Check the University Catalogs website at www.catalogs.umn.edu for the most current course information. The courses in this catalog are not offered every semester. To find out whether a course is offered during a particular semester, consult the online Class Schedule at onestop.umn.edu/registrar/registration/courses.html.

Course Designators
In conjunction with course numbers, departments and programs are identified by a 2-, 3-, or 4-letter designator prefix (e.g., CE for Civil Engineering, POL for Political Science, ECON for Economics). When no designator precedes the number of a course listed as a prerequisite, that prerequisite course is in the same department as the course being described.

Course Numbers
0xxx ...... Courses that do not carry credit toward any University degree.
1xxx ...... Courses primarily for undergraduate students in their first year of study.
2xxx ...... Courses primarily for undergraduate students in their second year of study.
3xxx ...... Courses primarily for undergraduate students in their third year of study.
4xxx ...... Courses primarily for undergraduate students in their fourth year of study; graduate students may enroll in such courses for degree credit. 4xxx courses can be counted for a Graduate School degree if the course is taught by a member of the graduate faculty or an individual appointed to Limited Teaching Status (LTS).
5xxx ...... Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Course Symbols
The following symbols are used throughout the course prerequisites of most University catalogs to denote common and recurring items of information.

*=........... Credit will not be granted if credit has been received for the course listed after this symbol.
&............ Concurrent registration is required (or allowed) in the course listed after this symbol.
#............ Approval of the instructor is required for registration.
%............ Approval of the department offering the course is required for registration.
@............ Approval of the college offering the course is required for registration.
,............ In prerequisite listings, comma means “and.”
1-4 cr [max 6]. The course can be taken for 1 to 4 credits and may be repeated for up to 6 credits.

Abbreviations
The following abbreviations are used throughout the course prerequisites of most University catalogs to denote common and recurring items of information.

Prereq......... Course prerequisites.
cr ................ Credit.
div ............. Division.
DUS ............ Director of undergraduate studies.
equiv .......... Equivalent.
fr, soph, jr, sr . Freshman, sophomore, junior, senior.
H............... Honors. Courses with an H following the course number satisfy honors requirements.
V............... Honors and Writing Intensive. Courses with a V following the course number satisfy both honors and liberal education writing intensive requirements.
W............... Writing Intensive. Courses with a W following the course number satisfy the writing intensive requirement for liberal education.
A-F only ......... A-F grade basis only; course may not be audited or take pass/fail
A-F or Aud ...... A-F grade basis, or course may be audited for no grade
S-N only ......... S-N grade basis only (pass/fail), course may not be audited or taken A-F
S-N or Aud ...... S-N grade basis (pass/fail), or course may be audited for no grade
No Grade ........ No grade will be given for the course; typically used for laboratory components of courses
OPT No Aud . Student selects the grading option; course may not be audited
Stdnt Opt ...... Student selects the grading option; course may be audited

Course Listing Sample

Xology (Xolo)

Xology and Diometrics
College of Liberal Education

Xolo 5101. Methods in Xology. (3-4 cr [max 8 cr]; A-F only. Prereq-3578 or #)
Historical, numerical, sociological, and Freudian methods of research in xology with applications to contemporary problems.
APPs 1620. Current Topics: Strategies for Student Success. (1 cr. [max 6 cr.]; Student Option No Audit; Every Fall & Spring)
For topics see class schedule.

APPs 1620H. Honors Current Topics: Strategies for Student Success. (1 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
For topics see class schedule.

Academic Health Center Shared (AHS)

AHS 1101. Orientation to Health Careers. (1 cr.; Student Option No Audit; Every Fall & Spring)
Interest/personality assessment, health-related academic majors/professions, professionalism/ethics in health care. Students integrate information about self and about careers to move toward major/career choice.

AHS 1102. Orientation to Health Careers. (1 cr.; Student Option No Audit; Every Fall & Spring)
Web course, Fall/spring—1cr. summer—2cr.
Interest/personality assessment, health-related academic majors/professions, professionalism/ethics. Integrating self-/career-related information.

AHS 1104. Experiences in Health. (2 cr.; Student Option: Every Fall, Spring & Summer)
Non-physician roles in health care from traditional to alternative and complementary roles. Minimum 35 hour volunteer experience with instructor approval. prereq: AHS 1101 or AHS 1102 or AHS 1600

AHS 1600. The Future Physician I: Medicine in the 21st Century. (1 cr.; A-F only; Every Fall)

AHS 1601. The Future Physician II. (1 cr.; Student Option; Every Fall & Spring)
A career in medicine. Life/work of physicians, what it takes to be successful. Issues/trends including Institute of Medicine core competencies, medical ethics, concept of health teams, multiculturalism, global issues, disparities in accessing medical care. prereq: Permission number; 1600 recommended

AHS 1602. The Future Physician III: Experiences in Health. (2 cr.; Student Option; Every Fall & Spring)
Online course for students confident in decision to prepare for medical school. Exercises designed to learn about/prepare for career in medicine. Community-based volunteer experience (35 hours) in setting that employs physicians/serves patients. prereq: [1600 or 1601], instr consent

AHS 2300. Orientation to Clinical Research. (1 cr.; A-F only; Every Fall & Spring)

AHS 2400. Writing a Personal Statement. (1 cr.; S-N only; Every Fall & Spring)
Develop competitive personal statement. Designed for students applying to health professional program in coming year.

AHS 3001. Health and Medicine in India in a Social and Cultural Context. (GP; 3 cr.; A-F only; Every Spring)
Students are required to attend two pre-orientations, travel to India on the global seminar, and complete a project and presentation upon their return to the United States. prereq: instr consent

AHS 3002. Global Health in Thailand - Humans, Elephants, and Disease. (GP; 3 cr.; A-F only; Every Spring)
Global Health in Thailand - This course involves a study abroad component to Thailand during Winter Break 2018. Please note that you must also apply for this seminar through the Learning Abroad Center. Registration deadline is October 1. Instructors: Karin Hamilton, DVM, MPH - College of Veterinary Medicine, Pre-Health Student Resource Center Dana Lovold, MPH - Pre-Health Student Resource Center Orientation dates: October 28, 2017, 8:30am-12:00pm AND December 2, 8:30am-12:00pm Abroad dates: December 27, 2017 - January 12, 2018 On campus classes: Wednesdays from 2:30pm - 3:20pm, January 17 - February 28, 2018; East Bank For more information, visit - http://www.umabroad.umn.edu/programs/asia-oceania/global-health-thailand/ or contact Amy Garwood-Diaz at garw0005@umn.edu

AHS 3101. The New Health Professions Team. (2 cr.; Student Option; Every Spring)
The future health of our world population requires a generation of creative, motivated, strategic, expansive thinkers prepared to collaborate across disciplines and sectors to preempt and address the causes of poor health in patients and populations. The knowledge and skills needed to be successful come from all disciplines, not just the health professions, and require us to learn about and work with each other. In addition to sharing discipline specific knowledge, the key is to translate concepts and language so interprofessional teams can identify, dissect, define, and solve health-related grand challenges together. This course will help students grow in their understanding and capacity to work in interdisciplinary teams in a multitude of settings, from serving patients to serving communities. As most of the knowledge, skills, and behaviors needed to work well with health care teams are the same for working successfully in general, this course also address many of the UMN Student Learning Outcomes (SLO) and Student Development Outcomes (SDO). prereq: This course is recommended for junior and senior undergraduate students pursuing a health career. Students are encouraged to take this course once they have completed many of their prerequisite courses for their major and their health profession. Students are also encouraged to have had some experience working or volunteering so they have some context for the course information.

AHS 4300. Directed Study. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Students complete project under supervision of instructor from Health Careers Center. Students provide written update at end of each term. A written progress report is required at end of project. prereq: instr consent

AHS 5100. HIV Drug Discovery. (3 cr.; A-F only; Every Fall)
Basic virology, medicinal chemistry, pharmacology of HIV chemotherapy. General process of drug discovery, including target selection/validation, in vitro assay development, computer-aided inhibitor design strategies/drug-like properties. Major classes of FDA-approved anti-HIV drugs. Intellectual properties, FDA regulatory issues, successful antiretroviral discovery story. prereq: One year of organic chemistry, [CHEM 2301 and 2302] or equivalent, one semester of biochemistry, [BIOC 3021 or equivalent]

Accounting (ACCT)

ACCT 2050. Introduction to Financial Reporting. (4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Introduction to financial accounting for U.S. organizations. Reading financial statements. prereq: Soph

ACCT 2050H. Honors: Introduction to Financial Reporting. (4 cr.; A-F or Audit; Every Fall & Spring)
Introduction to financial accounting for U.S. organizations. Reading financial statements.

ACCT 3001. Introduction to Management Accounting. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Costing techniques, including activity-based costing. Applying costing methods to determine costs of products, services, and production processes. Use of costs in operating/strategic decisions. prereq: 2050

ACCT 3150. Role of the Accountant in Today's Finance Function. (1 cr.; A-F only; Every Fall & Spring)
How to interact with financial, tax, audit, and IT personnel. How to be an accountant. Critical support role accountants play among market leading companies. Students define their vision for their accounting career. prereq: 2050

ACCT 5101. Intermediate Accounting I. (4 cr.; A-F or Audit; Every Fall & Spring)
Valuation, measurement, reporting issues related to selected assets/liabilities of firm. Theory underlying accounting issues. Applying accounting principles. prereq: Grade of at least B- in 2050, mgmt major or mgmt grad student, accounting certificate, select non mgmt students

ACCT 5102. Intermediate Accounting II. (4 cr.; A-F or Audit; Every Fall & Spring)
Basic valuation problems encountered in financial reporting. Focuses on valuation of liabilities. Accounting for leases, pensions, and deferred taxes. Introduces consolidated financial statements. prereq: 5101 [mgmt or grad mgmt student]

ACCT 5125W. Auditing Principles and Procedures. (WI; 4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Concepts of auditing, internal control/financial statements in accordance with generally accepted auditing/professional standards established by Public Company Oversight Board (PCAOB) and American Institute of Certified Public Accountants (AICPA). Writing Intensive course. prereq: [3101 or 5101 or 5102 or 6100], [acct major or grad mgmt student]

ACCT 5126. Internal Auditing. (; 2 cr.; A-F or Audit; Every Fall & Spring)
Financial/operational auditing. Standards. Managing the function. prereq: 2050

ACCT 5135. Fundamentals of Federal Income Tax. (; 4 cr.; A-F or Audit; Every Fall, Spring & Summer)
U.S. federal system of taxation. Concepts of gross income, deductions, credits. Analysis of structure of Internal Revenue Code, its provisions with respect to specific areas of law. Interrelationships between legislative, judicial, and administrative authority. Methods, tools, and techniques to conduct tax research. prereq: [2050 or MBA 6030], [mgmt or grad mgmt student]

ACCT 5160. Financial Statement Analysis. (; 2 cr.; A-F or Audit; Every Fall & Spring)
Interpretation/analysis of financial statements. Introduces basic techniques of financial statement analysis and applies them in different settings (e.g., in investment/credit decisions). prereq: [5100/6100 or 3101/5101], [accounting or finance major]

ACCT 5180. Consolidations and Advanced Reporting. (2 cr.; A-F or Audit; Every Spring & Summer)
Theory underlying preparation of consolidated financial statements, as well as mechanical computations needed to prepare statements. prereq: 5101, 5102 recommended, or MBA 6030. MBA students must register A/F grade base.

ACCT 5201. Intermediate Management Accounting. (2 cr.; A-F or Audit; Every Fall & Spring)
This course is an in-action course. The course explores the topic of management accounting in greater depth. The course expands introductory course material via special emphasis on decision making, problem solving skills and exploration of accounting’s role within overall management. The course is an in-action class. We will have a project working on a business case from a firm as the final assessment for the course. prereq: 3001, acct or finance major

ACCT 5236. Introduction to Taxation of Business. (; 2 cr.; A-F or Audit; Every Fall & Spring)
Introduction to the income tax laws governing the taxation of corporations, partnerships, limited liability companies, limited liability partnerships, and S corporations. Students will also increase their knowledge and skills related to tax research by writing research memorandums. prereq: 5135, acct major

ACCT 5310. International Accounting. (; 2 cr.; A-F or Audit; Every Fall & Spring)
Causes/history of international differences in design of financial accounting/reporting systems, efforts to harmonize them into worldwide system. Role/impact of currency translation on financial statements. International Accounting Standards, conceptual framework. prereq: 5101; [5102 or concurrent registration is required (or allowed) in 5102] recommended

ACCT 5420. MAcc directed study. (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Internship or directed study in Master of Accountancy degree program. prereq: MAcc student

ACCT 6075. Managing the Global Corporate Tax Rate. (; 2 cr.; A-F only; Periodic Summer)

ACCT 6100. Financial Statement Analysis. (; 4 cr.; A-F only; Every Fall)
Overview of asset/liability valuation, income measurement. How economic events are reported in the financial statements of a firm. Accounting theory/standard-setting process from perspective of users of financial statements. prereq: MBA 6030, MBA student

ACCT 6101. Financial Accounting II. (; 2 cr.; A-F or Audit; Every Fall)

ACCT 6140. Managerial Economics. (; 3 cr.; A-F only; Every Fall & Spring)
N/A prereq: MBA 6030, MBA 6035

ACCT 6201. Control and Incentives. (; 4 cr.; A-F only; Every Fall & Spring)
Design of activity-based costing, performance measurement, and incentive systems to support strategy of firm. Use of accounting measurements in balanced scorecard, economic value-added, and decentralized decision making. Information issues in design of incentive systems. prereq: MBA 6235; micro economics recommended

ACCT 6320. Current Topics in Accounting. (; 1-4 cr.; A-F only; Periodic Fall & Spring)
Topics vary. prereq: MBA 6130, MBA student

ACCT 6335. Advanced Managerial Accounting. (; 2 cr.; A-F or Audit; Every Spring)
Topics of current interest. Detailed treatment of concepts learned in core. Application of concepts in complex settings. Harvard cases. prereq: MBA 6035 or MBA 6235

ACCT 6601. Internal Control. (4 cr.; A-F only; Every Fall)

ACCT 6602. Securities and Exchange Commission (SEC) and Standard Setting. (4 cr.; A-F only; Every Fall & Spring)

ACCT 6603. Advanced Auditing. (4 cr.; A-F only; Every Fall)
Auditing of derivatives, business combinations, fair value instruments, and other accounting topics. Evaluating the discipline of forensic accounting.

ACCT 6604. Advanced Management Accounting. (2 cr.; A-F only; Every Fall)
Advanced Management Accounting will expose students to the application of management accounting from a strategic perspective. Students will deepen their knowledge and understanding of management accounting? s role in areas such as sustainability, environmental accounting, time-based accounting, including time-based activity-based costing, activity-based management, value chain analysis, business process re-engineering, benchmarking, target costing, product life cycle management, quantifying qualitative improvements and $big data?. Via cases and discussion of current articles, students will explore the most current and challenging issues facing management accountants.

ACCT 6605. Negotiations for Financial Executives. (2 cr.; A-F only; Every Spring)
In Negotiations for Financial Executives, students will develop an individual negotiating style and learn to adapt their negotiating style to various situations. Students will learn the methods and frameworks for negotiating effectiveness: preparation, setting high expectations, listening, and a commitment to ethics. During the class, students will have opportunities to apply the preparation model to plan a negotiation and actually apply their knowledge in a live case situation.

ACCT 8801. Topics in Empirical Research I. (; 2 cr.; max 4 cr.; Student Option; Every Fall & Spring)
Capital-markets stream of empirical research in accounting. Accounting earnings and stock prices, earnings-based security valuation (theoretical and empirical), estimation of earnings-based risk measures, market anomalies, and related topics from corporate
finance. Econometric techniques in market-based empirical research/application to data analysis. prereq: Business admin PhD student or instr consent

**ACCT 8802. Topics in Empirical Research II.** (2 cr.; Student Option; Every Fall & Spring) Empirical capital markets research topics course. The course is designed to include current research topics in capital markets that are cutting-edge and topics in the instructor's area of expertise. Topics will vary with each offering.

**ACCT 8803. Topics in Empirical Research III.** (2 cr.; A-F only; Every Fall & Spring) The course is designed to include current research topics in Empirical Research that are cutting-edge and topics in the instructor's area of expertise. Topics will vary with each offering.

**ACCT 8804. Empirical Research Topics II.** (2 cr.; Student Option; Every Fall & Spring) Current research topics that are cutting edge and in instructor's area of expertise. Topics in the area will vary.

**ACCT 8811. Information Economics I.** (2 cr.; Student Option; Periodic Fall & Spring) Asymmetric information, incentives, and contracts. Moral hazard, adverse selection, reputation, and signaling phenomena. Applications to accounting such as transfer pricing, budgeting, cost allocations, performance measurement, audit pricing. prereq: Business admin PhD student or instr consent

**ACCT 8812. Information Economics II.** (4 cr.; Student Option; Every Fall & Spring) Information in capital markets; asset pricing with asymmetric information; economics of disclosure and information acquisition, prereq: Business admin PhD student or instr consent

**ACCT 8813. Information Economics III.** (2 cr.; A-F only; Every Fall & Spring) Asymmetric information, incentives, and contracts. Moral hazard, adverse selection, reputation, and signaling phenomena. Applications to accounting such as transfer pricing, budgeting, cost allocations, performance measurement, audit pricing.

**ACCT 8821. Capital Markets I.** (2 cr.; Student Option; Every Fall & Spring) Auction markets; price formation in experimental asset markets; experimental studies of information transfer and capital market efficiency; experimental tests of strategic behavior, trust, and reciprocity.

**ACCT 8822. Capital Markets II.** (2 cr.; Student Option; Every Fall & Spring) Heuristics and biases in information processing, auditor judgment, mental accounting, and decision aids.

**ACCT 8823. Capital Markets III.** (2 cr.; A-F only; Periodic Fall & Spring) PhD seminar course concentrating on current topics in Capital Markets.

**ACCT 8831. Analytical Research Topics I.** (2 cr.; Student Option; Every Fall & Spring) The course is designed to include current analytical research topics that are cutting-edge and topics in the instructor's area of expertise. Topics will vary with each offering.

**ACCT 8832. Analytical Research Topics II.** (2 cr.; Student Option; Every Fall & Spring) The course is designed to include current analytical research topics that are cutting-edge and topics in the instructor's area of expertise. Topics will vary with each offering.

**ACCT 8833. Topics in Analytical Research III.** (2 cr.; A-F only; Periodic Fall & Spring) PhD seminar course focusing on current topics in Analytical Research

**ACCT 8892. Readings in Accounting.** (1-8 cr.; max 16 cr.) Student Option; Every Fall, Spring & Summer) Readings appropriate to an individual student's program or objectives that are not available in regular courses. prereq: Business admin PhD student or instr consent

**ACCT 8894. Research in Accounting.** (1-8 cr.; max 16 cr.) Student Option; Every Fall, Spring & Summer) Individual research on an approved topic appropriate to student's program and objectives. prereq: Business admin PhD student or instr consent

### Addiction Studies (ADDS)

**ADDS 5011. Foundations in Addiction Studies.** (2 cr.; A-F only; Every Fall & Spring) Theoretical perspectives/concepts related to etiology of alcohol/drug dependency/abuse. Emphasizes bio-psycho-social models of addiction/disease; psychodynamics, social learning, contingency, family systems. Connection of theory to empirical research.

**ADDS 5021. Introduction to Evidence Based Practices and the Helping Relationship.** (3 cr.; A-F only; Every Fall & Spring) Initiating, conducting, and terminating a counseling relationship. Use of self in counseling process. Nature/process of helping. Evidence-based practices/theories. Reading, discussion, written exercises, role-play, observation, feedback, out-of-class practice.

**ADDS 5031. Applied Psychopharmacology.** (2 cr.; A-F only; Every Fall & Spring) Categories of psychoactive drugs. Medicines to treat mental disorders. Substances such as alcohol, nicotine, cocaine, and marijuana. What occurs physiologically when someone takes a psychoactive drug.

**ADDS 5041. Methods and Models I: Motivational Counseling.** (2 cr.; A-F only; Every Fall, Spring & Summer) Concepts of motivational interviewing. Spirit of MI. Primary counseling skills. Working with resistance. Identifying/elicitng change talk. Transitioning into change, negotiating treatment plan. Strengths/shortcoming of MI. prereq: 5021

**ADDS 5051. Methods and Models II: Cognitive Behavioral Therapy.** (2 cr.; A-F only; Every Fall, Spring & Summer) Components of cognitive model. Assessment, case formulation, automatic thoughts, core beliefs, cognitive restructuring, behavior change elements, therapeutic relationship. Learn, practice, master key concepts.

**ADDS 5061. Foundations of Group Work.** (3 cr.; A-F only; Every Fall & Spring) Designing/facilitating therapy groups. Intra-/inter-personal dynamics, leadership skills, developmental aspects, ethical issues. Application to therapy of chemically addicted individuals. Lectures, discussion, experiential exercises, small groups, readings.

**ADDS 5071. Foundations of Co-occurring Disorders.** (2 cr.; A-F only; Every Fall, Spring & Summer) Understanding mentally ill/chemically abusive or dependent client. Intervention, advocacy, education, support for client/those part of his/her environment. Social, environmental, multicultural factors that contribute resources for these clients.

**ADDS 5081. Multicultural Foundations of Behavioral Health.** (3 cr.; A-F only; Every Fall & Spring) What is culture? How might culture, cultural practices, and history be significant in the use/abuse of substances? How is culture relevant to the attitudes/practices in the prevention/treatment of substance use/abuse? Multicultural counseling and cultural competence in addiction counseling. People as individuals. Clinician's own cultural worldview/other cultural worldviews.

**ADDS 5091. Assessment and Treatment Planning I.** (3 cr.; A-F only; Every Fall, Spring & Summer) Core addictions counseling. Clinical assessment, case management, documentation treatment planning, ethical issues. Students begin process of securing internship.

**ADDS 5121. Professional Seminar 1.** (1 cr.; S-N only; Every Fall, Spring & Summer) Prepares students for successful entry into field of substance use disorder counseling by focusing on facets that are critical to their professional development. Through discussions, experiential learning activities, guest lectures and site visits, students gain further understanding of the internship placement process and requirements, settings that fit their individual training and career goals, requirements for initial licensing and renewal, the testing process, models of professional development, the importance of professional advocacy and associations, self-care and requirements and benefits of clinical supervision. Professional ethics, including state rules, statutes, codes of conduct and regulations for practitioners and agencies are also addressed. Students will also develop their job search skills and apply them to secure a field placement for the internship seminar.

**ADDS 5224. Integrating Spirituality in Counseling Practice.** (2 cr.; A-F only; Every Fall, Spring & Summer) Knowledge/skills of counseling students/practitioners in professional competencies for addressing spiritual/religious issues. Lecture,
This course is a requirement for all third year medical students. Its goal is to prepare medical students to recognize, diagnose, and care for patients with psychiatric disorders encountered in most medical practices.  

ADPY 7502. Elective Rotation In Addiction Medicine.  
(6 cr.; H-N or Audit; Every Fall & Spring)  
Elective rotations are offered in a variety of substance abuse treatment settings. Our program is innovative and flexible, using interventions from many schools. Each treatment plan is fully individualized, and may include 12-step approaches, Rational Recovery, social learning theory, and psychiatric care. Designed for students of any specialty. prereq: ADPy 7-500  

ADPY 7503. Elective Experience in Research in Addiction Medicine.  
(3-6 cr.; H-N or Audit; Every Fall & Spring)  
A variety of clinical research projects offer the student excellent opportunities for developing research skills, as well as a deeper understanding of the addiction process. Ongoing projects include research on medical complications of alcoholism, treatment of alcohol and other drug dependence, brain imaging, neuropsychological testing and impairment, case management, and homelessness and alcohol/drugs. Other projects are available or possible and can be arranged. prereq: Approval of course director  

ADPY 7505. Assessment and Treatment of Torture Victims.  
(2 cr.; H-N or Audit; Every Fall, Spring & Summer)  
How to assess/treat survivors of political torture. As part of an interdisciplinary team, students have patient contact, participate in special projects. Two-week field experience. prereq: 7500, MED 7500, med sr  

ADPY 7512. Psychiatry Consultation/ Liaison.  
(4 cr.; H-N only; Every Fall, Spring & Summer)  
The student is teamed with a resident and staff who supervise progressive participation in service activities. Case-directed teaching is complemented by seminars with assigned readings and service conferences.  

ADPY 7514. Substance Abuse and Associated Psychiatric Disorders.  
(6 cr.; H-N or Audit; Periodic Fall & Spring)  
The student works with patients with substance use and/or abuse disorders. The student’s involvement covers a spectrum of services including inpatient, intensive outpatient program, partial hospitalization, outpatient program, and outpatient follow-up. Supervision is conducted by Senior G-4 Resident and Staff. prereq: Approval of course director  

ADPY 7516. Chemical Dependency Services.  
(2 cr.; H-N only; Every Fall, Spring & Summer)  
The student’s time is spent primarily in group therapy and lecture settings in the adult chemical dependency unit. The student will meet with the medical director during the rotation.  

ADPY 7518. Geriatric Psychiatry.  
(4 cr.; H-N only; Every Fall, Spring & Summer)  
See patients 60+ years/their families. Evaluate brain-behavior complications of medical/neurological illness.  

ADPY 7530. Psychiatry Scholarly Work.  
(4 cr.; H-N only; Every Fall, Spring & Summer)  
The student arranges a program with a faculty supervisor. Choosing the supervisor and the content of the course is the student’s responsibility and must be approved by the faculty supervisor and course director. The student arranges a program with a faculty supervisor. Choosing the supervisor and the content of the course is the student’s responsibility and must be approved by the faculty supervisor and Dr. Mackenzie.  

ADPY 7535. Clinical Practice of Psychiatry.  
(4 cr.; H-N only; Every Fall, Spring & Summer)  
The various clinical experiences provide opportunities for diagnostic evaluation and treatment for a range of psychiatric disorders in adults and/or children, including bipolar and unipolar affective disorders, anxiety disorders, adjustment disorders, attentional disorders, personality disorders and some psychotic disorders.  

ADPY 7640. Essentials of Interdisciplinary Health Care.  
(1 cr.; H-N or Audit; Periodic Fall & Spring)  
Knowledge/skills to work successfully in interdisciplinary health care. Web-based course.  

ADPY 7910. Adult Psychiatry Medical Residency.  
(6 cr.; [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)  
Adult psychiatry medical residency.  

ADPY 7911. Psychiatry PGY-1 at VA Medical Center.  
(8 cr.; [max 24 cr.]; H-N or Audit; Every Spring & Summer)  
Introduction to wide variety of psychiatric topics. Lectures by invited speakers and by clinical/psychiatric faculty. prereq: PGY-1 psychiatry resident, dept consent  

ADPY 7930. Adult Psychiatry Medical Fellowship.  
(6 cr.; [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)  
Adult psychiatry medical fellowship.  

ADPY 7952. Geriatric Psychiatry Fellowship  
VA Med Ctr.  
(6 cr.; [max 24 cr.]; H-N or Audit; Periodic Fall)  
Fifth year fellowship in geriatric psychiatry at VA Medical Center. prereq: Psychiatric resident/fellow, dept consent  

ADPY 7971. Consultation Liaison  
Psychiatric Fellowship.  
(8 cr.; H-N or Audit; Every Spring & Summer)  
Fifth year fellowship in consult-liaison psychiatry. prereq: C-L fellow/psychiatric resident, dept consent  

ADPY 7972. Psychiatric Child Fellowship: Year I.  
(8 cr.; [max 24 cr.]; H-N or Audit; Every Fall, Spring & Summer)  
First year of two-year fellowship in child/adolescent psychiatry, PGY-4 level. prereq: Psychiatric resident/fellow, dept consent  

ADPY 7973. Chemical Dependency Fellowship.  
(8 cr.; [max 24 cr.]; H-N or Audit; Every Spring & Summer)  

AEM 1301. Ballooning: Design, Build, and Fly. (2 cr. [max 4 cr.]; Student Option No Audit; Every Fall) Lighter-than-air vehicles have a long history including, though not starting with, the first flights to carry people (under hot-air balloons) in the late 1700s in France. The use of hydrogen, then later helium, as lifting gas allowed balloons to carry payloads to much higher altitudes, including into the stratosphere. Tethered balloons were used for military applications during the American Civil War, WWI, and WWII. By the 1930s self-propelled rigid airships, such as German Zeppelins, and non-rigid airships, often called blimps, regularly carried passengers and cargo across the Atlantic. In this hands-on course we will hone a variety of useful design/build skills, including microcontroller programming, soldering, CAD, and radio control, then design and build miniature airships and use them to perform missions in indoor flying spaces. The main flight event, possibly styled as a competition, will be a required day-long class activity on a weekend date late in the semester (and announced at the start of the semester). The class will also include balloon-related experiments and data analysis, plus historical presentations about ballooning.

AEM 1805. First Year Projects: Aircraft and Spacecraft. (2 cr. [max 4 cr.]; Student Option No Audit; Periodic Fall & Spring) Topics related to air and space travel with an emphasis on hands-on projects and activities.


AEM 2301. Mechanics of Flight. (3 cr.; A-F or Audit; Every Spring) Standard atmospheric properties, basic aerodynamics, operation of lift/drag. Airfoils, finite wings. Elements of aircraft performance and atmospheric flight mechanics. Introduction to Matlab and simulations for aircraft design. prerequisite: PHYS 1301W, [concurrent registration is required (or allowed) in MATH 2374 or equiv], CSE

AEM 4253. Computational Fluid Mechanics. (3 cr.; A-F only; Every Fall) Introductory concepts in finite difference and finite volume methods as applied to various ordinary/partial differential model equations in fluid mechanics. Fundamentals of spatial discretization and numerical integration. Numerical linear algebra. Introduction to engineering and scientific computing environment. Advanced topics may include finite element methods, spectral methods, grid generation, turbulence modeling. prereq: 4201, CSCI 1113, CSE upper division

AEM 4295. Problems in Fluid Mechanics. (3 cr.; A-F only; Every Fall, Spring & Summer) Topics of current interest. Individual projects with consent of faculty sponsor. prereq: dept consent

AEM 4301. Orbital Mechanics. (3 cr.; A-F or Audit; Every Spring) The two-body problem. Earth-satellite operations, orbit performance, reentry dynamics, space environments, interplanetary trajectories. Numerical simulations. Design project. prereq: [2012 or equiv], [MATH 2373 or equiv], [CSE upper div or grad student]

AEM 4303W. Flight Dynamics and Control. (WI; 3 cr.; A-F only; Every Spring) Forces/moments, trim, linearization, transfer functions, dynamic response characteristics for aircraft. Aircraft stability/controllability, static longitudinal/lateral stability. Phugoid, short period, spiral, roll subsidence, dutch roll modes. Handling qualities. Design project. prereq: [2012, 2301, 3101, [WRIT 1301 or equiv], [CSE upper div or grad student]] or instr consent

AEM 4305. Spacecraft Attitude Dynamics and Control. (3 cr.; A-F or Audit; Every Spring) Kinematics/dynamics for six-degree of freedom rigid body motions. Euler's angles/equations. Torque free motion, spin stabilization, dual-spin spacecraft, nutation damping, gyroscopic attitude control, gravity gradient stabilization. Linear systems analysis, Laplace transforms, transfer function control theory. PID controllers. prereq: [4301, [3101 or ME 3281 or EE 3015], CSE upper div] or grad student

AEM 4321. Automatic Control Systems. (3 cr.; A-F only; Every Fall) Modeling, characteristics, and performance of feedback control systems. Stability, root locus, and frequency response methods. Nyquist and Bode diagrams. Lead-lag and PID compensators. Digital implementation and hardware considerations. prereq: CSE upper div or grad student

AEM 4331. Aerospace Vehicle Design. (4 cr.; A-F only; Every Fall) Multidisciplinary student teams perform conceptual designs of aerospace vehicles, components, missions, or systems that incorporate realistic constraints/applicable engineering standards. Papers on professional ethics/contemporary aerospace issues. Oral preliminary/critical design reviews. prereq: [2301, 4202, AEM sr] or instr consent

AEM 4333. Aerospace Design: Special Projects. (3 cr.; [max 6 cr.]; Student Option; Every Spring) Student groups design, build, and test aerospace projects. Projects include designs from 4331 or projects such as microgravity experiments. Students keep design log/ notebook, prepare status reports, and give final oral presentation. prereq: 4331 or instr consent

AEM 4495. Problems in Aerospace Systems. (3 cr.; A-F only; Every Fall, Spring & Summer) Topics of interest or individual projects.

AEM 4501. Aerospace Structures. (3 cr.; A-F or Audit; Every Spring) Advanced strength of materials analysis of elastic structures with aerospace applications; failure modes and criteria, buckling, matrix methods for analysis, plane truss design; energy and Castigliano methods for statically determinate and indeterminate structures; torsion and bending of asymmetrical thin-walled sections. Design project. prereq: CSE upper div or grad, 3031 or equiv

AEM 4502. Computational Structural Analysis. (3 cr.; Student Option; Fall Odd Year) Application of finite element methods to problems in structural analysis. Emphasizes properly posing problems and interpreting calculation results. Use of commercial FEA packages. Introduction to theory of finite elements. prereq: [Grade of at least C in 4501, [CSE upper div or grad student]] or instr consent

AEM 4511. Mechanics of Composite Materials. (3 cr.; Student Option; Every Spring) Analysis, design, and applications of laminated and chopped fiber reinforced composites. Micro- /macro-mechanical analysis of elastic constants, failure, and environmental degradation. Design project. prereq: 3031, [CSE upper div or grad student]

AEM 4581. Mechanics of Solids. (3 cr.; Student Option; Fall Even Year) Continuum mechanics in one dimension: kinematics; mass, momentum/energy, constitutive theory. Wave propagation, heat conduction. Strings. Euler-Bernoulli theory, 3-D deformations/stress. Topics from fracture mechanics, structural stability, vibrations, thin films, layered media, smart materials, phase transformations, 3-D elastic wave propagation. Elasticity, viscoelasticity, plasticity, prereq: 3031, [Math 2373 or equiv], [Math 2374 or equiv], CSE upper div

AEM 4595. Problems in Mechanics and Materials. (1-3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Topics of current interest. Individual projects with consent of faculty sponsor. prereq: dept consent

AEM 4601. Instrumentation Laboratory. (3 cr.; A-F or Audit; Every Spring) Introduction to lab instrumentation. Computerized data acquisition. Statistical analysis of data. Time series data, spectral analysis. Transducers for measurement of solid, fluid, and dynamical quantities. Design of experiments. prereq; CSci 1113, EE 3505, EE 3006, [upper div BAEM]

AEM 4602W. Aeromechanics Laboratory. (WI; 4 cr.; A-F or Audit; Every Fall) Experimental methods/design in fluid/solid mechanics. Wind tunnel/water channel experiments with flow visualization, pressure, velocity, force measurements. Measurement of stresses/strains/displacements in solids/structures: stress concentrations, materials behavior, structural dynamics. Computerized data acquisition/analysis, error analysis, data reduction. Experiment design. Written/oral reports. Lab ethics. Writing intensive. prereq: 4201, 4501, 4601, [WRIT 1301 or equiv], [CSE upper div or grad]

AEM 4796. Professional Experience. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Work experience with substantive engineering component. Written report. prereq: CSE upper div, AEM major, dept consent

AEM 4894H. Senior Honors Thesis. (3 cr.; A-F only; Every Spring) Writing thesis under direction of AEM faculty member, prereq: Honors student, permission of University Honors Program, AEM major

AEM 4896. International Professional Experience. (3 cr.; A-F only; Every Fall, Spring & Summer) International work experience with substantive engineering component. Written report. prereq: CSE upper div, AEM major, dept consent

AEM 5247. Hypersonic Aerodynamics. (3 cr.; A-F or Audit; Spring Odd Year) Importance/properties of hypersonic flow. Hypersonic shock and expansion-wave relations. Local surface inclination methods. Approximate/exact methods for hypersonic inviscid flow fields. Viscous flow: boundary layers, aerodynamic heating, hypersonic viscous interactions, computational methods. Hypersonic propulsion and vehicle design. prereq: 4202 or equiv, CSE grad student

AEM 5253. Computational Fluid Mechanics. (3 cr.; A-F or Audit; Every Fall) Introductory concepts in finite difference and finite volume methods as applied to various ordinary/partial differential model equations in fluid mechanics. Fundamentals of spatial discretization and numerical integration. Numerical linear algebra. Introduction to engineering and scientific computing environment. Advanced topics may include finite element methods, spectral methods, grid generation, turbulence modeling. prereq: [4201 or equiv], [CSci 1113 or equiv], CSE grad student

AEM 5321. Modern Feedback Control. (3 cr.; Student Option; Every Fall) State space theory for multiple-input-multiple-output aerospace systems. Singular value decomposition technique, applications to performance/robustness. Linear quadratic control
gussian and eigenstructure assignment design methods. Topics in H[infinity symbol]. Applications. prereq: 4321 or EE 4233 or ME 5281 or equiv

AEM 5333. Design-to-Flight: Small Uninhabited Aerial Vehicles. (3 cr.; A-F only; Periodic Spring)
Designing, assembling, modeling, simulating, testing/lying of uninhabited aerial vehicles. Rapid prototyping software tools for vehicle modeling. Guidance, navigation, flight control, real-time implementations, hardware-in-the-loop simulations, flight tests. prereq: [4202, concurrent registration is required (or allowed) in 4303W, 4601 or equiv], instr consent

AEM 5401. Intermediate Dynamics. (; 3 cr.; A-F or Audit; Every Fall)
Three-dimensional Newtonian mechanics, kinematics of rigid bodies, dynamics of rigid bodies, generalized coordinates, holonomic constraints, Lagrange equations, applications. prereq: CSE upper div or grad, 2012, Math 2243

AEM 5451. Optimal Estimation. (; 3 cr.; Student Option; Fall Even Year)
Basic probability theory. Batch/recurseeleast squares estimation. Filtering of linear/non-linear systems using Kalman and extended Kalman filters. Applications to sensor fusion, fault detection, and system identification. prereq: [MATH 2243 or STAT 3021 or equiv], [4321 or EE 4231 or ME 5281 or equiv] or instr consent

AEM 5501. Continuum Mechanics. (3 cr.; Student Option; Every Fall)
Concepts common to all continuous media; elements of tensor analysis; motion, deformation, vorticity; material derivatives; mass, continuity equation; balance of linear, angular momentum; geometric characterization of stress; constitutive equations. prereq: CSE upper div or grad, 3031, Math 2243 or equiv or instr consent

AEM 5503. Theory of Elasticity. (; 3 cr.; A-F or Audit; Every Spring)
Introduction to the theory of elasticity, with emphasis on linear elasticity. Linear and nonlinear strain measures, boundary-value problem for linear elasticity, plane problems in linear elasticity, three dimensional problems in nonlinear elasticity. Topics in nonlinear elasticity, micromechanics, contact problems, fracture mechanics. prereq: 4501 or equiv, Math 2263 or equiv or instr consent

AEM 5581. Mechanics of Solids. (3 cr.; Student Option; Fall Even Year)
Continuum mechanics in one dimension: kinematics; mass, momentum/energy, constitutive theory. Wave propagation, heat conduction. Strings. Euler-Bernoulli theory. 3-D deformations/stress. Topics from fracture mechanics, structural stability, vibrations, thin films, layered media, smart materials, phase transformations, 3-D elastic wave propagation. Elasticity, viscoelasticity, plasticity. prereq: 3031 or equiv, [Math 2373 or equiv], [Math 2374 or equiv], [CSE grad student]

AEM 5581. Mechanics of Solids. (3 cr.; Student Option; Fall Even Year)
Continuum mechanics in one dimension: kinematics; mass, momentum/energy, constitutive theory. Wave propagation, heat conduction. Strings. Euler-Bernoulli theory. 3-D deformations/stress. Topics from fracture mechanics, structural stability, vibrations, thin films, layered media, smart materials, phase transformations, 3-D elastic wave propagation. Elasticity, viscoelasticity, plasticity. prereq: 3031 or equiv, [Math 2373 or equiv], [Math 2374 or equiv], [CSE grad student]

AEM 5651. Aeroelasticity. (; 3 cr.; A-F or Audit; Every Fall)
Static aeroelastic phenomena, torsional divergence of a lifting surface, control surface reversal. Aerelastic flutter, unsteady aerodynamics. Problems of gust response, buffetig. Design project. prereq: 4202, 4301, [grad student or CSE upper div]

AEM 8000. Seminar: Aerospace Engineering and Mechanics. (; 1 cr. [max 4 cr.]; S-N or Audit; Every Fall & Spring)
To be determined prereq: DGS consent

AEM 8201. Fluid Mechanics I. (; 3 cr.; Student Option; Every Fall)
Mathematical and physical principles governing the motion of fluids. Kinematic, dynamic, and thermodynamic properties of fluids; stress and deformation; equations of motion; analysis of rotational and irrotational inviscid incompressible flow; two-dimensional and three-dimensional potential flow. prereq: 4201 or equiv, Math 2263 or equiv

AEM 8202. Fluid Mechanics II. (; 3 cr.; Student Option; Every Spring)
Analysis of incompressible viscous flow; creeping flows; boundary layer flow. prereq: 8201

AEM 8203. Fluid Mechanics III. (; 3 cr.; Student Option; Every Fall)
Analysis of compressible flow and shock waves; method of characteristics for one-dimensional unsteady flow and for two-dimensional steady flow. prereq: 8202

AEM 8207. Hydrodynamic Stability. (; 3 cr. [max 4 cr.]; Student Option; Periodic Fall)

AEM 8211. Theory of Turbulence I. (; 3 cr.; Student Option; Periodic Fall)
Reynolds equations, methods of averaging, elements of stability theory and vortex dynamics; description of large vortical structures in mixing layers and boundary layers; horseshoe vortices; flow visualization. prereq: 8202

AEM 8212. Theory of Turbulence II. (; 3 cr.; Student Option; Periodic Fall)
Prandtl's mixing length theory applied to classical boundary layer, pipe, jet, and wake flows; prediction methods used at Stanford Conference; law of wall; law of wake; K-epsilon method. prereq: 8211

AEM 8213. Turbulent Shear Flows. (; 3 cr.; A-F or Audit; Periodic Fall)
Equations of motion for turbulent flow. Isotopic/homogeneous turbulence. Free shear flows. Wall turbulence, elements of vortex dynamics. prereq: 8201, 8202

AEM 8221. Rheological Fluid Mechan.ics. (; 3 cr.; Student Option; Periodic Fall)
Methods of solution for flows of simple fluids with general constitutive equations. Topics from viscometric flow, extensional flow, perturbations of the rest state with steady and unsteady flow, secondary flow. prereq: 8201 or 5501 or instr consent

AEM 8231. Molecular Gas Dynamics. (; 3 cr.; Student Option; Periodic Fall)
Kinetic theory of gases, Boltzmann equation, Maxwell-Boltzmann distribution, collisions, transport properties. Introduction to quantum mechanics. Statistical thermodynamics, classical/quantum statistics. Partition functions and thermodynamic properties. Irreversible thermodynamics. prereq: [4201 or equiv], [4203 or equiv], [ME 3324 or equiv]

AEM 8232. Physical Gas Dynamics and Molecular Simulation. (3 cr.; A-F or Audit; Periodic Spring)
Molecular description of gas dynamics. Kinetic theory, transport theory, quantum mechanics for internal energy partitions, statistical thermodynamics. Finite rate chemical kinetics. Emphasis on link to continuum fluid dynamics. Overview of numerical simulation techniques for the Boltzmann equation with emphasis on direct simulation Monte Carlo. prereq: AEM 8231

AEM 8241. Perturbation Methods in Fluid Mechanics. (; 3 cr.; Student Option; Periodic Fall)
Method of matched asymptotic expansions presented through simple examples and applied to viscous flows at high and low Reynolds numbers and other problems in fluid mechanics and applied mathematics. prereq: 8202 or instr consent

AEM 8251. Finite-Volume Methods in Computational Fluid Dynamics. (; 3 cr.; Student Option; Periodic Spring)
Development of finite-volume computational methods for solution of compressible Navier-Stokes equations. Accuracy, consistency, and stability of numerical methods; high-resolution upwind shock-capturing schemes; treatment of boundary conditions; explicit and implicit formulations; considerations for high performance computers; recent developments and advanced topics. prereq: 4201 or 8201 or equiv, COS 3107 or equiv

AEM 8253. Computational Methods in Fluid Mechanics. (; 3 cr.; A-F or Audit; Periodic Fall)

AEM 8261. Nonlinear Waves in Mechanics. (; 3 cr.; Student Option; Periodic Fall)
Theory of kinematic, hyperbolic, and dispersive waves, with application to traffic flow, gas dynamics, and water waves. prereq: 5501 or instr consent

AEM 8271. Experimental Methods in Fluid Mechanics. (; 3 cr.; Student Option; Periodic Fall)
Overview of computer organization, including external communications and A/D, D/A conversion. Measurement techniques, such as
pressure measurements and hot-wire and laser Doppler anemometry. Signal processing and uncertainty; computer control of experiments. prereq: 4201, inst consent

AEM 8295. Selected Topics in Fluid Mechanics. (1-4 cr. [max 8 cr.]; Student Option; Periodic Fall, Spring & Summer) Includes individual student projects completed under guidance of a faculty sponsor. prereq: dept consent

AEM 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

AEM 8400. Seminar: Aerospace Systems. (1 cr.; max 4 cr.; S-N or Audit; Every Fall & Spring) Developing program of research in aerospace Systems. Discussions of current research/topics of interest. prereq: Aeron Eng grad student


AEM 8421. Robust Multivariable Control Design. (3 cr.; Student Option; Periodic Spring) Application of robust control theory to aerospace systems. Role of model uncertainty/modeling errors in design process. Control analysis and synthesis, including $H_{\infty}$ and $H_{2}$ optimal control design and analysis and synthesis, including $H_{2}$ and $H_{\infty}$ optimal control design and analysis and synthesis, including $H_{\infty}$ optimal control design and analysis and synthesis, including $H_{\infty}$ optimal control design and analysis and synthesis, including $H_{\infty}$ and $H_{2}$ optimal control design and analysis and synthesis, including $H_{2}$

AEM 8423. Convex Optimization Methods in Control. (3 cr.; A-F or Audit; Periodic Fall) Practical aspects of convex optimization methods applied to solve design/analysis problems in control theory. prereq: 5321 or EE 5321 or equiv

AEM 8426. Optimization and System Sciences. (3 cr.; A-F or Audit; Periodic Fall) Review of probability concepts and random variables, nonlinear stochastic differential equations and their numerical solutions, Monte-Carlo simulations, Gauss-Markov process, stochastic dynamic programming, and optimal control of practical uncertain dynamic systems. prereq: 5321 or 5431, CSE grad student


AEM 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

AEM 8451. System Identification: Theory and Applications. (3 cr.; A-F or Audit; Periodic Spring) Modeling methods for dynamic systems using measurement data, or in combination with first principles, based on theory of systems/signals. Primary emphasis on linear systems for control system design/simulation applications. Examples from aerospace applications. prereq: 4321 or equiv

AEM 8495. Advanced Topics in Aerospace Systems. (1-4 cr. [max 32 cr.]; A-F or Audit; Every Fall, Spring & Summer) Individual student projects completed under guidance of a faculty sponsor. prereq: dept consent

AEM 8500. Research Seminar in Mechanics of Materials. (1 cr. [max 12 cr.]; S-N or Audit; Every Fall & Spring) Seminars given by students, faculty, and visitors on topics drawn from current research. prereq: instr consent

AEM 8511. Advanced Topics in Continuum Mechanics. (3 cr. [max 6 cr.]; A-F or Audit; Periodic Fall) Constitutive equations; invariance and thermodynamic restrictions. Nonlinear elasticity theory; exact solutions, minimization, stability. Non-Newtonian fluids; viscometric flows, viscometric functions, normal stress. Other topics may include reactive and/or nonreactive mixtures, nonlinear plasticity, and deformable electromagnetic continua. prereq: 5501 or instr consent

AEM 8521. Advanced Topics in Elasticity. (3 cr.; A-F or Audit; Periodic Fall) Contact stresses, finite deformations, and other topics. prereq: 5503

AEM 8523. Elastodynamics. (3 cr.; A-F or Audit; Periodic Fall) Waves and vibrations in rods, beams, and plates; dispersion; volume and surface waves; reflection; energy theorems; vibrations of bounded media and relation to technical theories: elements of nonlinear waves, inelastic waves, and stability of motion of elastic systems. prereq: 4581 or 5501 or instr consent


AEM 8531. Fracture Mechanics. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theories of mechanical breakdown. Kinetic rate theories and instability considerations; formation of equilibrium cracks and circular crack propagation under pulses; statistical aspects of strength and fracture of micromolecular systems; time and temperature dependency in fracture problems and instability of compressed material systems. prereq: 5503 or instr consent

AEM 8533. Theory of Plasticity. (3 cr.; Student Option; Periodic Fall) Theory of permanent deformation of ductile metals; bi-linear material models, Drucker's three bar truss, and other examples; 3-D continuum formulation, yield surfaces, hardening rules, and material stability; slip line theory, Prandtl punch solution; single crystal plasticity. prereq: 5203 or instr consent

AEM 8541. Mechanics of Crystalline Solids. (3 cr.; Student Option; Periodic Fall) Atomic theory of crystals and origins of stress in crystals. Relation between atomic and continuum description; phase transformations and analysis of microstructure; effects of shear stress, pressure, temperature, electromagnetic fields, and composition on transformation temperatures and microstructure; interfacial energy in solids. prereq: 5501 or instr consent

AEM 8551. Multiscale Methods for Bridging Length and Time Scales. (3 cr.; A-F or Audit; Periodic Spring) Classical/energizing techniques for bridging length/time scales. Nonlinear thermoelasticity, viscous fluids, and micromagnetics from macro/atomic viewpoints. Statistical mechanics, kinetic theory of gases, weak convergence methods, quasicontinuum, effective Hamiltonians, MD, new methods for bridging time scales. prereq: Basic knowledge of [continuum mechanics, atomic forces], familiarity with partial differential equations, grad student in [engineering or mathematics or physics]

AEM 8595. Selected Topics in Mechanics and Materials. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Includes individual student projects completed under guidance of a faculty sponsor. prereq: dept consent

AEM 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) To be determined prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

AEM 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

AEM 8880. Plan B Project. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Satisfies project requirement for Plan B Master's degree. May appear on M.S. program

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but does not count toward 20-credit minimum in the major field. Topic arranged by student and advisor; written report required, prerequisite: Grad aerospace engineering or mechanics major, dept consent

**AEM 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Max 18 cr per semester or summer; 24 cr required

### Aerospace Studies (AIR)

**AIR 1000. Leadership Laboratory.** (1 cr. [max 10 cr.]; S-N or Audit; Every Fall & Spring) In Air Force ROTC, you will not only develop your knowledge and skills as a leader in the classroom, you will also apply them for two hours per week in the Leadership Laboratory. There, you'll develop your demonstration of command, effective communication, physical fitness and knowledge of military customs and courtesies.

**AIR 1104. Heritage and Values of the United States Air Force.** (; 1 cr.; A-F or Audit; Every Fall) "Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force.

**AIR 1105. Foundations of the United States Air Force II.** (; 1 cr.; A-F or Audit; Every Spring) This is a survey course designed to introduce students to the United States Air Force. It provides an overview of the basic characteristics, missions, and organization of the Air Force. It also introduces written and oral communication skills.

**AIR 1201. Def.** (1 cr.; A-F only; )

**AIR 1202. Derrm.** (1 cr.; A-F only; )

**AIR 1204. The Evolution of USAF Air and Space Power I.** (; 1 cr.; A-F or Audit; Every Fall & Spring) This survey course covers the beginnings of manned flight and the development of aerospace power in the United States, including the employment of air power in WWI, WWII, Korea, Vietnam and the Gulf War. It also covers the peaceful employment of U.S. air power in civic actions, space exploration support and scientific missions.

**AIR 1205. The Evolution of USAF Air and Space Power II.** (; 1 cr.; A-F or Audit; Every Fall & Spring) This survey course covers the beginnings of manned flight and the development of aerospace power in the United States, including the employment of air power in WWI, WWII, Korea, Vietnam and the Gulf War. It also covers the peaceful employment of U.S. air power in civic actions, space exploration support and scientific missions.

**AIR 3301. Air Force Leadership, Quality, and Communication.** (; 3 cr.; A-F or Audit; Every Fall) Air Force leadership, management, writing, conflicts. Opportunity to present Air Force briefing.

**AIR 3302. Air Force Officership, Quality, and Communication.** (; 3 cr.; A-F or Audit; Every Spring) Focus on completing Quality Air Force training, learning the Officer Professional Development system, exploring leadership styles, ethics, core values, character development, and standards of conduct. Improve written and oral communication skills. Case studies. prerequisite: 3301 recommended

**AIR 3401. National Security Policy.** (; 3 cr.; A-F or Audit; Every Fall) National security process, regional studies, advanced leadership ethics, Air Force doctrine, and military justice. Military as a profession, officership, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Focus on refining communication skills.

**AIR 3402. Preparation for Active Duty.** (; 3 cr.; A-F or Audit; Every Spring) National security process, regional studies, advanced leadership ethics, Air Force doctrine, Military law, current issues affecting military professionalism. Preparation for active duty as second lieutenant in U.S. Air Force. prerequisite: 3401 recommended

### African Amer & African Studies (AFRO)

**AFRO 1011. Introduction to African American Studies.** (; 3 cr.; Student Option; Every Spring) The study of peoples of African descent including the evolution of African American culture, comparative race relations, feminism and social policy change.

**AFRO 1021. Introduction to Africa.** (GP; 3 cr.; Student Option; Every Fall & Spring) A comparative regional examination of contemporary African challenges and varied struggles using case studies, and a range of analytical parameters. Of particular focus will be issues of political destabilization, social fragmentation, economic disruption; internal displacement and international migration within regional and global contexts.

**AFRO 1023W. Introduction to African World Literature.** (GP; WI,LIITR; 3 cr.; A-F only; Every Fall & Spring) Literary voices from Africa, North America, and the Caribbean. Short fiction, prose, poetry, and drama that examines slavery, colonialism, and neo-colonialism. Oral narrative traditions, rites, rituals, customs. Personal/collective cultural identities. Racial, gender, and class dynamics within cultural/social historical contexts.

**AFRO 1201. Racial Formation and Transformation in the United States.** (DSJ,SOCS; 3 cr.; Student Option; Every Fall) How aggrieved racialized groups struggle over identity, culture, place, and meaning. Histories of racialization. Strategies toward rectification of historical injustices from dispossession, slavery, exploitation, and exclusion.

**AFRO 1911. Black Reality Television.** (DSJ; 3 cr.; Student Option No Audit; Periodic Fall & Spring) Many critics date the summer of 2000, when Survivor and Big Brother quickly became ratings juggernauts, as the beginning of the contemporary reality television boom. Within a few short years, shows like College Band 2 began pushing the genre to centralize the experiences of black cast members and, today, reality shows that feature solely or predominantly black casts are among the most successful of the genre. For some people the proliferation of black reality television has been welcome, while for others it has been a major cause for concern, particularly given the complex history of black representation in U.S. public culture. In this course, we will consider what is at stake in the cultural battles over black reality television, as well as how various intersecting modalities of difference such as race, gender, class, and sexuality affect the conditions under which black reality television programming is produced and consumed.

**AFRO 1917. Inequality and the American Dream.** (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Increasing and intensifying inequality is perhaps the most pressing socio-economic problem of our time. A significant threat to democracy, the American dream, and national values of diversity and inclusion, wealth inequality today has not only surpassed that of the Great Depression but also grafted onto longstanding, intersectional cleavages of race, gender, indigeneity, class, and sexuality. The richest one percent have captured nearly 60 percent of all income gains from 1977 to 2000, and in 2010, the top 20 percent of households owned almost 90 percent of all privately held wealth in the United States, while the net worth of the bottom 40 percent was negative. Simultaneously, much of the current political polarization, cultures of resentment, and rise in scapegoating and racist anti-immigrant actions have also been attributed to the attendant consequences of rising inequality, anxiety, and insecurity. And yet, many social critics argue that instead of addressing the key causes of inequality and the crisis of the American dream, the powerful in society have seized on these conditions to mobilize an avalanche of discontent among sectors of the downwardly mobile in a way that often obscures the key reasons for their predicament and scapegoats those at the social margins. Given this context, it is imperative to better understand and analyze the histories, cultural assumptions, and hierarchies that have produced contemporary inequality. How did we get to this point? What are the consequences, and what might we expect in the future? This set of seminars asks these hard questions and engages in precisely this exploration. These four freshman seminars (AFRO 1917, ANTH 1917, GWSS 1917, HIST 1917) will occasionally meet together, and will bring together scholars across multiple disciplines (African American
Studies, Anthropology, Feminist Studies, History, and beyond) who are substantively engaged with scholarship on class, race, indigeneity, gender, and sexuality. We believe that this cross-fertilization is critical because the fault-lines of inequality have precisely cohered to these structural formations and categories of analysis.

AFRO 3001. West African History: Early Times to 1800. (GP; 3 cr.; Student Option; Every Fall) West Africa from early times to establishment/histories of states. Relations with North African, Mediterranean, Asian, and American worlds. Non-centralized political authority.

AFRO 3002. West African History: 1800 to Present. (GP; 3 cr.; Student Option; Every Fall, Spring & Summer) West African history from late 18th century to present. Past/profound changes including new 19th century state formation, European colonialism, post-colonial issues.


AFRO 3103. World History and Africa. (3 cr.; A-F or Audit; Fall Even Year) Contributions of African American thinkers to making of African history/strategies to rework theoretical/analytical foundations of world history. Writings/intellectual networks of major thinkers whose historical/ethnographic works on Africa spanning nineteenth to twentieth century.

AFRO 3108. Black Music: A History of Jazz. (3 cr.; Student Option; Every Spring) The development of jazz in America and in the world, with special emphasis given to the roots or jazz in the African American experience.


AFRO 3125W. Black Visions of Liberation: Ella, Martin, Malcolm, and the Radical Transformation of U.S. Democracy. (CIV, WI; 3 cr.; A-F only; Every Spring) Course on the critical thought of Black intellectual-activists and others enmeshed in the struggles for the radical transformation of U.S. democracy. Introduces the following three leaders and activists--Ella Baker, Martin Luther King, Jr., and Malcolm X--whose work in the building of the Black freedom movement spanned the period from the 1930s to the late 1960s. Course proposition is that their life and times in the struggle for liberation offer important insights into the transformation of the U.S. political economy from the welfare/warfare state to the neoliberal state. These intellectual-activists, as well as others who translate their radical traditions through Black-Brown and Afro-Asian solidarity projects (e.g. Grace Lee Boggs of Detroit) have responded to racial formation in the U.S. and presented not just visions of liberation but concrete alternatives at the grassroots to usher in a more just, egalitarian, and ethical society.

AFRO 3131. Peace & Conflict in 21st Century Africa. (3 cr.; A-F only; Fall Odd Year) Departing from a country-specific focus and a comparative regional perspective, this course examines contemporary African challenges and varied struggles using case studies, and a range of analytical parameters. Of particular interest will be issues relating to peace and (in)security, ethnic/civil clashes, religious conflicts, authoritarianism, democracy and related impacts: political destabilization, social fragmentation, economic disruption; internal displacement and international migration within regional and global contexts etc. Historical contexts (colonial legacies) and contemporary dynamics (contemporary realities) will be studied from a political, and sociological perspective to establish course content and outcomes.

AFRO 3135. Political Dynamics in the Horn of Africa. (GP,SOCS; 3 cr.; Student Option; Every Spring) Who wields political power? Who challenges those in power? And how do they legitimize their claims and go about enforcing them? These are the core questions that will guide our exploration of the political dynamics in the Horn of Africa. Just like most regions in Africa, the Horn is home to diverse cultures and languages. What distinguishes it, however, is the contested nature of state borders, which have been redrawn in ways not observed anywhere else in Africa since the end of European colonialism. The purpose of this class is to delve deeper into these conflicts, to examine the interactions between incumbent governments, armed rebel groups and international actors in shaping war and peace in the Horn. Throughout this journey, we will pay special attention to ideas of sovereignty, identity and violence and draw on literature outside of the Horn to help us better dissect what is going on within it.

AFRO 3205. History of South Africa from 1910. (3 cr.; Student Option; Periodic Fall) The history of South Africa from the Union to the present. Focus on such issues as African and Afrikaner nationalism, structures of apartheid, forced population removals, divestment and sanctions, and the post-apartheid era.

AFRO 3251W. Sociological Perspectives on Race, Class, and Gender. (WI; 3 cr.; A-F or Audit; Every Fall & Spring) Analytical overview of three major forms of inequalities in the United States today: race, class, gender. Focus on these inequalities as relatively autonomous from one another and as deeply connected/interwined with one another. Intersectionality key to critical understanding of these social forces. Social change possibilities.

AFRO 3301. The Music of Black Americans. (AH,DSJ; 3 cr.; Student Option; Every Fall, Spring & Summer) Musical contributions of African American artists/innovators from 1619 to present. Spirituals, blues, ragtime, gospel, art music, jazz.

AFRO 3402. Pleasure, Intimacy and Violence. (3 cr.; Student Option; Spring Odd Year) Gender/sexual violence to poststructural, anti-racist theories and debates about social construction of sexuality. How intimacy and violence are co-constituted within normative frameworks of U.S. governmentality. Writings by black feminist criminologists who have linked incarceration, welfare reform, and other forms of state regulation to deeply systemic forms of violence against people of color.


AFRO 3431. Early Africa and Its Global Connections. (GP,HIS; 3 cr; max 4 cr.; Student Option; Every Fall & Spring) Survey of African history from earliest times to 1800. Focuses on socioeconomic, political, and cultural development in pre-colonial Africa from ancient Egypt through the era of the transatlantic slave trade.

AFRO 3432. Modern Africa in a Changing World. (GP,HIS; 3-4 cr.; Student Option; Every Fall, Spring & Summer) Socioeconomic, political, and cultural development in Africa, from abolition of transatlantic slave trade through postcolonial era.


AFRO 3436. Contemporary African Conflicts: From Somalia to South Africa. (3 cr.; Student Option; Periodic Fall)
AFRO 3578. Contemporary Sub-Saharan African Popular Art Forms. (3 cr. ; A-F only; Every Fall) This course explores contemporary sub-Saharan African popular cinema, popular music, community theatre, street arts, bus slogs, comic books, graphic art, social media, fashion, sports, and other forms of popular communication as signifiers of larger social, political, and economic processes. It examines popular cultural forms as constantly evolving expressions of social, political, and personal identities in an ever globalized and interconnected world. As sites where the tensions, frictions, collisions and notably, the productive creativities of the local and the global are circulated, negotiated and contested, African popular cultures provide insights into a unique and increasingly crucial facet of contemporary African artistic practice as critical intervention. Indeed, in their function as channels of communication generated within local cultures as reactions to transnational phenomena and dynamics, African popular forms offer timely perspectives on questions of cultural resurgence, global power relations and their underpinning national, ethnic and gender implications. Through our discussion of art and gender, for instance, we will examine the ways in which art in African was/is used to empower women.

AFRO 3592W. Black Women's Life-Writing. (DSJ, WI, LITR; 3 cr. ; Student Option; Periodic Fall & Spring) The literature of African American women writers explored in novels, short stories, essays, poetry, autobiographies, and drama from the 18th to the late-20th century.

AFRO 3593. The African American Novel. (3 cr. ; Student Option; Every Spring) Explore African American novelistic traditions. Plot patterns, character types, settings, symbols, themes, mythologies. Creative perspectives of authors themselves. Analytical frameworks from contemporary literary scholarship.

AFRO 3597W. Introduction to African American Literature and Culture I. (DSJ, WI, LITR; 4 cr. ; Student Option; Every Fall) African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

AFRO 3598W. Introduction to African American Literature and Culture II. (DSJ, WI, LITR; 4 cr. ; Student Option; Every Spring) African American oral tradition, autobiography, poetry, essay, fiction, oratory, drama. From after Harlem Renaissance to end of 20th century.

AFRO 3601W. African Literature. (GP, WI, LITR; 3 cr. ; A-F only; Every Fall, Spring & Summer) Oral/written literature of 19th/20th centuries. Focus on key contemporary issues facing African societies and how African writers and other cultural producers have responded to these challenges in diverse artistic and cultural forms. Theoretical models and conceptual frameworks underpin and guide critical readings throughout the semester.

AFRO 3625W. Women Writers of Africa and the African Diaspora. (GP, WI, LITR; 3 cr. ; A-F only; Spring Even Year) Works of black women writers from Europe, Africa, South America, and the Caribbean. Novels, drama, films, and essays.

AFRO 3627. Seminar: Harlem Renaissance. (3 cr. ; Student Option; Every Fall) Review Harlem Renaissance from variety of perspectives. Literary, historical, cultural, political, international. Explore complex patterns of permeation/interdependency between worlds inside/outside of what W.E.B. Du Bois called "Veil of Color."

AFRO 3654. African Cinema. (AH, GP; 3 cr. ; Student Option; Periodic Spring & Summer) Films by African filmmakers from West, Central, and Southern Africa. Aesthetic, theoretical, and sociocultural issues will be explored through class screenings and critical readings.

AFRO 3655. African-American Cinema. (AH, DSJ; 3 cr. ; Student Option; Spring Even Year) African American cinematic achievements from silent films of Oscar Micheaux through contemporary Hollywood and independent films. Class screenings, critical readings.

AFRO 3745. Black Cultural Studies. (AH, DSJ; 3 cr. ; Student Option; Every Spring) What is black life? And what does it mean to talk about black life in the context of the push toward the liberation of black lives? In recent years we have become accustomed to hearing about and debating the efficacy of the term and movement "Black Lives Matter," but what, other than precarity, constitutes these lives that matter? How have black people collectively thrived even under conditions that would assume otherwise? In this course we will consider the myriad ways black people have gone about creating, dreaming, struggling, building, educating, loving, and living, even in the midst of all that works to bring death near. We will explore a range of cultural forms, including stand-up comedy, hip hop and R&B music, reality television, social media, and film, in order to contemplate the urgency and necessity of black social life, or, what it means to be with and for black people.

AFRO 3864. African American History: 1865 to 1865. (3 cr. ; Student Option; Periodic Spring) Importance of dynamics of class, gender, region, and political ideology. Changing nature of race/religion.

AFRO 3865. African American History: 1865 to the Present. (3 cr. ; Student Option; Every Fall, Spring & Summer) History of African American men and women from the beginning of the 20th century to the present. Discussion of internal migrations, industrialization and unionization, The Great Depression, world wars, and large scale movements for social and political change.


AFRO 3867. Black Men: Representations and Reality. (3 cr. ; Student Option; Every Spring) This course will explore the lived reality of black men in the United States. Ranging historically and thematically-wide, this course will introduce students to the experience of black male labor force participation and employment outcomes; deconstruct representations of black masculinity in popular culture; explore academic dilemmas associated with primary and secondary educational pursuits; and uncover issues connected with law, incarceration, and criminal justice. In addition, this course will examine relationship complexities involving black men and black women, black men and white women, and black men and black men, looking closely at the African-American role in traditional and non-traditional family structures. The course will also address the most central of questions: What is the black male experience, given the growing diversity of black maleness in Minnesota, the United States, and the Diaspora. At the center of the course is not only what other people have said about the black male historical and contemporary experience, but also how black men have imagined and constructed their own experience over time.

AFRO 3868W. Race, War, and Race Wars in American History. (WI; 3 cr. ; A-F or Audit; Fall Odd Year) Role that race has played in American war history. Impact that wars have had on race and race relations in the United States and the world. Literature and film.

AFRO 3910. Topics in African American Literature and Culture. (; 1-3 cr. ; max 9 cr.) ; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

AFRO 3920. Topics in African Studies. (; 4 cr. ; max 8 cr.) ; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

AFRO 3993. Directed Study. (1-5 cr. ; max 10 cr.) ; Student Option; Every Fall, Spring & Summer) Guided individual research and study. Prereq: instr consent, dept consent, college consent.
AFRO 4105. Ways of Knowing in Africa and the African Diaspora. (3 cr.; A-F only; Every Fall)
Impact of European knowledge systems on African world. How peoples on African continent and across African diaspora have produced/defined knowledge. Continuity/change in the way African peoples have thought about and left their epistemological imprints upon the world.

AFRO 4112. The Beat Goes on: Advanced Studies in the Poetry of Rap. (3 cr.; A-F only; Every Spring)

AFRO 4231. Color of Public Policy: African Americans, American Indians, Asian Americans & Chicanos in the U.S. (3 cr.; Student Option; Periodic Fall)
Examines structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

AFRO 4335. African American Politics. (3 cr.; Student Option; Periodic Fall & Spring)
This course examines the historical and contemporary efforts by African Americans to gain full inclusion as citizens in the U.S. political system. The course focuses on topics such as the politics of the civil rights movement; black presidential bids including the historic election of Barack Obama; and racialized voting in federal and state elections.

AFRO 4406. Black Feminist Thought. (3 cr.; Student Option; Periodic Spring)
Critically examines spatiality of African descendant women in Americas/larger black diaspora. Writings from black feminist/queer geographies, history, contemporary cultural criticism. Recent black feminist theorizing.

AFRO 4478W. Contemporary Politics in Africa and the Colonial Legacy. (GP, WI; 3 cr.; Student Option; Every Spring)
Examines how current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by the pre-colonial and colonial processes. Reality of independence; recurring political and economic crises, global context, and prospects for effective democracy. prereq: POL 1054 or POL 3051 or non-pol sci grad or instr consent

AFRO 4910. Topics in African American and African Studies. (1-3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Topics specified in Class Schedule.

AFRO 4991W. Thesis Research and Writing. (WI; 3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Preparing a research paper that satisfies major project requirement. Defining a research problem. Collecting/analyzing data. Writing the research paper. prereq: dept consent

AFRO 5101. Seminar: Introduction to Africa and the African Diaspora. (3 cr.; Student Option; Periodic Fall & Spring)
Comparative frameworks, related theories, and pivotal texts in study of Africa and African Diaspora.

AFRO 5103. World History and Africa. (3 cr.; A-F or Audit; Fall Even Year)
Contributions of African American thinkers to making of African history/strategies to rework theoretical/analytical frameworks of world history. Writings/intellectual networks of major thinkers whose historical/ethnographic works on Africa spanning nineteenth to twentieth century. prereq: Grad student or instr consent

AFRO 5120. Social and Intellectual Movements in the African Diaspora. (3 cr.; A-F or Audit; Every Fall)

AFRO 5181W. Blacks in American Theatre. (WI; 3 cr.; Student Option; Periodic Spring)
Historical survey of significant events in the development of American Black theatrical tradition; essays, plays, playwrights, and theatre from 19th century. prereq: 3112 or instr consent

AFRO 5182W. Contemporary Black Theatre: 1960-Present. (WI; 3 cr.; Student Option; Spring Even Year)
Essays, plays, playwrights, theatres that have contributed to contemporary Black theatre from beginning of Black Arts Movement to present.

AFRO 5191 Seminar: The African American Experience in South America. (3 cr.; Student Option; Periodic Fall & Spring)
Ideological, political, religious, and cultural ties that have informed African American and black South African relations from late 18th century to present.

AFRO 5406. Black Feminist Thought. (3 cr.; Student Option; Periodic Spring)
Critically examines spatiality of African descendant women in Americas/larger black diaspora. Writings from black feminist/queer geographies, history, contemporary cultural criticism. Recent black feminist theorizing.

AFRO 5593. The African American Novel. (3 cr.; Student Option; Every Fall)

AFRO 5625. Women Writers of Africa and the African Diaspora. (3 cr.; Student Option; Spring Even Year)
Works of black women writers from Europe, Africa, South America, and the Caribbean. Novels, drama, films, and essays.

AFRO 5627 Seminar: Harlem Renaissance. (3 cr.; Student Option; Every Fall)
Review Harlem Renaissance from variety of perspectives. Literary, historical, cultural, political, international. Complex patterns of permeation/interdependency between worlds inside/outside of what W.E.B. Du Bois called "the Veil of Color." prereq: Grad student or instr consent

AFRO 5866. The Civil Rights and Black Power Movement, 1954-1984. (3 cr.; A-F or Audit; Every Fall)

AFRO 5910. Topics in African American and African Studies. (2-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Topics vary by instructor.

AFRO 5932. The Production of Knowledge, Negotiating the Past, and the Writing of African Histories. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Recent scholarship on social history of Africa. Focuses on new literature on daily lives of ordinary people in their workplaces, communities, households. prereq: Grad student or instr consent

AFRO 5993. Directed Study. (1-3 cr.; Student Option; Every Fall, Spring & Summer)
Guided individual reading/study for qualified seniors and graduate students. prereq: instr consent

AFRO 8202 Seminar: Intellectual History of Race. (3 cr.; Student Option; Every Fall & Spring)
Shifting and contested meanings of "race" from the "Age of Conquest" to the present. Starting from the proposition that race is not a fixed or stable category of social thought or being, the seminar seeks to ascertain how and why Western ideas about race have changed.

AFRO 8554. Seminar: Gender, Race, Nation, and Policy--Perspectives from Within the African Diaspora. (3 cr.; Student Option; Every Fall & Spring)
Interdisciplinary analysis of U.S. domestic and foreign policies as they affect Africans and peoples of African descent in the diaspora. Intersection of gender, race, nation, and class. prereq: instr consent

AFRO 8802. Seminar: Orientalism. (3 cr.; Student Option; Periodic Fall & Spring)
Recent arguments related to Orientalism as a trend in modern literary and cultural criticism.

AFRO 8910. Topics in Studies of Africa and the African Diaspora. (3 cr.; max 9 cr.; Student Option; Every Fall & Spring)
Topics specified in Class Schedule.

Ag Industries & Marketing (AIM)

AIM 4011. Student Project/Field Investigation. (3 cr.; Student Option; Every Fall & Spring)
**AFEE 1001. Introduction to Agricultural Education, Communication & Marketing.** (3 cr.; Student Option; Every Fall & Spring) Historical development of the discipline of agricultural education; orientation to career opportunities; areas and expectations of specialization; issues in the field.

**AFEE 2051. Current Technical Competencies.** (3 cr.; Student Option; Every Fall) Prepares agricultural education teachers and other agricultural professionals to use technology. Develop basic skills and knowledge to plan, implement, operate, and maintain agricultural structural and mechanical systems. Experiential learning principles and applied problem solving.

**AFEE 2096. Career Exploration & Early Field Experience in Agricultural Education, Communication, and Marketing.** (2 cr.; A-F only; Every Spring) Analyses of occupations, employment potential, expectations for work, and readiness for careers in agricultural education, communication, and marketing. Field placement experiences examine career options and professionals in the field. Observe schools, extension offices, and agricultural businesses to learn about the work/workplaces in agricultural education, communication, and marketing.

**AFEE 2221W. Foundations of Leadership Practice.** (WI; 3 cr.; A-F or Audit; Every Fall) How to be an effective leader in profit/non-profit agricultural settings. Roles, responsibilities, knowledge, attitudes, and skills to hire staff, set goals, coach, mentor/manage teams, and improve communication.

**AFEE 2421. Professional Communication for Agriculture, Food, and the Environment.** (3 cr.; A-F or Audit; Every Fall & Spring) Speaking/writing about scientific/technical issues. Student-centered, relies on interaction/participation. Public communication.

**AFEE 3096. Experiential Learning: Production and Business.** (1-3 cr.; max 9 cr.; Student Option; Every Fall) Experiential learning in agricultural production and business. Planned, organized, monitored, and evaluated based on a per-experience diagnosis of learning prerequisite to higher level courses in technical agriculture and agricultural business. prerequisite: AgEd major, instr consent

**AFEE 3106. Agricultural Policy and Issues in Minnesota.** (3 cr.; A-F only; Spring Odd Year) This course will introduce students to advocacy and policy-making that affects Minnesota’s agricultural industry, specifically at the farm level. They will experience the policy-making process from an initial idea to building support, lobbying, legislative work, implementation, and the effect policies have on Minnesota farmers. Students will get a behind-the-scenes look at the policy process in action by meeting lawmakers, lobbyists, and staff while on field trips to the Minnesota State Capitol and Minnesota Department of Agriculture. Students will also shadow a current legislator, participate in a mock senate, hear from multiple guest speakers, and research the decision-making process by following an agricultural bill through the legislative session. prerequisite: 30 credits or instructor approval

**AFEE 3112. Building Construction Technology.** (3 cr.; A-F or Audit; Every Fall) Instructional/lab exercises in light frame building construction. Site layout, foundations, framing, plumbing, insulating, sheathing, roofing. Emphasizes safety and use of modern tools, materials, and prefabricated components.

**AFEE 3430. Communicating Food, Agriculture & Environmental Science to the Public.** (3 cr.; A-F or Audit; Every Spring) Planning/strategy for communication campaigns related to food/agriculture. Student-centered, relies on interaction/participation. prerequisite: Sophomore standing or 30 cr

**AFEE 3480. Special Topics in Agricultural Education.** (1-4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer) Lectures by visiting scholar or regular faculty member. Topics specified in Class Schedule.

**AFEE 3993. Undergraduate Directed Study in Agricultural Education, Communication & Marketing.** (1-4 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Topics may be chosen to permit study in areas of education or to supplement areas of inquiry not provided for in the regular program structure.

**AFEE 4221. Rural Leadership Development.** (WI; 3 cr.; Student Option; Spring Odd Year) Understanding the role, function, and features of leadership in rural communities; importance of personal involvement, personal leadership qualities, and vision for individuals and rural community organizations.

**AFEE 4450W. Advanced Agricultural Journalism and Persuasive Writing for Ag, Food & Environmental Sciences.** (WI; 3 cr.; A-F or Audit; Every Fall) In this course, students research, write, and edit stories for agricultural, food and environmental organizations and media. Students produce a final portfolio that demonstrates their ability to create professional-level work such as magazine articles, news stories, biographies, marketing materials, blog posts, news releases and scripts.

**AFEE 5110. Foundations of Agricultural Education.** (3 cr.; A-F only; Every Fall) This course explores historical and philosophical foundations and current structures of school-based agricultural education programs. Students will understand, value, and apply strategies to implement and manage the integrated program model of agricultural education.

**AFEE 5111W. Agricultural Education: Methods of Teaching.** (WI; 4 cr.; Student Option; Every Fall) Use of teaching resources; principles of teaching and learning; problem-solving techniques, lesson plan construction for large group, small group and individual investigations; student management; and assessment.

**AFEE 5112. Agricultural Education Program Organization and Curriculum for Youth.** (3 cr.; Student Option; Every Spring) Development of community school program in agriculture, agribusiness, and environmental science. Program to meet graduation outcomes and determine student needs.

**AFEE 5114. Agricultural Education Teaching Seminar.** (1 cr.; Student Option; Every Spring) Reflective learning on teacher preparation experience; identify issues and problems facing the discipline; needs for continual preparation and program adjustment.


**AFEE 5118. Strategies for Managing and Advising the FFA Organization.** (2 cr.; A-F or Audit; Every Spring) Principles and techniques to advise an FFA chapter. Historical and philosophical basis of FFA, organization and structure. Integration with classroom instruction, public relations, recruitment, and administration of FFA chapters.

**AFEE 5220. Special Topics in Agriculture Education and Extension.** (1-3 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Content varies by offering.

**AFEE 5231. Agricultural Education Curriculum K-12.** (2 cr.; A-F or Audit; Periodic Fall) Philosophy, organization, and administration of instruction in agricultural education programs at the elementary, middle, and high school levels.

**AFEE 5233. Advanced Procedures in Teaching Agricultural Education.** (2 cr.; A-F or Audit; Periodic Fall) New developments in methodology; assessment of innovations and procedures; consideration of various levels of instruction.

**AFEE 5235. Experiential Learning in Agricultural Education.** (2 cr.; Student Option; Periodic Fall & Spring)
AGRO 1093. Directed Studies. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

Allows study of agronomy in greater depth or in areas not currently offered in formal courses. Tutorial instruction under staff guidance. prereq: 4 cr in agronomy, instr consent

AGRO 1101. Ecology of Plant Systems. (BIOL; 4 cr.; Student Option; Every Spring)

Designed for students who are not majors in a life science program, but who wish to acquire a better understanding of biological concepts especially as they relate to their lives. We examine current issues related to food, food production and the environment which provide the context to investigate fundamental concepts of biology including productivity, energy, genetic change in populations, and environmental responses to human activity. We use a problem-based learning approach to explore three contemporary issues of great importance: risks and benefits of GMOs, farming and food, and the dead zone in the Gulf of Mexico. Lab, greenhouse, field, and classroom discussions.

AGRO 1103. Crops, Environment, and Society. (ENV; 4 cr.; Student Option; Every Fall)

Plants that supply food, fiber, beverages, and medicine to humans. Plant identification, plant physiology, plant breeding/biotechnology, plant ecology, crop culture/management.

AGRO 1660W. First-Year Colloquium/Experience in Agroecosystems Analysis. (WI; 2 cr.; A-F or Audit; Every Fall)

Agroecosystems and their impacts on the environment, landscapes, and rural communities. Students develop a course plan within their major, explore career options, and increase their familiarity with the department, its history, and its faculty/staff. Field trips, discussions, readings, reflective writings. prereq: 1st yr in major hosted by Department of Agronomy and Plant Genetics

AGRO 2022. Growth and Development of Minnesota Field Crops. (1 cr. [max 2 cr.]; S-N only; Every Fall)

Students learn how field crop species grow and develop, how unique traits of crop species contribute to ecosystem services, and how to identify important growth stages of crops. In addition to traditional agronomic crops (small grains, alfalfa, soybean and corn), students will work with annual and perennial species that represent emerging crops grown for grain, oil seed, novel products, cover crops and biomass. Course work includes lectures, labs (greenhouse and field), and online assignments and quizzes. prereqs: AGRO 1101 or HORT 1001 or BIOL 1009 or BIOL 1001 and AGRO 1103

AGRO 2501. Plant Identification for Urban and Rural Landscapes. (1 cr.; Student Option; Periodic Fall)

Identification of weed species and native herbaceous plants that are important in crop production, turf management, horticulture production, and landscapes systems. This course will emphasize the identification of weed species and other plants found in Minnesota and the upper Midwest area of the United States. Plant families, life cycles, habitats and relationships to humans. prereq: BIOL 1009 or equiv

AGRO 3203W. Environmental, Global Food Production, and the Citizen. (GP, WI; 3 cr.; Student Option; Every Spring)

Ecological/ethical concerns of food production systems in global agriculture: past, present, and future. Underlying ethical positions about how agroecosystems should be configured. Decision cases, discussions, videos, other media.

AGRO 3305. Agroecosystems of the world. (GP; 3 cr.; Student Option; Every Fall)

Explore four different areas of world agriculture (Minnesota, Morocco, Nepal, Costa Rica) by networking with locals on ground in each region through online interactions. Food, agriculture, environment. Biophysical/socio-cultural aspects of agroecosystems through unique multi-disciplinary lens.

AGRO 3660. Plant Genetic Resources: Identification, Conservation, and Utilization. (3 cr.; A-F only; Spring Every Year)


AGRO 4015. Topics in Agronomy. (1 cr.; Student Option; Periodic Fall, Spring & Summer)

This course focuses on current topics in crops, cropping systems, and plant improvement.

AGRO 4093. Directed Studies for Advanced Students. (1.4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

Allows study of agronomy in greater depth or in areas not currently offered in formal courses. Tutorial instruction under staff guidance. prereq: 15 cr in agronomy, instr consent

AGRO 4096W. Professional Experience Program: Internships. (WI; 2 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)

Supervised professional experience with a private company, public agency, or nonprofit organization involved in plant production or food systems. Reflective analysis of professional experience and technical communication on a topic related to the internship. This course meets on campus once in late spring and twice in early fall with several online activities during the summer.

AGRO 4097W. Undergraduate Research Thesis. (WI; 2 cr.; S-N only; Every Fall, Spring & Summer)

Research/thesis conducted under supervision of CFANS faculty member. Written thesis describing research results. prereq: Jr or Sr

AGRO 4105. Crop Management Field School: A Hands-on Immersion. (1 cr. [max 2 cr.]; A-F only; Every Summer)

In this course, you will apply and integrate principles and concepts of agronomy, plant
pathology, entomology, and soil and weed science in a hands-on field setting with real-life scenarios and problems common in production agriculture. prereq: BIOL 1001, 1009 or HORT 1001; AGRO 1103, and SOIL 2125

AGRO 4505. Biology, Ecology, and Management of Invasive Plants. (3 cr.; Student Option; Periodic Fall & Spring) Ecology/biology of invasive plant species (weeds). Principles of invasive plant management in agricultural/horticultural, urban, wetland, aquatic, and other non-cropland landscape systems, utilizing biological, cultural, and chemical means. Management strategies to design systems that optimize invasive plant management in terms of economic, environmental, and social impacts. prereq: 4005, [Bio 3002 or equiv], Soil 2125, [Agro 2501 or Hort 1011]

AGRO 4605. Strategies for Agricultural Production and Management. (3 cr.; Student Option; Every Fall) Information/tools necessary to make informed land management decisions in ever-evolving economic, policy, climate environments. Evaluate hows, whats, whys of crop management by solving real-world problems that agricultural professionals face. State-of-the-art production/management practices for major agricultural crops in Minnesota. Lectures feature agricultural professionals/experts. Lab component provides hands-on experience with modern equipment/data interpretation. prereq: 1101 or equivalent, [CHEM 1015/17 or equivalent], SOIL 1125 or equivalent, [jr or sr or grad student or instr consent]

AGRO 4660. Senior Capstone. (2 cr.; A-F or Audit; Every Fall) Complexities of agricultural issues. Exercises/discussions integrating previous educational situations. Linked to undergrad internships/experiential learning opportunities such as thesis or directed studies or service learning. Written/oral assignments.

AGRO 4888. Issues in Sustainable Agriculture. (2 cr.; Student Option; Every Fall, Spring & Summer) Agroecology, sustainable practices, production economics, environmental quality, holistic resource management, healthy food/water, rural communities. Meet sustainable-agriculture advocates, including farmers, faculty, and representatives of non-profit sustainable-agriculture organizations. prereq: 1103, Soil 1125 or 2125 or equiv

AGRO 5021. Plant Breeding Principles. (3 cr.; Student Option; Every Fall) This course is intended for advanced undergraduate students and graduate students that are either: 1) not plant breeding majors who will benefit from a basic understanding of how genetics is applied to plant improvement; or 2) plant breeding majors lacking prior coursework in plant breeding. The objective of this course is to develop an understanding of the underlying principles, ideas, and concepts important to applying genetic principles to plant breeding, evaluating breeding methods, and enhancing genetic progress and efficiency.

AGRO 5121. Applied Experimental Design. (4 cr.; Student Option; Every Spring) Principles of sampling methodologies, experimental design, and statistical analyses. Methods/procedures in generating scientific hypotheses. Organizing, initiating, conducting, and analyzing scientific experiments using experimental designs and statistical procedures. prereq: Stat 5021 or equiv or instr consent

AGRO 5311. Research Methods in Crop Improvement and Production. (1 cr.; S-N or Audit; Every Fall & Summer) Demonstrations and discussions of techniques in crop improvement and/or production research. Presentations integrate biotechnology with traditional breeding methods; production sessions emphasize ecologically sound cropping systems. prereq: applied plant sciences grad

AGRO 5321. Ecology of Agricultural Systems. (3 cr.; A-F or Audit; Every Spring) Ecological approach to problems in agricultural systems. Formal methodologies of systems inquiry are developed/applied, prereq: [3xxx or above] course in [Agro or AnSc or Ent or Hort or PiPa or Soil] or instr consent

AGRO 5431. Applied Plant Genomics and Bioinformatics. (3 cr.; Student Option; Every Fall) Analysis, interpretation, visualization of large plant genomic datasets. Basic computer programming, applying large-scale genomics to answer basic/applied biological questions, understanding limitations of each application, presenting concise visual findings from large-scale datasets. prereq: Grad student or undergrad with genetics course

AGRO 5980. Publishing in Plant Science Journals. (2 cr.; S-N only; Every Fall) Organizational/writing skills for reporting research results in a peer-reviewed journal manuscript. Publishing process: choosing your journal; characteristics of good scientific writing; ethics, plagiarism, and authorship; stating your objectives; writing the different components of a manuscript; citing literature; use of tables and figures; proofreading. Written manuscript ready for submission to a plant science journal. prereq: instr consent

AGRO 5999. Special Topics: Workshop in Agronomy. (1-6 cr.; Student Option; Every Fall, Spring & Summer) Workshops on various topics in agronomy and plant genetics. Presenters/faculty may include guest lecturers/experts. Topics specified in class schedule.

AGRO 8005. Supervised Classroom or Extension Teaching Experience. (2 cr.; S-N or Audit; Every Fall & Spring) Classroom or extension teaching experience in one of the following departments: Agronomy and Plant Genetics; Biosystems and Agricultural Engineering; Horticultural Science; Plant Pathology; or Soil, Water, and Climate. Participation in discussions about effective teaching to strengthen skills and develop personal teaching philosophy. prereq: Grad SENG major, instr consent

AGRO 8023. Evolution of Crop Plants. (3 cr.; A-F or Audit; Spring Even Year) Origin, distribution, and evolution of cultivated plants; implication of the effects of evolutionary processes on crop breeding for needs of people today. prereq: 9 grad cr in ag or bio science

AGRO 8202. Breeding for Quantitative Traits in Plants. (3 cr.; Student Option; Spring Odd Year) Principles and concepts of population and quantitative genetics/application in designing and implementing a plant breeding program/theory, experimental approaches, and evidence that form the basis for these concepts and breeding strategies. prereq: [5201, STAT 5021] or instr consent

AGRO 8241. Chromosomal and Molecular Genetics of Plant Improvement. (3 cr.; Student Option; Spring Even Year) Mixture of classic/current info in molecular plant genetics, biotech, and genomics. Students devise experiments in breeding, genetics, genomics, physiology, cellular/molecular biology, and other areas. prereq: Introductory Genetics course

AGRO 8900. Advanced Discussions. (1-3 cr. [max 36 cr.]; Student Option; Periodic Fall & Spring) Special workshops or courses in applied plant sciences for graduate students only.

Akkadian (AKKA)

AKKA 5011. Elementary Akkadian I. (3 cr.; Student Option; Periodic Fall) Introduction to cuneiform script. Basics of Old Babylonian morphology and syntax. Written drills, readings from Hammurabi laws, foundation inscriptions, annals, religious and epic literature. prereq: Adv undergrads with instr consent or grads

AKKA 5012. Elementary Akkadian II. (3 cr.; Student Option; Periodic Fall) Continuation of 5011. Readings include The Gilgamesh Epic, The Descent of Ishtar, Mari Letters, Annals of Sennacherib and Assurhaddon, Sargon II. prereq: 5011

American Indian Studies (AMIN)

AMIN 1001. American Indian Peoples in the United States. (DSJ; 3 cr.; Student Option; Every Fall & Spring) Introduction to how voices/visions of indigenous peoples have contributed to history of cultural expression in North America. Historic contexts/varieties of this expression by region, tribal cultures. Emphasizes contributions in literature, philosophy, politics, fine arts.

AMIN 1002. Indigenous Peoples in Global Perspective. (GP; 3 cr.; A-F or Audit; Every Fall & Spring) Colonial experiences of selected indigenous peoples in Americas, Euroasia, Pacific Rim.

AMIN 1003. American Indians in Minnesota. (DSJ,HIS; 3 cr.; A-F or Audit; Every Fall & Spring)
History, culture, and lived experience of American Indian people in Minnesota. Self-representation and histories of Anishinaabeg (Ojibwe) and Dakota peoples through film, music, oral traditions, and written texts. Work by non-Indian scholars focuses on cultural, philosophical, and linguistic perspectives of Anishinaabe and Dakota peoples.

**AMIN 1201. Racial Formation and Transformation in the United States.** (DSJ, SOCS; 3 cr.; Student Option; Every Fall) How aggrieved racialized groups struggle over identity, culture, place, and meaning. Histories of racialization. Strategies toward rectification of historical injustices from dispossession, slavery, exploitation, and exclusion.

**AMIN 1912. Strange Spirits: Monsters, Star Beings, and Other Mysterious Creatures in American Indian Literature.** (3 cr.; A-F only; Every Spring) Maybe you’ve seen a movie where the characters spot strange creature moving through the dark woods of a shadowy night and one of them explains, “It’s a windigo. Native Americans say it eats human flesh.” Maybe you wondered what this monster is and what Native people think of it. Maybe you thought it strange that a film was using a creature from Native tradition to threaten non-Native characters. Maybe you thought using such a creature was a bit too similar to those old movies where “savage” Indians threaten pioneer families. In this seminar, we explore what strange spirits like windigos, Sasquatch, or Star Beings (aliens) mean in Native and non-Native contexts. In Indigenous contexts, such stories carry knowledge about how to live ethically with the world. We will also examine texts by non-Natives that engage with the Native content of these stories, asking whether they engage with this content as knowledge or as entertainment. Our comparative examination raises important questions about the relation of colonialism to the appropriation of Native lands and cultural expressions.

**AMIN 3001. Public History.** (3 cr.; A-F or Audit; Periodic Fall & Spring) Interpretations of collective past as produced in public venues, including museum exhibitions, films, theme parks, and websites. Intellectual and political issues in history produced for public audiences. Career opportunities. prereq: instr consent

**AMIN 3010. Structure of Anishinaabemowin, the Ojibwe Language.** (; 3 cr.; A-F or Audit; Periodic Fall) Analysis of grammatical structures of Anishinaabemowin. prereq: 3103

**AMIN 3141. American Indian Language Planning.** (3 cr.; A-F or Audit; Periodic Fall) Planning for maintenance/revitalization of North American indigenous languages. Condition/status of languages. Documentation, cultivation, literacy, education. prereq: 3103 or 3123

**AMIN 3201W. American Indian Literature.** (DSJ,WILTR; 3 cr.; A-F only; Every Fall & Spring) Comparative studies of oral traditions, modern literature from various tribal cultures.

**AMIN 3205. Art of Central and South America Before Columbus.** (AH; 3 cr.; Student Option; Periodic Fall) Art/architecture of native peoples of Americas from twelfth century B.C. until arrival of Europeans in sixteenth century. Ways that people living in diverse areas of South America/Mesoamerica used art/architecture. Tools to investigate Pre-Columbian art at more advanced levels.

**AMIN 3301. American Indian Philosophies.** (AH,DSJ; 3 cr.; Student Option; Every Fall, Spring & Summer) World views of indigenous people of Americas. Topics include native medicines/healing practices, ceremonies/ritual, governance, ecology, humor, tribal histories, status of contemporary native people.

**AMIN 3304. Indigenous Filmmakers.** (AH; 3 cr.; Student Option; Every Spring) Analysis of film/video made by American Indian writers, directors, producers within contexts of tribally specific cultures/histories, as well as within context of US culture/film history.

**AMIN 3312. American Indian Environmental Issues and Ecological Perspectives.** (ENV; 3 cr.; Student Option; Every Spring) American Indian environmental issues in U.S./Canada. Analysis of social, political, economic, legal forces/institutions. Colonial histories/tribal sovereignty.

**AMIN 3402. American Indians and the Cinema.** (AH,DSJ; 3 cr.; A-F or Audit; Every Spring & Summer) Representations of American Indians in film, historically/contemporarily. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

**AMIN 3409. American Indian Women: Ethnographic and Ethnohistorical Perspectives.** (DSJ,HIS; 3 cr.; Student Option; Fall Even Year) Comparative survey of ethnographic/ethnohistorical writings by/about American Indian women.


**AMIN 3602. Archaeology and Native Americans.** (DSJ; 3 cr.; Student Option; Fall Even Year) Historical, political, legal, and ethical dimensions of the relationship of American archaeology to American Indian people. Case studies of how representational narratives about Native people are created through archaeology; responses by Native communities; and the frameworks for collaborative and equitable archaeological practice. Professional ethics in archaeology/heritage studies in American contexts.

**AMIN 3604. Indigenous Immersion Methods for the Home, Classroom, and Community.** (3 cr.; A-F only; Every Spring) Prepares students as advanced language students to participate in and facilitate immersion environments within both formal and informal settings including the home, second language classrooms, immersion classrooms, language tables, immersion camps, and other community settings. prereq: OJIB 3104, DAKO 3124 or four semesters of another target language

**AMIN 3701. Ojibwe Culture and History.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring) Ojibwe culture, history, and traditions, including philosophy, religion, and lifestyle. Students develop an appreciation for the values and belief systems of traditional Indian people.

**AMIN 3711. Dakota Culture and History.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring) Dakota culture, language, history, literature. Contemporary issues, the arts.

**AMIN 3871. American Indian History: Pre-Contact to 1830.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring) American Indian history from the era of ancient Native America to the removal era. Social, cultural, political, and economic diversity of Native American peoples and Native American experiences with European colonialism.

**AMIN 3872. American Indian History: 1830 to the Present.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring) Focus on the impact of federal Indian policy on American Indian cultures and societies, and on American Indian culture change.

**AMIN 3876. American Indian Education.** (3 cr.; Student Option; Periodic Spring) Educational processes in American Indian cultures. History of school programs established for tribes by missionaries/U.S./Canadian governments. Importance of boarding schools in shaping the lives, families, communities, educational expectations of Indian people in late-19th/early-20th centuries.

**AMIN 4231. Color of Public Policy: African Americans, American Indians, Asian Americans, & Chicanos in the U.S..** (3 cr.; Student Option; Periodic Fall) Structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

**AMIN 4501. Law, Sovereignty, and Treaty Rights.** (3 cr.; Student Option; Periodic Fall, Spring & Summer) History of American Indian law and the post-contact effects of colonial and U.S. law on
American Indians through the 20th century. prereq: 1001

AMIN 4511. American Indian Political Economy. (3 cr.; Student Option; Periodic Fall, Spring & Summer)
Sources, nature, consequences of social/economic development/change in Indian communities. Precontact Indian communities. Effect of European contact. Social movements into 20th century, including phenomenon of urban Indian communities. prereq: 1001

AMIN 4525W. Federal Indian Policy. (WI; 3 cr.; Student Option; Periodic Fall, Spring & Summer)
Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature related to policies.

AMIN 4532. Vine Deloria, Jr.: A Renaissance Indigenous Figure. (3 cr.; Student Option; Periodic Fall & Spring)
In-depth consideration of indigenous scholar and activist Vine Deloria Jr.’s intellectual works, and impacts on fields such as law, religion and theology, history, natural and social science, literary criticism, education, anthropology, paleontology, and political science. Students read, discuss, produce research on an aspect of Deloria’s work.

AMIN 4820W. Senior Seminar. (WI; 3 cr.; A-F only; Every Fall)
Seminar for preparation/completion of American Indian Studies Senior Project requirement.

AMIN 4990. Topics in American Indian Studies. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Topics specified in Class Schedule.

AMIN 4994. Directed Research. (1-12 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer)
Individually arranged research with faculty to meet student needs and interests. Prereq-instr consent, dept consent, college consent.

AMIN 4996. Field Study. (1-12 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Opportunities for experiential learning in a variety of American Indian community settings. Consult department faculty at least one term before enrolling. Prereq-instr consent, dept consent, college consent.

AMIN 5107. The Structure of Anishinaabemowin, the Ojibwe Language. (3 cr.; A-F or Audit; Periodic Fall)
Analysis of grammatical structures of Anishinaabemowin. prereq: 3104

AMIN 5141. American Indian Language Planning. (3 cr.; A-F or Audit; Periodic Fall)
Planning for maintenance/revitalization of North American indigenous languages. Condition/status of languages. Documentation, cultivation, literacy, education. prereq: 3103 or 3123 or instr consent

AMIN 5202. American Indians and the Supreme Court. (3 cr.; Student Option; Periodic Fall & Spring)
Seminar explores the role and the practice of the US Supreme Court as a policy-making institution when dealing with indigenous nations and their citizens. Analysis of theoretical, behavioral, political, and institutional perspectives. Students work includes reading and textual analysis, leading discussions, analytical research paper.

AMIN 5402. American Indians and the Cinema. (AH,DSJ; 3 cr.; A-F or Audit; Every Spring & Summer)
Representations of American Indians in film, historically/contemporarily. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

AMIN 5409. American Indian Women: Ethnographic and Ethnohistorical Perspectives. (DSJ,HS; 3 cr.; Student Option; Fall Even Year)
Comparative survey of ethnographic/ethnohistorical writings about/indigenous American Indian women.

AMIN 5412. Comparative Indigenous Feminisms. (GP; 3 cr.; Student Option No Audit; Periodic Fall & Spring)
The course will examine the relationship between Western feminism and indigenous feminism as well as the interconnections between women of color feminism and indigenous feminism. In addition to exploring how indigenous feminists have theorized from ‘the flesh’ of their embodied experience of colonialism, the course will also consider how indigenous women are articulating decolonization and the embodiment of autonomy through scholarship, cultural revitalization, and activism.

AMIN 5890. Readings in American Indian and Indigenous History. (3 cr.; Student Option; Periodic Fall & Spring)
Students in this course will read recently published scholarship in American Indian and Indigenous history that takes up pressing research questions, promises to push inquiry in new directions, and that theorizes important interventions in our thinking to understand where the field is situated and moving. Reflecting the instinctively interdisciplinary nature of American Indian and Indigenous history, readings will be drawn not just from the discipline of history but across other disciplines such as Anthropology, American Studies, Geography, Literature, Political Science, and Legal Studies. As well, readings will include scholarship that reaches out to embrace the Global Indigenous studies turn. prereq: Advanced undergrad with instr consent or grad student

American Sign Language (ASL)

ASL 1701. American Sign Language I. ( ; 5 cr.; Student Option; Every Fall, Spring & Summer)
First of a 4-course sequence. American Sign Language (ASL), cultural values/rules of behavior of Deaf community in the United States. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab sessions.

ASL 1702. American Sign Language II. ( ; 5 cr.; Student Option; Every Fall, Spring & Summer)
Second of four-course sequence. American Sign Language (ASL), cultural values/rules of behavior of U.S. deaf community. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab, prereq: 1701 with grade of at least [S or C-] or dept consent

ASL 3001. Cultural and Sociolinguistic Views within the Deaf Community. ( ; 3 cr.; Student Option; Every Fall & Spring)
This course investigates the Deaf community using an ethnocentric view of culture. Students will explore cultural readings and various sources in class discussion using multi-disciplinary approaches: sociological, educational, and linguistic views. Can be taken concurrently with ASL 1701-3704. Class instruction conducted entirely in ASL with an English interpreter.

ASL 3703. American Sign Language III. ( ; 5 cr.; Student Option; Every Fall, Spring & Summer)
Third of a four-course sequence. American Sign Language (ASL), cultural values/rules of behavior of U.S. deaf community.
Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of Deaf culture. Lab, prereq: 1702 with grade of at least [S or C-] or dept consent

**AMST 3704. American Sign Language IV.** ('; 5 cr.; Student Option; Every Fall, Spring & Summer)

Fourth of a four-course sequence. American Sign Language (ASL), cultural values/ rules of behavior of U.S. deaf community. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingerspelling, aspects of deaf culture. Lab, prereq: 3703 with grade of at least [S or C-] or dept consent

**AMST 3800. ASL Independent Study: Extended Study.** (; 1-3 cr. [max 6 cr.]; S-N only; Every Fall & Spring)

Tutoring/supporting ASL instruction. Social/academic situations. Trained in tutoring by SMART Learning Commons. prereq: Completion of or concurrent registration is required (or allowed) in 3704

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**American Studies (AMST)**

**AMST 1011. Religions and American Identity in the United States from World War II to the Present.** (CIV; 3 cr.; Student Option; Every Fall)

Political/cultural watersheds of last 60 years. Changing ideas about religion. Debates within/ between religious traditions/communities. How gender, race, class, and sexuality have shaped relationships between religion and politics. Tensions between secularism and religiosity and liberalism and fundamentalism. Ways in which religion has acted as both a progressive and a conservative political force.

**AMST 1012. Migrants, Refugees, Citizens, and Exiles: The U.S. on an Immigrant Planet.** (CIV; 3 cr.; Student Option; Every Spring)

Immigration to the United States at various historical periods and across geographical/political terrains. How immigration, as a national/racial project, is shaped by legal categories and discursive practices based on race, class, gender, and sexuality. Diverse ways marginalized groups produce national/transnational political practices.

**AMST 1401. Comparative Genders and Sexualities.** (DSJ; 3 cr.; Student Option; Every Spring)

Gender/sexual practices/identities within international frameworks. How such practices/identities reflect/refract national ideals and express national/international division.

**AMST 1511. Americans Abroad: Rethinking Travel, Culture, & Empire.** (GP,HIS; 3 cr.; Student Option; Every Spring)

In this course, we will look at Americans (including ourselves) who travel abroad and what their experiences, both in the present and historically, tell us about how we imagine others and our/place in the world. What do these experiences tell us about who we are as a people, a culture, and a nation? This course will examine how these experiences have transformed (and continue to transform) Americans and the countries and cultures with which they interact. Indeed, this course challenges students to consider the overall effects that these processes have had on America's relationship with the rest of the world.

**AMST 1911. Asian Americans and Food.** (DSJ; 3 cr.; Student Option; Periodic Fall)

Asian Americans have always been intimately connected to food practices and institutions in the American imagination. Food is the medium through which Asian American cultural difference, their status as "perpetual foreigners," and the "model minority character" are typically expressed and disseminated. Historically, Asian migration to the United States was fueled by labor needs, particularly in the agricultural sector. In addition, Asian labor has been stereotypically linked to food service and preparation such as the ubiquitous Chinese take-out place and more recently, the sushi and Korean fusion joints. This course is an introduction to the interdisciplinary study of food as a way to understand the historical, social, and cultural aspects of Asian American food preparation, distribution, and consumption. Students will investigate the politics and poetics of Asian American food ways by examining social habits and rituals around food in homes, restaurants, and other public venues. Texts include ethnographic essays, fictional works, memoirs, magazines, visual arts, and television shows.

**AMST 2011. The United States since September 11.** (CIV,HIS; 3 cr.; Student Option; Every Fall)

How American citizenship and nationhood have changed since 9/11. The event and its aftermath in historical perspective. Political, economic, and military antecedents. How 9/11 has changed relations between the U.S. government, U.S. citizens, immigrants, and international community. How 9/11 has been remembered.

**AMST 2031. Chasing the American Dream: Economic Opportunity & Inequality in the U.S.** (DSJ,HIS; 3 cr.; Student Option; Every Spring)

This course begins by focusing on the historical origins and meanings of the American dream. How did this dream of unlimited opportunity come about? What has it meant in different historical moments and to divergent social groups? And, why does it continue to be such a powerful and compelling idea in the United States and around the world?

**AMST 3001. Contemporary Perspectives on Asian America.** (DSJ; 3 cr.; Student Option; Every Spring)


**AMST 3003. Public History.** (3 cr. [max 4 cr.]; A-F or Audit; Periodic Fall & Spring)

Interpretations of collective past as produced in public venues, including museum exhibitions, films, theme parks, websites. Intellectual and political issues in history produced for public audiences. Career opportunities.

**AMST 3112. Prince, Porn, and Public Space: The Cultural Politics of the Twin Cities in the 1980s.** (DSJ,HIS; 3 cr.; Student Option; Every Fall)

This course uses music (especially Prince and the Replacements), debates around pornography/sex, and shifts around access to public space in order to explore the local culture and national importance of the Twin Cities during the 1980s.

**AMST 3113W. Global Minnesota: Diversity in the 21st Century.** (DSJ, WI; 3 cr.; Student Option; Every Fall, Spring & Summer)

Diverse cultural (racial, ethnic, class) groups in America. Institutions/processes that shape their relations and create domination, resistance, hybridity, nationalism, racism, alliance. Specific content may vary.

**AMST 3114. America in International Perspective.** (DSJ; 3 cr.; Student Option; Every Fall & Spring)

The nature of international cultural exchange. The impact of U.S. cultures and society on other countries of the world as well as the impact of other cultures and societies on the United States.

**AMST 3212. Dissident Sexualities in U.S. History.** (3 cr.; A-F or Audit; Every Fall)

History of sexuality in United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transgender, bisexual, lesbian, gay identities/communities. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.

**AMST 3252W. American Popular Culture and Politics: 1900 to 1940.** (CIV, WI,HIS; 4 cr.; Student Option; Every Fall & Summer)


**AMST 3253W. American Popular Culture and Politics: 1940 to the Present.** (CIV, WI,HIS; 4 cr.; Student Option; Every Spring & Summer)


**AMST 3752. Chicanas and Chicanos in Contemporary Society.** (DSJ; 3 cr.; Student Option; Every Spring)

Introduction to sociological analysis of theoretical/methodological approaches to Chicano/a and Latina/o communities. Socioeconomic conditions, education, cultural
change, the family, gender relations, political experiences. Theories, issues, methods of sociological research. Debates regarding qualitative/quantitative research methods.

**AMST 3920. Topics in American Studies.** (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Topics specified in Class Schedule.

**AMST 3993. Directed Studies.** (1-9 cr.; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. prereq: instr consent

**AMST 4101. Gender, Sexuality, and Politics in America.** (DSJ,HIS; 3 cr.; Student Option; Every Fall)
Ways public and private life intersect through the issues of gender, sexuality, family, politics, and public life; ways in which racial, ethnic, and class divisions have been manifest in the political ideologies affecting private life.

**AMST 4301. Workers and Consumers in the Global Economy.** (DSJ; 3 cr.; Student Option; Every Fall)

**AMST 4961. Proseminar I.** (3 cr.; Student Option; Every Fall)

**AMST 4962W. Second Proseminar in American Studies.** (WI; 3 cr.; Student Option; Every Fall & Spring)
Problem related to representative theme, figure, or period. Students research/write senior theses. prerequisite: AmSt sr or instr consent

**AMST 5412. Comparative Indigenous Feminisms.** (GP; 3 cr.; Student Option; Periodic Fall & Spring)
The course will examine the relationship between Western feminism and indigenous feminism as well as the interconnections between women of color feminism and indigenous feminism. In addition to exploring how indigenous feminists have theorized from the flesh of their embodied experience of colonialism, the course will also consider how indigenous women are articulating decolonization and the embodiment of autonomy through scholarship, cultural revitalization, and activism.

**AMST 5920. Topics in American Studies.** (1-4 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Topics specified in Class Schedule.

**AMST 8201. Historical Foundations of American Studies.** (3 cr.; Student Option; Every Fall)
Exposition of American studies as a field of inquiry, including its history, major theoretical framework, and interdisciplinary methodologies. prereq: grad AmSt major

**AMST 8202. Theoretical Foundations and Current Practice in American Studies.** (3 cr.; Student Option; Every Spring)
Analysis of central theoretical work in the field and survey of key methodologies. prereq: grad AmSt major or instr consent or dept consent

**AMST 8231. Cultural Fallout: The Cold War and Its Legacy, Readings.** (3 cr.; Student Option; Every Fall & Spring)
Culture of Cold War, its legacy. How it affected/reflected domestic politics, public policies, civic life, gender expectations, sexuality, class relations, racial justice, and civil rights. Impact of domestic anti-communism and of American cultural politics abroad.

**AMST 8232. Cultural Fallout: The Cold War and Its Legacy, Research.** (3 cr.; Student Option; Every Fall & Spring)
Student produces a research paper on history/culture of Cold War era as it developed in United States after World War II. Research projects build upon readings from 8231. prereq: 8231

**AMST 8239. Gender, Race, Class, Ethnicity, and Sexuality in the United States: Readings.** (3 cr.; Student Option; Every Fall)
Social, cultural, and artistic modes of self-expression. Intellectual analysis of people in the United States identified as female or male or as members of groups defined by race, ethnicity, class, or sexual orientation. prereq: instr consent

**AMST 8240. Gender, Race, Class, Ethnicity, and Sexuality in the United States: Topical Development.** (3 cr. [max 9 cr.]; Student Option; Every Spring)
Social, cultural, and artistic modes of self-expression and intellectual analysis of people in the United States identified as female or male or as members of groups defined by race, ethnicity, class, or sexual orientation. prereq: instr consent

**AMST 8249. Popular Culture and Politics in the 20th Century: Readings.** (3 cr.; Student Option; Periodic Fall & Spring)
Popular arts in their political/social context. Issues of race, gender, class, and nationalism.

**AMST 8250. Popular Culture and Politics in the 20th Century: Research Strategies.** (3 cr.; Student Option; Periodic Fall & Spring)
Popular arts in their political/social context. Focuses on issues of race, gender, class, and nationalism. prereq: 8239 or instr consent

**AMST 8259. Literature, History, and Culture: Research Strategies.** (3 cr.; Student Option; Periodic Fall & Spring)
Interdisciplinary study of connections between literary expression and history, particularly as they articulate themes in American culture. prereq: instr consent

**AMST 8260. Literature, History, and Culture: Topical Development.** (3 cr.; Student Option; Periodic Fall & Spring)
Interdisciplinary study of connections between literary expression and history, particularly as they articulate themes in American culture. prereq: instr consent

**AMST 8288. Working in the Global Economy: Readings.** (3 cr.; Student Option; Periodic Fall)
Debates about global economy’s consequences for American culture/character. Effects of global capitalism on factory work, service sector, pink-collar, and factory work in multinational corporations and professional/managerial positions inside/outside U.S. borders. How work is lived through race, class, gender, and nation.

**AMST 8289. Ethnographic Research Methods: Research Strategies in American Studies.** (3 cr.; Student Option; Periodic Spring)
Students conduct an empirical research project, write a final paper. Assumptions/practices of positivism, reflexive science, and feminist methodology. Issues surrounding politics/ethics of feminist research. Dilemmas in practice of fieldwork, oral histories, reading, and writing. prereq: 8288 or instr consent

**AMST 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

**AMST 8401. Practicum in American Studies.** (3 cr.; S-N or Audit; Periodic Fall & Spring)
Training in teaching undergraduate courses in American studies. prereq: instr consent

**AMST 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**AMST 8666. Doctoral Pre-Thesis Credits.** (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
x prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**AMST 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**AMST 8801. Dissertation Seminar.** (3 cr.; S-N or Audit; Every Fall & Spring)
Conceptualizing the research problem for the dissertation and structuring the process of writing a chapter of it. prereq: AmSt doctoral student beginning dissertation work

**AMST 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required
ANAT 3001. Human Anatomy. (; 3 cr.; Student Option; Every Fall)

Anatomical relationships. Function based upon form. Clinical applications. Gross (macroscopic) anatomy, histology (microscopic anatomy). Neuroanatomy (nervous system), embryology (developmental anatomy). prereq: [BIOI 1002 or BIOI 1009 or BIOI 2002 or equiv], at least soph

ANAT 3171. Principles of Human Anatomy Laboratory for Mortuary Science Students. (; 2 cr.; Student Option; Every Spring)

Human anatomy laboratory for mortuary science students who have had a previous human anatomy lecture course. prereq: Mortuary science student

ANAT 3601. Principles of Human Anatomy. (; 3 cr.; Student Option; Every Spring)

Anatomical relationships. Function based upon form. Clinical applications. Gross (macroscopic) anatomy, histology (microscopic anatomy). Neuroanatomy (nervous system), embryology (developmental anatomy). prereq: [BIOI 1002 or BIOI 1009 or BIOI 2002 or equiv]. concurrent registration is required (or allowed) in 3602 or concurrent registration is required (or allowed) in 3612.

ANAT 3602. Principles of Human Anatomy Laboratory. (; 2 cr.; Student Option; Every Spring)

Complements 3601 or 3611. prereq: 3001 or 3001 or INMD 3001 or 3001 or concurrent registration is required (or allowed) in 3601 or concurrent registration is required (or allowed) in 3612.

ANAT 3608H. Principles of Human Anatomy Laboratory for Honors Students. (; 3 cr.; A-F only; Every Spring)

Lab work required for 3602 or 3612. Additional dissection of human cadavers/related projects. Supplements 3001 or 3601 or 3611. prereq: concurrent registration is required (or allowed) in 3601 or concurrent registration is required (or allowed) in 3611 or 3001), sophomore, junior or senior, honors

ANAT 3611. Principles of Human Anatomy. (; 3 cr.; Student Option; Every Spring)

Anatomical relationships. Function based upon form. Clinical applications. Gross (macroscopic) anatomy, histology (microscopic anatomy). Neuroanatomy (nervous system), embryology (developmental anatomy). prereq: [BIOI 1002 or BIOI 1009 or BIOI 2002 or equiv], at least soph; concurrent registration is required (or allowed) in 3602 or concurrent registration is required (or allowed) in 3612 recommended

ANAT 3612. Principles of Human Anatomy Laboratory. (; 2 cr.; Student Option; Every Spring)

Complements 3601 or 3611. prereq: 3001 or 3001 or INMD 3001 or 3001 or concurrent registration is required (or allowed) in 3601 or concurrent registration is required (or allowed) in 3611.

ANAT 4900. Directed Studies in Anatomy. (; 1-6 cr.; S-N only; Every Spring)

x prereq: instr consent

ANAT 5095. Advanced Problems in Anatomy. (; 1-6 cr.; [max 12 cr.]; A-F only; Every Fall, Spring & Summer)

Exceptional projects that do not easily fit within confines of other ANAT offerings. Examples include but not limited to individual teaching or research projects. prereq: one or more ANAT classes, instr consent

ANAT 5150. Human Gross Anatomy. (5 cr.; A-F only; Every Fall)

Human cadaveric dissection based on traditional preparation, lab dissection, review sections, radiographic analysis, clinical correlations. Taught by regions. Extremities, torso, head/neck. Assessment by mid-semester/final written/practical examinations. prereq: instr consent. For Medical Students. graduate program as determined by instructor.

ANAT 5525. Anatomy and Physiology of the Pelvis and Urinary System. (; 1-2 cr.; A-F only; Every Spring)

Two-day intensive course. Pelvis, perineum, and urinary system with cadaveric dissection. Structure/function of pelvic and urinary organs, including common dysfunction and pathophysiology. Laboratory dissections, including kidneys, ureters, urinary bladder, pelvic viscera and perineum (male or female), pelvic floor, vascular and nervous structures. Grand rounds section. prereq: One undergrad anatomy course, one undergrad physiology course, instr consent

ANAT 5999. Head and Neck Anatomy. (; 3 cr.; Student Option; Every Fall & Summer)

Head/neck anatomy. prereq: [Medical or dental] resident

Anesthesiology (ANES)

ANES 5587. Adv Clinical Physiology I for Nurse Anesthetists. (; 3 cr.; A-F or Audit; Every Fall)

Cellular mechanisms underlying systems physiology. Cellular physiology, physiology of excitable tissues, renal physiology, cardiovascular physiology, hemostasis.

ANES 5588. Advanced Clinical Physiology II for Nurse Anesthetists. (; 3 cr.; A-F or Audit; Every Spring)

Respiratory physiology, acid-base physiology, gastrointestinal physiology, metabolism, endocrinology, reproductive physiology, physiology of pregnancy/labor. prereq: Advanced Clinical Physiology I for Nurse Anesthetists

ANES 5866. Chemistry and Physics for Nurse Anesthetists. (; 3 cr.; A-F or Audit; Every Summer)

Chemical equilibrium, organic chemistry, physics of fluids/gases, anesthetic applications. prereq: General chemistry or instr consent

ANES 7015. Directed Study, Anesthesia Topics/Project Course Development. (; 1-15 cr.; H-N only; Every Fall & Spring)

ANES 7181. Introduction to Anesthesiology. (; 2 cr.; P-N only; Every Fall, Spring & Summer)

The student will receive supervised training in the operating suite at Fairview-University Medical Center (University Campus), assisting in the management of all types of surgical patients under the direction of the faculty and residents of the Department of Anesthesiology. The rotation is divided into one-week segments; each student may select sub-specialty areas on the basis of interest.
The student will spend the majority of his/her time in the operating room because only under such controlled conditions can there be leisurely teaching of essential life-support skills. There is no night or weekend call.

ANES 7182. Anesthesiology Research. (2-8 cr.; H-N only; Every Fall, Spring & Summer)
On- or off-campus learning experiences individually arranged between the student and a faculty member for credit in areas not covered by regular courses. May include clinical/basic science research, library research or special projects.

ANES 7183. Anesthesiology Advanced Elective. (4 cr.; H-N only; Every Fall, Spring & Summer)
The experience will build on the basics learned in rotation 7181, and include greater utilization of manual skills such as starting i.v. catheters, endotracheal intubation, and a greater understanding of physiology and interpretation of data from multiple simultaneous monitors.

ANES 7184. Rural Externship in Clinical Anesthesiology. (0-3 cr.; H-N only; Every Fall, Spring & Summer)
Students shadow surgical medical director in all aspects of patient care and administrative duties. Care of patients in OR. Clinics visit. ICU consult. Riding with paramedics. Meeting with CEO of hospital for strategic planning.

ANES 7185. Anesthesia Advanced Elective - VA. (4 cr.; H-N only; Every Fall, Spring & Summer)
This 4-week advanced rotation is focused on the medical student who is interested in pursuing a career in anesthesiology and/or desires additional anesthesia experience in managing medically complex patients undergoing medium to high-risk surgery. Students will have the opportunity to care for the aging veteran population. There will be an emphasis on managing patients with multiple co-morbid conditions undergoing cardiac and vascular surgery. Additionally, medical students will learn more advanced concepts during cases that include ENT, thoracic, and abdominal surgery. The medical student will develop skills including placing peripheral intravenous catheters, endotracheal intubation, arterial lines, and central lines. The medical student will develop a greater understanding of perioperative cardiovascular physiology/hemodynamics and pulmonary physiology, ventilator management and interpretation of data from multiple simultaneous monitors. They will function at the level of a sub-intern and will be given advanced responsibilities consistent with their level of knowledge and skill.

ANES 7186. Clinical Practice in Anesthesia. (15 cr.; H-N or Audit; Every Fall & Spring)

ANES 7286. Directed Study Anesthesia Project: Clinical. (1-15 cr.; H-N or Audit; Every Spring)

ANES 7910. Anesthesiology Medical Residency. (6 cr.; max 120 cr.; No Grade Associated; Every Fall, Spring & Summer)
Anesthesiology medical residency.

ANES 7930. Anesthesiology Medical Fellowship. (6 cr.; max 120 cr.; No Grade Associated; Every Fall, Spring & Summer)
Anesthesiology medical fellowship.

ANES 8269. Research in Anesthesia. (1 cr.; Student Option; Every Fall & Spring)

Animal Science (ANSC)

ANSC 1001. Orientation to Animal Science. (1 cr.; A-F or Audit; Every Fall)
Current issues, career planning, professional development. Interviews with faculty and other resource persons.

ANSC 1011. Animals and Society. (CIV; 3 cr.; Student Option; Every Fall)
This online course is designed for anyone interested in the ways in which we as a human society interact with, affect and are affected by non-human animals. Students will gain a broad understanding of the major ways in which humans use animals in contemporary society, including as food, as companions, as research subjects, and as entertainment. Other topics will include: social and ethical issues concerning animal use, the human-animal bond, animals in culture, and animals and the law.

ANSC 1101. Introductory Animal Science. (4 cr.; Student Option; Every Fall & Spring)
Fundamental concepts of animal breeding, physiology, nutrition, and management as they apply to the production of beef, dairy, horses, poultry, sheep, swine, and other livestock. Fall term class open only to ANSC majors. Spring term class open to all majors.

ANSC 1201. Backyard Chickens - Science and Practice. (3 cr.; Student Option; Every Spring)
Backyard Chickens - Science and Practice is an online course designed to meet the needs of students interested in understanding chickens in general, and for those who engage or are planning to engage in small scale farming of chickens. This course, expanded over 6 modules; (1) Basic biology and behavior (2) Selection (3) Housing (4) Nutrition (5) Management and (6) Diseases as it relates to chickens, will help the students understand the basic science of rearing chickens. Each of the six modules encompasses pertinent short video or PowerPoint lectures that provide fundamental and applied information on backyard chicken rearing.

ANSC 1205. Animal Handling - Livestock. (1 cr.; A-F only; Every Fall & Spring)
Students will learn how to handle and restrain animals safely. Cattle, sheep, and pigs in the Animal Science Department?S St. Paul animal units are the animals primarily worked with. Students will perform common animal husbandry techniques on these animals. Proper techniques that promote animal welfare will be emphasized. This course is meant for Animal Science freshmen students that have minimal experience working with livestock.

ANSC 1403. Companion Animal Nutrition and Care. (3 cr.; Student Option; Every Spring)
This course is designed for individuals having no prior training with animals or nutrition but have interest in caring for and understanding the contemporary importance of companion animals. Emphasis will be on nutrition of healthy animals and the various factors that play a role in feeding an animal adequately. These factors include animal behavior, environmental conditions, food type, and availability. The course will emphasize basic principles of nutrition. The target audience of this course is all undergraduate students interested in nutrition and care of companion animals. The course will focus on companion animals, but not exclusively dogs and cats.

ANSC 1511. Food Animal Products for Consumers. (3 cr.; Student Option; Every Fall)
Introduction to the compositional variation, processing, selection, storage, cookery, palatability, nutritional value, and safety of red meat, poultry, fish, and dairy products.

ANSC 1701. Historical Influence of the Horse on Society. (HIS; 3 cr.; Student Option; Every Fall)
Concepts of historical inquiry using the powerful/changing relationship between Man and horse. Students function as historians: framing questions, searching for appropriate sources, developing explanation model with reasoned arguments, and finally, write/defend interpretation.

ANSC 211. Dairy Cattle Judging. (2 cr.; Student Option; Every Fall)
Evaluation of dairy animals on the basis of physical appearance, including classes of heifers and cows from the six major dairy breeds. Held in conjunction with the Minnesota State Fair. Training in oral reasons. prereq: instr consent

ANSC 212. Livestock and Carcass Evaluation. (3 cr.; Student Option; Every Spring)
Evaluation of cattle, swine, and sheep. Breeding stock evaluation on live appraisal, performance records, and breeding values. Market animals evaluated, graded, and priced on physical appearance followed by evaluation and grading of their carcasses.

ANSC 213. Beginning Livestock Judging. (2 cr.; Student Option; Fall Odd Year)
Visual evaluation of beef cattle, swine, and sheep for type, muscling, degree of finish, structure, and soundness. Short oral presentations. Preparation for collegiate livestock judging competition.

ANSC 215. Animal Welfare Science and Ethics. (3 cr.; A-F only; Every Spring)
This multidisciplinary course helps students develop an intellectual framework for understanding and interpreting issues involving animal welfare and ethics of animal use in agriculture, science and society.

ANSC 216. Introduction to Applied Animal Behavior. (3 cr.; A-F only; Every Spring)
Basic concepts and applications of animal behavior within the contexts of human use. Emphasis on domesticated species, but other...
species within captive environments also examined.

**ANSC 2055. Horse Management.** (2 cr.; Student Option; Every Fall)
This course is offered online (semi-self paced) and provides an introduction to equine-related careers, the equine industry, and horse breeds and behavior. Current events will be discussed including topics such as horse slaughter and unwanted horses. Students will learn about the importance of bodyweight estimation, body condition scoring, hay analysis, plants poisonous to horses, liability, insurance options, as well as feeding, pasture, manure, and facility management. Equine health care will be discussed including colic, hoof care, vaccinations, deworming, and the role of genetics. Each week, students will participate in a course discussion, quiz, or exam.

**ANSC 2056. Horse Management Practicum.** (2 cr.; Student Option; Every Fall)
Best management practices. Daily care (in small groups, weekends included) of horses. Volunteer day at local equine nonprofit. Applied equine management research project. Two group presentations. prereq: 2055 or concurrent registration is required (or allowed) in 2055

**ANSC 2401. Animal Nutrition.** (3 cr.; Student Option; Every Fall)
Classification/function of nutrients. Use of nutrients for body maintenance, growth, egg production, gestation, and lactation. Comparative study of digestive systems of farm animal species.

**ANSC 3007. Equine Nutrition.** (3 cr.; Student Option; Every Spring)

**ANSC 3011. Statistics for Animal Science.** (4 cr.; Student Option; Every Fall & Spring)
Basic statistical concepts. Develop statistical reasoning/critical thinking skills. Descriptive statistics, probability, sampling and sampling distributions, hypothesis testing, experimental design, linear correlation, linear regression, and multiple regression. How to make sound arguments/decisions based on statistics when reviewing news articles or scientific publications with statistical content. Explore/draw conclusions from data using a basic statistical software package.

**ANSC 3015. Animal Welfare Judging and Assessment.** (3 cr.; Student Option; Every Fall)
Advanced application of animal welfare science toward the assessment of real-life scenarios in agriculture, companion, and exotic animals. Top students will compete on the UMN team at the Intercollegiate Animal Welfare Judging and Assessment Competition held in November each year.

**ANSC 3092. Undergraduate Research in Animal Science.** (1-3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Students conduct research project under supervision of faculty member.

**ANSC 3141. Advanced Dairy Judging.** (1 cr.; Student Option; Every Spring)
Training in presentation of oral reasons in dairy cattle judging. Selected students from this course participate in fall intercollegiate dairy judging contest. prereq: 2011 or instr consent

**ANSC 3142. Advanced Livestock Judging.** (2 cr.; Student Option; Fall Even Year)
Visual evaluation of beef cattle, swine, and sheep for muscling, finish, structure, and soundness. Use of production (growth and reproduction) records in evaluation. Oral presentations. Preparation for national collegiate livestock judging contest. prereq: instructor consent

**ANSC 3203W. Environment, Global Food Production, and the Citizen.** (GP,W; 3 cr.; Student Option; Every Spring)
Ecological/ethical concerns of food production systems in global agriculture: past, present, and future. Underlying ethical positions about how agroecosystems should be configured. Interactive learning using decision cases, discussions, videos, other media.

**ANSC 3221. Animal Breeding.** (4 cr.; Student Option; Every Fall)
Application of qualitative and quantitative genetics to animal breeding. Concepts of livestock improvement through selection and mating programs.

**ANSC 3301. Human and Animal Physiology.** (3 cr.; Student Option; Every Fall & Spring)

**ANSC 3302. Human and Animal Physiology Laboratory.** (1 cr.; Student Option; Every Fall & Spring)
Companion course to 3301. Physiological principles are demonstrated using active learning approaches. Nervous system, muscles, cardiovascular, respiration, renal, endocrinology/metabolism, blood, immunology, reproduction, prereq: 3301 or concurrent registration is required (or allowed) in 3301

**ANSC 3305. Reproductive Biology in Health and Disease.** (4 cr.; Student Option; Every Fall)
Reproductive organ functions, fertilization, estrous cycle and endocrine control, reproductive efficiency, problems/principles of artificial insemination. Anatomy, physiology, biochemistry of mammary gland. Mammary growth, initiation/maintenance of lactation, milk synthesis, factors influencing lactation curve. prereq: Biol 1009 or equiv

**ANSC 3307. Artificial Insemination Techniques.** (1 cr.; S/N or Audit; Every Spring)
Hands-on training/techniques of artificial insemination at an off-campus laboratory setting. Techniques of AI and semen handling. Criteria for selection of bulls. prereq: instr consent

**ANSC 3403. Companion Animal Hot Button Issues.** (3 cr.; Student Option; Every Fall)
Various issues that affect companion animals in our society. Students debate pros/cons of each issue and formalize their own opinions based on information presented by debate teams.

**ANSC 3480. Topics in Animal Science.** (1-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Various topics

**ANSC 3509. Animal Biotechnology.** (BIOL,T; 4 cr.; Student Option; Every Fall)
ANSC 3509 is a course for undergraduates seeking a broad understanding of animal biotechnology in a single semester. The course covers the major concepts and principles of modern animal biotechnology. Topics include: genes and genomes, recombinant DNA technology, proteins as products, DNA fingerprinting and forensic analysis, bioremediation, aquatic biotechnology, medical biotechnology, and bioethics as it pertains to biotechnology. The laboratory component will focus on teaching molecular techniques necessary to gather DNA profiling data of scarlet macaws in southwest Belize. The Scarlet Macaw Protection Program is a conservation initiative between the Wildlife Institute (WI), the Belize Wildlife & Referral Clinic (BWRC) and Friends for Conservation & Development (FCD). The purpose of the Scarlet Macaw Protection Program is to support a specific scarlet macaw population in the Chiquibul Forest, which is under heavy poaching threat. The conservation strategy is to remove chicks from nest sites that are under highest threat of poaching, and for which security provision is most prohibitive. Chicks are reared with the aim to be reintroduced into the wild. The Animal Biotechnology laboratory will use DNA isolated from feathers gathered at scarlet macaw nesting sites and housing facilities in Belize. The DNA will be used to genotype scarlet macaws to establish parentage, genealogy and nesting/breeding behavior.

**ANSC 3511. Animal Growth and Development.** (3 cr.; Student Option; Every Spring)
Principles of animal growth. Interaction of nutrition, hormones, exercise, heredity, and disease in regulating growth. prereq: College-level biology course

**ANSC 3555. Applied Livestock and Poultry Microbiology.** (2 cr.; A-F only; Spring Even Year)
This applied microbiology course is intended to provide theoretical basis and hands-on experience to students on major pathogenic bacteria colonizing livestock and domestic poultry. This course will provide skills to
the students who seriously consider farm animal and poultry microbiology research and/or teaching in their careers. Pathogenic bacteria in livestock and poultry such as Listeria monocytogenes, Escherichia coli O157: H7, and Salmonella, fungal microorganisms (Aspergillus), and beneficial microorganisms such as Lactobacillus, will be discussed. In addition, the course will introduce feed testing methods (Bacteriological Analytical Manual (BAM) methodology), common antibacterials/ antibiotics used for decontamination and disinfection, and the emerging alternatives to antibiotics with a perspective on bacterial antibiotic resistance. In a flipped class room format, the students will gather necessary information provided by the instructor, listen to short lectures on the methods and mechanisms, participate in demonstrations, and apply it in a typical BSL2 laboratory set up under supervision. All students should undergo BSL2 training prior to enrollment. Online training counts to approximately 5-6 hours. Not more than 4 students will be allowed for each session due to BSL2 pathogenic microbiology space restriction, access to RAR facilities, and some non-conventional microbiological methods. Special health conditions, pregnancy, and immunocompromised situations must be consulted with the instructor prior to enrollment. The students must obtain clearance from ROHC for their tetanus vaccination status. preq: Instructor Permission


ANSC 3801. Livestock Merchandising. (; 3 cr.; Student Option; Spring Odd Year) Promotion/merchandising of purebred livestock. Hands-on training in advertising, livestock photography, showing/fitting, sale organization. Field trips to seed stock operations/auctions. Presentations by industry and breed association leaders. Students conduct annual sale. preqr: Jr or sr or instr consent

ANSC 4099W. Undergraduate Research Thesis. (WI; 1-6 cr.; max 12 cr.; A-F or Audit; Every Fall, Spring & Summer) Usually one full year. Research/thesis experience under supervision of CFANS faculty member. Written bound thesis, oral presentation of research results. preq: Jr or sr or major in AnSc, instr consent

ANSC 4011. Dairy Cattle Genomics. (3 cr.; Student Option; Every Spring) Quantitative genetic principles of breeding dairy cattle. Evaluation of males, females. Systems of mating. Rates of genetic improvement with/ without AI. preq: (prereq 3221, previous or current registration in 4604, at least junior status)

ANSC 4092. Special Problems in Animal Science. (1-4 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Independent study in an area of animal science, under supervision of faculty member. preq: instr consent

ANSC 4093. Tutorial in Animal Science. (; 1-4 cr.; Student Option; Every Fall, Spring & Summer) Informally structured to encourage in-depth study of specific disciplines in animal science. Pertinent readings; preparation of written essays of high quality required. preq: instr consent

ANSC 4096. Professional Experience Program: Internship. (1-3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Supervised professional experience in animal industries and farm enterprise systems. Various aspects of the industry and related fields. Evaluative reports. Consultations with faculty advisers and employers. preq: CFANS undergrad, instr consent, agreement form

ANSC 4099. Special Workshop in Animal Science. (; 1-4 cr. [max 8 cr.]; Student Option; Every Fall & Spring) Independent study in an area of animal science, under supervision of faculty member. preq: instr consent

ANSC 4305. Companion & Wild Species Reproduction. (; 2 cr.; A-F only; Every Spring) Reproductive physiology specific to domesticated companion canine and feline species as well as avian species. Management of breeding and reproductive diseases in companion species as well as conservation management in wild species. preq: ANSC 3305

ANSC 4401. Swine Nutrition. (; 3 cr.; Student Option; Every Fall) A comprehensive review of major considerations in providing optimum, cost-effective nutrition to swine in all stages of production. preq: 2401, 3511 recommended

ANSC 4403. Ruminant Nutrition. (; 3 cr.; Student Option; Every Spring) Nutrient requirements of ruminants, physiology of digestion in ruminants, nutrient content of feedstuffs, primarily forages; energy utilization, protein and nonprotein nitrogen utilization; nutritional disorders; formulation of adequate rations. preq: 2401


ANSC 4601. Pork Production Systems Management. (4 cr.; Student Option; Fall Odd Year) Interrelationships of business, marketing, and biological performance of pigs in various types of production systems. preq: 2401; 3221 recommended


ANSC 4603. Beef Production Systems Management. (4 cr.; Student Option; Every Fall) How to resolve problems and manage cow-calf, stocker, or feedlot operations. Segments of beef industry, challenges. Nutrition, reproduction, genetics, and health in beef cattle production. Students evaluate a beef cattle enterprise and contribute in marketing, selection, reproduction, nutrition, or health management, preq: concurrent registration is required (or allowed) in 4613

ANSC 4604. Dairy Production Systems Management. (4 cr.; Student Option; Every Spring) Practical applications of principles of animal breeding, nutrition, physiology, reproduction, housing, and economics in a problem solving context. Decision-cases, farm visits, field diagnostic techniques labs. preq: Pre-req: AnSc 1101, AnSc 2401 Concurrent registration is not allowed in 4614

ANSC 4613. Advanced Beef Production Systems Management. (2 cr.; Student Option; Every Fall) Half semester course. Student enterprise-analysis teams evaluate a beef cattle enterprise and solve problems in marketing, selection, reproduction, nutrition, or health management, preq: 4603


ANSC 5091. Research Proposals: From Ideas to Strategic Plans. (WI; 3 cr.; Student Option; Every Fall & Spring) You have a great research idea, now what? How do you turn your idea into a proposal? It has been said paraphrasing Edison, that "you have 99 ideas but the 100th one is the one that works." This course will guide students in the research process of how to turn your idea into a proposal, to include the development of hypothesis, aims, and objectives and a research strategy. The aim of the course is to provide students with tools to understand the structure of scientific reports and proposals, literature searches and basic data interpretation. The student will learn about different research approaches and how to achieve consistency in their research projects. We will guide students in how to begin and develop a written research proposal that will satisfy the requirements of their advisers,
institution and funding organizations. prereq: There are no prerequisites, however, having taken ANSC 3011 Statistics for Animal Science is desirable.

ANSC 5099. Special Workshop in Animal Science. (1-6 cr. [max 12 cr.]; Student Option; Every Spring) Topics vary. See Class Schedule or department. Topics may use guest lectures/experts. prereq: instr consent


ANSC 5305. Companion & Wild Species Reproduction. (2 cr.; A-F only; Every Spring) Principles of reproductive physiology specific to domesticated companion canine and feline species as well as avian species. These principles discussed in the context of the management of breeding and reproductive diseases in companion species as well as conservation management in wild species. prereq: instr consent

ANSC 5555. Applied Livestock and Poultry Microbiology. (2 cr.; A-F only; Spring Even Year) This applied microbiology course is intended to provide theoretical basis and hands-on experience to students on major pathogenic bacteria colonizing livestock and domestic poultry. This course will provide skills to the students who seriously consider farm animal and poultry microbiology research and/or teaching in their careers. Pathogenic bacteria in livestock and poultry such as Listeria monocytogenes, Escherichia coli O157: H7, and Salmonella, fungal microorganisms (Aspergillus), and beneficial microorganisms such as Lactobacillus, will be discussed. In addition, the course will introduce feed testing methods (Bacteriological Analytical Manual (BAM) methodology), common antibacterials/antibiotics used for decontamination and disinfection, and the emerging alternatives to antibiotics with a perspective on bacterial antibiotic resistance. In a flipped class room format, the students will gather necessary information provided by the instructor, listen to short lectures on the methods and mechanisms, participate in demonstrations, and apply it in a typical BSL2 laboratory set up under supervision. All students should undergo BSL2 training prior to enrollment. Online training counts to approximately 5-6 hours. Not more than 4 students will be allowed for each session due to BSL2 pathogenic microbiology space restriction, access to RAR facilities, and some non-conventional microbiological methods. Special health conditions, pregnancy, and immunocompromised situations must be consulted with the instructor prior to enrollment. The students must obtain clearance from ROHC for their tetanus vaccination status.

ANSC 5625. Nutritional Biochemistry. (3 cr.; Student Option; Every Fall) Overview of biochemical molecules and pathways important in nutritional events. prereq: BIOC 3021 or instr consent

ANSC 5626. Nutritional Physiology. (3 cr.; A-F only; Every Spring) Whole body macronutrient metabolism as it relates to endoecy of metabolic diseases. Signaling between tissues to control homeostasis. How dysregulation of crosstalk can lead to metabolic diseases. How diet, exercise, or starvation impact metabolism. Regulation of food intake and energy expenditure. Designing/analyzing/interpreting research data.

ANSC 5700. Cell Physiology. (4 cr.; A-F only; Every Fall) Cell Physiology involves the study of control mechanisms involved in maintaining homeostasis with respect to a variety of parameters including regulation of pH, volume, nutrient content, intracellular electrolyte composition, membrane potential, receptor signaling and aspects of intercellular communication. The first half of this team-taught course is organized in a partially online format where students learn from on-line materials and then take an on-line quiz each week before meeting with the instructor to review key concepts in class. The second half of the course is presented in lecture format. Student evaluation is based on quiz scores, in-class exams and graded problem sets.

ANSC 8011. Applied Statistical Models and Analysis for Animal Science Professionals. (3 cr.; A-F only; Every Spring) This course is designed for graduate students in the applied agricultural, animal science, and related programs that require an understanding of applied statistical analysis and interpretation of research data. Students will learn central principles in sampling, experimental design, and statistical analysis. The course will have an intense focus on data analysis of research data with SAS software. By the end of the semester, students should be able to generate testable hypotheses, organize a work plan to collect research data, and analyze results using appropriate statistical procedures and SAS software. Prerequisites: STAT 3021 or 5021; Statistical Analysis or equivalent, or consent of instructors

ANSC 8111. Genetic Improvement of Animals. (3 cr.; Student Option; Periodic Fall) Application of population genetics to livestock breeding; selection index theory and practice; basis of relationships and covariances among relatives; and selection based on multiple sources of information. prereq: instr consent

ANSC 8121. Linear Model Methods. (3 cr.; Student Option; Periodic Fall) Techniques and statistical tools for analysis of data. Matrix manipulation, least-squares procedures, correction for environmental factors, estimation of components of variance, and standard errors of estimates. prereq: Stat 5021

ANSC 8134. Ethical Conduct of Animal Research. (3 cr.; A-F or Audit; Every Fall) Ethical considerations in use of animal subjects in agricultural, veterinary, and biomedical research. Federal, state, and University guidelines relating to proper conduct for acquisition/use of animals for laboratory, observational, epidemiological, and clinical research. Regulatory requirements, bases for what is deemed proper conduct. Societal impact on scientific investigations utilizing animal subjects. prereq: Grad student or prof school student or instr consent

ANSC 8141. Mixed Model Methods for Genetic Analysis. (2 cr. [max 4 cr.]; A-F or Audit; Spring Odd Year) Theoretical foundation of genetic prediction, selection index theory, best linear unbiased prediction, multivariate mixed models, estimation of variance components using maximum/restricted maximum likelihood methods, genomic prediction/variance component estimation. prereq: 5200 or CMB 5200 or equiv

ANSC 8194. Research in Animal Genetics. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Research in quantitative genetics, cyto genetics, molecular genetics, and other areas related to animal breeding. prereq: instr consent

ANSC 8211. Animal Growth and Development. (3 cr.; Student Option; Every Spring) Whole body growth of animals, bone, and adipose tissue; structure, function, differentiation, and development of tissues; mode of action of hormones, growth factors, and growth promoters. prereq: instr consent

ANSC 8294. Research in Muscle Chemistry and Physiology. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Research in selected areas. prereq: instr consent

ANSC 8311. Animal Bioenergetics. (3 cr.; A-F or Audit; Every Fall & Spring) Integrated systems approach to energy metabolism of animals. Application of classical techniques of calorimetry and comparative slaughter. Development of systems for expressing energy content of feeds, and techniques for measuring whole body and organ metabolism of specific nutrients. prereq: instr consent; BIOC 4331 recommended

ANSC 8312. Protein Metabolism. (3 cr.; A-F or Audit; Periodic Fall) Basic and applied concepts of protein metabolism in farm animals. prereq: BIOC 4331

ANSC 8320. Concepts and Developments in Nutritional Physiology. (3 cr. [max 6 cr.]; A-F or Audit; Every Spring) Review and critical evaluation of pertinent scientific literature. prereq: instr consent

ANSC 8330. Concepts and Developments in Animal Nutrition. (1-2 cr. [max 8 cr.]; A-F or Audit; Every Fall) Review, critical evaluation of recent research reports. prereq: instr consent
ANSC 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ANSC 8340. Concepts and Developments in Swine Nutrition. (2 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring) Review and critical evaluation of scientific literature, prereq: instr consent

ANSC 8344. Mechanisms of Hormone Action. (2 cr.; Student Option; Fall Even Year) Major signal transduction, apoptosis. Topics incorporate pharmacology, biochemistry, and cell biology of hormone action in relevant physiological systems. Lectures on basic principles. Specialized lectures. Discussion of primary literature, prereq: Course in biochemistry or cell biology or instr consent

ANSC 8394. Research in Animal Nutrition. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Research in selected areas: topics and animal species determined by consultation. prereq: instr consent

ANSC 8411. Physiology of Reproduction. (3 cr.; A-F or Audit; Periodic Fall) Emphasis is on gametogenesis, conception, and implantation. prereq: 3305 or equiv

ANSC 8421. Physiology of Fertilization and Gestation. (3 cr.; Student Option; Periodic Fall) Physiological events occurring during gametogenesis; capacitation and fertilization; period of the embryo; period of the fetus; and parturition. prereq: 3305 or instr consent

ANSC 8431. Immunoreproduction. (3 cr.; Student Option; Periodic Fall) Blood groups and polymorphic proteins affecting reproduction; immunoglobulin formation; antigens of semen, ova, and genital secretions; immunopathology; maternal-fetal incompatibility; and antibodies to hormones. prereq: 3305 or instr consent

ANSC 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

ANSC 8451. Reproductive Endocrinology. (2 cr.; A-F or Audit; Periodic Fall) Hormonal regulation of mammalian reproductive cycles and seasonal patterns; nutritional and stress effects on reproductive endocrinology; mechanism of hormone action. prereq: 3305 or 3327 or equiv, BioC 3021

ANSC 8494. Research in Animal Physiology. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Individual research under faculty direction. Topic determined by consultation: a specialized aspect of a thesis problem or an independent problem of mutual interest to graduate student and adviser. prereq: instr consent

ANSC 8510. Graduate Seminar. (1 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Students attend seminars and lead a seminar, giving oral presentation of scientific data. Public speaking skills. Preparing visuals for scientific presentations. Audience critiques of presentations. prereq: instr consent

ANSC 8594. Research in Animal Science. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Research including experimental studies in disciplines associated with animal production and research, with emphasis on interdisciplinary studies. prereq: instr consent

ANSC 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) x prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ANSC 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ANSC 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

ANSC 8990. Curricular Practical Training. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Industrial work assignment involving animal science. Review/approval by faculty member and director of graduate studies. Final report covering work assignment. prereq: AnSc grad student, dept consent

Anthropology (ANTH)

ANTH 1001. Human Evolution. (BIOL; 4 cr.; Student Option; Every Fall, Spring & Summer) The principles of evolutionary theory, behavioral biology, comparative anatomy, and Paleolithic archaeology are used to reconstruct the major events in human evolution. The course allows us to understand the behavior of our ancestors as well as ourselves.

ANTH 1002. Cultural Heritage and Archaeology. (4 cr.; Student Option; Every Fall) Archaeology/archaeological epistemology as scholarly research, cultural heritage, and subject of competing claims. Students compare media about archaeology for different interpretations of the past.


ANTH 1003W. Understanding Cultures. (GP,WI,SOC; 4 cr.; Student Option; Every Fall & Spring) Introduction to social and cultural anthropology. Comparative study of societies and cultures around the world. Topics include adaptive strategies; economic processes; kinship, marriage, and gender; social stratification; politics and conflicts; religion and ritual; personality and culture.

ANTH 1101. Human Biological Diversity. (3 cr.; A-F only; Spring Odd Year) This course explores the many biological dimensions across which modern humans differ. Of all primate species, Homo sapiens has, by far, the greatest distribution: we inhabit nearly every part of the terrestrial earth. As a consequence, variation within our species is both substantial and complex. On one hand, widely dispersed populations tend to differentiate through the process of adaptation to local environments and the accumulation of random genetic changes. On the other hand, complex patterns of gene exchange and culturally-mitigated migration can overwrite endemic variation, keeping our species genetically integrated and leaving traces of the prehistoric spread of populations around the world. Here, we will explore what it means to be human by examining the diversity of biological adaptations within our species. What features are unique to certain populations? What features unite us as a species? We will also work through the complex issues related to concepts of human race, and discuss the biological underpinnings of human variation.

ANTH 1911W. Changing Human Adaptations. (ENV,WI; 3 cr.; Student Option No Audit; Periodic Fall) Humans, like all other species, are an integral part of the ecology of the earth. We display a series of adaptations that allow us to eat, grow, find mates, and raise offspring. How have human adaptations been modified over time; for example, as we spread out of Africa beyond the low latitudes? How do our adaptations change as we change our own environment? For humans, our interactions with the environment include a high dependence on sociality, technology, agriculture, trade, and today, fossil fuels. We will consider changes in human diets, methods of food acquisition, geographic distribution, and social structure from the earliest ape-like humans through the Stone Age on into the present day to explore how long humans have made a significant impact on the environment.

ANTH 1914W. From "O Brother Where Art Thou?" to "12 Years a Slave": American Cinema and American Roots Music. (DSJ,WI; 3 cr.; Student Option No Audit; Periodic Fall) This seminar focuses on the ways in which popular culture (movies and other visual media) presents and comments upon southern American "roots" music. Although the music had deep roots in the American past, it also underwent dramatic transformations with the coming of industrial capitalism to the South
Whenever you take a trip, do you people-watch and wonder about these interesting humans that surround you? Why they look the way they do? How they know how to behave in different situations? Why they eat really weird foods? Anthropology answers these questions using a holistic, bio-cultural framework. In this course we will explore the relationship between human bodies and human culture, using the five fields of anthropological inquiry: biological anthropology, archaeology, cultural anthropology, linguistics and applied anthropology. We will answer questions such as: How and why did our physiques evolve into the form we see today? What cultural and environmental influences affect human variation throughout the world? What effects do religion, law, and society have on the way people think about, discuss, and use their bodies today? How do we learn about our past from examining human remains? How and why do differences in language use define us as persons? How can anthropological insight lead to great careers in law, medicine, business and public service?

ANTH 2006. Humans and Aliens: Learning Anthropology through Science Fiction. (GP; 3 cr.; Student Option; Every Spring) Pairs anthropology texts with science fiction stories to illustrate how our future is more dependent on how humanity works anthropologically than what next technological invention has to offer.

ANTH 3001. Introduction to Archaeology. (SOCSS; 4 cr.; Student Option; Fall Even, Spring Odd Year) The fundamentals of fieldwork, laboratory analysis, and interpretation in archaeology. How field and laboratory research are designed and implemented, and how results are interpreted.

ANTH 3002. Sex, Evolution, and Behavior: Examining Human Evolutionary Biology. (4 cr.; A-F or Audit; Every Spring) Methods/theories used to understand humans in an evolutionary framework. What can be known only, or primarily, form an evolutionary perspective. How evolutionary biology of humans might lead to better evolutionary theory. How physiology, development, behavior, and ecology coordinate/co-evolve in humans.


ANTH 3004. Great Controversies in Anthropology. (GP, SOCSS; 3 cr.; A-F or Audit; Every Spring) Notable controversies in anthropology: Is human "reason" the same in all cultures? What makes up evidence/truth when we study people? Whose "voices" should be heard? Should anthropologists support contemporary attempts at economic "development"? Is it possible to agree on a set of universal individual or cultural rights? Can we make qualitative judgments about cultures? What civic/political responsibilities does the anthropologist have at home and with the people whom she or he studies? In-class debates.

ANTH 3005W. Language, Culture, and Power. (DSJ, WI, SOCSS; 4 cr.; Student Option; Every Spring) Studying language as a social practice, students transcribe and analyze conversation they record themselves, and consider issues of identity and social power in daily talk.

ANTH 3006. Humans and Aliens: Learning Anthropology through Science Fiction. (GP; 3 cr.; Student Option; Every Spring) Pairs anthropology texts with science fiction stories to illustrate how our future is more dependent on how humanity works anthropologically than what next technological invention has to offer.

ANTH 3008. Introduction to Flintknapping. (3 cr.; A-F or Audit;) Hands-on experience in replication of prehistoric stone tools, as basis for archaeological analysis and as art form in itself.

ANTH 3009. Prehistoric Pathways to World Civilizations. (HIS; 3 cr.; Student Option; Every Spring) How did complex urban societies first develop? This course addresses this question in ten regions of the world including Maya Mesoamerica, Inca South America, Sumerian Near East, Shang Civilization in East Asia, and early Greece and Rome.


ANTH 3020. Topics in the Anthropology of Africa. (3 cr.; Student Option; Periodic Fall) Perspectives on Africa using ethnographic methods and theories. Topics such as kinship and gender; ecological adaptations; economic systems; belief systems; political organization; art and aesthetics; Islamization; colonization; liberation movements and nationalism; culture change.

ANTH 3021W. Anthropology of the Middle East. (GP, WI, SOCSS; 3 cr.; A-F or Audit; Fall Even Year) Anthropological methods of analyzing/interpreting Middle Eastern cultures/societies.

ANTH 3023. Culture and Society of India. (GP,SOCS; 3 cr.; Student Option; Spring Even Year)
Contemporary society and culture in South Asia from an anthropological perspective with reference to nationalism; postcolonial identities; media and public culture; gender, kinship and politics; religion; ethnicity; and the Indian diaspora.

ANTH 3027W. Archaeology of Prehistoric Europe. (HIS,WI; 3 cr.; Student Option; Every Fall)
How archaeologists analyze/interpret artifacts to develop knowledge about formation of European society, from earliest evidence of human occupation to Roman period.

ANTH 3028. Introduction to Historical Archaeology. (; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Emphasizes research approaches. Documentary research, oral history, probate inventories/acculturation, integration of documents/archaeological data, analysis of community patterning, social analysis of architecture, foodways, artifact identification, mean ceramic dating, industrial archaeology, estimation of social status with cemetery data, sampling, report writing.

ANTH 3034. Roots Music in American Culture and Society. (; 3 cr.; Student Option; Every Spring)
Southern American vernacular music that came to public attention in the 1920s and 1930s. Issues of race, class, and historical context.

ANTH 3035. Anthropologies of Death. (GP,SOCS; 3 cr.; A-F or Audit; Every Spring)

ANTH 3036. The Body in Society. (; 3 cr.; Student Option; Spring Odd Year)
Body-related practices throughout the world. Readings, documentaries, mass media.

ANTH 3041. Ecological Anthropology. (; 3 cr.; Student Option; Periodic Fall)

ANTH 3043. Art, Aesthetics and Anthropology. (; 3 cr.; Student Option; Summer Odd Year)
The relationship of art to culture from multiple perspectives including art as a cultural system; the cultural context of art production; the role of the artist in different cultures; methodological considerations in the interpretation of art across cultural boundaries.

ANTH 3046W. Romance and Culture. (GP,WI; 3 cr.; A-F only; Every Spring)
Romance, aspects of this kind of love relationships from different perspectives in social/biological sciences. Draws on cross-cultural materials.

ANTH 3049W. Anthropology of Social Class. (WI; 3 cr.; A-F only; Fall Odd Year)
Anthropological concept of culture. Theories of class difference. Investigate comparative ethnographic about experience of class difference. Classic texts, mass media/full-length ethnographic accounts will be used.

ANTH 3101. Human Biological Diversity. (3 cr.; A-F only; Spring Odd Year)
This course explores the many biological dimensions across which modern humans differ. Of all primate species, Homo sapiens has, by far, the greatest distribution: we inhabit nearly every part of the terrestrial earth. As a consequence, variation within our species is both substantial and complex. On one hand, widely dispersed populations tend to differentiate through the process of adaptation to local environments and the accumulation of random genetic changes. On the other hand, complex patterns of gene exchange and culturally-mediated migration can overwrite endemic variation, keeping our species genetically integrated and leaving traces of the prehistoric spread of populations around the world. Here, we will explore what it means to be human by examining the diversity of biological adaptations within our species. What features are unique to certain populations? What features unite us as a species? We will also work through the complex issues related to concepts of human race and discuss the biological underpinnings of human variation.

ANTH 3205. Art of Central and South America Before Columbus. (AH; 3 cr.; Student Option; Periodic Fall)
Art/architecture of native peoples of Americas from twelfth century B.C. until arrival of Europeans in sixteenth century. Ways that people living in diverse areas of South America/Mesoamerica used art/architecture. Tools to investigate Pre-Columbian art at more advanced levels.

ANTH 3212. Globalization, Markets, and Inequality. (; 3 cr.; A-F or Audit; Periodic Spring)
Globalization of American business/culture, uneven relationships between developed/underdeveloped national economies, social/economic consequences of market economies and free trade. Focuses on growing inequalities in global economy. Wall Street and transnational corporations, sweatshops, consumer culture, brand-name global marketing, mass downsizing.

ANTH 3221. Field School. (; 6 cr.; Student Option; Every Summer)
Field excavation, survey, and research. Intensive training in excavation techniques, recording, analysis, and interpretation of archaeological materials or prehistoric remains. prereq: instr consent

ANTH 3242W. Hero, Savage, or Equal? Representations of NonWestern Peoples in the Movies. (WI; 3 cr.; A-F only; Fall Even Year)
Images of nonWestern peoples and cultures as they have appeared in movies and in other popular media.

ANTH 3255. Archaeology of Ritual and Religion. (3 cr.; Student Option; Fall Even Year)
The course discusses evidence for the origins of religion and its diverse roles in human societies over millennia. It focuses on how artifacts and architecture are essential to religious experience. It asks: What constitutes religion for different cultures? Why is religion at the heart of politics, social life, and cultural imagination?

ANTH 3306W. Medical Anthropology. (GP,WI; 3 cr.; A-F or Audit; Every Fall)
Relations among human afflication, health, healing, social institutions, and cultural representations cross-culturally. Human health/affliction. Medical knowledge/power. Healing. Body, international health, colonialism, and emerging diseases. Reproduction. Aging in a range of geographical settings. prereq: 1003 or 1005 or entry level soc sci course recommended

ANTH 3301. The Human Fossil Record. (3 cr.; A-F only; Fall Even Year)
Fossil evidence paleoanthropologists use to reconstruct human evolutionary history. Taxonomy, phylogeny, behavior, ecology, tool use, land use, biogeography. Hands-on examination of fossil casts, readings from primary/secondary professional sources. prereq: 1001 or instr consent

ANTH 3302. Zooarchaeology Laboratory. (; 3 cr.; A-F only; Every Fall)
How archaeologists reconstruct past societies, diets, and environments. Bones and bone fragments to skeletal element (e.g., femur, humerus, ulna, radius, ulna, radius, ulna, radius, ulna, radius), side, age, and taxon (e.g., horse, bison, antelope, hyena). Adaptations and functional morphology of animals? anatomy. Tool marks, tool marks, burning, and types of bone breakage. Past societies' hunting, sharing, cooking practices as well as environmental reconstruction using vertebrates.

ANTH 3305. Human Skeletal Analysis. (4 cr.; Student Option; Every Spring)

ANTH 3501. Managing Museum Collections. (3 cr.; A-F or Audit; Fall Even Year)
The care and maintenance of collection objects and their associated information are a crucial part of both the sciences and the humanities. This course is designed to provide foundations and practical experience with many of the issues faced by those responsible for museum collections: conservation, legal issues, organization and classification, digitization, accessibility, and policies and procedures. The course includes lectures by museum
professors, field trips to local facilities, and hands-on activities. Credit will not be granted if credit has been received for ANTH 5501.

ANTH 3601. Archaeology and Native Americans. (DSJ; 3 cr.; Student Option; Fall Even Year)
Historical, political, legal, and ethical dimensions of the relationship of American archaeology to American Indian people. Case studies of how representational narratives about Native people are created through archaeology; responses by Native communities; and the frameworks for collaborative and equitable archaeological practice. Professional ethics in archaeology/historical studies in American contexts.

ANTH 3913. Capstone Project Planning. (1 cr.; A-F only; Every Fall, Spring & Summer)
Evaluation of work to date. Planning future course work and prospectus for senior research project. Defining senior project, finding an adviser, developing preliminary bibliography. prereq: [Ir or sr] anth major, instr consent

ANTH 3980. Topics in Anthropology. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall, Spring & Summer)
Topics specified in Class Schedule.

ANTH 4001. Advanced Method and Theory in Archaeology. (; 3 cr. [max 9 cr.]; Student Option; Every Spring)
An upper-level archaeology class, highly recommended for anthropology students considering a career in archaeology or biological anthropology. Some years it is taught as a methods course (e.g., Experimental Archaeology), other years as a theory course (e.g., the Archaeology of Religion).

ANTH 4003W. Contemporary Perspectives in Cultural Anthropology. (WI; 3 cr.; A-F or Audit; Periodic Fall & Spring)
This course considers issues of race, class, gender, "culture," and globality across multiple genres of writing (ethnography, history, fiction, poetry, memoir). We do this by reading the work of writers who, with an ethnographic sensibility, focus on a particular person whose life is lived in obscurity, at the margins. We ask how such an approach that aims to evoke a world through a life might allow the reader to understand how people move across space and time and through their social worlds, in ways that other kinds of ethnographic or historical writing might not. prereq: [1003 or 1005], or instr consent

ANTH 4007. Laboratory Techniques in Archaeology. (WI; 1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Plant remains, material culture, faunal remains, human osteology. Emphasizes lab experience. Instructor consent required. prereq: instr consent

ANTH 4007H. Honors: Laboratory Techniques in Archaeology. (WI; 1-4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Plant remains, material culture, faunal remains, human osteology. Emphasizes lab experience. Instructor consent required. prereq: instr consent

ANTH 4009W. Warfare and Human Evolution. (WI; 3 cr.; A-F or Audit; Fall Even Year)
Is warfare universal? Are there truly peaceful societies? Why war occurs more often at some times/places. How/when/why warfare evolved. Warfare and intergroup aggression in other animals. Role of warfare and its primitive antecedents in evolution of our species.

ANTH 4013. Capstone Project. (; 1-3 cr.; Student Option; Every Fall, Spring & Summer)
Independent research project fulfilling the senior option; directed by a faculty member. prereq: sr major, instr consent

ANTH 4013H. Honors Thesis. (; 3 cr.; A-F only; Every Fall & Spring)
Independent research project fulfilling the senior option and the honors thesis requirement; directed by a faculty member. prereq: Sr major, honors student, instr consent

ANTH 4019. Symbolic Anthropology. (; 3 cr.; Student Option; Periodic Fall)
Pragmatic/structural aspects of social symbolism cross-culturally. Focuses on power, exchange, social boundaries, gender, and rituals of transition/reversal. prereq: 1003 or 1005 or grad student or instr consent

ANTH 4025. Studies in Ethnographic Classics. (; 3 cr.; A-F or Audit; Periodic Fall)
Five types of explanations employed in ethnographic research: diffusionism and theory of survivals; functionalist response; British structuralists; French structuralism; interpretive turn. Problems in ethnographic practice, analysis, and writing. Focuses on several classic monographic examples and associated theoretical writing. prereq: 1003 or 1005

ANTH 4031W. Anthropology and Social Justice. (WI,CIV; 4 cr.; Student Option; Spring Odd Year)
Practical application of theories/methods from social/cultural anthropology. Issues of policy, planning, implementation, and ethics as they relate to applied anthropology. prereq: 1003 or 1005 or 4003 or grad student or instr consent

ANTH 4035. Ethnographic Research Methods. (; 3 cr.; Student Option; Every Spring)
History of and current issues in ethnographic research. Research projects, including participant observation, interviewing, research design, note taking, life history, and other ethnographic methods. prereq: 1003 or 1005 or grad student

ANTH 4043. Romans, Anglo-Saxons and Vikings: Archaeology of Northern Europe. (; 3 cr. [max 4 cr.]; Student Option; Periodic Spring)
Archaeology of the British Isles, Scandinavia, and northern continental Europe, from the Romans through the Viking Period. Themes to be examined include social and political organization, cross-cultural interaction, art and symbolism, and religion and ritual.

ANTH 4047. Anthropology of American Culture. (SOC; 3 cr.; Student Option; Every Spring)
Anthropological approaches to contemporary American society/culture. Tensions between market and family. Unity, diversity. Individualism, community.

ANTH 4049. Religion and Culture. (; 3 cr.; Student Option; Periodic Fall)
Religious beliefs and world views cross-culturally. Religious dimensions of human life through theories of origins, functions, and forms (e.g. myth, ritual, symbolism) of religion in society. prereq: 1003 or 1005 or instr consent

ANTH 4053. Economy, Culture, and Critique. (GP,SOC; 3 cr.; Student Option; Every Fall)

ANTH 4069. Environmental Archaeology. (; 3 cr.; Student Option; Periodic Fall)
Use of remains from archaeological sites and off-site records of ancient landscapes, vegetation, and climate to reconstruct how humans interacted with their environments. Interdisciplinary approaches toward reconstructing past human environments; long-term local and global environmental change.

ANTH 4071. Race, Culture, and Vision. (; 3 cr.; A-F or Audit; Periodic Fall, Spring & Summer)
Evaluation of main trends in study of racism. Psychological, sociological, symbolic, and "critical" approaches that treat racism as a sociodiscursive phenomenon. Racist discourse as a practice that defines an "other" and subjugates that other to strategies of exclusion. prereq: 1003 or 1005 or 3003 or instr consent

ANTH 4075. Cultural Histories of Healing. (GP,SOCS; 3 cr.; A-F or Audit; Spring Even Year)
Introduction to historically informed anthropology of healing practice. Shift to biologically based medicine in Europe, colonialist dissemination of biomedicine, political/cultural collisions between biomedicine and "ethnomedicines," traffic of healing practices in a transnationalist world.

ANTH 4077. Neanderthals: Biology and Culture of Humanity's Nearest Relative. (; 3 cr.; Student Option; Periodic Fall)
Paleontological/archaeological record. Students reconstruct behavioral similarities/differences between Neanderthals and modern humans. Why humans alone survived end of Pleistocene. prereq: 1001 or 3001 or 3002 or instr consent

ANTH 4101. Archival Analysis for Anthropologists. (; 3 cr.; Student Option; Every Fall)
Methods for anthropological archival research. Preservation, curation, and organizational bias in archives. Analytic scale, voice, historical texts as material culture. Students engage in archival research.
ANTH 4121. Business Anthropology. (; 3 cr. ; Student Option; Every Spring) Anthropological/ethnographic understandings/ research techniques.

ANTH 4329. Primate Ecology and Social Behavior. (; 3 cr. ; A-F or Audit; Periodic Fall) Primates as model system to explore animal/human behavior. Factors influencing social/group composition. Mating systems. Prevalence of altruistic, cooperative, and aggressive behavior. Strength of social bonds in different species. Evolution of intelligence/ culture. prereq: BIOL 1009 or BIOL 1951 or BIOL 3411 or ANTH 1001 or instr consent

ANTH 4344. Europe and its Margins. (; 3 cr. ; A-F only; Every Fall) Europe and its margins, an anthropological/ ethnographic perspective. Key topics in the study of Europe and European societies. Ethnography, fiction, film. prereq: One course in ANTH or GLOS

ANTH 4991. Independent Study. (; 1-6 cr. ; Student Option; Every Fall, Spring & Summer) Under special circumstances and with the approval of the instructor, qualified students may register for a listed course on a tutorial basis. prereq: instr consent

ANTH 4992. Directed Readings. (; 1-6 cr. ; Student Option; Every Fall, Spring & Summer) Allows students to pursue special interests in anthropology through reading materials under the guidance of a faculty member. prereq: instr consent

ANTH 4993. Directed Study. (; 1-6 cr. ; Student Option; Every Fall, Spring & Summer) Allows students to pursue special interests in anthropology under the guidance of a faculty member. prereq: instr consent

ANTH 4994W. Directed Research. (WI; 1-6 cr. ; Student Option; Every Fall, Spring & Summer) Qualified students may conduct a well-defined research project under the guidance of a faculty member. prereq: instr consent

ANTH 5008. Advanced Flintknapping. (; 3 cr. ; A-F or Audit; Periodic Fall) Hands-on training in techniques of advanced stone tool production, artifact reproduction, and lithic experimental design for academic/artistic purposes. prereq: [3008 or 5269] or instr consent

ANTH 5009. Human Behavioral Biology. (; 3 cr. ; A-F or Audit; Every Spring) In-depth introduction to, and critical review of, human behavioral biology, examining the approaches in anthropology and related fields. Classic texts/recent empirical studies of humans and other species. Theoretical underpinnings of this new discipline/how well theoretical predictions have been supported by subsequent research.

ANTH 5015W. Biology, Evolution, and Cultural Development of Language. (SOCS, WI; 3 cr. ; Student Option; Every Spring) Language in pre-historic humans. Brain/vocal tract structure. How gossip/music shaped human communication.

ANTH 5021W. Anthropology of the Middle East. (GP, WI, SOCS; 3 cr. ; Student Option; Fall Even Year) Anthropological field methods of analyzing/interpreting Middle Eastern cultures/societies.

ANTH 5027W. Archaeology of Prehistoric Europe. (HIS, WI; 3 cr. ; Student Option; Every Fall) How archaeologists/historians analyze/interpret artifacts to develop knowledge about formation of European society, from earliest evidence of human occupation to Roman Period. Interpreting archaeological evidence from specific sites to understand broad trends in human past.

ANTH 5028. Introduction to Historical Anthropology. (3 cr. ; A-F or Audit; Periodic Fall & Spring) Emphasizes research approaches. Documentary research, oral history, probate inventories/acculturation, integration of documents/archaeological data, analysis of community patterning, social analysis of architecture, foodways, artifact identification, mean ceramic dating, industrial archaeology, estimation of social status with cemetery data, sampling, report writing.

ANTH 5031W. Ethnographies of Science. (WI; 3 cr. ; A-F only; Spring Even Year) Ethnographic, historical, and sociological accounts of scientific practice. How facts are constructed/negotiated. Social, cultural, and political influences on scientific methods. How scientific projects articulate with hierarchies of race/gender. International differences in scientific practice. prereq: Sr or grad student or instr consent

ANTH 5041. Ecological Anthropology. (; 3 cr. ; Student Option; Periodic Fall) Concepts, theories, and methods of ecological anthropology (cultural ecology) show how humans interact with the biophysical environment. Compare biological and cultural interactions with the environment; examine adaptive strategies cross-culturally. prereq: grad or instr consent

ANTH 5112. Reconstructing Hominin Behavior. (3 cr. ; A-F or Audit; Spring Even Year) Major hypotheses regarding evolution of human behavior. Combine evidence from realm of biological anthropology as we consider link between bone biology/behavior. Archaeological record. Hypotheses about biocultural evolution regarding tool-use, hunting, scavenging, food sharing, grandmothers, cooking, long distance running. prereq: Previous coursework in Biological Anthropology or Archaeology

ANTH 5113. Primate Evolution. (3 cr. ; A-F only; Fall Odd Year) Evolutionary history of primates. Particular focus on origin/diversification of apes/Old World monkeys. prereq: Anthropology major, junior or senior

ANTH 5121. Business Anthropology. (; 2 cr. ; Student Option; Every Spring) Anthropological/ethnographic understandings/research techniques. prereq: MBA student

ANTH 5128. Anthropology of Education. (3 cr. ; Student Option; Spring Odd Year) Cross-cultural perspectives in examining educational patterns. Implicit/explicit cultural assumptions. Methods/approaches to cross-cultural studies in education.

ANTH 5221. Anthropology of Material Culture. (; 3 cr. ; A-F or Audit; Periodic Fall) The course examines material culture as a social creation, studied from multiple theoretical and methodological perspectives (e.g., social anthropology, archaeology, primatology, history of science). The course examines the changing role of material culture from prehistory to the future.

ANTH 5244. Interpreting Ancient Bone. (; 4 cr. ; A-F or Audit; Every Fall) How anthropologists use fossil bones to answer questions of past human diet, behavior, and environments. Basics of skeletal-element/species identification of humans and large mammals. Project where students analyze a small assemblage of bones. Emphasizes scientific method, data analysis using computers. prereq: 1001

ANTH 5255. Archaeology of Ritual and Religion. (3 cr. ; Student Option; Fall Even Year) The course discusses evidence for the origins and its diverse roles in human societies over millennia. Focuses on how artifacts and architecture are essential to religious experience. It asks: What constitutes religion for different cultures? Why is religion at the heart of politics, social life, and cultural imagination?

ANTH 5269. Analysis of Stone Tool Technology. (4 cr. ; A-F or Audit; Fall Even Year) The course offers practical lab experience in analyzing archaeological collections of stone tools to learn about human behavior in the past. Students gain experience needed to get a job in the cultural resource management industry.

ANTH 5401. The Human Fossil Record. (; 3 cr. ; A-F only; Fall Even Year) Fossil evidence paleoanthropologists use to reconstruct human evolutionary history. Taxonomy, phylogeny, behavior, ecology, tool use, land use, and biogeography. Examination of fossil casts, readings from primary/secondary professional sources. prereq: 1001 or instr consent

ANTH 5402. Zooarchaeology Laboratory. (; 3 cr. ; A-F only; Every Fall) How archaeologists reconstruct the past through the study of animal bones associated with artifacts at archaeological sites. Skeletal element (e.g., humerus, femur,ibia), and taxon (e.g., horse, antelope, sheep, bison, hyena) when confronted with bone. Comparative collection of bones from known taxa.

ANTH 5403. Quantitative Methods in Biological Anthropology. (4 cr. ; Student Option; Fall Even, Spring Odd Year) Quantitative methods used by biological anthropologists. Applying these methods to real

ANTH 5412. Comparative Indigenous Feminisms. (GP; 3 cr.; Student Option No Audit; Periodic Fall & Spring) The course will examine the relationship between Western feminism and indigenous feminism as well as the inter connections between women of color feminism and indigenous feminism. In addition to exploring how indigenous feminists have theorized from 'the flesh' of their embodied experience of colonialism, the course will also consider how indigenous women are articulating decolonization and the embodiment of autonomy through scholarship, cultural revitalization, and activism.


ANTH 5444. Archaeological Ceramics. (4 cr.; A-F only; Every Spring) Ceramics as material, technology, and cultural/social trace. Methods of assessing technology/use. Research, design, and interpretation of ceramic analyses. Students work with collections and propose/answer a research question about a ceramic assemblage. Readings, discussion. prereq: 3001 or instr consent

ANTH 5464. Archaeology of Representation as Communication. (3 cr.; A-F only; Every Spring) Seminar. Uses of paintings, sculptures, drawings, and patterns as means of communication, from earliest representations of 30,000 years ago to present day.

ANTH 5448. Applied Heritage Management. (3 cr.; A-F only; Every Spring) Contexts of cultural heritage applicable to federal/state protection. Approaches to planning/management. Issues of heritage/stakeholder conflict.

ANTH 5450. Spatial Analysis in Anthropology: Research Design and Field Applications. (3 cr.; Student Option No Audit; Spring Even Year) This advanced undergraduate and graduate course introduces students to spatial analyses essential to anthropological ethnography, archaeology, and historical ecology. It builds on introductory courses at UMN, providing students an opportunity to learn anthropological applications of spatial analysis methods, including: research design, field mapping, database management, digital survey platforms, GIS analyses, and integration of quantitative and qualitative (ethnographic and historical) data. The structure of the course will follow the trajectory of a typical doctoral-level anthropological project, from pre-field data acquisition and preparation, to in-field data collection, post-field analysis, and presentation. Students who take this course will master skills that are crucial for successful anthropological spatial analysis in the field and laboratory.

ANTH 5501. Managing Museum Collections. (3 cr.; A-F or Audit; Fall Even Year) The care and maintenance of collection objects and their associated information are a crucial part of both the sciences and the humanities. This course is designed to provide foundations and practical experience with many of the issues faced by those responsible for museum collections: conservation, legal issues, organization and classification, digitization, accessibility, and policies and procedures. The course includes lectures by museum professionals, field trips to local facilities, and hands-on activities. Credit will not be granted if credit has been received for ANTH 3501.

ANTH 5601. Archaeology and Native Americans. (DSJ; 3 cr.; Student Option; Fall Even Year) Historical, political, legal, and ethical dimensions of the relationship of American archaeology to American Indian people. Case studies of how representational narratives about Native people are created through archaeology; responses by Native communities; and the frameworks for collaborative and equitable archaeological practice. Professional ethics in archaeology/heritage studies in American contexts.

ANTH 5980. Topics in Anthropology. (3 cr. max 6 cr.; Student Option; Every Fall & Spring) Topics specified in Class Schedule.

ANTH 8000. Prehistoric Pathways to World Civilizations. (3 cr.; Student Option; Every Spring) How did complex urban societies first develop? This course addresses this question in ten regions of the world including Maya Mesoamerica, Inca South America, Sumerian Near East, Shang Civilization in East Asia, and early Greece and Rome.


ANTH 8112. Reconstructing Hominin Behavior. (3 cr.; A-F or Audit; Spring Even Year) Consider major hypotheses regarding evolution of human behavior. Evidence/arguments used to support or reject hypotheses. Consider link between bone biology/behavior. Archaeological record for more holistic understanding of evidence.

ANTH 8113. Primate Evolution. (3 cr.; A-F only; Fall Odd Year) Evolutionary history of primates, with particular focus on origin/diversification of apes/Old World monkeys. prereq: Anthropology doctoral student

ANTH 8114. Biological Anthropology Graduate Program Seminar: Behavioral Ecology of Primates. (3 cr.; A-F or Audit; Fall Odd Year) Course focuses on the behavioral ecology of primates, including humans, with a focus on how the evolution of social behaviors relates to ecology. The course serves as one of three Biological Anthropology Graduate Program Seminars, which provide training in the foundations of biological anthropology. For Biological Anthropology graduate students, the take-home exam for this course will stand as one of the three required Preliminary Papers. Students outside of Biological Anthropology are welcome to enroll pending permission of the instructor. prereq: Anthropology graduate student or instr consent.

ANTH 8120. Problems in Culture Change and Applied Anthropology. (3-6 cr.; Student Option; Periodic Fall & Spring) Comparative studies of change in cultural systems. Impact of global processes on local cultures. Roles of anthropology and anthropologists in policy, planning, implementation, and evaluation.

ANTH 8201. Humans and Nonhumans: Hybrids and Collectives. (3 cr.; Student Option; Periodic Spring) Social life as consisting of relationships not only among human beings, but also between humans and nonhumans: animals, plants, environments, technologies, etc. Focuses on figure of hybrid, its role in formations of collective life.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
ANTH 8203. Research Methods in Social and Cultural Anthropology. (3 cr.; Student Option; Every Fall)
Classic and current issues in research methodology, including positivist, interpretivist, feminist, and postmodernist frameworks. Methodology, in the broadest sense of the concept, is evaluated. Students conduct three research exercises and set up an ethnographic research project. prereq: Grad anth major or instr consent

ANTH 8205. Economic Anthropology. (3 cr.; Student Option; Periodic Fall & Spring)
Theoretical foundations of economic anthropology examined through critical readings of traditional, classical, and contemporary authors. Ethnographic puzzles of material life and issues of ecological degradation, development, market expansion, gender, and transglobal processes.

ANTH 8207. Political and Social Anthropology. (3 cr.; Student Option; Periodic Fall & Spring)
Western concepts of politics, power, authority, society, state, and law. Cross-cultural approaches to these concepts in historical perspective. Major theoretical frameworks and current problems and positions in social and political anthropology. Ethnographic classics and new directions.

ANTH 8213. Ecological Anthropology. (3 cr.; Student Option; Periodic Fall & Spring)
Seminar on method, theory, and key problems in ecological anthropology and human ecology. Examines approaches in light of human practices, interactions between culture and the environment, global environmental change, and our understanding of human dimensions of ecosystem-based management.

ANTH 8215. Anthropology of Gender. (3 cr.; Student Option; Periodic Fall & Spring)
Comparative, cross-cultural approach to gender. Focuses on various theories (e.g., feminist, postmodernist, psychoanalytic) of power, gender, authority, and femininity and masculinity. Gender ambiguity and issues of sexuality. prereq: Grad anth major or instr consent

ANTH 8219. Grant Writing. (2 cr.; Student Option; Periodic Fall & Spring)
Students draft a research proposal in their area of interest. Seminar involves reading and evaluating proposals, learning about funding and process of submitting proposals, nuts of bolts of composing a proposal, and ethics of research in anthropology. prereq: Grad anth majors preparing to submit research grant proposals next academic yr

ANTH 8220. Field School. (6 cr.; Student Option; Every Summer)
Advanced field excavation, survey, and research. Intensive training in excavation techniques, recordation, analysis, and interpretation of archaeological materials or prehistoric remains.

ANTH 8230. Anthropological Research Design. (3 cr. [max 6 cr.]; A-F or Audit; Periodic Fall & Spring)
Training seminar on research development, coordination, grant management, field/laboratory research management, fundraising. prereq: Anth grad student or instr consent

ANTH 8244. Interpreting Ancient Bone. (4 cr.; A-F or Audit; Periodic Fall & Spring)
How anthropologists use fossil bones to answer questions of past human diet, behavior, and environments. Skeletal element and species identification (of humans, large mammals). Students analyze small assemblage of bones for class project. Scientific method, data analysis using computers. prereq: instr consent

ANTH 8333. FTE: Masters. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

ANTH 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

ANTH 8510. Topics in Archaeology. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring)
Seminar examines particular aspects of archaeological methods and/or theory. Topics vary according to student and faculty interests.

ANTH 8555. Master’s Project Credits. (3 cr.; S-N only; Every Fall, Spring & Summer)
Student may contact the department for more information.

ANTH 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ANTH 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ANTH 8810. Topics in Sociocultural Anthropology. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring)
Seminar examines particular aspects of method and/or theory. Topics vary according to student and faculty interests.

ANTH 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall & Spring)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

ANTH 8980. Anthropology Graduate Workshop. (1 cr. [max 3 cr.]; Student Option; Periodic Fall)
Seminar examines aspects of the discipline that transcend traditional subfield boundaries.

ANTH 8991. Independent Study. (1-18 cr.; Student Option; Every Fall, Spring & Summer)
Under special circumstances and with instructor approval, qualified students may register for a listed course on a tutorial basis. prereq: instr consent

ANTH 8992. Directed Reading. (1-18 cr. [max 54 cr.]; Student Option; Every Fall, Spring & Summer)
tbd prereq: instr consent

ANTH 8993. Directed Study. (1-18 cr.; Student Option; Every Fall, Spring & Summer)
Directed Study prereq: instr consent

ANTH 8994. Directed Research. (1-18 cr.; Student Option; Every Fall, Spring & Summer)
N/A prereq: instr consent

APPAREL DESIGN (ADES)

ADES 1221. Apparel Assembly Fundamentals. (3 cr.; A-F or Audit; Every Fall)
Methods/applications of apparel assembly, from micro to macro perspective. prereq: Pre-apparel design major or instr consent

ADES 2196. Work Experience in Apparel Design. (1-4 cr. [max 8 cr.]; Only S-N; Every Fall, Spring & Summer)
Supervised work experience in business, industry, or government, related to student’s area of study. Integrative paper or project. prereq: Plan submitted/approved by [advisor, internship supervisor], written approval of supervisor, instr consent

ADES 2211. Fashion Illustration and Portfolio Development. (4 cr.; A-F or Audit; Every Spring)
Illustration skills specific to garments/textiles. Traditional media/CAD applications. Critique/analysis of visual communication of apparel design concepts.

ADES 2213. Textile Analysis. (4 cr.; A-F or Audit; Every Fall)
Physical, chemical, and biological characteristics of fibers, yarns, textile structures, and finishes. Their effect on performance/appearance of textile products, including apparel, interior, and industrial textiles. prereq: DHA major or pre-major or instr consent

ADES 2214. Softlines Analysis. (3 cr.; A-F or Audit; Every Spring)
Physical characteristics of softline products related to function for target market. Class experiences based on methods of analysis, including visual inspection, quality, construction, costing, and fit/sizing. prereq: DHA major or minor or instr consent

ADES 2221. Apparel Design Studio I. (4 cr.; A-F or Audit; Every Spring)
Theories/methods in designing apparel for various user groups. Relation of two-dimensional pattern shape to three-dimensional body. Introduction to flat-pattern draping. prereq: [DHA 1201 or RM 1201], [1221 or DHA 1221], apparel design premajor
ADhs 2222. Apparel Design Studio II. (4 cr.; A-F or Audit; Every Fall & Spring) Design process in developing apparel for specific user group. Advanced principles/methods of developing patterns for body, including flat pattern, draping, fitting. Computer-aided design tools for illustration, pattern making. prereq: [2221 or DHA 2221] with a grade of at least C-. Apparel Design major, pass portfolio review

ADhs 3196. Field Study: National or International. (1-10 cr.; A-F or Audit; Every Fall, Spring & Summer) Faculty-directed field study in a national or international setting. prereq: instr consent

ADhs 3217. Fashion: Trends and Communication. (3 cr.; A-F or Audit; Every Fall) Relation of fashion trends to visual analysis of apparel. Application to design/retail.

ADhs 3223. Apparel Design Studio III. (4 cr.; A-F or Audit; Every Spring) Study tailored/non-tailored apparel structures. Experiment with various materials/structures using traditional/innovative methods. Principles of manipulating materials/structures applied to series of garments. prereq: [2222 or DHA 2222] with grade of at least C-. Apparel Design major, pass portfolio review

ADhs 3224W. Apparel Design Studio IV. (WI; 4 cr.; A-F or Audit; Every Spring) Principles and theory of functional apparel design. Conduct and apply research in designing apparel for situations requiring thermal or impact protection, accommodation for mobility, or facilitation for bodily function. prereq: apparel design major

ADhs 3225. Apparel Design Research. (1 cr.; A-F only; Every Spring) Market/visual research to support development of apparel line directed at specific audience. prereq: 3224 or concurrent registration is required (or allowed) in DHA 3224

ADhs 3227. Technical Design Studio. (4 cr.; A-F only; Every Fall) Technical development of sewn product for production. Variability in human physical sizes, and grading and fit across a population. In team-based projects, you will develop a sewn product pattern; generate prototypes and technical specifications; source materials; and plan, execute, and evaluate a production run for a sewn product. prereq: 2213, [3223 with grade of C or above]

ADhs 4193. Directed Study in Apparel Design. (1-4 cr.; max 8 cr.; A-F or Audit; Every Fall, Spring & Summer) Independent study in Design, Housing, and Apparel under tutorial guidance. prereq: Undergrad, instr consent

ADhs 4196. Internship in Apparel Design. (1-4 cr.; S-N or Audit; Every Fall, Spring & Summer) Supervised work experience relating activity in business, industry, or government to student's area of study. Integrative paper or project may be required. prereq: Completion of at least one-half of professional sequence, plan submitted and approved in advance by adviser and internship supervisor, written consent of faculty supervisor, instr consent

ADhs 4215. Product Development: Softlines. (4 cr.; A-F or Audit; Every Spring) Product development for apparel and other sewn products. Developing products in a lab studio for effectiveness, reliability, and marketability. Team approach using merchandising/design principles to develop products for specific markets. prereq: 2213 or DHA 2213 or apparel design major or clothing design major or retail merchandising major or instr consent

ADhs 4218W. Fashion, Design, and the Global Industry. (WI; 3 cr.; max 6 cr.; A-F only; Every Fall) Relationship of fashion, dress, and culture to fashion industry. Globalization, fashion centers, design, time/place. Focuses on Chinese fashion industry. prereq: Upper level undergraduate or grad student

ADhs 4225. Apparel Design Studio V. (4 cr.; A-F or Audit; Every Fall) Market research information/implementation. Designing for specific audience, market, user group. Applying market research to design line of apparel. Research of promotional methods for design project. prereq: [3224 or DHA 3224; 3225 or DHA 3225] with grade of at least C-, apparel design major

Apparel Studies (APST)

APST 5117. Retail Environments and Human Behavior. (3 cr.; A-F or Audit; Every Fall) Theory/research related to designed environment across retail channels. prereq: Grad student or instr consent


APST 5123. Living in a Consumer Society. (3 cr.; A-F only; Fall Odd Year) Consumerism within U.S. society. Commodification of healthcare, education, and production of news. Commercialization of public space/culture. What drives consumer society. How meaning is manufactured. What the lived experiences are of consumers today. Postmodern market. Alternatives to consumer society. prereq: Sr or grad student

APST 5170. Topics in Apparel Studies. (1-4 cr.; max 32 cr.; A-F or Audit; Every Fall, Spring & Summer) In-depth investigation of specific topic, announced in advance.

APST 5193. Directed Study in Apparel Studies. (1-4 cr.; max 8 cr.; A-F or Audit; Every Fall, Spring & Summer) Independent study in apparel studies under tutorial guidance. prereq: instr consent

APST 5218. Fashion, Design, and the Global Industry. (3 cr.; A-F only; Every Fall) Relationship of fashion, dress, and culture to time, place, and design. Focuses on fashion centers, fashion industry, and globalization. Chinese fashion industry as case study.

APST 8170. Topics in Apparel Studies. (1-3 cr.; max 6 cr.; A-F or Audit; Every Fall & Spring) In-depth investigation of a topic announced in advance. prereq: Varies with topic

APST 8180. Professional Seminar. (1-2 cr.; max 4 cr.; A-F or Audit; Every Fall & Spring) Professional development issues/trends.

APST 8192. Readings in Apparel Studies. (1-3 cr.; max 8 cr.; A-F or Audit; Every Fall, Spring & Summer) Independent study/review of books/periodicals under tutorial guidance. prereq: instr consent

APST 8193. Directed Study. (1-3 cr.; max 8 cr.; A-F or Audit; Every Fall, Spring & Summer) Directed study in apparel studies. prereq: instr consent

APST 8222. Plan B Master's Project. (3 cr.; S-N or Audit; Every Fall & Spring) Plan B master's project. prereq: DHA master's student, instr consent

APST 8267. Dress and Culture. (3 cr.; A-F or Audit; Fall Even Year) Cultural factors of identity expressed through dress. Focuses on issues of cultural diversity through analysis of dress and textiles within a specific world region. prereq: 4212 or instr consent

APST 8268. Behavioral Aspects of Dress. (3 cr.; A-F or Audit; Fall Odd Year) Research and social science theories as applied to appearance/dress as manifestations of human behavior.

APST 8271. Retailing: Strategic Perspectives. (3 cr.; A-F or Audit; Fall Even Year) Selected topics in the field of retailing. Students extend their thinking regarding consumer behavior to strategic retail management.

APST 8272. Digital Consumers: Theories in Retail and Consumer Studies. (3 cr.; A-F or Audit; Spring Odd Year) Reviews range of critical theories in retail/consumer studies to explore issues in multi-
channel retailing environments. Exposure to breadth of topics in multi-channel retailing. Practical research experience. prereq: DES 8102 or equivalent quantitative methods class.

### Applied Business (ABUS)

**ABUS 3051. Career Skills in the Professional Environment for Juniors and Seniors.** (; 2 cr. ; Student Option; Every Fall & Spring)

**ABUS 3065. Computer Security for the Business Professional.** (; 3 cr. ; Student Option; Every Fall)
Computer security without technical jargon. Real-world examples and issues. Practices for safe, secure, and ethical computer use: virus, worm, and malware detection and elimination; antivirus and firewall selection; secure Internet purchasing; social networking sites; web page setup. prereq: Basic computer/Internet navigation skills; laptop with browser and MS Word or equivalent.

**ABUS 3301. Introduction to Quality Management.** (; 3 cr. ; A-F or Audit; Every Fall & Spring)
Principles/concepts of managing quality in business applications. Improving business processes with six sigma method. Implementing/leading process improvement. Baldrige Award, ISO 9000. prereq: Introductory statistics

**ABUS 3510. Communicating Virtually Across Global Teams in Applied Business Settings.** (; 4 cr. ; A-F or Audit; Every Fall) Collaborative exploration of virtual communication within teams/ across cultures. Impact of technologies on global business/societies. Virtual team functioning/ dynamics. Influence of cultural perspective on communication within group. Role of communication technology in cultural development. Ethical/legal implications.

**ABUS 4012. Strategic Decision Making and Problem Solving.** (; 3 cr. ; A-F or Audit, Every Fall) Frameworks/processes for decision-making. Analyzing causes, effects of problems, and solutions in organizations. Creativity, team building. Case studies, final real-world project, online presentation. prereq: 45 cr

**ABUS 4013W. Legal, Ethical, and Risk Issues for Managers.** (WI; 3 cr. ; A-F or Audit; Every Fall & Spring) Key legal, ethical, and risk frameworks in business activity and civic life. Students will identify areas of exposure within their specific industry and learn about best practices to minimize legal liability and manage risk. The writing-related instruction is designed to develop effective management-level communication skills regarding legal, ethical, and other risks and to develop a thoughtful analytical approach to addressing real-world risks. prereq: CMgt 4111 recommended for CMgt students, 45 semester credits

**ABUS 4022W. Management in Organizations.** (WI; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Demands on today’s managers, with a focus on small to medium-sized organizations. Techniques/ideas beyond traditional studies. Applying management theory at all levels. Managing in a global workplace. Organizational planning and decision making. Organizing resources. Leading/motivating people. Controlling/evaluating organizational activities. This writing intensive designated course will spend significant time focusing on the writing process. Writing is crucial to this discipline because clear, accurate, and professional communication is essential to organization management. The ability to write effectively in terms of specified audiences ensures, in the professional world, successful communication between team members as well as the success of the projects, companies, and employees they represent. prereq: 45 semester credits recommended

**ABUS 4023W. Communicating for Results.** (WI; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Aspects of communication essential for being persuasive/influential. Organizing/presenting ideas effectively, strategies for audience analysis, choosing communication methods, making appropriate use of informal influence methods, handling dissent. Processes for intercultural communication. prereq: 45 cr completed

**ABUS 4041. Dynamics of Leadership.** (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Successful leadership via flexible approach. Knowledge, skills, and abilities that leaders develop from eight leadership strategies: academic, bureaucratic, eclectic, economic, fellowship, military, political, social. Ways to lead diverse populations in a global environment. prereq: 45 cr completed

**ABUS 4043. Project Management in Practice.** (; 3 cr. ; A-F or Audit; Every Fall & Spring) Introduction to project management: tools and techniques for defining, scheduling, and managing a project. Learn about team development and ways to enhance team performance through planning and executing a project. Requires use of MS Project, which will be made available to students without cost via download. prereq: 45 cr completed


**ABUS 4104. Management and Human Resource Practices.** (; 3 cr. ; A-F or Audit; Every Fall & Spring) Providing day-to-day leadership. Organizing work, motivating employees. Delegating, coordinating, and achieving results. Front line human resource practices, including selection, induction, and training of new employees, employee appraisal. Handling grievances/discipline. prereq: 45 cr completed

**ABUS 4151. Innovation for Leaders and Organizations.** (; 3 cr. ; A-F or Audit; Every Spring) Innovation as cornerstone of knowledge economy. History of innovation process, importance to individuals/organizations. Strategies to foster innovation. Responsibilities in innovation skill-building/leadership. prereq: 45 cr

**ABUS 4211. Facility Asset Management, Finance, and Budgeting.** (; 2 cr. ; A-F or Audit; Every Fall) Examination of different types of leases. Relevance of BOMA (Building Office & Managers Association) space standards. Understanding components of total annual and capital facility costs. Analyzing and interpreting facility financial statements and reports. Constructing facility capital and operating budgets. Illustrating GAAP (generally accepted accounting principles) related to asset capitalization, and applying financial terminology when speaking to the chief financial officer. Recommended prereq: ABUS 4101 or basic accounting/finance knowledge/experience

**ABUS 4213. Facility Management Fundamentals.** (; 3 cr. ; A-F or Audit; Every Fall) Managing operation and maintenance of building systems and facility management departments. Operation of mechanical, electrical, and plumbing systems. Critical spaces, fire/life safety systems, utilities. Maintenance for specific building systems. Technology and resources used to support building operations and maintenance.

**ABUS 4217. Real Estate Development: Process and Tools.** (; 2 cr. ; A-F or Audit; Every Fall) Real estate development creates and alters our built environment. Working with architects, engineers, contractors, financing teams, government, and a host of consultants, real estate developers transform ideas into buildings, and with this, the spaces in which we live, work, and play. So, how do developers identify good and bad opportunities, and then, once committed, manage a wide group of stakeholders, often with disparate interests, to get the project completed and operating as planned? It is a challenge every step of the way, with a myriad of risks and obstacles to overcome, but with significant potential rewards. This course traces the development process from beginning to end, introducing foundational knowledge in project feasibility.
analysis and financial modeling, and integrating real world examples via case studies and interviews with Twin Cities-based practitioners. Prereq: 45 credits. Familiarity with finance and accounting concepts helpful.

**ABUS 4321. Evaluating Performance Excellence in Organizations.** (3 cr.; S-N or Audit; Every Fall, Spring & Summer) Systematic processes for leadership, quality improvement, performance excellence. Analyze strengths/improvements using Baldrige National Quality Award and MNQA criteria. Students join MNQA board of evaluators and complete team evaluation of group seeking MNQA. prereq: Submit MNQA evaluator application

**ABUS 4501. Building and Running a Small Business Enterprise.** (4 cr.; A-F or Audit; Every Fall) Basic marketing, finance, and leadership principles that apply to the formation of a small business enterprise. A variety of class discussions and independent reflective exercises will enable students to assess their resources and develop management, leadership, and business administration skills. The final project is collaborative: the creation of a business plan for a start-up. Prerequisites: None, although previous business experience or study will be helpful.

**ABUS 4502. Inclusive Business Leadership: Advancing Diversity.** (3 cr.; A-F or Audit; Every Fall) This course explores leveraging an organization’s diversity through inclusive leadership. Taking consideration of the value of diversity to the next level, we ask: How do we unleash the full potential of a diverse organization? To answer, students will do personal reflection on diversity, inclusiveness, and unconscious biases, and also take the Cultural Orientations Indicator (COI). This increased self-awareness will serve as a foundation for students to strategically plan and actively engage business leaders in creating more inclusive business practices.

**ABUS 4509. New Product Development.** (3 cr.; A-F or Audit; Every Spring) How new consumer, industrial, and service products are planned/developed. Idea generation, concept/buyer testing, pricing, sales/profit strategies, product positioning, promotion, packaging/distribution. Marketing case histories. Student projects. prereq: 4103 or 4701 or Mktg 3001, at least 45 cr or instr consent

**ABUS 4515. Strategy and Management for a Sustainable Future.** (3 cr.; A-F or Audit; Every Spring) Sustainability in business. Relationship of sustainable environments to organizations. Economic/strategic enterprise value. Relationship of sustainable business practices to marketplace trends/realities. prereq: 45 cr completed

**ABUS 4571W. Introduction to Grant Writing for Health Care and Nonprofit Organizations.** (WI; 3 cr.; A-F or Audit; Every Fall & Spring) Nonprofits and health care entities will continue to be challenged by limited resources and increased needs in communities they serve. This reality also results in an increased need for these groups to find additional financial support. This course will provide an understanding of ways to find, research, and write proposals for grants offered by government and private entities. As a writing intensive course, it will spend significant time focusing on the writing process. Writing is crucial to the field because the only way for a nonprofit to be awarded a grant is by submitting a written proposal. The strength of the proposal has a significant impact on the money that an organization will receive. Students will become familiar with various sections of the proposal by drafting, editing, and seeking feedback, and by revising a needs assessment, goal statement, budget justification, and statement of organizational purpose. By learning how to write well in the field, students will increase their chances of being employed by a nonprofit and securing funding for their organization.

**ABUS 4701. Introduction to Marketing.** (3 cr.; A-F or Audit; Every Fall & Spring) Conceptual tools for creating a marketing plan. How marketing relates to other functional areas of business. Importance of an ethical, global view. prereq: [Macroeconomics or microeconomics], 45 cr

**ABUS 4702. Applied Digital Marketing.** (3 cr.; A-F or Audit; Every Fall) Digital marketing represents the fastest growing sector in most marketing departments. But what is digital marketing? Understanding the digital realm of marketing requires a curiosity about how new technologies will change business, while grasping the key strategies that drive tactics and trends. This course is designed to be a primer on the world of digital marketing and ways it will affect both your future employment and larger business trends. Through case studies, discussion forums, and interactive activities, you will learn about the latest research and best practices in the industry to have a solid grasp of the core concepts and tools of digital marketing management, both today and in the future. Prerequisites: None

**ABUS 4703. Marketing for the Professional Practice.** (3 cr.; A-F or Audit; Every Summer) Principles of marketing applied to the management of the professional practice. Internal and external environment, market segmentation, positioning, differentiation, branding, and formulating a marketing plan with goals, strategies, and financial considerations. prereq: 45 sememter cr

**ABUS 4705. Leadership and Management for the Professional Practice.** (3 cr.; A-F or Audit; Every Summer) Foundation needed for successful leadership or management of a professional practice including recruitment, motivation, and compensation of employees, leadership of effective teams, choosing an appropriate organizational structure, understanding and leveraging diversity, developing a healthy culture, managing change, negotiations, and business ethics. Real-world examples to highlight successful and unsuccessful practices. Apply these principles to their own specific professional interests to become more effective leaders and managers. prereq: 45 semester cr

**ABUS 4707. Financial Management for the Professional Practice.** (3 cr.; A-F or Audit; Every Summer) Foundation knowledge to understand financial principles and apply them to investment, organizational, and operational decisions in a professional practice. Case studies using Excel to model common scenarios in practice. prereq: 45 semester cr

**ABUS 4709. Managing the Professional Practice I: Business Design.** (3 cr.; A-F or Audit; Every Summer) Factors/challenges involved in designing structure of professional practice. Core values/mision, design of services, physical design, risk management, equipment/IT, partners/staffing. Exercises in applied practice development/management. prereq: 45 cr

**ABUS 4711. Managing the Professional Practice II: Operations.** (3 cr.; A-F or Audit; Every Summer) Factors/challenges in day-to-day operations of professional practice. Marketing, human resources, finance, entrepreneurial spirit, inventory management, operational quality, transitions. Exercises in applied operations. prereq: 4709. 45 cr

**ABUS 4993. Directed Study.** (1-3 cr. [max 6 cr.]: Student Option; Every Fall, Spring & Summer) Specially arranged projects, trips, or field work. prereq: instr consent, dept consent

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**Applied Economics (APEC)**

**APEC 1001. Orientation to Applied Economics.** (1 cr.; A-F or Audit; Every Fall) Introduction to curriculum offerings, liberal education requirements, employment opportunities, faculty in the Department of Applied Economics. Emphasizes historical development of the discipline, areas of specialization, coursework expectations, career planning.


environment/health/safety. Public goods, tax policy. prerequisite: Honors student, proficiency in high school algebra


APEC 1201. Applications of Excel in Economics and Management. (1 cr.; A-F only; Every Fall) This course offers students the opportunity to master the basic and intermediate functionality of Microsoft Excel, and apply those skills to economic and managerial applications such as the financial impact of loans and investments, growth accounting, basic regression analysis, demand and cost estimation, and resource allocation. In addition, this course also emphasizes competencies regarding presenting and discussing quantitative data (demonstrating quantitative literacy), determining effective data display with charts, and making adequate choices about the graphical presentation of data. This course will enable students to become proficient in assembling and presenting data using Microsoft Excel.

APEC 1251. Principles of Accounting. (3 cr.; A-F only; Every Fall) Financial accounting. Theory, concepts, principles, procedures. Preparation/understanding of the four financial statements.

APEC 1905. The Ordinary Business of Life: Issues in Business, Government, and Macroeconomics. (3 cr.; A-F only; Every Fall) The world of economics is sometimes referred to as the study of the ordinary business of life. In this course we will discover, reflect on, and teach ourselves about a selected group of topics in the fields of business management and economics. While the first quarter of our meetings will be on business and economic history to provide context (the "Economic Revolution," the Federal Reserve System, and the role of government in the economy), the second quarter of class will analyze macro issues related to the domestic and world economies (economic growth, income inequality, the New Economy, and globalization). The third and fourth quarters of our time together will be micro-related. As part of this class, we will investigate the fields of leadership and business ethics through a series of readings and films. In addition, throughout the term some of our class discussions will be dedicated to helping you make your transition to and navigation of the University a smooth one. prerequisite: freshman

APEC 3001. Applied Microeconomics: Consumers, Producers, and Markets. (4 cr.; Student Option; Every Fall & Spring) Consumer/producer decisions. Theory of supply/demand. Markets, pricing, investment, effect regulation, market failures. prerequisite: [1101 or Econ 1101 or 1101H or Econ 1101H], [MATH 1142 or MATH 1271] or instr consent; intended for undergrads in [Ag/Food Bus Mgmt, Appl Econ]

APEC 3002. Applied Microeconomics: Managerial Economics. (4 cr.; Student Option; Every Fall & Spring) Microeconomic theory, its application to managerial problems. Introduction to regression analysis, demand analysis, demand function estimation, forecasting, cost function estimation, resource allocation decisions, linear programming, market structure, pricing policy, risk analysis, investment analysis. prerequisite: APEC 3001 or Econ 3101 AND SOC 2550 or Stat 3011

APEC 3003. Introduction to Applied Econometrics. (4 cr.; A-F only; Every Spring) Econometrics is the core empirical methodology used in economics. It allows economists (and others) to learn about the world through data in non-experimental situations. This course teaches student how to use common types of econometric analysis to answer research questions in an experiential learning environment. prerequisite: APEC 1101 or equiv., STAT 3011 or equiv.

APEC 3004. Management Science Workshop. (2 cr.; Student Option; Every Spring) The Management Science Workshop focuses on quantitative techniques from management science relevant to applied economics and agribusiness management problems, emphasizing applications of linear and nonlinear programming to decision problems of firms and other organizations. The economic foundations of the models and the economic interpretations of their solutions are emphasized. Specific topics include production planning, logistics, scheduling, inventory management, and network models. The course is lab-based and all applications use Excel, with the Solver add-in, as the software platform; however, more specialized software may be introduced. prerequisite: APEC 3001 or Econ 3101

APEC 3006. Applied Macroeconomics: Government and the Economy. (3 cr.; Student Option; Every Fall & Spring) Public sector and market economics. Public goods, externalities, and other allocation issues. Government and stabilization of national economy. Overview of new classical/Keynesian models. Principles of taxation. Individual income tax. Sales, business, and property taxes. prerequisite: [[1102 or Econ 1102], [3001 or Econ 3101]] or instr consent

APEC 3007. Applied Macroeconomics: Policy, Trade, and Development. (GP; 3 cr.; Student Option; Every Fall & Spring) Indicators of economic development, growth in trade, and welfare of developing countries. Globalization. Drivers of growth, productivity, technical change, and research. Comparative advantage. Distribution consequences of trade. Trade policy instruments/institutions. prerequisite: [1101 or Econ 1101], [1101H or Econ 1101H], [1102 or Econ 1102], [1102H or Econ 1102H]; 3001, 3006 recommended


APEC 3071. Microeconomics of International Development. (3 cr.; Student Option; Every Fall) Characteristics and performance of peasant agriculture; potential role of agriculture in economic development, and design of economic policies to achieve agricultural and economic development; role of women in agricultural development. prerequisite: 1101, 1102, Econ 1101, 1102, or instr consent

APEC 3202. An Introduction to the Food System: Analysis, Management and Design. (3 cr.; Student Option; Every Fall) Introduction to use of systems thinking for exploration of problems in contemporary food system from multidisciplinary perspective. System concepts. Historical evolution of food system. Analysis, management, design.

APEC 3411. Commodity Marketing. (3 cr.; Student Option; Every Fall) Economic concepts related to marketing agricultural commodities. Conditions of competitive markets, historical perspectives on market institutions/policy, structural characteristics of markets, policies/regulations affecting agricultural marketing of livestock, crop, and dairy products. prerequisite: 1101 or Econ 1101

APEC 3451. Food and Agricultural Sales. (3 cr.; Student Option; Every Spring) Professional selling of agricultural and food products. Students build/refine sales abilities, identify/qualify prospects, deliver sales presentations, close the sale. Principles of market research. prerequisite: 1101 or Econ 1101

APEC 3480. Topics in Applied Economics. (1-4 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer) Lectures and discussion on applied economics subjects. Topics specified in Class Schedule.

APEC 3501. Agribusiness Finance. (3 cr.; Student Option; Every Fall)
APEC 3511. Retail Supermarket Case Analysis. (3 cr.; A-F only; Every Fall) This course provides students with the tools to address real-world issues faced by the retail food industry. The National Grocers Association (NGA) determines the particular case annually, and the event is held at their annual meeting along with the Industry-University Coalition. Elements of the solution may involve marketing, budgeting, strategic pricing, and market research. Students are asked to prepare a presentation to a group of retail grocers at the annual meeting of the NGA, typically held in Las Vegas, NV. Students will complete weekly assignments in which they lay the groundwork for the competition. The competition is held in February. During the Fall semester, students engage in research and evaluation of options on the case study. During the Spring semester, students finalize their presentations and compete at the NGA Show with teams from about 18 other universities that are members of the NGA Industry-University Coalition. The competition involves a 15-minute presentation on the first day with 10 minutes of questions and answers. Students are guaranteed to present twice with a second presentation on the second day. Four finalists are chosen for the finals on the third day with the winning team being recognized at the evening banquet and a cash prize. Students will also have the opportunity to interact with industry representatives at the show in a number of ways during the four days. prereq: APEC 1101 or Econ 1101 or Econ 1101H.

APEC 3515. Entrepreneurship Fundamentals for Value-Added Rural Businesses. (3 cr.; A-F only; Every Fall) Process of starting a new business or organizing. Creating a new value proposition in which people are willing to pay for this new product or service according to its perceived value. Students identify market niches and develop plans to exploit them. Student-run businesses may be created as well as self-standing independent businesses.

APEC 3562. Fundamentals of Rural Property Appraisal. (3 cr.; Student Option; Every Fall) There are two major objectives for this course. One is to develop an understanding of the fundamentals and principles of valuing and appraising rural property, especially farmland. Students will gain an appreciation of what an appraiser does, what constitutes a sound appraisal and how to apply this knowledge in their careers. The second major objective is to show students how to evaluate an individual land parcel. Buying land involves many individual factors that must be considered. prereq: 1101 or Econ 1101.

APEC 3611W. Environmental and Natural Resource Economics. (ENV, WI; 3 cr.; Student Option; Every Spring) Analysis of financing and investment strategies for agribusiness firms and their effects on liquidity, solvency, and profitability. Analysis of financial institutions, markets, and instruments. Management problems, issues facing financial intermediaries serving agriculture. prereq: [[1251 or Acct 2050], 60 cr] or instr consent.

APEC 3611W. Environmental and Natural Resource Economics. (ENV, WI; 3 cr.; Student Option; Every Spring) Analysis of financing and investment strategies for agribusiness firms and their effects on liquidity, solvency, and profitability. Analysis of financial institutions, markets, and instruments. Management problems, issues facing financial intermediaries serving agriculture. prereq: [[1251 or Acct 2050], 60 cr] or instr consent.

APEC 3611. Principles of Farm Management. (3 cr.; Student Option; Every Fall) Concepts of resource use. Financial/economic feasibility. External effects, market failures. Resource use, environmental problems. Measuring impacts of resource development. Economics of alternative resource programs, environmental strategies. prereq: 1101 or Econ 1101 or Econ 1101H or Econ 1101H.

APEC 3811. Principles of Farm Management. (3 cr.; Student Option; Every Fall) Strategic and operations aspects of farm management; financial analysis, budgeting, strategic management; marketing plan and control; enterprise and whole farm planning and control; investment analysis, quality, risk, and personnel management. prereq: 1101 or Econ 1101.

APEC 3821. Retail Center Management. (3 cr.; Student Option; Every Spring) Management of garden centers, grocery stores, and other retail units selling perishable agricultural products. prereq: [1101 or Econ 1101], [1251 or Acct 2050] or instr consent.

APEC 3841. Agricultural Cooperatives and Mutuals. (3 cr.; Student Option; Every Fall) Introduction to the cooperative and mutual form of business organization. Extensive applications to agricultural, food, and consumer cooperatives are used. The class is an active-student learning process with a distance learning component. prereq: ApEc 1101 or Econ 1101 or Econ 1101H.

APEC 3991. Independent Study in Applied Economics. (1-4 cr.; A-F only; Student Option; Every Fall) Independent study and supervised reading and research on subjects not covered in regularly offered courses. instr consent.

APEC 4311. Tourism Development: Principles, Processes, Policies. (3 cr.; Student Option; Every Spring) Evolution of tourism industry; economic, environmental, and sociocultural impacts of tourism development; influence of government policies and organizations; models and tools needed for successful development; consequences of development activities and ways to involve stakeholders in decisions. prereq: 1101, 1102 or Econ 1101, 1102.

APEC 4451W. Food Marketing Economics. (CIV, WI; 3 cr.; Student Option; Every Fall) Economics of food marketing in the United States. Food consumption trends, consumer food behavior, marketing strategies, consumer survey methodology, food distribution/retailing system. Policy issues related to food marketing. Individual/group projects. prereq: [[1101 or Econ 1101], [1101H or Econ 1101H], SCO 2550 or STAT 3011 or equiv, 60 cr] or instr consent.

APEC 4461. Horticultural Marketing. (3 cr.; A-F only; Every Fall) Major areas in horticultural marketing. Difference between horticultural products and commercial commodities. Core marketing components that should be used by every small horticultural business. Approaches to consumer research.


APEC 4501. Financial Modeling: Spreadsheet Applications in Finance, Management, and Marketing. (2 cr.; A-F or Audit; Every Spring) Designing/implementing solutions to problems in finance, management, and marketing with MS Excel? spreadsheet and VBA language. Exercises cover topics such as proforma financial statement analysis, efficient portfolio derivation, capital budgeting, and options, and VBA aspects such as user-defined functions, macros, variables, and forms.

APEC 4821W. Business Economics and Strategy. (WI; 3 cr.; Student Option; Every Spring) Strategic management for production, processing, wholesaling, retailing, and service. Strategy formulation, implementation, and control. Business plans. Case study analysis. prereq: 3002, [3501 or FINA 3001], and [ACCT 3001 or MGMT 3001 or MKTG 3001] or instr consent.

APEC 5031. Methods of Economic Data Analysis. (3 cr.; Student Option; Every Fall) Statistical and econometric techniques for applied economists. Theory and application of multivariate regression model using data sets from published economic studies. Emphasis on use of statistical techniques to understand market behavior. prereq: Math 1271, Stat 5021, knowledge of matrix algebra.

APEC 5032. Economic Data Analysis for Managerial and Policy Decisions. (3 cr.; Student Option; Every Fall) Statistical and econometric methods for the analysis of large data sets to support managerial and policy decisions. Methods for organizing, accessing, and ensuring the quality of data. Estimation techniques include panel data methods, limited dependent variable models, and time series analysis. Clarity of reporting and design of procedures for maintaining and updating data estimates. prereq: 5031 or instr consent.

APEC 5151. Applied Microeconomics: Firm and Households. (3 cr.; Student Option; Every Fall) Quantitative techniques for analysis of economic problems of firms and households. Links between quantitative tools and economic analysis. Regression analysis, mathematical programming, and present value analysis. prereq: APEC 3001, Math 1272, and Math 2243 or equiv or grad student or instr consent.

APEC 5152. Applied Macroeconomics: Income and Employment. (3 cr.; Student Option; Every Spring) Static general equilibrium open economy models and simple business cycle models that
examine economic growth, business cycles, and fiscal and monetary policy. Input-output analysis and large scale econometric models. Sources/properties of economy and sector-wide data. Empirical applications. Prerequisites. prereq: 3001 or Math 1271 or Math 2243 or equiv or grad student or instr consent

APEC 5321. Regional Economic Analysis. (3 cr.; Student Option; Every Spring) Developmental patterns. Role of resources, transportation, and institutional constraints. Migration, investments in growth and change. Economic information in investment and location decisions. Economic development policies and tools. Economic impact analysis. prereq: 3006 or Econ 3102 or instr consent

APEC 5411. Commodity Marketing. (3 cr.; Student Option; Every Fall) Economic concepts related to marketing agricultural commodities. Conditions of competitive markets, historical perspectives on market institutions/policy, structural characteristics of markets, policies/regulations affecting agricultural marketing of livestock, crop, and dairy products. prereq: graduate student and 1101 or Econ 1101


APEC 5481. Futures and Options Markets. (; 3 cr.; Student Option; Every Spring) Economic concepts related to futures/options trading. Hedging, speculation.

APEC 5511. Labor Economics. (3 cr.; Student Option; Periodic Fall) Theoretical foundations of labor markets. Intertemporal/household labor supply. Demand for labor, efficiency wages. Human capital theory, unemployment, migration decisions. Analysis of econometric research applied to labor policy issues such as minimum wage, tax policy, social insurance, education. prereq: [3001 or Econ 3101 or PA 5021], (PA 5032 or equiv) or instr consent

APEC 5541. Labor Economics. (3 cr.; Student Option; Periodic Fall) Theoretical foundations of labor markets. Intertemporal/household labor supply. Demand for labor, efficiency wages. Human capital theory, unemployment, migration decisions. Analysis of econometric research applied to labor policy issues such as minimum wage, tax policy, social insurance, education. prereq: [3001 or Econ 3101 or PA 5021], (PA 5032 or equiv) or instr consent

APEC 5651. Economics of Natural Resource and Environmental Policy. (3 cr.; Student Option; Every Spring) Economic analyses, including project evaluation of current natural resource/ environment issues. Intertemporal use of natural resources, natural resource scarcity/ adequacy, environmental quality, and mechanisms for pollution control and their implications for public policy. prereq: [3001 or Econ 3101], (ESPM 3611 or Econ 3611 or ECON 3261) or instr consent

APEC 5711. U.S. Agricultural and Environmental Policy. (3 cr.; Student Option; Periodic Spring) U.S. agricultural policy in an open world economy; role of private markets and government in regulating supply and demand; income vs. price support, supply controls, environmental constraints, and export protectionism; functioning of markets; roles of public interest groups and future of American agricultural policy. prereq: 3001 or Econ 3101

APEC 5721. Economics of Science and Technology Policy. (3 cr.; Student Option; Every Fall) This course covers the economic effects of science and technology policies, such as intellectual property rights. The course considers the effects of policies on: (1) the economic growth and development levels of countries; (2) the international technology transfers that occur between countries through trade, foreign direct investment, and licensing arrangements; and (3) differences in the economic welfare of developed and developing countries. prereq: APEC 3001 or Econ 3101 or instr consent

APEC 5731. Economic Growth and International Development. (3 cr.; Student Option; Periodic Spring) Economics of research and development. Technical change, productivity growth. Impact of technology on institutions. Science and technology policy. prereq: 3002 or [Econ 3101, Stat 3022]; Econ 4211 recommended

APEC 5741. Resource Economics. (3 cr.; Student Option; Every Fall) Analysis of resource allocation. Resource scarcity and sustainability. Resource management. Environmental impacts/implications of resource use. Environmental economic valuation. prereq: 3001 or Econ 3101 or Econ 5151 or Intermediate Microeconomics

APEC 5751. Global Trade and Policy. (3 cr.; Student Option; Every Fall) Trade policies of import/export nations, gains from trade, trade negotiations/agreements. Free trade and common market areas. Exchange rate impacts. Primary commodities and market instability. Current trade issues. prereq: 3001 or Econ 3101 or PA 5021

APEC 5821. Business Economics and Strategy. (3 cr.; Student Option; Every Spring) Strategic management for production, processing, wholesaling, retailing, and service. Strategy formulation, implementation, and control. Business plans and case study analysis. prereq: graduate student and 3002, [3551 or FINA 3001], and [ACCT 3001 or MGMT 3001 or MKTG 3001]

APEC 5831. Food and Agribusiness Marketplace. (2 cr.; A-F only; Every Spring) This is a graduate student survey course of the industrial organization and current policy issues in the food and agribusiness marketplace. It represents a collaboration between the College of Food, Agricultural, and Natural Resource Sciences and the Carlson School of Management. The course uses short readings and speakers. A comprehensive look at all of the sectors in the food and agribusiness value chain is described. Topics include food policies (Farm Bills, food stamps, food labeling, and similar topics); environmental policies (water, invasive species, agriculture production and similar topics); and industrial organization issues (marketing and production contracts, overview of firm strategic orientation, distribution and similar topics). Readings, guest speakers, and presentations are used. prereq: graduate student

APEC 5832. The Business of Food Systems. (1 cr.; Student Option; Every Fall) This is a graduate survey course to introduce students to the Minnesota food industry through its regulatory process, research and development, and industry structure. It is an integrated week-long course that includes field study tours of Minnesota agriculture and food economy coupled with classroom instruction. Each year the course will focus on two Minnesota industries such as dairy, beef, soybean, corn, potatoes, and other agricultural and food industries. The course has been developed through a collaboration with College of Veterinary Medicine, School of Public Health, and College of Food, Agricultural, and Natural Resource Sciences.

APEC 5841. Agricultural Cooperatives and Mutuals. (3 cr.; Student Option; Every Fall) Introduction to cooperative and mutual form of business organization. Extensive applications to agricultural, food, and consumer cooperatives are used. Active-student learning process with a distance learning component.

APEC 5891. Independent Study: Advanced Topics in Farm and Agribusiness Management. (1-4 cr.; Student Option; Every Fall & Spring) Special topics or individual work suited to the needs of particular groups of students. prereq: instr consent

APEC 5991. Special Topics and Independent Study in Applied Economics. (: 1-4 cr.; max 48 cr.; Student Option; Every Fall, Spring & Summer) Special classes, independent study, and supervised reading/research on subjects/problems not covered in regularly offered courses. prereq: instr consent

APEC 8001. Applied Microeconomic Analysis of Consumer Choice and Consumer Demand. (2 cr.; A-F or Audit; Every Fall) Consumer behavior/demand. Introduction to welfare analysis. General equilibrium analysis in pure exchange economy. Part of four-course sequence (APEC 8001-8004), prereq: [(MATH 2243, MATH 2263 or equiv)] or instr consent

APEC 8002. Applied Microeconomic Analysis of Production and Choice Under Uncertainty. (2 cr.; A-F or Audit; Every Fall) Production, competitive markets, and choice under uncertainty. Technology and production, cost minimization and profit maximization, production duality, efficiency and technical change, general equilibrium of production. Part of four-course sequence (APEC 8001-8004), prereq: [(MATH 2243, MATH 2263 or equiv)] or instr consent

APEC 8003. Applied Microeconomic Analysis of Game Theory and Information. (: 2 cr.; A-F or Audit; Every Spring) Strategic competition, game theory, and information. Non-cooperative games, static games of complete and imperfect information, dynamic games of complete/incomplete information, application of incomplete information. Part of four-course sequence
APEC 8004. Applied Microeconomic Analysis of Social Choice and Welfare. (2 cr.; A-F or Audit; Every Spring)
Welfare economics/measurement, externalities and social choice. Welfare theorems in general equilibrium, externalities and public goods, social choice, social welfare, and welfare change measurement. Part of four-course sequence (APEC 8001-8004). prereq: [ECON 8003 or ECON 8103], [MATH 2243, MATH 2263] or equiv or instr consent

APEC 8202. Mathematical Optimization in Applied Economics. (3 cr.; Student Option; Fall)
Economic foundations and applications of mathematical and dynamic programming and optimal control. Mathematical optimization concepts; structures and economic interpretations of various models of the firm, consumer, household, sector, and economy. Model building and solution techniques. prereq: [ECON 5151] or equiv or instr consent

APEC 8203. Applied Welfare Economics and Public Policy. (3 cr.; Student Option; Every Spring)
Basic concepts underlying measurement of welfare changes, problems of market failure and externalities, social welfare functions, and distribution within and across generations. Application of concepts, based on case studies of the environment, returns to research, technical change, and agricultural policy. prereq: calculus, intermediate econ theory

APEC 8206. Dynamic Optimization: Applications in Economics and Management. (3 cr.; Student Option; Every Spring)
Formulation and solution of dynamic optimization problems using optimal control theory and dynamic programming. Analytical and numerical solution methods to solve deterministic and stochastic problems for various economic applications. prereq: [ECON 5151] or equiv or instr consent

APEC 8211. Econometric Analysis I. (4 cr.; Student Option; Every Fall)
Classical multiple regression, stochastic regressors, heteroscedasticity, autocorrelated disturbances, panel data, discrete dependent variables. prereq: ApEc 5031 or equiv OR Ph.D. student OR instr consent

APEC 8212. Econometric Analysis II. (4 cr.; Student Option; Every Spring)
Second semester of econometrics for Ph.D. students. Specification tests, instrumental variables, heteroscedasticity, panel data, simultaneous equations, bootstrap methods, limited dependent variable models, semiparametric estimation, econometrics of program evaluation, general method of moments, time series, hazard models. prereq: 8211 or equiv or instr consent

APEC 8221. Programming for Economists. (2 cr.; Student Option; Fall Even Year)
Applications of computer programming in econometrics. Introduction to and best practices in programming, including writing functions, organizing and commenting code, vectorization and other performance tips. Programmatic acquisition of novel economic datasets through Application Programming Interfaces (APIs), web scraping, and databases. Efficient cleaning and merging of datasets. Finally, a survey of common computational challenges in econometric estimation and potential solutions. prereq: APEC 5031 or equiv

APEC 8222. Big Data Methods in Economics. (2 cr.; Student Option; Fall Even Year)
Challenges, techniques, and opportunities presented by data that has one or more of the following characteristics: large, unstructured, high frequency, variable quality. The course will consist of three parts: 1) computational tools for applying standard econometric techniques on large datasets, 2) extracting summary information from unstructured data (e.g. images, text) for use in econometric analysis, 3) application of statistical learning techniques (e.g. classifiers, regression trees, machine learning) and the role of such techniques in causal inference. prereq: APEC 5031 or equiv; APEC 8221 or equivalent programming experience

APEC 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

APEC 8341. Applied Public Finance. (3 cr.; A-F or Audit; Periodic Spring)
Current economic research on government tax and expenditure policy. Apply tools of applied economics to public finance issues. Tax policy, taxation and household decisions (including labor supply and saving), taxation and the firm (including the cost of capital), and fundamental tax reform. Alternative demand models for public goods, public choice theory, and fiscal federalism. prereq: ECON 8001-8004 or ECON 8001-8004 or ECON 8101-8104

APEC 8401. Consumer Behavior and Household Economics. (2 cr.; A-F or Audit; Periodic Fall)
Seven-week course. Microeconomic analysis of individual and household behavior. Both theoretical and empirical issues. Demand theory-statistical models to dynamic models. Equivalence scales/intrahousehold allocation. prereq: [ECON 8001 or concurrent registration in ECON 8001], [8002 or concurrent registration in ECON 8002], [8003 or concurrent registration in ECON 8003], [8004 or concurrent registration in ECON 8004] or [ECON 8001 or concurrent registration in ECON 8001], [ECON 8002 or concurrent registration in ECON 8002], [ECON 8003 or concurrent registration in ECON 8003], [ECON 8004 or concurrent registration in ECON 8004] or [ECON 8101 or concurrent registration in ECON 8101], [ECON 8102 or concurrent registration in ECON 8102] or [ECON 8103 or concurrent registration in ECON 8103], [ECON 8104 or concurrent registration in ECON 8104], [8211 or concurrent registration in 8211], [8212 or concurrent registration in 8212]

APEC 8402. Information and Behavioral Economics. (2 cr.; A-F or Audit; Periodic Fall)
Consumer behavior. Standard economic models. Alternative models that incorporate psychological phenomena. Influence of information on consumer choice over time and under uncertainty. Expected and unexpected utility theory, bounded rationality, prospect theory, choice over time. prereq: 8401, [ECON 8001 or concurrent registration in ECON 8001, [8002 or concurrent registration in ECON 8002], [8003 or concurrent registration in ECON 8003], [8004 or concurrent registration in ECON 8004] or [ECON 8001 or concurrent registration in ECON 8001], [ECON 8002 or concurrent registration in ECON 8002], [ECON 8003 or concurrent registration in ECON 8003], [ECON 8004 or concurrent registration in ECON 8004] or [ECON 8101 or concurrent registration in ECON 8101], [ECON 8102 or concurrent registration in ECON 8102] or [ECON 8103 or concurrent registration in ECON 8103], [ECON 8104 or concurrent registration in ECON 8104], [8211 or concurrent registration in 8211], [8212 or concurrent registration in 8212]

APEC 8403. Consumer Theory and Demand Analysis. (3 cr.; A-F only; Periodic Fall & Spring)
Microeconomic analysis of consumer theory and demand analysis. Theoretical and empirical issues. Measurement issues and index numbers in consumer theory, develops empirical demand specifications. Theoretical and empirical consumer demand specifications are then applied to current topics in food assistance, food nutrition, and health topics. prereq: [ECON 8001 or concurrent 8001], [8002 or concurrent 8002], [8003 or concurrent 8003], [8004 or concurrent 8004] or [ECON 8001 or concurrent ECON 8001], [ECON 8002 or concurrent ECON 8002], [ECON 8003 or concurrent ECON 8003], [ECON 8004 or concurrent ECON 8004] or [ECON 8101 or concurrent ECON 8101], [ECON 8102 or concurrent registration in ECON 8102] or [ECON 8103 or concurrent registration in ECON 8103], [ECON 8104 or concurrent registration in ECON 8104], [8211 or concurrent registration in 8211], [8212 or concurrent registration in 8212], [MATH 1271 or equiv]

APEC 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

APEC 8501. Labor Economics I. (2 cr.; A-F or Audit; Periodic Spring)
Theoretical and empirical studies of compensating differentials, discrimination, personnel economics, and gross flows. prereq: Concurrent enrollment in APEC 8502 is required, 8003 or equiv or concurrent registration is required (or allowed) in 8003, 8211, 5032 or equiv

APEC 8502. Labor Economics II. (2 cr.; A-F or Audit; Periodic Spring)
Topics in applied microeconomics related to labor supply and human capital. Household
decisions and resulting outcomes in labor market. Household labor supply. Estimation of labor supply and earnings functions. Theory of human capital, wage structure and determination, and impacts of tax and transfer policies.

APEC 8601. Natural Resource Economics. (3 cr.; Student Option; Periodic Fall & Spring) Economic analysis of resource use and management. Capital theory, dynamic resource allocation. Applications to renewable and nonrenewable resources. Empirical studies, policy issues. prereq: [5151, 8202, 8206] [ECON 5151 or equiv] or instr consent

APEC 8602. Economics of the Environment. (3 cr.; Student Option; Every Fall) Economic analysis of environmental management, emphasizing environmental policy. Application of microeconomic theory to problems of market failure, market-based pollution control policies, contingent valuation, hedonic models, option value, and other topics. prereq: 8004 or ECON 8004 or ECON 8104 or equiv or instr consent

APEC 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral Pre-Thesis Credits prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

APEC 8701. Trade and Development I. (2 cr.; Student Option; Fall Odd Year) This course will analyze international trade and economic policies that affect trade. The course will consider the determinants of trade, the welfare effects of trade, and the implications of trade liberalization or protectionism. The course will use contemporary economic theory and econometric methods of analysis; and will provide an economic foundation for analyzing issues on the frontier of the academic literature and policy debate.

APEC 8702. Trade and Development II. (2 cr.; Student Option; Every Fall) This course will focus on the applied microeconomics of international development. The course will focus on empirically testing the various theories developed to account for persistent economic underdevelopment and poverty. We will start from key ideas and methods in empirical development economics, then cover household models (both unitary and otherwise), intrahousehold models, market formation and market participation, land markets, technology adoption, risk and insurance, and other topics related to development microeconomics, all from an empirical perspective. prereq: First-year PhD level microeconomics and econometrics

APEC 8703. Trade and Development III. (2 cr. [max 3 cr.]; Student Option; Periodic Spring) Topics in the microeconomic analysis of development covered include: education (both the determinants of educational outcomes and the impact of those outcomes on several economic outcomes), poverty, inequality, demography (population, fertility and gender issues), and the impact of international aid.

APEC 8704. Trade and Development IV. (2 cr.; Student Option; Every Spring) This course will focus on the applied microeconomics of international development. It will empirically analyze various market failures in developing countries, their role in driving persistent poverty, and interventions to address them. The course will focus specifically on the functioning of financial, labor, and healthcare markets, as well as the influence of social networks and economic decisions and outcomes.

APEC 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

APEC 8793. Master’s Paper: Plan B Project. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer) Students work under guidance of adviser to complete their Plan B Paper project. prereq: Agri/ApEc MS student or ApEc MS student


APEC 8803. Marketing Economics. (3 cr.; A-F or Audit; Periodic Fall & Spring) Review of market structure, conduct, and performance. Market interdependency over space/time. Product forms. Issues pertaining to market failures/interventions. prereq: [Econ 8001, Econ 8002] or [Econ 8101, Econ 8102, Econ 8103] or instr consent

APEC 8804. Managerial Economics. (3 cr.; Student Option; Periodic Fall & Spring) Analysis of managerial decisions by organizations/individual entrepreneurs. Application of dynamic programming to investment/resource allocation decisions. Economics of business organization, including boundaries of the firm, mechanisms for vertical coordination. Economic implications of alternative ownership structures. prereq: [8001, 8002, 8003, 8004] or [Econ 8101, Econ 8102, Econ 8103, Econ 8104] or instr consent; majors must register on A-F basis.

APEC 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral thesis credit. prereq: ApEc PhD student; max 18 cr per semester or summer; 24 cr required

APEC 8901. Graduate Seminar: MS & PhD. (1 cr.; S-N or Audit; Every Fall) Attendance and active participation in applied economics research seminars. Effective research methods. Research topics and observe professional methods of research presentations.

APEC 8902. Graduate Research Development Seminar. (1 cr.; S-N or Audit; Every Fall & Spring) Faculty, students, outside speakers present research ideas/results, which participants critique. Topics vary according to interests of speakers. prereq: ApEc MS student or ApEc PhD student

APEC 8903. PhD Qualifying Paper Seminar I. (1 cr.; S-N only; Every Fall) Support for writing second year Qualifying Paper. Purpose of paper is to provide guided opportunity for doctoral students to complete substantial research paper. prereq: 8001-8004 or Econ 8001-8004 or Econ 8101-8104

APEC 8904. PhD Qualifying Paper Seminar II. (1 cr.; S-N only; Every Spring) Provides support to doctoral students writing second year Qualifying Paper. Purpose of paper is to provide guided opportunity for students to complete substantial research paper. prereq: APEC 8903

APEC 8991. Advanced Topics in Applied Economics. (1-6 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer) Special seminars or individual work on subjects suited to needs of students. prereq; instr consent

Applied Plant Sciences (APSC)

APSC 8123. Research Ethics in the Plant and Environmental Sciences. (0.5 cr.; S-N or Audit; Every Spring) Ethics training to graduate students enrolled in plant/environmental graduate research programs and fulfill requirement for training in responsible conduct of research. Course meets during first seven weeks of spring semester.

APSC 8201. Advanced Plant Breeding. (3 cr.; A-F or Audit; Spring Odd Year) This course covers the principles underlying the application of genetics and statistics to cultivar development; evaluation of breeding methods; and methods to enhance genetic progress and efficiency through the application of statistical genetics, genomics, and molecular markers. In terms of format, this course is combination of lecture, discussion, and computer lab, varying according to the topic. An emphasis will be placed on classical and current literature to teach concepts, as well as hands-on experience with data analysis. Introductory courses in plant breeding/genetics and statistics. Knowledge of population and quantitative genetics would be useful but not required.

APSC 8270. Graduate Seminar. (2 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring) Examine qualities of effective scientific presentations. Develop skills in presenting
scientific information effectively. Practice public speaking skills. Presenting scientific information to the general public. Organize a seminar series. prereq: Grad major in Applied Plant Sciences or instructor consent

APSC 8280. Current Topics in Applied Plant Sciences. (1-3 cr. [max 4 cr.]; S-N or Audit; Periodic Fall & Spring) This variable-credit course is a forum for learning and discussing contemporary topics in applied plant sciences. The topics covered differ according to the instructor and term that the class is taught.

APSC 8333. FTE: Master’s. (1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

APSC 8444. FTE: Doctoral. (1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

APSC 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

APSC 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

APSC 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Applied Professional Studies (APS)

APSC 5100. Topics in Applied Professional Studies. (1-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Topics in Applied Professional Studies. prereq: dept consent

APSC 5101. Ecological Design for Horticulture. (3 cr. ; A-F or Audit; Periodic Summer) Design/systems thinking with plant mechanisms, prereq: SOIL 5125, HORT 1001, dept consent

APSC 5102. Garden Design: Theory and Application. (2 cr. ; A-F or Audit; Periodic Spring) This course provides an overview of the garden design process, the analysis and conceptual design of the landscape, exploration of the design characteristics of plants, sustainable design and a descriptive journey into several historical garden styles. You will be introduced to a variety of topics, including the design process, basic design principles, and the basic concepts of graphic communication in garden design. A working knowledge of design process and principles is critical to quality design. This course is intended to strengthen student awareness and knowledge of design rather than fully develop the skills necessary to draw, develop and implement garden designs. This course is different from fact-based horticulture science courses. Although you will be held responsible for learning a broad range of principles and processes in this course, there are typically no absolute right answers relative to design assessment and critique. What is more important is that you gain the ability to articulate and assess design character and quality and give evidence of your thought process.

APSC 5103. Integration of Sustainable Agriculture Concepts. (3 cr. ; A-F only; Every Fall) Biodiversity, ecological balance, nutrient cycling, soil quality. Organic practices of tillage, fertility management, weed control, insect control. Specific practices compared with conventional/integrated pest management. Economic analysis of both organic/conventional practices, prereq: AGRO 1101 or 1103 or BIOL 101 or BIOL 1009 or HORT 1001 or HORT 6011 or inst consent, [sr or grad student admitted to MPS in Horticulture] Because of the Sxx level, undergraduates need permission numbers to register. Students can obtain permissions by writing to: reeox001@umn.edu

APSC 5201. Career and Job Search Preparation for Graduate Students. (1 cr. ; S-N only; Every Fall & Spring) Job search and career development tools. Goals, networking, job search, resume/CV, interviewing. Assignments include resume/CV, informational interview, career development plan. prereq: dept consent

APSC 5901. Microeconomics for High School Teaching. (3 cr. ; A-F only; Every Summer) This is an online course intended for inservice and pre-service teachers who want to build or enhance their content knowledge in microeconomics and their pedagogical skills in teaching microeconomics to high school students. The course will include strategies for developing curriculum and instruction for microeconomics that engage students of diverse backgrounds. prereq: The prerequisites for this course are: licensed secondary school teachers in social studies, business, consumer science, or agricultural education; or pre-service secondary school teachers in a teaching licensure program in social studies, business, consumer science, and dept consent

APSC 6001. Introduction to Applied and Professional Studies. (3 cr. ; A-F only; Every Fall) This course serves as the introductory course for students in the Master of Professional Studies in Civic Engagement. Students in the course will be introduced to graduate level inquiry, and will augment critical thinking skills that frame applied business and disciplinary practice. Students will grapple with real-world problems and topical content, engaging with relevant scholarship, readings, and disciplinary methodologies. In doing so, they will gain proficiency in critical thinking, business ethics, and cultural competency in collaboration with their peers. This course offers students unique opportunities to engage in cross-disciplinary partnerships and creative problem-solving simulating real-world situations.

APSC 6002. Civic Engagement Capstone. (3 cr. ; S-N only; Every Spring) This course serves as the capstone course for students in the Master of Professional Studies in Civic Engagement. This course will synthesize the disciplinary and applied business coursework taken by students during their graduate career and will facilitate completion of an individualized, applied capstone project based on their community engagement career focus. This culminating experience, taken in the final year of the program, will provide students with an opportunity to engage in creative problem solving to address pressing real-world needs.

APSC 6011. Presentations in the Biological Sciences. (2 cr. ; A-F only; Every Summer) Course introduces students to the diverse ways in which biologists communicate in their professional lives. In this course students will choose an article from the primary literature and practice presenting the information to a range of audiences through a variety of techniques including soundbites, interviews, conference talks, conference posters, TED talks, podcasts, and internet videos.

APSC 6311. Cross-Functional Leadership and Communication. (3 cr. ; A-F or Audit; Every Spring) This course provides a deep analysis of the leadership process, as influenced by social and emotional intelligence. Students will explore the interconnected roles that social intelligence and competencies play across diverse personal, cultural, and political contexts and business functions. Additionally, students will be asked to apply leadership frameworks to social and emotional intelligence competencies to enhance leadership capacity across individual, group, and organization levels.

APSC 6312. Fundamentals of Organizational Finance. (3 cr. ; A-F or Audit; Every Fall) This course explicates organizational finance from the lens of a non-financial manager, helping students gain an applied understanding of financial and accounting concepts and the role finance plays in the economic viability of a business. Students will learn to construct financial statements and use these tools to strategically determine the overall business financial health. Students will forecast possibilities for future growth in relation to costs associated with operational expenses and the cost of capital. Students will review basic economic frameworks and complete case studies focusing on the connection of global economic influences to company and industry financial indicators. Specific topics include financial analysis; planning, forecasting, and budgeting; cash flow, and strategic financing.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
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Arabic (ARAB)

**APS 6313. Harnessing Big Data.** (;/ 3 cr. ; A-F or Audit; Every Fall)
In this course, students will analyze the structure and reliability of big data sets and how big data can be applied to decision making in organizations. Students will lean to use numerical, statistical and geometric models to organize data, make predictions, form valid arguments, and support conclusions. Students will also be introduced to the growing field of Business Intelligence and Data Analytics. Topics include data mining, text mining, business intelligence architecture, data reporting systems, dashboards, and data visualization tools such as Tableau and Power BI.

**APS 6314. Leading Projects and Teams.** (;/ 3 cr. ; A-F or Audit; Every Spring)
This course provides students the background and skills needed to enhance teamwork, make informed business decisions, or resolve productivity issues effectively. This course will focus on the principles techniques, and tools used to plan, control, monitor, and review projects to meet organizational monetary and time constraints. Through case studies and practical application, students will practice project management skills along with setting team priorities, performance objectives, and the team decision making process.

**APS 6950. Topics in Professional Studies.** (;/ 1-3 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Topics in professional studies. prereq: dept consent

**APS 6993. Directed Studies.** (;/ 1-6 cr. ; Student Option No Audit; Every Fall, Spring & Summer)
Directed Studies prereq: dept consent

**APS 6994. Directed Research.** (;/ 1-6 cr. ; S-N only; Every Fall, Spring & Summer)
Directed research. prereq: dept consent

**APS 8001. Introduction to Research in the Biological Sciences.** (;/ 1 cr. ; A-F only; Every Fall, Spring & Summer)
Resources available at U of M/College of Continuing Education that will help complete Master of Biological Sciences degree. Required of all MBS students.

**APS 8002. Final Project Course for Plan B MBS Students.** (;/ 2-3 cr. ; S-N only; Every Fall, Spring & Summer)
Synthesize/complete Plan B graduate final project. prereq: dept consent

**APS 8003. Capstone Course for Plan C MBS Students.** (;/ 2-3 cr. ; S-N only; Every Fall, Spring & Summer)
MBS students synthesize/complete Plan C graduate final project. prereq: dept consent

**APS 8110. Graduate Seminar Series.** (;/ 1 cr. [max 3 cr.]; S-N only; Every Fall, Spring & Summer)
Recent developments in student's field of interest presented in research seminars by scientific experts. prereq: dept consent

**ARAB 1101. Beginning Arabic I.** (5 cr. ; Student Option No Audit; Every Fall & Summer)
Oral practice, reading, comprehension, basic grammar.

**ARAB 1102. Beginning Arabic II.** (5 cr. ; Student Option No Audit; Every Spring & Summer)
Comprehension, oral practice, reading of standard Arabic. prereq: 1101 or instr consent

**ARAB 3101. Intermediate Arabic I.** (5 cr. ; Student Option No Audit; Every Fall)
Advanced grammar/conversational practice. Reading Arabic texts.

**ARAB 3102. Intermediate Arabic II.** (5 cr. ; Student Option No Audit; Every Spring & Summer)
Advanced grammar, analyses of readings, oral comprehension, prereq: 3101 or instr consent

**ARAB 3290. Arabic Language Teaching Tutorial.** (;/ 1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Students tutor beginning students of Arabic and are part of department's Arabic language team. prereq: Grade of A in 3102/4122

**ARAB 3542. Medieval Islam.** (;/ 3 cr. ; Student Option;)
Islamic dynasties, Mamluks and Mongols, Crusaders and Assassins. Abbasid Caliphat's disintegration and rise of Seljuk Turks.

**ARAB 3811. Egyptian Colloquial Arabic I.** (3 cr. ; A-F only; Every Fall & Summer)
This course is designed for students of Arabic who have taken a minimum of two semesters of Modern Standard Arabic (ARAB 1101 and 1102), or the equivalent thereof as determined by a placement test. The course provides training in the fundamentals of Egyptian Colloquial Arabic, one of the most widely-spoken and widely-understood Arabic vernaculars. Students practice the expression and comprehension of communicative needs in a variety of daily-life, informal situations. In addition, they are acquainted with a range of authentic cultural materials (film, TV broadcasts, songs) in Egyptian Arabic. The course relies heavily on oral practice and class periods are designed to be interactive. This course is open to non-native speakers and non-heritage learners of Arabic only. It cannot be taken in lieu of ARAB 3101 or ARAB 3102 to fulfill the CLA second language requirement; it can, however, be taken concurrently with these classes. Credit will not be granted if student has already taken ARAB 3900 Fall 2016, Summer 2016

**ARAB 3900. Topics in Arabic.** (;/ 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Topics specified in course guide.

**ARAB 3993. Directed Study.** (;/ 1-3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
For advanced students with individual faculty members. Prereq-instr consent, dept consent, college consent.

**ARAB 4101. Beginning Arabic I for Graduate Student Research.** (5 cr. ; Student Option No Audit; Every Fall & Summer)
Oral practice, reading, comprehension, grammar.

**ARAB 4102. Beginning Arabic II for Graduate Student Research.** (5 cr. ; Student Option No Audit; Every Spring & Summer)
Comprehension, oral practice, reading of standard Arabic. Meets with 1102. prereq: 4101 or equiv

**ARAB 4121. Intermediate Arabic I for Graduate Student Research.** (5 cr. ; Student Option No Audit; Every Fall)
Advanced grammar, conversational practice. Reading Arabic texts. prereq: 4102 or equiv

**ARAB 4122. Intermediate Arabic II for Graduate Student Research.** (5 cr. ; Student Option No Audit; Periodic Spring & Summer)
Advanced grammar, analyses of readings, oral comprehension. Meets with 3102. prereq: 4121 or equiv

**ARAB 5040. Readings in Arabic Texts.** (;/ 3 cr. [max 9 cr.]; A-F only; Every Fall)
Post-advanced study of extensive, complex original Arabic texts and development of students' Arabic discussion and writing skills in the realms of literature, academia, media and/or business. All primary and secondary readings, assignments, in-class analysis and discussion are done fully in Arabic. Topics specified in Class Schedule.

**ARAB 5101. Advanced Arabic I.** (4 cr. ; Student Option No Audit; Every Fall)
Advanced readings in classical/modern Arabic. Compositions based on texts. prereq: Grade B- or higher in 3102 or instr consent

**ARAB 5102. Advanced Arabic II.** (4 cr. ; Student Option No Audit; Every Spring)
Readings of Arabic texts. Writing compositions based on texts. Continuation of 5101.

**ARAB 5992. Directed Readings.** (;/ 1-3 cr. ; Student Option; Every Fall & Spring)
Individual research and readings for advanced students.

Textbooks used are Samia Louis' Kallimni 'Arabi and Kallimni 'Arabi Aktar. The course is designed for students of Arabic who have completed Egyptian Colloquial Arabic I, or the equivalent thereof, as determined by a placement test. This course is open to non-native speakers and non-heritage learners of Arabic only. As a 3-credit course, it cannot be taken in lieu of ARAB 3101 or ARAB 3102 to fulfill the CLA second language requirement. It can, however, be taken concurrently with these classes. Credit will not be granted if student has already taken ARAB 3900 Spring 2016, Summer 2016

**ARAB 3812. Egyptian Colloquial Arabic II.** (3 cr. ; A-F only; Every Spring & Summer)
As the continuation of ARAB 3811 Egyptian Colloquial Arabic I, this course focuses on further developing oral expression and comprehension skills in Egyptian Arabic. By practicing the target language, students explore important elements of Egyptian culture and history and engage with a dynamic cross-section of authentic media and cultural material including film, television, news, and music. The course relies heavily on oral practice and class periods are designed to be interactive.

Textbooks used are Samia Louis' Kallimni 'Arabi and Kallimni 'Arabi Aktar. The course is designed for students of Arabic who have completed Egyptian Colloquial Arabic I, or the equivalent thereof, as determined by a placement test. This course is open to non-native speakers and non-heritage learners of Arabic only. As a 3-credit course, it cannot be taken in lieu of ARAB 3101 or ARAB 3102 to fulfill the CLA second language requirement. It can, however, be taken concurrently with these classes. Credit will not be granted if student has already taken ARAB 3900 Spring 2016, Summer 2016

**ARAB 3900. Topics in Arabic.** (;/ 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Topics specified in course guide.

**ARAB 3993. Directed Study.** (;/ 1-3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
For advanced students with individual faculty members. Prereq-instr consent, dept consent, college consent.

**ARAB 4101. Beginning Arabic I for Graduate Student Research.** (5 cr. ; Student Option No Audit; Every Fall & Summer)
Oral practice, reading, comprehension, grammar.

**ARAB 4102. Beginning Arabic II for Graduate Student Research.** (5 cr. ; Student Option No Audit; Every Spring & Summer)
Comprehension, oral practice, reading of standard Arabic. Meets with 1102. prereq: 4101 or equiv

**ARAB 4121. Intermediate Arabic I for Graduate Student Research.** (5 cr. ; Student Option No Audit; Every Fall)
Advanced grammar, conversational practice. Reading Arabic texts. prereq: 4102 or equiv

**ARAB 4122. Intermediate Arabic II for Graduate Student Research.** (5 cr. ; Student Option No Audit; Periodic Spring & Summer)
Advanced grammar, analyses of readings, oral comprehension. Meets with 3102. prereq: 4121 or equiv

**ARAB 5040. Readings in Arabic Texts.** (;/ 3 cr. [max 9 cr.]; A-F only; Every Fall)
Post-advanced study of extensive, complex original Arabic texts and development of students' Arabic discussion and writing skills in the realms of literature, academia, media and/or business. All primary and secondary readings, assignments, in-class analysis and discussion are done fully in Arabic. Topics specified in Class Schedule.

**ARAB 5101. Advanced Arabic I.** (4 cr. ; Student Option No Audit; Every Fall)
Advanced readings in classical/modern Arabic. Compositions based on texts. prereq: Grade B- or higher in 3102 or instr consent

**ARAB 5102. Advanced Arabic II.** (4 cr. ; Student Option No Audit; Every Spring)
Readings of Arabic texts. Writing compositions based on texts. Continuation of 5101.

**ARAB 5992. Directed Readings.** (;/ 1-3 cr. ; Student Option; Every Fall & Spring)
Individual research and readings for advanced students.
MRCO 1301. Accelerated Colloquial Moroccan Arabic I. (6 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 1401. Intensive Colloquial Moroccan Arabic I. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 1701. Accelerated Modern Standard Arabic I. (6 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 1801. Intensive Beginning Modern Standard Arabic. (10 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 2301. Accelerated Colloquial Moroccan Arabic II. (6 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 2701. Accelerated Modern Standard Arabic II. (6 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 2801. Intensive Low Intermediate Modern Standard Arabic. (10 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3005. Introduction to the Arabic Newspaper. (3-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3006. Media Arabic. (3-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3007. Gender, Modernization, and Social Change in Morocco. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3008. Trajectories of Representation: Indigenous and Western Images of Morocco. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3009. Moroccan Society and Culture. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3010. Readings in Contemporary Maghrebi Literature. (3-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3011. Readings in Islamic Texts I. (3-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3012. Readings in Islamic Texts II. (3-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3013. Islam: Past and Present. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3014. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3015. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3016. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3017. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3018. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3019. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3020. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3021. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3022. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3023. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3024. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3025. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3026. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3027. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3028. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3029. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3030. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3031. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3032. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3033. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3034. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3035. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3036. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3037. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3038. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3039. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3040. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3041. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3042. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3043. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3044. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3045. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3046. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3047. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3048. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3049. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3050. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3051. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3052. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3053. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3054. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3055. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3056. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3057. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3058. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

MRCO 3059. Morocco: Changes and Cultural Identities. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.
Sketching/drawing conventions of visual phenomena/forms. prereq: pre-arch major or BDA major; no prereq in summer

ARCH 3150. Topics in Architecture. (3; 1-6 cr. [max 24 cr.]; Student Option; Periodic Fall & Spring) Selected topics in architecture design, theory, representation, or history.

ARCH 3211. BDA: Image, Authorship, and Architecture. (2 cr.; A-F only; Periodic Fall & Spring) Understanding the discipline and practice of architecture as fundamentally grounded in visual literacy, communication and authorship. Assignments and discussion help students: identify and characterize authorship of imagery; critically evaluate and converse about authorship of imagery; understand one's own authorship and its potential for growth, exploration and expression of visual themes in architecture.

ARCH 3212. BDA: Analytical Modeling of Contemporary Architecture. (3 cr.; A-F only; Periodic Fall & Spring) Insight into analytical modeling as one of the most important tools for a designer. Exercises, activities and iterative making of analytical models will help students to gain insight into works of contemporary architecture; analyze constituent elements and systems of form, space and order; investigate and make visible the underlying conceptual notions that generated the work; explore physical modeling as modes and techniques of analysis and representation; explore the specific issue of scale in analysis, representation and design resolution; read 2-D architectural drawings and translate them into 3-D physical form; and generally improve physical modeling skills.

ARCH 3221. BDA: Masonry Design and Construction. (3 cr.; A-F or Audit; Periodic Fall & Spring) This is a fast paced, high-energy course that combines modern design tools with the art and craft of making through a hands-on design-build process. This workshop is an opportunity for architecture students to learn and practice masonry design and construction by working directly with the Bricklayers & Allied Craftworkers (BAC) Local Union (Minnesota/ North Dakota) Apprenticeship Training Center and in conjunction with the International Masonry Institute (IMI).

ARCH 3222. BDA Box Problem. (2 cr.; A-F only; Periodic Fall & Spring) Students gain insight into the process of making by designing a wooden box that addresses a specific ritual, ceremony, event or activity of their choosing. The box will be evaluated on creativity, technique, craft, and risk. Introduction and practice with a variety of woodworking joints and techniques used to construct a wooden box.

ARCH 3223. BDA: Screen Test: Metal Work. (2 cr.; A-F only; Periodic Fall & Spring) Understanding the screen as an architectural element and screening as an architectural device. Understanding the nature of making and material craft in the design process, specifically metals and metal alloys designed and fabricated as architectural screen panels. Students develop: ability to understand, work with and transform metals; design vocabulary around screens, screening and patterns in architecture; design ideas as material assemblies and spatial propositions; verbal and visual communication skills as part of the design process; criteria for making design decision relevant for using screens, screening and patterns in architecture.

ARCH 3250. Design Workshop. (3; 1-6 cr. [max 54 cr.]; A-F only; Every Fall & Spring) Design process as it relates to architecture. Hands-on projects involving interactive design process. Students develop rigorous/inventive graphic means of communicating. prereq: 2281, [Arch BA or BDA major]

ARCH 3261. BDA: The Art of Daylighting Design: Exquisite Rooms. (0 cr.; A-F only; Periodic Fall & Spring) Daylighting design and luminous phenomena have long captured the imagination of designers and architects. The beauty and power of light and shadow inspires the work of the greatest architectural masters. This BDA Workshop explores the many roles of daylighting in architecture, and how it is shaped by the intersection of both poetic and performance goals and aspirations. A select group of exquisite rooms of leading modern and contemporary architects will be compared and contrasted to gain insight into larger luminous design concepts, principles, strategies, and lessons on the art of daylighting design. Physical and computer models, photography, rendered drawings, diagramming, and computer analysis will be explored to understand the daylighting design philosophies, strategies, and details of 'Masters of Light' and the application of daylighting design lessons to an individual daylight investigation. Learning objectives are: to compare and contrast poetic and performance daylighting design concepts, principles, and strategies of modern and contemporary architects; to develop a comparative knowledge of daylighting theories and practices from case studies of exquisite rooms to gain the knowledge and skills necessary to effectively develop and assess qualitative and quantitative daylighting strategies; and to develop a personal daylighting design theory, process, and practice.

ARCH 3271. BDA: Watercolor Sketching: Exploring Iconic Sites. (2 cr.; A-F only; Periodic Fall & Spring) Students will develop skills in representation and visualization using watercolor as a medium for examining architecture as material, structure and attitude. Students will explore creative methods in representation through a process of working en plein air. A new site of architectural significance will be visited each week. The goal of this design workshop is for students to discover and capture a sense of space, material and design in a personal manner, developing skills in representation as well as in design process. The way of working en plein air reflects a tradition in architecture of studying precedents in situ as well as an attitude captured by Frederick Frank in The Zen of Seeing, namely: To stop rushing around, to sit quietly on the grass, to switch off the world and come back to the earth, to allow the eye to see a willow, a bush, a cloud, a leaf, is an unforgettable experience.

ARCH 3281. Undergraduate Architecture Studio I. (6 cr.; A-F only; Every Fall) Introduction to architectural design in relation to site. prereq: BS Arch major

ARCH 3282. Undergraduate Architecture Studio II. (6 cr.; A-F only; Every Spring) Introduction to architectural design in relation to program. prereq: [3281 or 4281], BS Arch major

ARCH 3301. Drawing for Design in Architecture. (3 cr.; A-F or Audit; Every Fall & Spring) Introduction to practical/conceptual function of drawing in architecture. prereq: [1301 or LA 1301 or 2301]. [Arch or BED major]

ARCH 3312. Drawing Infrastructure. (4 cr.; A-F only; Periodic Spring) This course will explore both historic and modern infrastructure as cultural and engineering constructs through representation as a form of critical research. The course is location and content and focus will change as location of study program changes. The course will be structured around study trips, readings, on-site lectures and will be supplemented by the participation of several guest speakers.

ARCH 3351. AutoCad I. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Concepts, tools, and techniques of computer-aided drawing with current AutoCAD Release. Producing dimensioned/annotated drawings for plotting. 3-D drawing capabilities. Use of dimension variables, attributes, blocks, symbols. prereq: Arch major or BED major or instr consent

ARCH 3381. Introduction to Computer Aided Architectural Design. (3 cr.; A-F or Audit; Every Fall) Introduction to 2-D drawing, 3-D modeling/animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management. prereq: Arch major or BED major or instr consent

ARCH 3391. Design and Representation with BIM. (3 cr.; A-F or Audit; Every Fall) In this course, students will be introduced to the concept of Building Information Modeling (BIM) through the use of Autodesk Revit, one of the BIM software tools most commonly used in architectural practice today. Students will engage in a series of design exercises that will require both learning and applying Revit in the context of real world architectural scenarios. In addition to learning Autodesk Revit as a design tool, we will examine the use of BIM technology within the architectural industry through a series of case study examples. Also, presenters will share firsthand accounts of CAD and BIM Software being implemented in architectural practice.
ARCH 3111V. Architectural History to 1750. (GP, WI, HIS; 3 cr.; A-F only; Every Fall) History of architecture/city planning from antiquity to 1750, as illustrated by major monuments from western/non-western cultures. prereq: Soph or above

ARCH 3111W. Architectural History to 1750. (GP, WI, HIS; 3 cr.; A-F or Audit; Every Fall) Built environment as a tool to study the human past from ancient times to 1750. Major trends of style and form and the relationships, practices, beliefs that have shaped human behavior. prereq: Soph or above

ARCH 3412. Architectural History Since 1750. (GP, HIS; 3 cr.; A-F or Audit; Every Spring) Examples of the built environment from the Enlightenment to the present are studied within a broad social, cultural, and political context. Major architectural movements and their associated forms and designs. prereq: Soph or above

ARCH 3412H. Honors: Architectural History Since 1750. (GP, HIS; 3 cr.; A-F or Audit; Every Spring) Built environment from the Enlightenment to the present in a broad social, cultural, and political context. Major architectural movements and associated forms/designs. Ideas/philosophies that have emerged over time. Lecture, textbooks, discussion, writing, drawing, looking, and researching. prereq: Soph, honors

ARCH 3451W. Theory in Design Use. (WI; 3 cr.; A-F only; Every Spring) Introduction to contemporary architectural criticism. Ideas put forth by this criticism in three papers. Relating these ideas to student's own design work. prereq: [1701, 3311, 3312], [one BS design studio or two BDA workshops]

ARCH 3511. Material Transformations: Technology and Change in the Built Environment. (TS; 3 cr.; A-F only; Periodic Fall) Surveys development of significant architectural material technologies/their relationships to society/natural environment.

ARCH 3611. Design in the Digital Age. (3 cr.; A-F or Audit; Every Spring) Introduction to design, design process. Developing/understanding ways of seeing, thinking, and acting as a designer. Changes in design being wrought by digital technology. Team design project.

ARCH 3711V. Honors: Environmental Design and the Sociocultural Context. (CIV, WI, SOCS; 3 cr.; A-F only; Every Fall) Designed environment as cultural medium and as product of a sociocultural process and expression of values, ideas, behavioral patterns. Design/construction as complex political process. prereq: Honors, [soph or above]

ARCH 3711W. Environmental Design and the Sociocultural Context. (CIV, WI, SOCS; 3 cr.; A-F only; Every Fall) Designed environment as cultural medium/product of sociocultural process/expression of values, ideas, behavioral patterns. Design/construction as complex political process. prereq: Soph or above

ARCH 3722. The City in Visual Culture. (AH, GP; 3 cr.; A-F only; Every Spring) Grounded by the rich, complex and diverse architectural and urban contexts of the city, this course will examine how the spaces of the city are created, experienced and represented through its visual culture. The class will investigate how the physical landscape of the city has changed over time through all its historical incarnations. The course is location and content and focus will change as location of study program changes. The course will be structured around weekly seminars, readings, on-site lectures and will be supplemented by the participation of several guest speakers.

ARCH 3756. Public Interest Design: Principles and Practices. (3 cr.; A-F or Audit; Every Spring) As the allied fields of design evolve in response to an increasing number of global challenges - inequity, social and political turmoil, disruptive climate-change, accelerating population growth - the question of how designers will address the needs of the most vulnerable among us is fundamental. Public Interest Design (PID), an emerging area of specialization within the design professions, specifically considers the concerns of the vast majority of the world’s inhabitants who are historically under-resourced and ill-equipped to respond to the ? Grand Challenges? facing humankind. With this mind, this introductory survey course has two aims: First, to critically examine the range of environmental, economic, social, and ethical issues that underpin work with under-resourced and ill-equipped settings. Second, to investigate organizational models that seek to broaden the traditional scope of the allied design fields as disciplines and professions by advocating a humanitarian basis for practice.

ARCH 3993. Directed Study. (1-3 cr.; A-F only; Every Fall, Spring & Summer) Guided individual reading or study. prereq: instr consent

ARCH 4150. Topics in Architecture. (3 cr.; A-F or Audit; Periodic Fall & Spring) Advanced multimedia visualization techniques, including solid modeling, photo-realistic rendering. Creating still renderings/animations. Ways computer visualization can be used for design exploration, feedback during idea development, and realistic representation of designs. prereq: 3351, Architectural Design major or instr consent

ARCH 4150W. Topics in Architecture (Writing Intensive). (WI; 1-4 cr.; max 24 cr.) A-F only; Periodic Fall & Spring) Selected topics in Architecture that meet Writing Intensive requirements.

ARCH 4194H. Thesis/Capstone Project. (3 cr.; max 6 cr.; A-F only; Every Fall & Spring) Individualizes honors experience by connecting aspects of major program with special academic interests. prereq: Arch major, sr, honors

ARCH 4283. Undergraduate Architecture Studio III. (6 cr.; A-F only; Every Fall) Introduction to architectural design in relation to materials, construction methods, prereq: [3282 or 4282], B.S. Arch major

ARCH 4284. Undergraduate Architecture Studio IV. (6 cr.; A-F only; Every Spring) Topical design studio. prereq: 4283, BS Arch major

ARCH 4321. Architecture in Watercolor. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Watercolor as tool in design process. Foundation principles, techniques, medium, tools, materials. Color relationships, mixing, composition, applications to design. prereq: 2301

ARCH 4325. Architectural Photography: Imaging by Design. (4 cr.; A-F only; Periodic Fall & Spring) Principals of architectural photography as language of design through lectures, demonstrations, critical discussions. Ongoing photographic study under framework of conceptual themes. compositional forms, graphic styling, use of natural/artificial light, technical issues. prereq: BDA or BS major or Landscape Design and Planning major or instr consent

ARCH 4341. Architecture Portfolio Design. (3 cr.; A-F only; Every Fall & Spring) An introduction to design principles as they relate to the architecture portfolio. Students extend design thinking and visual communication skills in architecture into broader, life-long applications within the architecture profession by designing a portfolio that represents in a meaningful way a range of architecture and/or other coursework.

ARCH 4361. 3-D Computer Architectural Modeling and Design. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Use of 3D computer modeling for representation in abstract/realtistic ways. Creation/arrangement of objects. Setting up lighting. Developing surface materials. Creating still renderings/animations. Ways computer visualization can be used for design exploration, feedback during idea development, and realistic representation of designs. prereq: 3511, Arch major

ARCH 4382. Computer-Aided Architectural Design. (3 cr.; A-F or Audit; Every Spring) Computer-aided tools as used in design. Practice in 2-D and 3-D CAD, image manipulation, advanced multimedia visualization techniques, including solid modeling, photo realistic imaging, animation, and video editing/recording.

ARCH 4410. Topics in Architectural History. (1-4 cr.; max 24 cr.; A-F only; Periodic Fall & Spring) Selected topics in Architectural History

ARCH 4421W. Architecture and Interpretation: The Cave and the Light. (WI; 3 cr.; A-F or Audit; Periodic Spring) Historical/hermeneutical investigation of iconography of grotto. Intertwined themes of descent into earth and ascent to light, from earliest strata of human culture to present day. prereq: [3411, 3412] or instr consent
ARCH 4423. Gothic Architecture. (3 cr.; A-F or Audit; Periodic Fall)
History of architecture and urban design in Western Europe, from 1150 to 1400. prereq: 3411 or instr consent

ARCH 4424. Renaissance Architecture. (3 cr.; A-F or Audit; Periodic Fall)
History of architecture and urban design in Italy, from 1400 to 1600. Emphasizes major figures (Brunelleschi, Alberti, Bramante, Palladio) and evolution of major cities (Rome, Florence, Venice). prereq: 3411 or instr consent

ARCH 4425. Baroque Architecture. (3 cr.; A-F or Audit; Periodic Fall)
Architecture and urban design in Italy, from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin). prereq: 3411 or instr consent

ARCH 4428. History and Culture of European Cities. (GP, HIS; 3 cr.; A-F only; Every Spring)
This is a history course aimed at investigating the rich urban, landscape and architectural legacy of European cities, tracing their complex histories through the development of city morphology, and ceremonial and quotidian spaces. The course is location and content oriented, and students will change location of study program changes. Lectures are in class and also includes several field trips to historic sites and landscapes.

ARCH 4431. Eighteenth-Century Architecture and the Enlightenment. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Architecture, urban planning, and garden design in Europe and America, 1650 to 1850.

ARCH 4432. Modern Architecture. (3 cr.; A-F or Audit; Fall Odd Year)
Architecture and urban design in Europe and the United States from early 19th century to World War II. prereq: 3412 or instr consent

ARCH 4434. Contemporary Architecture. (3 cr.; A-F or Audit; Fall Even Year)
Developments, theories, movements, and trends in architecture and urban design from World War II to present. prereq: 3412 or instr consent

ARCH 4435. History of American Architecture. (3 cr.; A-F or Audit; Periodic Fall)
Through lectures, readings, discussion, and research, we will analyze buildings and spaces?architect designed and ?vernacular?? in the context of social, political, economic, technological, and ecological change. As we address these issues, we will examine the ways design and daily life, performed locally, interacted with national and global systems and flows; and the role the built environment has played in advancing structures and concepts of class, gender, race, ethnicity, and power. Students will gain a broad familiarity with the history of American buildings and landscapes, develop critical frameworks for analysis, and enhance their understanding of the environments they interact with every day?as designers, citizens, consumers, and professionals.

ARCH 4511. Materials and Methods I. (3 cr.; A-F or Audit; Every Fall)

ARCH 4521. Environmental Technology I. (3 cr.; A-F or Audit; Every Fall)
Issues related to environmental quality/design. Climate response. Heating, cooling, lighting design. Indoor air quality. prereq: BS Arch major

ARCH 4552. Integrated Design Processes. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)

ARCH 4561. Architecture and Ecology. (ENV; 3 cr.; A-F or Audit; Every Spring)
Introduction to theories/practices of ecological approaches to architectural design. Ecological context, implications/opportunities of architecture. Historical/theoretical framework for ecological design thinking. Issues studied at various scales: site/community, building, component.

ARCH 4571. Architectural Structures I. (3 cr.; A-F or Audit; Every Fall)

ARCH 4671. Historic Preservation. (3 cr.; A-F or Audit; Every Fall)
Philosophy, theory, origins of historic preservation. Historic archaeology, research, descriptive analysis, documentation. Government's role, standards/guidelines. Building codes, neighborhood preservation, advocacy. Using primary/secondary resources. Controversial aspects. prereq: Jr or sr or instr consent

ARCH 4672. Historic Building Conservation. (3 cr.; A-F or Audit; Every Fall)

ARCH 4674. World Heritage Conservation. (3 cr.; A-F only; Periodic Fall)
Design/planning options for conservation of historic buildings/cultural heritage sites. Case studies link current practices, methods/solutions with expert preservationists, site conservationists, local communities in development/design of conservation proposals. prereq: Jr or sr or instr consent

ARCH 4701W. Introduction to Urban Form and Theory. (WF, 3 cr.; A-F only; Every Spring)
Urban form, related issues of design/theory/culture. Thematic history of cities. Lectures, discussions, assignments. prereq: [3411, 3412] or instr consent

ARCH 5001. Architectural Design Studies: Representation & Design. (1 cr.; A-F only; Every Summer)
During this six week, summer intensive course, students will focus on basic issues of visual thinking and conceptual representation in architecture. This sequence of complementary exercises introduces issues and ways of working intended to complement educational backgrounds from other, non- architectural, disciplines. To do that we have designed the exercises to juxtapose different ways of perceiving and understanding constructed environments. While exploring these architectural ways of thinking, the exercises will also help to acknowledge preconceptions that may hinder one's ability to explore conceptual decisions.

ARCH 5101. Architectural Design Studies. (7 cr.; S-N only; Every Summer)
Principles/methods architecture design. Theories, history, technologies, media, and processes as foundation for critical thinking. Analytic modeling, visual thinking. prereq: 3+ track for MArch

ARCH 5110. Architecture as Catalyst. (1 cr. [max 3 cr.]; S-N only; Every Spring)
Topical workshops on design methods, theories, or emerging practices. prereq: MArch

ARCH 5207. Venice Design Workshop. (4 cr.; A-F only; Every Spring)
Design interventions with special concerns for urban landscapes, heritage conservation, and sustainable development. Jointly conducted with a graduate landscape architecture design studio. Design techniques for site plans/masterplans. Final project. prereq: MArch or instr consent

ARCH 5212. Undergraduate Architecture Studio 05: Advanced Design. (6 cr.; A-F only; Every Fall)
Advanced design studio to engage students in range of critical subjects to be determined by respective instructors. Intended to challenge students with independent/experimental approach to design that builds on prior knowledge, develop working methodologies/design ethics. prereq: C- or better in 3281, 3282, 4283, 4284

ARCH 5241. Principles of Design Programming. (3-4 cr.; A-F or Audit; Periodic Spring)
Architectural programming. Client/user needs. Equipment, space, activity analysis.
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

ARCH 5250. Advanced Topics in Design. (1-6 cr. [max 24 cr.]; A-F only; Every Fall, Spring & Summer)
Advanced topics in architectural design.

ARCH 5301. Conceptual Drawing. (3 cr.; A-F or Audit; Every Spring)
Drawing as a way of analyzing, exploring, and generating design ideas. Projection systems, diagramming, mapping. Different modes of visual perception. Nonverbal structures. prereq: MArch major or instr consent

ARCH 5313. Visual Communication Techniques in Architecture. (3 cr.; A-F or Audit; Every Fall & Spring) Delineation, presentation, and design techniques. Various visual media and methods of investigation. prereq: M Arch major or instr consent

ARCH 5321. Architecture in Watercolor. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Watercolor as a tool in design process. Foundation principles, techniques, medium, tools, materials. Color relationships, mixing, composition, applications to design. prereq: M Arch grad student or instr consent

ARCH 5350. Topics in Architectural Representation. (1-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Selected topics in architectural representation.

ARCH 5361. 3-D Computer Architectural Modeling and Design. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Use of 3D computer modeling for representation in abstract/realistic ways. Computer modeling software. Creation/arrangement of objects, setting up lighting, developing surface materials, creating still renderings/animations. Ways in which computer visualization can be used for design exploration, for feedback during development of ideas, and for realistic representation of fully formed designs. prereq: M Arch major

ARCH 5372. Computer Methods II. (1 cr.; S-N or Audit; Every Spring) Current techniques, computer programs, and their application to architectural computing and design. prereq: 5371, concurrent registration is required (or allowed) in 8252 and M Arch major or instr consent

ARCH 5381. Introduction to Computer Aided Architectural Design. (3 cr.; A-F or Audit; Every Fall) 2-D drawing, 3-D modeling/animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management. prereq: Arch or BED or M Arch or grad student in LA or instr consent

ARCH 5382. Computer Aided Architectural Design. (3 cr.; A-F or Audit; Every Spring) 2-D/3-D CAD, image manipulation. Advanced multimedia visualization techniques for design, including solid modeling, photo-realistic imaging, animation, video-editing/recording.

ARCH 5391. Design and Representation with BIM. (3 cr.; A-F or Audit; Every Fall) In this course, students will be introduced to the concept of Building Information Modeling (BIM) through the use of Autodesk Revit, one of the BIM software tools most commonly used in architectural practice today. Students will engage in a series of design exercises that will require both learning and applying Revit in the context of real world architectural scenarios. In addition to learning Autodesk Revit as a design tool, we will examine the use of BIM technology within the architectural industry through a series of case study examples. Also, presenters will share firsthand accounts of CAD and BIM Software being implemented in architectural practice.

ARCH 5392. Digital Documentation: Facades. (3 cr.; A-F or Audit; Every Spring) This course explores contemporary architectural practice that are bound up in a constantly evolving relationship: Facades and BIM. Over the course of the semester, students will study the anatomy of contemporary enclosure systems and understand the requirements that shape them. We will look at systems that are complex, layered and multi-functional, and develop an understanding of contemporary enclosure design relative to historical precedents.

ARCH 5410. Topics in Architectural History. (3 cr.; max 12 cr.; A-F or Audit; Every Fall & Spring) Advanced study in architectural history. Readings, research, seminar reports.

ARCH 5411. Principles of Design Theory. (3 cr.; A-F or Audit; Every Spring) Principles of design and their instrumentation. How and why architecture theory is generated. Types and significance of formal analysis. Theoretical positions and modes of criticism. prereq: M Arch major or instr consent

ARCH 5412. Architecture: A Global and Cultural History. (3 cr.; A-F only; Every Fall) This course examines the history of architecture from a global perspective, addressing a variety of traditions and geographical locations, and following their interconnections and exchanges.

ARCH 5413. Modern and Contemporary Global Architecture. (3 cr.; A-F only; Every Spring) This course is a global history of modern and contemporary architecture, tailored to graduate students in the M.Arch. program. The course examines the architectural production of the 20th and 21st centuries through the focused study of buildings, urban plans, unbuilt designs, manifestos, and other visual and textual documents. Students will be called upon to reflect on issues of design, planning, programming, technology, and representation, connecting this course to their architectural training and future professional practice. At the same time, the course will offer a critical and multidisciplinary perspective, presenting architecture in the context of culture, politics, economics, ideology, and other historical developments. The premise of this course is the fundamental role of history for contemporary and future architectural practice. The course assignments, readings, and activities aim to spur a productive dialogue between critical reflection and historical knowledge with an eye towards creative action.

ARCH 5421. Architecture and Interpretation: The Cave and the Light. (3 cr.; A-F only; Periodic Spring) Historical/hermeneutical investigation of iconography of grotto. Intertwined themes of descent into earth and ascent to light, from earliest strata of human culture to present day. prereq: 3411, 3412 or instr consent

ARCH 5423. Gothic Architecture. (3 cr.; A-F or Audit; Spring Odd Year) History of architecture and urban design in the Middle Ages and Renaissance, from 1250 to 1500. prereq: MS Arch or M Arch major or instr consent

ARCH 5424. Renaissance Architecture. (3 cr.; A-F or Audit; Periodic Fall & Spring) History of architecture and urban design in Italy, from 1400 to 1600. Emphasizes major figures (Brunelleschi, Alberti, Bramante, Palladio) and evolution of major cities (Rome, Florence, Venice). prereq: MS Arch or M Arch major or instr consent

ARCH 5425. Baroque Architecture. (3 cr.; A-F or Audit; Fall Odd Year) Architecture and urban design in Italy, from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin). prereq: MS Arch or M Arch major or instr consent

ARCH 5431. Eighteenth-Century Architecture and the Enlightenment. (3 cr.; A-F or Audit; Periodic Fall & Spring) Architecture, urban planning, and garden design in Europe and America from 1650 to 1850.

ARCH 5432. Modern Architecture. (3 cr.; A-F or Audit; Periodic Fall) Architecture and urban design in Europe and the United States, from early 19th century to World War II. prereq: MS Arch or M Arch major or instr consent

ARCH 5434. Contemporary Architecture. (3 cr.; A-F or Audit; Every Fall) Developments, theories, movements, and trends in architectural and urban design, from World War II to present. prereq: MS Arch or M Arch major or instr consent

ARCH 5435. History of American Architecture. (3 cr.; A-F or Audit; Periodic Fall) Through lectures, readings, discussion, and research, we will analyze buildings and spaces?architect designed and "vernacular"? in the context of social, political, economic, technological, and ecological change. As we address these issues, we will examine the ways design and daily life, performed locally, interacted with national and global systems
and flows; and the role the built environment has played in advancing structures and concepts of class, gender, race, ethnicity, and power. Students will gain a broad familiarity with the history of American buildings and landscapes, develop critical frameworks for analysis, and enhance their understanding of the environments they interact with every day?as designers, citizens, consumers, and professionals.

ARCH 5441. Minnesota: Architecture and Landscapes. (3 cr.; A-F only; Every Spring) History of major architectural monuments, urban phenomena, and landscape forms of Minnesota. Interrelationships between architecture, geography, and people. prereq: [3411; 3412] recommended

ARCH 5446. Architecture Since World War II: Postwar Experimentation: Aesthetics and Politics of Architecture. (3 cr.; A-F only; Every Fall) Eight-week seminar. Avant-garde architectural responses to postwar consciousness of social issues/meaning. How tenets of western avant-gardism were transformed by regional constraints when introduced to post-independent agendas of non-western world. prereq: M Arch major

ARCH 5450. Topics in Architectural Theory. (1-3 cr.; max 9 cr.; A-F or Audit; Every Fall, Spring & Summer) Selected topics in architectural theory and criticism.

ARCH 5451. Architecture: Defining the Discipline. (4 cr.; A-F only; Periodic Fall & Spring) Paradigms through which architecture has defined itself. Implications for its practice, product, and architecture in general. Lecture, discussion, design exercises. prereq: M Arch major

ARCH 5452. Architecture: Design, Form, Order, and Meaning. (4 cr.; A-F or Audit; Every Fall & Spring) Architecture and the issue of meaning. Explores fundamental and constituent elements of architectural form and order; their inherent tectonic, phenomenal, experimental, and symbolic characteristics; their potential and implications for the creation and structure of meaningful human places. prereq: M Arch major or instr consent

ARCH 5461. North American Indian Architecture. (3 cr.; Student Option; Every Spring) Historic/contemporary principles/theories of North American Indian architecture. Culture, technology, environment, art, and craft of North American Indians in their settlements/architecture. prereq: M Arch major or instr consent

ARCH 5462. Venice: A Port City. (3 cr.; A-F only; Every Spring) Historical understanding of Venice and its lagoon, the rise and decline of Venice as a maritime empire as well as a port city of global trades, and environmental issues of heritage conservation. Seminars/field trips highlighting architectural and artistic achievements of Venice. prereq: M.Arch or MLA or instr consent


ARCH 5516. Technology Two: Luminous and Thermal Design. (6 cr.; A-F only; Every Spring) Concepts/principles of daylighting, thermal, energy, and systems integration. Architectural/technological implications of lighting and thermal design. Ecological thinking in support of sustainable design decision making. prereq: M Arch

ARCH 5517. Technology Three: Structural Systems. (3 cr.; A-F only; Every Fall) Structural behavior in withstanding gravity and lateral forces. Evolution, range, and applications of structural systems. Structural analysis. Graphical methods, site visits, analog/digital modeling. Case studies, problems. prereq: M Arch student

ARCH 5518. Environmental Technology: Integrative Ecological Design for Responsive Architecture. (3 cr.; A-F only; Every Fall) This course introduces the ecological design concepts and principles of daylighting, thermal, energy, and building systems integration. The course will provide students with an understanding of the primary architectural and technological implications of lighting and thermal to inform design and ecological thinking to support sustainable design decision-making.

ARCH 5521. Material Investigation: Concrete. (4 cr.; A-F only; Every Spring) Design projects identify common problems/improvements, investigate alternatives, and develop solutions where concrete is primary building material. prereq: MArch or MS

ARCH 5523. Material Investigation: Steel and Glass. (4 cr.; A-F only; Every Spring) Design projects identify common problems/improvements, investigate alternatives, and develop solutions where steel and glass are the primary building materials. prereq: Grad student

ARCH 5527. Material Investigations: Stone and Water. (4 cr.; A-F only; Every Spring) Design projects identify common problems/improvements, investigate alternatives, and develop solutions where stone and water are primary building material. prereq: M.Arch or M.S.

ARCH 5539. Daylighting and Architecture Design. (4 cr.; A-F only; Every Spring) Ecological design approaches that combine ecological, physiological, and experiential aspects to enhance relationship to place. How formal, aesthetic, and experiential aspects of daylighting support/foster sustainable architectural design. prereq: M Arch major

ARCH 5541. Material Strategies. (3 cr.; A-F only; Every Fall) Emergent materials in advanced building design; strategies for material approaches relevant to global resource flows, technological trajectories, and sociocultural effects. Research projects based on evaluative tools and case studies. prereq: M Arch or Arch MS major

ARCH 5550. Topics in Technology. (1-4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Selected topics in architecture technology, e.g., construction, environmental management, energy performance, lighting, materials.

ARCH 5561. Tech 1, Structures for Building. (3 cr.; A-F only; Every Fall) Role of structure in architectural design. Common systems found throughout history. Review systems to identify parameters that influence structural decisions. prereq: M Arch major or instr consent

ARCH 5562. Tech 2, Intro to Building Technology. (3 cr.; A-F only; Every Fall) Origin/development of architectural idea. Designs as direct means of representing our underlying intentions. prereq: M.Arch or instr consent

ARCH 5563. Tech 3: Advanced Building Technology Integrated Building Systems. (3 cr.; A-F only; Every Fall) Logic of integrating building systems. Improving understanding of/thinking critically about integration principles, theories, practice, application. Identifying/working through problems the project architect must address. prereq: M.Arch or instr consent

ARCH 5564. Tech 4: Building Structural Systems. (3 cr.; A-F only; Every Fall) Main concepts related to building structures. Basic knowledge of flow of forces. Review of rules for sizing structures. Calculations to understand systems behavior. Knowledge/tools to design buildings considering structure within design process. prereq: MArch or instr consent

ARCH 5609. Development and Implementation of Research. (3 cr.; A-F only; Every Fall) Bridge gaps among architectural research, design, practice. Forum for students to independently develop research topics/implement research methods related to architectural scholarship/practice, aided by classmates, instructor, guest lecturers. prereq: instr consent

ARCH 5611. Design in the Digital Age. (3 cr.; A-F or Audit; Every Spring) Introduction to design, design process. Developing/understanding ways of seeing, thinking, and acting as a designer. Changes in design being wrought by digital technology. Team design project. prereq: Grad student or upper level undergrad student

ARCH 5621. Professional Practice in Architecture. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Legal, ethical, business, and practical requirements of architectural practice.
ARCH 5630. Practicum: Advanced Issues in Practice. (3 cr. [max 6 cr.]; S-N only; Every Fall & Spring) Advanced architectural practice topics not normally covered in curricula are examined/evaluated as foundation for licensure/ARE 4.0 testing processes. prereq: M.S. Architecture or M.Arch

ARCH 5650. Topics in Architectural Practice. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Topics in architectural practice, methods of design production, marketing, operation, and relationships among clients, architecture, and society. prereq: 5621, Arch major or 5621, M Arch major or instr consent

ARCH 5651. Building Stories. (3 cr. [max 12 cr.]; A-F only; Every Spring) Professional practice education by means of case study analysis.

ARCH 5670. Topics in Historic Preservation. (1-3 cr. [max 12 cr.]; Student Option; Periodic Fall) Selected topics in the theory, philosophy, research, and methods of architectural historic preservation.

ARCH 5671. Historic Preservation. (3 cr.; Student Option; Every Fall) Philosophy, theory, origins of historic preservation. Historic archaeology/research, descriptive analysis, documentation of historic buildings. Government's role in historic preservation, preservation standards/guidelines, preservation/building codes, preservation advocacy.

ARCH 5672. Historic Building Conservation. (3 cr.; Student Option; Every Spring) Historic building materials, systems, and methods of conservation. Discussion of structural systems, building repair and pathology, introduction of new environmental systems in historic buildings, and conservation of historic interiors. Research on historic building materials and techniques using primary and secondary resources and on documentation of a specific historic site through large-format photography and measured drawings. prereq: 3412, 5671 or instr consent

ARCH 5673. Historic Property Research and Documentation. (3 cr.; Student Option; Every Spring) Philosophy, theory, methods of historic building research. Descriptive analysis of buildings, building documentation, historical archaeology, architectural taxonomy. prereq: [3412, 3641, 4671, 5671, 4672 or 5672] or instr consent

ARCH 5674. World Heritage Conservation. (3 cr.; A-F only; Periodic Fall) Investigations of World Heritage conservation and nomination for the preservation of historic buildings and sites and their management for public use. Case studies link current practices, methods, and solutions with expert preservationists, site conservationists and local communities in the development and design of preservation strategies. prereq: MS in Arch-HP concentration or M.Arch or MLA or instr consent


ARCH 5677. Preservation of the Vernacular Built Environment and Cultural Landscape. (3 cr.; A-F only; Periodic Spring) Theoretical, methodological, practical implications of preserving vernacular environment such as commercial blocks, strips/buildings, warehouses/sheds, wharves/piers, abandoned streetcar tracks/railroad spurs. prereq: Grad student, open to upper level (junior/senior) undergraduates with instr consent. Honors student encouraged.

ARCH 5678. Preservation & Sustainability. (3 cr.; A-F or Audit; Every Spring) Topics covered may include identification of historic properties, consideration of constraints on modification, examination of potential energy-saving treatments, consideration of the full range of options for ?greening? buildings and neighborhood, and discussion of resolution of conflicts between the two.

ARCH 5686. Research Practices Final Project: Research into Practice. (4 cr.; A-F only; Every Fall) The course is the first of a three-??course final project sequence required as the capstone experience for MS-??RP students. The course provides a forum for understanding the current state of research in the design and building industry and its trajectories and trends. Students will apply this knowledge to a regionally based commercial or non-????profit practices in the building industry, assessing the firm's research capacity, mapping its potential in context of innovative precedents and suggesting future growth. prereq: MS-RP student

ARCH 5687. Research Practices Final Project: Practice into Research. (4 cr.; S-N only; Every Fall) Course is the second of a three-??course final project sequence required as the capstone experience for MS-??RP students. Building upon the previous semester understanding the state of research in the building industry, this course develops a single case study project in comparative context of contemporary practice. The work of individual students adds to a single collective knowledge base on project best practices and development of industry-???? wide metrics and standards. Course meets concurrently with ARCH 5688 Representation of Case Studies. prereq: Arch 5686

ARCH 5688. Research Practices Final Project: Representation of Case Studies. (1 cr.; A-F only; Every Fall) The course is the third of a three-??course final project sequence required as the capstone experience for MS-??RP students. This course meets concurrently to ARCH 5687 Practice into Research. Information graphics are essential to understanding and explaining critical issues in a case study. The format of information can be designed to emphasize comparisons between projects or to highlight unique characteristics of individual projects. This course will explore a variety of strategies commonly used in case study documentation and ask the student to apply one method to present the case developed in ARCH 5687. prereq: Arch 5686

ARCH 5711. Theory and Principles of Urban Design. (3 cr.; A-F or Audit; Every Spring) Seminar. Debate on dominant theories/paradigms informing city design from renaissance to 21st century. Critical issues central to current debates. prereq: M Arch major or LA grad major or grad student or instr consent

ARCH 5721. Case Studies in Urban Design. (3 cr.; A-F or Audit; Every Spring) Reading seminar. Evolution of contemporary city. Dynamics that created contemporary urban spatial patterns. Planning/design theories that have guided public interventions in built environment. Thematic texts, classroom discussions. prereq: Grad student or instr consent

ARCH 5731. Territorial City. (3 cr.; A-F only; Every Fall) Seminar. Students research, define, and test conditions within which the territory and contemporary city coexist. Site for research is Twin Cities metropolitan area. Readings, discussions, field trips, collaborative development of urban proposals.

ARCH 5750. Topics in Urban Design. (1-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Special topics in theory/practice of urban design.

ARCH 5756. Public Interest Design: Principles and Practices. (3 cr.; A-F or Audit; Every Spring) As the allied fields of design evolve in response to an increasing number of global challenges?inequity, social and political turmoil, disruptive climate-change, accelerating population growth?the question of how designers will address the needs of the most vulnerable among us is fundamental. Public Interest Design (PID), an emerging area of specialization within the design professions, specifically considers the concerns of the vast majority of the world's inhabitants who are historically under-resourced and ill-equipped to respond to the "Grand Challenges" facing humankind. With this mind, this introductory survey course has two aims: First, to critically examine the range of environmental, economic, social, and ethical issues that underpins work with under-resourced domestic and international communities?including how
these concerns can be collectively addressed to become more resilient; and second, to investigate organizational models that seek to broaden the traditional scope of the allied design fields as disciplines and professions by advocating a humanitarian basis for practice.

ARCH 5993. Directed Study. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) Guided individual reading or study. prereq: instr consent

ARCH 8101. Subjects and Methods in Architecture. (2 cr.; S-N or Audit; Periodic Fall & Spring) The discipline of architecture. prereq: Grad Arch major or instr consent

ARCH 8250. Advanced Topics in Design. (1-6 cr.; S-N or Audit; Periodic Spring & Summer) Design studio. prereq: Admitted to 3+ track for MArch prog or instr consent

ARCH 8251. Graduate Architectural Design I. (9 cr.; A-F or Audit; Every Fall) Design projects focus on fundamental issues of space/form/light/materiality in relation to human habitation. Design as a process of exploration/inquiry. Modes/media of representation, their critical impact. prereq: MArch or instr consent

ARCH 8252. Graduate Architectural Design II. (6 cr.; A-F or Audit; Every Spring) Fundamental architectural problems involving design as a creative inquiry. Individual and collaborative effort. prereq: 8251, grad Arch major or instr consent

ARCH 8253. Graduate Architectural Design III. (6 cr.; A-F or Audit; Every Fall) Issues of design process, representation, programming, technology, and urban relations. prereq: [8251, MArch] or instr consent

ARCH 8254. Technical Applications in Design. (3 cr. [max 6 cr.]; A-F or Audit; Every Fall) Design potential inherent in technical development process of design project. Testing concepts, developing details, integrating building systems. Structural bay enclosure, cost considerations, regulatory compliance. Building-information modeling, analog/digital representations in architecture document production. prereq: [8253, MArch major] or dept consent

ARCH 8255. Graduate Architectural Design V. (6 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Fundamental architectural problems involving design as a creative inquiry. Individual/collaborative effort. prereq: [8254, grad Arch major] or instr consent

ARCH 8259. Directed Graduate Architectural Design. (6 cr.; A-F or Audit; Every Spring) N/A prereq: 8251, grad Arch major or instr consent

ARCH 8299. Master's Final Project. (10 cr.; S-N only; Every Spring) Final studio project for Plan C master's. Measures knowledge of architecture and ability to conduct research for design proposal, communicate in visual/written representations. Proposal, graphic presentation of project. prereq: Plan C, MArch

ARCH 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ARCH 8350. Advanced Topics in Representation. (1-3 cr.; A-F or Audit; Periodic Fall & Spring) Theory and practice of visual representation in architecture. prereq: Grad Arch major or instr consent

ARCH 8450. Topics in Theory. (1-3 cr.; A-F or Audit; Every Fall & Spring) Topics vary prereq: 5411, grad Arch major or instr consent

ARCH 8494. Directed Research in Architectural History. (1-3 cr.; A-F or Audit; Every Spring) tbd prereq: Grad Arch major or instr consent

ARCH 8550. Topics in Technology. (1-3 cr.; A-F or Audit; Every Fall & Spring) Special topics in theory/practice of architecture technologies. prereq: Grad arch major or instr consent

ARCH 8561. Sustainable Design Theory and Practice. (3 cr.; A-F only; Every Fall) History, theory, and ethics of sustainable design processes/practices. Emphasizes approaches to sustainable architecture. Regional/global ecological issues, design strategies, methods of assessment. Primary architectural/technological implications of sustainable design theory/practice that inform design thinking/research. Sustainable design issues. Research projects, case studies, fieldwork. prereq: [5513, [grad MS or MArch]] or instr consent

ARCH 8563. Energy and Indoor Environmental Quality Issues in Sustainable Design. (3 cr.; A-F or Audit; Every Spring) Energy/IEQ aspects of sustainable design related to global environmental issues. Energy/IEQ strategies, methods, and tools as applied to sustainable building design. Research projects, case studies. prereq: [5513, [grad MS or MArch]] or instr consent

ARCH 8565. Materials Performance in Sustainable Building. (3 cr.; A-F only; Every Fall) Building-material properties, resource conservation, fabrication/construction processes in production of high performance sustainable building designs. Application of assessment/evaluation tools (LCA, BEES, Athena or LEED) for IEQ, waste reduction and management with an emphasis on experimental/analytic methods. Aesthetic/technical solutions that integrate design selection processes, construction methods, commissioning processes, and facility management, maintenance, and decommissioning. prereq: [5512, grad MS or MArch] or instr consent

ARCH 8567. Site and Water Issues in Sustainable Design. (3 cr.; A-F only; Every Spring) Site, water/building integration aspects of sustainable design. Site analysis. Water/site/building integration strategies, methods, and tools integrated with sustainable design issues such as energy, indoor environmental quality, and materials. Research projects, case studies, measurement methods. prereq: [5512, [grad MS or MArch student]] or instr consent

ARCH 8650. Topics in Architectural Practice. (1-3 cr.; A-F or Audit; Periodic Fall) N/A prereq: Grad Arch major or instr consent

ARCH 8750. Topics in Urban Design. (1-3 cr.; A-F or Audit; Periodic Fall) N/A prereq: Grad Arch major or instr consent

ARCH 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only

Art (ARTS)

ARTS 1001. Introduction to Contemporary Art and Theory. (DSL;AH; 3 cr.; Student Option; Every Fall & Spring) Introductory overview of contemporary artistic practices/theoretical foundations. Familiarization with contemporary critical/creative practices. Approaches to contemporary art through lens of cultural diversity/social justice.

ARTS 1001H. Honors Introduction to Contemporary Art and Theory. (AH,DSJ; 3 cr.; A-F or Audit; Every Fall & Spring) Introductory overview of contemporary artistic practices/theoretical foundations. Familiarization with contemporary critical/creative practices. Approaches to contemporary art through lens of cultural diversity/social justice. Prereq: Honors student

ARTS 1002. Art and Life: Thinking About Ethics Through Art. (AH,CIV; 3 cr.; Student Option; Every Fall & Spring) Case examples from visual arts. Ethical theories. Philosophical take on relationship between art, life, ethics.

ARTS 1003. MyMovies. (AH; 4 cr.; Student Option; Every Fall) Examination of new moving image/filmmaking practices. How technology has changed practice, aesthetics, discourse of moving images. Hybrid practice/study course. Create short films using new technologies such as smart-phones/other hand-held devices.

ARTS 1101. Introduction to Drawing. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer) This is an introductory studio course that exposes students to the ideas, methods, and materials of drawing. Fundamental elements such as line, value, texture, shape and space are explored in works using media such as graphite, charcoal and ink on a variety of surfaces. Found and other source materials
are utilized in collage and mixed-media works. In hands-on exercises and projects, students will create original work based on observation and imagination. This course will also introduce techniques and methods to realize and evaluate visual ideas. Technical demonstrations, lectures and exhibition visits will provide starting points for further explorations. Individual and group critiques will help students to address technical concerns and contextualize their work within the rich history of drawing. Studio work outside of class time is expected.

ARTS 1102. Introduction to Painting. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer)
This is an introductory studio course that will focus on the fundamentals of painting (oil and/or acrylic). We will explore a variety of media, techniques, and subject matter. Our assignments will emphasize developing the skills and understanding of basic painting fundamentals, using traditional and experimental approaches to painting, such as: color mixing and relationships, tone, mark-making, texture, abstraction, space, and visual language. There will be demonstrations, practice, field trip(s) and class discussion. We will develop the verbal and analytical skills necessary to critically examine students' work. We will look at historical and contemporary painters. This course provides an introduction to the creative process through hands-on investigation, observation of the immediate environment, and the exploring the artist's imagination. Studio work outside of class is expected.

ARTS 1103. Introduction to Printmaking: Relief, Screen and Digital Processes. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer)
Students will be introduced to techniques of relief printing using oil based inks, screenprinting using water based inks, and digital printmaking. Relief projects (linoleum and woodcut) emphasize the exploration of mark making, printing techniques and color layering. Screen print and digital applications will explore layering, color and image making strategies. Students will learn digital strategies for creating images in screen printing, working from both photo and drawn sources. The course includes the historical context and recent innovations for each process in order to develop contemporary applications for these each method. Students will develop meaningful content in conjunction with the acquisition of technical skills. Individual and group critiques will help students to address technical concerns and contextualize their work within the rich history of printmaking. Studio work outside of scheduled class time is expected.

ARTS 1104. Introduction to Drawing and Printmaking. (4 cr.; Student Option; Every Fall & Spring)
This course exposes students to the ideas, methods, and materials of drawing and printmaking. Fundamental elements such as line, value, texture, shape and space, and in works using media such as graphite, charcoal and ink on a variety of surfaces. Students will be introduced to printmaking methods through monoprinting and other immediate techniques. Hand-on exercises and projects, students will create original work based on observation and imagination. Slide lectures and critiques will help students to address technical concerns and contextualize their work within the rich history of these two graphic media. Studio work outside of scheduled class time is expected.

ARTS 1107. Introduction to Digital Drawing. (AH; 4 cr.; Student Option; Every Fall & Spring)
This course introduces students to digital drawing as a means of expression. Students will experiment with methods of making marks on a surface or virtual surface, and the materiality and process of making those marks. In this introductory drawing course, students will explore the realm of possibilities of digital technology as an essential component in a contemporary drawing practice. Elements such as line, value, texture, shape and space are explored in works using digital technology. Students will learn the basics of drawing using Wacom Bamboo, Cintiq tablets, and Adobe software applications. This class provides students with hands on experience with technological aids in art making such as a laser cutter, digital router, 3D printers, digital embroidery machine, vinyl cutter, and sonic welder. Students will also gain experience using large format Epson printers with a variety of materials. This class will use drawing to explore conceptual development and critical thinking. Individual and collaborative projects are aimed to provide students with technical ability while building concept and content in the work. Individual and group critiques will help students to address technical concerns and contextualize their work within the rich history of drawing. Studio work outside of scheduled class time is expected.

ARTS 1490. Workshop in Art. (1-4 cr.; [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Selected topics. Intensive studio activity.

ARTS 1701. Introduction to Photography. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer)
Presents conceptual, technical, historical aspects of photography within fine arts context. Emphasis on creative process through hands-on experience in use of camera, digital, black/white, darkroom processes.

ARTS 1704. Introduction to Moving Images. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer)
Introduction to Moving Images provides students with the fundamentals of moving image production including camera, basic lighting, and sound. Students will explore audio/visual aesthetics and fundamental elements of narrative, experimental, and animated moving images. Students create several short film projects, both individually and in groups and develop skills in critical evaluation through critique sessions that investigate the aesthetic, technical and cultural interpretation of moving images. This course is the prerequisite for intermediate level Department of Art courses in Moving Images including Narrative Digital Filmmaking, Experimental Film and Video, Animation, and Super 8 and 16 mm Filmmaking.

ARTS 1801. Introduction to Ceramics. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer)

ARTS 1802. Introduction to Sculpture. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer)

ARTS 1803. Introduction to Sculpture and Ceramics. (4 cr.; Student Option; Every Fall & Spring)
This course introduces the fundamentals of sculpture and ceramics through a studio practice with a variety of materials, methods, and ideas. Through a studio practice, students will have hands on experience to find a way to engage with creative production process. The finished pieces will be discussed through various points of view. The instruction in this class will be given through: 1. Demonstrations of techniques 2. Slide presentations and lectures 3. Individual assistance and instruction 4. Individual and group critiques / discussion and evaluation.

ARTS 1911. BioArt: Culturing Life. (3 cr.; A-F or Audit; Every Fall)
What do GFP Bunny (green fluorescent protein) and transgenic bacteria have to do with art? This interdisciplinary seminar explores BioArt as a contemporary art form that engages scientific and artistic processes to create artwork with biological organisms, living systems, and life processes. It questions the relationships among biological bodies, cultural bodies, technology, and bioethics. BioArt examples include Victimless Leather alive at MOMA, the DIY home kitchen Digestive Table, and the One Tree series of genetically identical trees living in San Francisco. Exploring topics from ecology to molecular biology, we will examine the dynamic process between scientist, artist, and the public, the poetic and political implications, and the ethical issues associated with the making of this art. Direct engagement with micro-organisms, reading and discussions that develop critical thinking, as well as laboratory and studio sessions will lead to individual and collaborative works of BioArt.

ARTS 1912. Art and Yoga. (3 cr.; A-F only; Every Fall)
This experiential course offers a dynamic mix of art and yoga with the goal of tapping into your creativity, cultivating a strong sense of embodiment and intuitive intelligence, and developing self-awareness. Each class opens...
ARTS 3110. Intermediate Drawing. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
An intermediate level course that expands upon skills learned in beginning drawing. Specialized drawing techniques in dry and wet media will be introduced as well as contemporary, experimental, and conceptual approaches and issues. Prereq: 1101 or 1104.

ARTS 3120. Intermediate Painting. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
This course explores traditional and nontraditional concepts and techniques of painting and the development of artistic voice. The goal of this course is to provide students with a working knowledge of techniques, materials, processes and aesthetic sensibilities related to contemporary painting. Exploration of individual approach and self-directed concepts are stressed. Students can choose to work with acrylics and/or oils. Studio work outside of scheduled class time is expected. Prereq: 1102.

ARTS 3130. Intermediate Printmaking: Traditional and Contemporary Approaches. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
The print as vehicle for conceptual/personal expression. Traditional printmaking techniques, evolving contemporary processes for realizing visual concepts, historical/cultural development of multiple/monotype as means of communication. Prereq: 1103 or 1104.

ARTS 3140. Figure Drawing. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
This course is designed to develop students' ability in drawing through observation and interpretation of the human form. Some in class work and assignments will be structured with strict limitations, including choices of media. Students will explore contemporary viewpoints and modern aspects of the figure through slide lectures and class discussions. Prereq: 1101 or 1104.

ARTS 3150. Dimensional Painting. (4 cr. [max 12 cr.]; Student Option; Every Spring)
This course explores the hybridization of painting, sculpture, and installation. The illusionary space and techniques of two dimensional media is combined and co-exists with three dimensional sculptural approaches. Projects will focus on both representational and abstract imagery. This class encourages the development of critical thinking, self-evaluation, and the pursuit of independent ideas. Contemporary and historical painting will be introduced as a reference for painting projects. In addition to creating artwork, we will discuss the creative process and artistic practice through selected readings. A goal of this course is for students to understand the importance of painting as a thinking process and as a language. Prerequisites: ARTS 1101, 1102, or 1104.

ARTS 3160. Drawing: Interpreting the Site. (4 cr. [max 12 cr.]; Student Option; Every Summer)
This art course focuses on the search for personal content as inspired by the site. Field trips will be taken weekly to diverse sites within an hour and a half of the campus. Field trips outside of the twin cities will be taken by using University of Minnesota mini-vans. Sites within the twin cities will meet at those particular environments. Sites can vary from historical locations to railroad yards. Students will experiment with a variety of approaches of style and idea as influenced by the site and use the medium of their choice. Artwork from the sites will be completed in class and as homework. Each site will expand the scope of artistic possibilities as each student attempts to personalize a new experience. Prereq: 1101 or 1104.

ARTS 3170. Intermediate Digital Drawing. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Possibilities of digital technology as tool and component in contemporary, creative drawing practice. Prereq: 1107.

ARTS 3180. Zines, Comics, and Books. (4 cr. [max 12 cr.]; A-F or Audit; Every Spring)
This course introduces students to the culture and creation of artist's books, comics, and zines. Students will generate one example of each format, while being exposed to a wide range of works and relevant processes. We will view and read examples across cultures and develop an understanding of the historical and contemporary contexts that artists' books, we will look at ?zines that embrace punk culture, gay culture, counter culture, and feminist movements. We will read graphic novels and connect with the local comics scene. We will visit archives of artists' books in the Twin Cities, starting with the press. Prereq: 1101 or 1104.

ARTS 3190. Watercolor Painting. (4 cr. [max 12 cr.]; Student Option; Every Spring)
Students will explore expressive and technical possibilities of watercolor including contemporary, traditional, and experimental approaches to painting. They will learn about pictorial structure, color relationships, and forming creative ideas for visual expression. Projects will focus on both representational and abstract imagery. This class encourages the development of critical thinking, self-evaluation, and the pursuit of independent ideas. Contemporary and historical painting will be introduced as a reference for painting projects. In addition to creating artwork, we will discuss the creative process and artistic practice through selected readings. A goal of this course is for students to understand the importance of painting as a thinking process and as a language. Prerequisites: ARTS 1101, 1102, or 1104.
ARTS 3304. Sculpture: Carving and Construction. (3 cr.; Student Option; Every Fall & Spring)

ARTS 3307. Contemporary and Traditional Approaches to Figurative Sculpture. (4 cr.; Student Option; Every Spring)
Clay modeling of human figure, other forms. Mold-making, plaster casting with historical/contemporary systems. Studio practice, investigation of traditional sculptural methods/concepts.  prereq: 1001, 1301

ARTS 3390. Sculpture Methods and Practice. (3-4 cr.; max 12 cr.; Student Option; Every Fall & Spring)
Selected sculptural processes with intensive studio activity. Various methods to foster working knowledge of materials and techniques: wood construction, kinetics, sound art, figure modeling, mold making, metal construction and casting, installation/performance art.

ARTS 3401V. Honors: Critical Theories and Their Construction From a Studio Perspective. (AH,WI,CIV; 3 cr.; A-F or Audit; Every Fall)
This honors course examines primary critical theories that shape analysis of works of art. Evaluation of works from artist’s perspective. Theory as organizational structure from which to understand contemporary works. prereq: [junior] or instr consent

ARTS 3401W. Critical Theories and Their Construction From a Studio Perspective. (WI,CIV,AH; 3 cr.; Student Option; Every Fall & Spring)
Primary critical theories that shape analysis of works of art. Evaluation of works from artist’s perspective. Theory as organizational structure from which to understand contemporary works. prereq: instr consent

ARTS 3404W. Professional Practices in the Arts. (WI; 3 cr.; A-F only; Periodic Fall & Spring)
Professional Practices in the Arts is a course that examines practical applications of presentation, documentation, business skills, and career planning specific to studio art. It provides a foundation of practical information to assist undergraduate and graduate studio majors in building a successful career. The course consists of lectures, discussions, readings, presentations, and demonstrations. The class will spend a significant amount of time discussing different types of art venues and the appropriate contexts for different types of work. Additionally, we will assess and interpret individual students’ work as a means to generating appropriate questions and insights for artists statements. prereq: Grad student or [Art BFA student or Art Major, jr or sr]

ARTS 3410H. Honors Tutorial in Visual Arts. (1-4 cr.; max 8 cr.; A-F or Audit; Every Fall, Spring & Summer)
Individual consultation with a faculty member on visual work, research project, presentation, paper, or bibliography. prereq: Honors, instr consent

ARTS 3415H. Honors Exhibition. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Advanced problems in studio and research, leading to a magna or summa exhibition. prereq: [Magnu or summa honors candidate], instr consent, dept consent

ARTS 3416H. Honors Thesis: Supporting Paper. (1 cr.; A-F or Audit; Every Fall, Spring & Summer)
Summa thesis paper written in support of honors exhibition or in relation to candidate’s visual/conceptual interests. prereq: Summa level honors candidate, instr consent

ARTS 3480. Internship. (1-3 cr. [max 6 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Field work at local, regional, national, or international arts organization or with professional artist provides experience in activities/administration of art/art-based organizations. prereq: BFA Art major, instr consent

ARTS 3490. Workshop in Art. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Selected topics and intensive studio activity; topics vary yearly.

ARTS 3499. Internship at Katherine E. Nash Gallery. (3 cr.; A-F only; Every Fall, Spring & Summer)
Hands-on experience in day-to-day operation/maintenance of Department of Art’s professional gallery. prereq: 1001 or ARTH 1000 or instr consent

ARTS 3710. Black and White Darkroom Photography. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Classical photographic practice, concentrating on camera and darkroom controls. Historical overview of the medium. Conceptual and contemporary approaches to traditional themes. prereq: 1701

ARTS 3720. The Extended Image. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Manipulation of the photo image using various camera and darkroom methods including sequence, multiples, narrative, and book formats. Marking and altering photographic surfaces, applied color, and toning. Use of the photograph in interdisciplinary projects. prereq: 1701

ARTS 3730. Intermediate Digital Photography. (4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Photographic digital imaging in fine arts. Manipulation, computer applications. Editing in photo imaging software. prereq: 1701

ARTS 3740. Lighting and the Constructed Image. (4 cr. [max 12 cr.]; Student Option; Every Spring)
Take charge of your photographs and moving images. This class is about making pictures vs. taking pictures. Students will learn to use flash and continuous light sources to shape the content and feeling of your work, to create worlds, characters, and stories. Some projects will be specific to still photography, but you will have the option of working with moving image in others. You will learn principles of lighting that apply to all media. In addition to lighting, the use of props, sets, costumes and digital manipulation will be explored in a series of student projects. We will learn to control and shape light in the studio and on location, in table-top setups and large-scale outdoor productions. We will look at contemporary and historic artists in all genres who are masters of the constructed image. There will be a lot of hands-on skills taught in this class, but always in the service of exploring and expressing your personal vision. prereq: ARTS 1701 Introduction to Photography

ARTS 3750. Narrative Digital Filmmaking. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Narrative forms of video. Documentary, live action, memoir, experimental forms. Digital video production and editing. Personal aesthetic and conceptual directions. Theory, critical readings about historical and contemporary works in video. prereq: [1704 or instr consent]

ARTS 3760. Experimental Film and Video. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)

ARTS 3770. Animation. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Creating ideas visually with 2- and 3-dimensional animation technologies. Vector- and layer-based raster animation. Modeling objects and spaces, creating textures, lighting, movement, sound track. prereq: 1704

ARTS 3780. Super 8 and 16 MM Filmmaking. (4 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
This course will explore the medium of Super 8 filmmaking in the tradition of the experimental and avant Garde. We will focus on the physicality of the film stock, the basic mechanics of the camera and projector, and how these elements translate into a visual language and aesthetic. Students will learn how to shoot, process, edit, splice, project, and transfer their own super 8 films. This course will balance the technical, conceptual, and historical aspects of small-gauge or amateur analog filmmaking, and address what it means to work in this medium at the beginning of the 21st century. The course will include presentations, readings, and discussions on contemporary and historical artists in the medium, as well as outside film screenings and lectures. Classroom visits by artists will also provide an informed context for the primary course objective.
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ARTS 5740. Lighting and the Constructed Image. (4 cr. [max 12 cr.]; Student Option; Every Spring) Take charge of your photographs and moving images. This class is about making pictures vs. taking pictures. Students will learn to use flash and continuous light sources to shape the content and feeling of your work, to create worlds, characters, and stories. Some projects will be specific to still photography, but you will have the option of working with moving image in others. You will learn principles of lighting that apply to all media. In addition to lighting, the use of props, sets, costumes and digital manipulation will be explored in a series of student projects. We will learn to control and shape light in the studio and on location, in table-top setups and large-scale outdoor productions. We will look at contemporary and historic artists in all genres who are masters of the constructed image. There will be a lot of hands-on skills taught in this class, but always in the service of exploring and expressing your personal vision. prereq: ARTS 1701 Introduction to Photography

ARTS 5750. Advanced Narrative Digital Filmmaking. (; 4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Narrative forms of video. Documentary, live action, memoir, experimental forms. Digital video production and editing. Personal aesthetic and conceptual directions. Theory, critical readings about historical and contemporary works in video. prereq: 3750

ARTS 5760. Experimental Film and Video. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Experimental approaches in producing digital video within a contemporary art context. Using digital media technologies in installation, performance, and interactive video art. Emphasizes expanding personal artistic development. Theoretical issues, critical/historical readings/writings in media arts. prereq: 3760

ARTS 5770. Animation. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Creating ideas visually with 2- and 3-dimensional animation technologies. Vector- and layer-based raster animation. Modeling objects and spaces, creating textures, lighting, movement, sound track. prereq: 3770

ARTS 5780. Advanced Super 8 and 16 MM Filmmaking. (4 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) This course will explore the medium of Super 8 filmmaking in the tradition of the experimental and avant ?garde. We will focus on the physicality of the film stock, the basic mechanics of the camera and projector, and how these elements translate into a visual language and aesthetic. Students will learn how to shoot, process, edit, splice, project, and transfer their own super 8 films. This course will balance the technical, conceptual, and historical aspects of small gauge or amateur analog filmmaking, and address what it means to work in this medium at the beginning of the 21st century. The course will include presentations, readings, and discussions on contemporary and historical artists in the medium, as well as outside film screenings and lectures. Classroom visits by artists will also provide an informed context for the primary course objective.

ARTS 5810. Advanced Ceramics. (4 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Critical discourse of aesthetics. History of, contemporary issues in clay and criticism. Independent, advanced projects. prereq: 3820 and 3830

ARTS 5850. Advanced Foundry and Metal Sculpture. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Metal casting of sculpture in bronze, iron, aluminum, other metals. Studio practice, investigation of historical/contemporary methods and concepts. Development of personal sculptural imagery. prereq: 3850 or inst consent

ARTS 5860. Advanced Sculpture. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) This advanced Sculpture course is self-motivated and self-directed studio class to help you develop and maintain a personal studio practice. The structure of this studio course provides space for in-depth research, idea development, individual exploration, experimentation, play and critical feedback.

ARTS 5890. 3D Modeling and Digital Fabrication. (4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) In this class, students will learn the basic skills of 3D computer modeling and digital fabrication to generate objects using the Department of Art's 3D Printers, 3-axis CNC Router and Laser Cutter. Instruction includes computer modeling in Adobe Illustrator and Rhino, transfer of files and object fabrication.

ARTS 5990. Independent Study in Art. (1-4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Independent study project designed by student in consultation with instructor. prereq: Major, completed regular course with instructor, instr consent

ARTS 8100. Practice and Critique: Drawing and Painting. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Creative practice/critique. Colloquium emphasizing individual goals/directions. Aesthetics, history, theory, contemporary issues in practices/criticism. prereq: Art MFA student

ARTS 8300. Practice and Critique: Sculpture. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Creative practice/critique. Colloquium emphasizing individual goals/directions. Aesthetics, history, theory, contemporary issues in practices/criticism.

ARTS 8333. FTE: Master's. (1 cr.; Grade Associated: Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ARTS 8401. Studio and Pedagogy: Philosophy and Practice. (3 cr. [max 6 cr.]; Student Option; Every Spring) Orientation to establishing studio practice, introduction of department and community resources, and preparation for teaching. Studio visits and critiques; development of teaching strategies. Required of drawing and painting students.

ARTS 8402. Theoretical Constructions in Contemporary Art. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Structure for examining and understanding current critical practice. Evaluation and questions about assumptions of theory in context of current artistic production.

ARTS 8403. MFA Professional Practices and Teaching Pedagogy. (3 cr.; A-F only; Every Spring) This course is intended to provide a context for developing a career as an artist and explore how to create a sustainable artistic practice. This course will also explore issues in contemporary arts education through multiple approaches and best practices in teaching pedagogy. A primary goal of the course is to provide the Department of Art graduate instructors with an opportunity to develop teaching skills before entering the classroom, access to UMN teaching resources and important information regarding expectations of University of Minnesota instructors and courses. Through visiting artist presentations, as well as those by professionals in arts administration, non-profits, established and non-traditional galleries, curators, critics, and recent art graduates, we will also examine the rich ecology of the arts in the Twin Cities community. We will also explore how to navigate the arts terrain successfully as an artist.

ARTS 8404. MFA Thesis Research + Writing. (3 cr.; A-F only: Every Fall) This workshop aims to facilitate the writing process of the MFA Thesis Supporting Paper for third-year graduate students. In accordance with the MFA advisory manual, students are challenged to articulate their creative investigations and processes as well as philosophical and critical perspectives developed throughout their course of study. By the time third-year reviews take place in December, students are expected to have a full-length draft of their text (15 pages, double-spaced, 12-point type) that names relevant reference points of the work, historical and contemporary art influences, a bibliography, and completes the requirements laid out in the MFA Advising Manual.

ARTS 8410. MFA Critique Seminar. (3 cr. [max 12 cr.]; A-F only; Every Fall & Spring) Taken for three semesters during the first and second year of the program, the MFA Critique Seminar provides candidates with

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
an intellectual community and critical forum in which they may test, temper, and enlarge the ideas that underlie their artistic goals. The seminar will meet weekly to critique, in rotation, the work-in-progress of all candidates. The cross-disciplinary nature of the conversation is meant to foster the widest possible dialogue among artists, encourage divergent thinking and discourage the easy acceptance of received notions. The seminar will also include critiques, and discussions with visiting artists, curators, etc.

**ARTS 8420. MFA Studio.** (; 1-6 cr.; [max 12 cr.]; A-F only; Every Fall & Spring)
This graduate level directed study offers students the opportunity to work with individual faculty. Students arrange regular meetings and develop a proposal for the semester, which is approved by the instructor. Prior to registration, the student must contact the faculty member with whom they hope to work.

**ARTS 8450. MFA Creative Thesis.** (1-9 cr.; [max 18 cr.]; A-F only; Every Fall & Spring)
Research/studio work in preparation for thesis exhibition. Third year students are required to complete 18 cr. of this course in their final year.

**ARTS 8490. Workshop in Art.** (; 1-4 cr.; [max 12 cr.]; Student Option; Periodic Fall & Spring)
Selected topics/intensive studio activity. Topics vary yearly.

**ARTS 8500. Practice and Critique: Printmaking.** (3 cr.; [max 12 cr.]; Student Option; Every Fall & Spring)
Creative practice/critique. Colloquium emphasizing individual goals/directions. Aesthetics, history, theory, contemporary issues in practices/criticism.

**ARTS 8600. Practice and Critique: Experimental and Media Arts.** (3 cr.; [max 12 cr.]; Student Option; Every Fall & Spring)
Creative practice/critique. Colloquium emphasizing individual goals/directions. Aesthetics, history, theory, contemporary issues in practices/criticism.

**ARTS 8700. Practice and Critique:Photography.** (3 cr.; [max 12 cr.]; Student Option; Every Fall & Spring)
Creative practice/critique. Colloquium emphasizing individual goals/directions. Aesthetics, history, theory, contemporary issues in practices/criticism.

**ARTS 8800. Practice and Critique: Ceramics.** (3 cr.; [max 12 cr.]; A-F or Audit; Every Fall & Spring)
Creative practice/critique. Colloquium emphasizing individual goals/directions. Aesthetics, history, theory, contemporary issues in practices/criticism.

**ARTS 8890. MFA Creative Thesis.** (1-9 cr.; [max 18 cr.]; A-F only; Every Fall & Spring)
Research/studio work in preparation for thesis exhibition.

**Art History (ARTH)**

**ARTH 1001. Introduction to Art History: Prehistoric to Contemporary.** (AH; 4 cr.; Student Option; Every Fall & Spring)
Major monuments/trends in art, prehistoric to present. Style, subject matter, patronage. Reconstructing artworks' original setting: religious, political, and social contexts. Western canon, occasionally in comparison with non-Western works.

**ARTH 1002W. Why Art Matters.** (AH,WI,GP; 4 cr.; Student Option; Every Fall) Introduction to history of topics that investigate power/importance of art both globally and in its diverse forms, from architecture and painting to video and prints. Sacred space, propaganda, the museum, art/genre, art/authority, tourism.

**ARTH 1004W. Introduction to Asian Art.** (HIS, WI; 3 cr.; Student Option; Every Fall) South, Southeast, East Asian art/material culture from Neolithic Age to twentieth century.

**ARTH 1912. Truth and Lies: Comparing Theories of the Image.** (GP; 3 cr.; A-F only; Periodic Fall & Spring)
What is an image? Is it what you see, or what your mind makes of it? Can an image be felt? Or heard? How is it that images produce emotions in their viewers such as fear, pity, or pleasure? If "seeing is believing" and "the camera never lies," why do some images appear truthful, while others are suspect? How do images make meaning, and how do we learn to read them? Is there a relationship between reading text and reading an image? Does reality exist prior to its representation, or is it constituted through representation?

This course will examine these questions comparatively in Western and South Asian aesthetic and philosophical traditions, from Plato's "Republic" to Bharata's "Natyasastra." We will study diverse media, from painting to photography to narrative fiction, and consider how the medium of representation relates to different forms of copying, imitation, and the production of knowledge. This course will equip students not only to theorize images of the past, but to re-imagine images that we interact with in nearly every moment of our daily lives.

**ARTH 1921W. Introduction to Film Study.** (AH,WI; 4 cr.; Student Option; Every Fall) Fundamentals of film analysis and an introduction to the major theories of the cinema, presented through detailed interpretations of representative films from the international history of the cinema.

**ARTH 3005. American Art.** (AH; 4 cr.; Student Option; Every Fall & Spring) Artistic practices in the United States: colonial period to cold war. America as idea/identity shaped, expressed, represented, and contested through art. Canon of American art history. Works by individuals outside of traditional channels of art instruction/reception. Questions about what does/does not count as art history.

**ARTH 3009. Medieval Art.** (AH; 3 cr.; Student Option; Every Fall & Spring) Medieval art in Western Europe, from around 1000 to the mid-14th century. Works from France, Spain, Germany, Italy, and England examined in their historical context. Cross cultural relations, development of completely new forms of art and techniques, and the processes of realization.

**ARTH 3012. 19th and 20th Century Art.** (; 3 cr.; Student Option; Every Fall, Spring & Summer) Major monuments/issues of modern period. Sculpture, architecture, painting, prints. Neo-classicism, romanticism, realism, impressionism, evolution of modernism. surrealism, fascist art, cubism, dadaism, abstract expressionism, pop art, conceptualism, postmodernism.

**ARTH 3013. Introduction to East Asian Art.** (GP; 3 cr.; Student Option; Every Fall) A selective examination of works of art produced in China, Korea and Japan from the neolithic era to modern times. Nearly every major type of object and all major styles are represented.

**ARTH 3014W. Art of India.** (AH,WI,GP; 4 cr.; Student Option; Every Fall, Spring & Summer) Indian sculpture, architecture, and painting from the prehistoric Indus Valley civilization to the present day.

**ARTH 3015W. Art of Islam.** (AH,WI,GP; 4 cr.; Student Option; Every Fall) Architecture, painting, and other arts from Islam's origins to the 20th century. Cultural and political settings as well as themes that unify the diverse artistic styles of Islamic art will be considered.

**ARTH 3018. Art of the Ottoman Empire.** (3 cr.; Student Option; Periodic Fall & Spring)
This course offers a wide-ranging introduction to visual culture under the Ottoman Empire. Initially formed as a small principality at the beginning of the fourteenth century in Anatolia, the Ottoman polity established itself as a major political and military power through the early modern period and beyond. With emphasis placed upon key monuments and objects, we will examine an array of artistic media, ranging from manuscript illumination and calligraphy to ceramics, textiles, metalwork, glasswork and jewelry. Major themes include the urban transformation of the Byzantine capital; the formation of imperial ideology and its visual articulation, the formation of a distinctive imperial style across media; the operation of court ateliers and societies of artists and artisans; contacts and interactions with the European and Islamic contemporaries; and cultural and artistic "decline."

**ARTH 3152. Art and Archaeology of Ancient Greece.** (HIS; 3 cr.; Student Option; Periodic Fall & Spring)
This course will provide an introduction to the history of Greek art, architecture and archaeology from the formation of the Greek city states in the ninth century BCE, through the expansion of Greek culture across the Mediterranean and Asia in the Hellenistic period, to the coming of Rome in the first century BCE. While this survey concentrates on the main developments of Greek art, an important sub-theme of this course is the changes Classical visual culture underwent as...
it served non-Greek peoples, including the role it played for Alexander and his successors in forging multiethnic, globally minded empires in Western, Central and South Asia. No background in the time period or discipline is expected and therefore this class will also serve as an introduction to interdisciplinary study of art history and the classical world. A number of art historical methodologies will be introduced in order to not only give students a useful background in art history but to give them the tools to think as art historians and incorporate related visual and textual evidence meaningfully into their writing.

ARTH 3162. Roman Art and Archaeology. (HIS; 3 cr.; Student Option; Fall Odd, Spring Even Year)
Introduction to history of Roman art, from formation of city-state of Rome under Etruscan domination, to transformation of visual culture in late antiquity under peoples influenced by the Romans.

ARTH 3182. Egypt and Western Asia: Art and Archaeology of Ancient Egypt and Western Asia. (AH,GP; 3 cr.; Student Option; Every Fall & Spring)
This course will provide students with foundational knowledge in the art, architecture, and archaeology of Egypt, East Africa, Asia Minor, Mesopotamia, Iran and Central Asia from the Neolithic through Late Antiquity (ca. 7,000 B.C.E. - 650 C.E.). Students will gain an understanding of the relationship between the visual material and the social, intellectual, political, and religious contexts in which it developed and functioned. In this regard, students will also gain an understanding of the evolution of, and exchanges and differences among, the visual cultures of these time periods and regions. It will also expose them to the preconditions for contemporary geopolitics in the region.

ARTH 3205. Art of Central and South America Before Columbus. (AH; 3 cr.; Student Option; Periodic Fall)
Art/architecture of native peoples of Americas from twelfth century B.C. until arrival of Europeans in sixteenth century. Ways that people living in diverse areas of South America/Mesoamerica used art/architecture. Tools to investigate Pre-Columbian art at more advanced levels.

ARTH 3216W. Chicana and Chicano Art. (WI; 3 cr.; Student Option; Periodic Fall & Spring)
A Chicana/o has been described as a Mexican-American with a political sense of identity that emerges from a desire for social justice. One journalist bluntly stated, “A Chicana is a Mexican-American with a non-Anglo image of himself” (Ruben Salazar, Los Angeles Times, 1970). This identity emerged through the Chicano Movement, a social and political mobilization that began in the 1960s and 1970s. The Chicano Movement witnessed the rise of community-based political organizing to improve the working conditions, education, housing opportunities, health, and civil rights for Mexican-Americans. For its inception, the Chicano Movement attracted artists who created a new aesthetic and framework for producing art. A major focus of Chicano/a artists of the 1960s and 1970s was representation, the right to self-determination, and the role of art in fostering civic and public engagement. This focus continues to inform Chicana/o cultural production. Social intervention, empowerment, and institutional critique remain some of the most important innovations of American art of the last several decades, and Chicana/o artists played a significant role in this trend.

ARTH 3309. Renaissance Art in Europe. (AH; 3 cr.; A-F or Audit; Every Fall & Spring)
Major monuments of painting/sculpture in Western Europe, 1400-1600. Close reading of individual works in historical context. Influence of patrons. Major social/political changes such as Renaissance humanism, Protestant Reformation, market economy.

ARTH 3311. Baroque Art in Seventeenth Century Europe. (AH; 3 cr.; Student Option; Every Spring)

ARTH 3312. European Art of the Eighteenth Century: Rococo to Revolution. (HIS; 3 cr.; Student Option; Every Fall)
Major developments in 18th-century painting, sculpture, and interior decoration, from emergence of Rococo to dawn of Neoclassicism. Response of art to new forms of patronage. Erotics of 18th-century art. Ways art functioned as social/political commentary.

ARTH 3315. The Age of Curiosity: Art and Knowledge in Europe, 1500-1800. (AH,TS; 3 cr.; Student Option; Every Fall & Spring)
Diverse ways in which making of art and scientific knowledge intersected in early modern Europe. Connections between scientific curiosity and visual arts in major artists (e.g., da Vinci, Durer, Vermeer, Rembrandt). Artfulness of scientific imagery/diagrams, geographical maps, cabinets of curiosities, and new visual technologies, such as the telescope and microscope.

ARTH 3335. Art History of the 19th Century: 1800-1900. (HIS; 3 cr.; Student Option; Fall Even Year)
Center of baroque culture--Rome--as city of spectacular and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

ARTH 3401. Art Now. (AH,CIV; 3 cr.; Student Option; Every Spring)
Analysis of visual representations in fine arts and popular media, in context of social issues. Obscenity, censorship, democracy, technology, commerce, the museum, propaganda, social role of artist. Understanding the contemporary world through analysis of dominant aesthetic values.

ARTH 3434. Art and the Environment. (AH,ENV; 3 cr.; Student Option; Every Fall & Spring)
Historical development of land, earth, and environmental art since 1968. Artists' engagement with environmental problems. Responses to changing aesthetic, political, biological, economic, agricultural, technological, and climactic conditions from global perspective.

ARTH 3464. Art Since 1945. (HIS; 3 cr.; Student Option; Periodic Spring)
Broad chronological overview of U.S./international art movements since 1945. Assessment of critical writings by major theoreticians (e.g., Clement Greenberg) associated with those movements. Theoretical perspective of postmodernism.

ARTH 3484. The Art of Picasso and the Modern Movement. (4 cr.; Student Option; Every Fall & Spring)
Works of Picasso in all media. Blue, Rose, Cubist, Classical, and later periods of Picasso's development against innovations in media; collage, utilization of found-objects, printmaking and ceramics. Autobiographical nature of imagery gives methodological basis for exploring frequently personalized themes.

ARTH 3577. Photo Nation: Photography in America. (AH; 3 cr.; Student Option; Every Fall & Spring)

ARTH 3578. Contemporary Sub-Saharan African Popular Art forms. (3 cr.; A-F only; Every Fall)
This course explores contemporary sub-Saharan African popular cinema, popular music, community theatre, street arts, bus slogans, comic books, graphic art, social media, fashion, sports, and other forms of popular communication as signifiers of larger social, political, and economic processes. It examines popular cultural forms as constantly evolving expressions of social, political, and personal identities in an ever globalized and interconnected world. As sites where the tensions, frictions, collisions and notably, the productive creativities of the local and the global are circulated, negotiated and contested, African popular cultures provide insights into a unique and increasingly crucial facet of contemporary African artistic practice as critical intervention. Indeed, in their function as channels of communication generated within local cultures as reactions to transnational phenomena and dynamics, African popular forms offer timely perspectives on questions of cultural resurgence, global power relations and their underpinning national, ethnic and gender implications. Through our discussion of art and gender, for instance, we will examine the ways in which art in Africa was/is used to empower women.

ARTH 3627. Seminar: Harlem Renaissance. (3 cr.; Student Option; Every Fall)

ARTH 3655. African-American Cinema. (AH,DSJ; 3 cr.; Student Option; Spring Even Year)

ARTH 3921W. Art of the Film. (AH,WS; 4 cr.; Student Option; Every Spring)
History of the moving image as an art form; major films, directors, genres, and styles. Films discussed include THE BIRTH OF A NATION, CITIZEN KANE, BICYCLE THIEF, RASHOMON, and JULES AND JIM.

ARTH 3926. The Cinema of Alfred Hitchcock. (AH; 3 cr.; Student Option; Fall Even Year)

ARTH 3929. Cinema Now. (AH; 3 cr.; Student Option; Fall Odd Year)
Course examines contemporary cinema, including fiction films, documentaries, animation, and avant-garde experiments. Focuses on feature-length theatrical films, but will also consider other aspects of the contemporary media world: graphic novels, video games, television series and the Internet (e.g., Youtube). Examines media production, distribution, marketing, exhibition, and reception. Course will also present a survey of developments in contemporary cinema studies, since the choice of films will support a variety of critical approaches including economic, aesthetic (generic, auteurist, formalist), ideological (race, class, gender), and reception studies.

ARTH 3940. Topics in Art History. (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Topics specified in Class Schedule.

ARTH 3971V. Honors: Art History Capstone. (WI; 3 cr.; A-F only; Every Fall & Spring)
Capstone course for art history majors, which teaches writing skills and strategies, and aids students in the completion of senior paper projects through the study of art historical methods. Students work with both the class instructor and individual faculty advisers on independent research and writing. prereq: ArtH major, instr consent

ARTH 3975. Directed Professional Experience. (1-2 cr.; Student Option; Every Fall, Spring & Summer)
Internship or research assistantship in approved program, art institution, business or museum. prereq: instr consent

ARTH 3993. Directed Study. (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)
TBD prereq: instr consent

ARTH 3994. Directed Research. (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall)
TBD prereq: instr consent

ARTH 5115. Hellenistic and Iranian Asia: Art and Archaeology of Hellenistic, Scythian, Kushan, and Sogdian Asia. (3 cr.; Student Option; Every Fall & Spring)
Transformations of Greek architecture, sculpture, painting, mosaic, and decorative arts beginning of the eastern Mediterranean and Hellenistic Asia. Art and archaeology of the post-Hellenistic Iranian world. Religious, political and historical contexts of archaeological sites, monuments, and art objects.

ARTH 5122. Persia and the Ancient Iranian World: Art and Archaeology of Achaemenid to Sassanian Persia. (3 cr.; Student Option; Every Fall & Spring)
Art, archaeology of ancient Persia and the wider ancient Iranian world from the rise of the Achaemenid empire in 650 BCE to the advent of Islam in the seventh century CE.

ARTH 5302. The Image Multiplied: Prints in Early Modern Europe. (3 cr.; A-F or Audit; Periodic Fall & Spring)
The technology of mechanically reproducing complex visual images on paper, a development of fifteenth-century Europe, transformed the early modern world no less than the emergence of digital media has transformed our own. Techniques of woodcut, engraving and etching quickly became important media for innovation within the fine arts. At the same time, they became equally important as sources for devotional imagery, for disseminating copies of other artworks, for the expansion of knowledge through scientific illustration, and for the effective broadcasting of political and religious messages during centuries of extraordinary political and religious upheaval. In this course we will investigate the cultural history of printed images in Europe from the time of their emergence in the fifteenth century through the mid-eighteenth century. Through lectures and class discussion, we will develop a familiarity with the technical aspects of printmaking and apply that understanding to the historical interpretation of specific works.

The course will not be an exhaustive survey of printmakers and printmaking styles during the early modern era but will instead approach the early modern print through the changing cultural circumstances of its production and reception. While we will consider the work of many lesser-known (and anonymous) artists, we will concentrate on the work of major printmakers such as Mantegna, D?rer, Goltzius, Rembrandt, Callot, Hogarth, and Piranesi. The course will include visits to local collections.

ARTH 5311. Baroque Rome: Art and Politics in the Papal Capital. (3 cr.; Student Option; Fall Even Year)
Center of baroque culture--Rome--as city of spectacle and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

ARTH 5336. Transformations in 17th Century Art: Caravaggio, Velazquez, and Bernini. (3 cr.; Student Option; Periodic Fall & Spring)
This course offers an in-depth examination of three of the most innovative masters of early modern European art, the painters Michelangelo Merisi da Caravaggio and Diego Velazquez, and the sculptor and architect Gianlorenzo Bernini. Through selected readings, slide presentations and discussions, we will explore the lives and works of these artists, paying particular attention to the ways they created an entirely new relationship between the work of art and the viewer and ushered in a radically new way of conceiving visual imagery.

ARTH 5411. Gender and Sexuality in Art Since 1863. (3 cr.; Student Option; Periodic Fall & Spring)
History of art from late 19th to early 21st century. How gender/sexuality have been central to that period's artistic production, art criticism, and aesthetic theorization. How gender/sexuality are important themes for artists. How the writing of history reveals assumptions about gender/sex. Critical reading/writing.

ARTH 5413. Alternative Media: Video, Performance, Digital Art. (3 cr.; A-F or Audit; Periodic Fall)
In-depth examination of development of alternative media in 20th/21st century art. Video technologies. Performance, time based art. Digital art. prereq: 3464 or instr consent

ARTH 5417. Twentieth Century Theory and Criticism. (3 cr.; Student Option; Periodic Fall)
Trends in 20th-century art theory, historical methodology, criticism. Key philosophical ideas
of modernism/postmodernism: formalism, semiotics, poststructuralism, feminism, Marxism, psychoanalysis, deconstruction. prereq: 3464 or instr consent

ARTH 5466. Contemporary Art. (3 cr.; Student Option; Periodic Spring) Survey of the art and important critical literature of the period after 1970. Origins and full development of postmodern and subsequent aesthetic philosophies. prereq: 3464 or instr consent

ARTH 5575. Boom to Bust: American Art from the Roaring Twenties to the Great Depression. (3 cr.; Student Option; Every Fall & Spring) American art/culture from 1917 to 1940. Boom of post-WWI affluence, bust of stock market crash, Midwestern Dust Bowl. How tumultuous times influenced painting, sculpture, photography, and industrial design.

ARTH 5655. African-American Cinema. (AH,DSJ: 3 cr.; Student Option; Periodic Fall) African American cinematic achievements, from silent films of Oscar Micheaux through contemporary Hollywood and independent films. Class screenings, critical readings.

ARTH 5756. Early Chinese Art. (3 cr.; Student Option; Periodic Fall & Spring) Art/material culture of early China from Neolithic age (ca. 10000-2000 BCE) to early imperial period (221 BCE-906 CE).

ARTH 5766. Chinese Painting. (3 cr.; Student Option; Fall Odd Years) Major works from the late bronze age to the modern era that illustrate the development of Chinese landscape painting and associated literary traditions.

ARTH 5777. The Diversity of Traditions: Indian Art 1200 to Present. (3 cr.; Student Option; Every Fall, Spring & Summer) Issues presented by sculpture, architecture and painting in India, from prehistoric Indus Valley civilization to present day.

ARTH 5781. Age of Empire: The Mughals, Safavids, and Ottomans. (3 cr.; Student Option) Artistic developments under the three most powerful Islamic empires of the 16th through 19th centuries: Ottomans of Turkey; Safavids of Iran; Mughals of India. Roles of religion and state will be considered to understand their artistic production.

ARTH 5783. Art, Diplomacy and Empire. (3 cr.; Student Option; Periodic Fall & Spring) This course examines the mobility and agency of objects and people in diplomatic practice. An emerging body of scholarship within Renaissance and early modern studies explores the exchange and global circulation of objects and their role in cultural encounters. The possibilities offered by this 'material turn' highlight the potential of objects to enable cultural contact, conversion and exchange across traditional political and cultural boundaries. At the same time, recent innovative and interdisciplinary approaches to exchange highlight cultural aspects of the diplomatic encounter. As a result, the roles of diplomats, interpreters, merchants as well as various types of objects and services continue to be interpreted in new ways. This course will introduce students to canonical texts associated with gift-exchange and reciprocity, and will explore their relevance to the disciplines of history and art history particularly with regard to imperial encounters and exchanges.

ARTH 5785. Art of Islamic Iran. (3 cr.; Student Option) Architecture, painting, and related arts in Iran from the inception of Islam (7th century) through the 20th century. Understanding the nature of Islam in Persianate cultural settings and how artistic production here compares to the Islamic world.

ARTH 5787. Visual Cultures in Contact: Cross-Cultural Interaction in the Ancient and Early Medieval Worlds. (3 cr.; Student Option; Fall Even Year) Evaluate critical perspectives from variety of interdisciplinary conversations. Framework for studying cross-cultural interaction among ancient visual cultures that integrates practical, cognitive, object oriented approaches. Cross-cultural movement/selective appropriation of objects/motifs.

ARTH 5926. The Cinema of Alfred Hitchcock. (3 cr.; Student Option; Fall Even Year) Achievement/significance of Alfred Hitchcock. British/American periods of career, major films, television program. Biographical, historical, technological, industrial, aesthetic issues surrounding his achievement.

ARTH 5930. Junior-Senior Seminar. (3 cr.; A-F or Audit; Periodic Fall & Spring) Major art-historical theme, artist, period, or genre. Topics specified in Class Schedule. prereq: [Jr or sr] ArtH major, instr consent

ARTH 5950. Topics: Art History. (3 cr.; max 9 cr.; Student Option; Every Fall, Spring & Summer) Topics specified in Class Schedule.

ARTH 5993. Directed Study. (1-4 cr.; max 12 cr.; A-F or Audit; Every Fall, Spring & Summer) TBD prereq: instr consent

ARTH 5994. Directed Research. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer) TBD prereq: instr consent

ARTH 8001. Art Historiography: Theory and Methods. (3 cr.; A-F or Audit; Periodic Fall & Spring) Key texts, from Renaissance to present, from western/non-western fields, relating to history/criticism of both art and visual culture. Focuses on recent critical theory, its re-examination of assumptions underlying the discipline.

ARTH 8120. Computer Applications in Art History and Archaeology. (3 cr.; Student Option; Every Fall & Spring) Seminar. Potential of digital technology as applied to art history/archaeology. Computer technologies as affecting methodologies of art history/archaeology. Way in which art history/archaeology can contribute to emerging computer applications.

ARTH 8190. Seminar: Issues in Ancient Art and Archaeology. (3 cr.; max 12 cr.; Student Option; Every Fall & Spring) Selected topics, with special attention to current scholarly disputes. Topics specified in Class Schedule. prereq: instr consent

ARTH 8200. Seminar: Medieval Art. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) Focus on a major art historical theme, artist, period, or genre.

ARTH 8320. Seminar: Issues in Early Modern Visual Culture. (3 cr.; A-F or Audit; Periodic Fall & Spring) Issues in visual culture of Europe and the Americas, 1500-1750. Topics vary, may include representation of body, collectors/collecting, impact of Reformation, image/book, art/discovery, early modern vision/visuality.

ARTH 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ARTH 8340. Seminar: Baroque Art. (3 cr.; max 12 cr.; Student Option; Every Spring) Topics vary. prereq: instr consent

ARTH 8400. Seminar: Issues in 19th-Century Art. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) Typical seminars have included symbolism, role of the academy and the avant-garde, surrealism in art and theory, and Franco-American relationships at the turn of the 20th century. prereq: instr consent


ARTH 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

ARTH 8500. Issues in Latin American Art. (3 cr.; max 12 cr.; Student Option; Every Spring) Topics vary.

ARTH 8520. Seminar: American Art and Material Culture. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) Topics in American art, popular art, and material culture, emphasizing methods and techniques of inquiry: creation and use of archives, oral history, sources for pictorial evidence, and current approaches to interpreting traditional and non-traditional data. prereq: instr consent
ARTH 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade_Associated; Every Fall, Spring & Summer) 
tbd prereq; Doctoral student who has not
passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; 
department consent for 3rd/4th registrations, up to 24 
combined cr; doctoral student admitted before 
summer 2007 may register up to four times, up 
to 60 combined cr

ARTH 8710. Seminar: Islamic Art. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) 
Focus depends on current research interests 
of the professor and needs and interests of 
graduate students in Islamic and Asian art 
history. prereq: instr consent

ARTH 8720. Seminar: East Asian Art. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) 
Research focuses on closely defined topic, 
such as a short period of Chinese art, a 
restricted subject, or role of a single artist. 
A substantive research paper is required 
and participation in the seminar dialogue is 
expected. prereq: instr consent

ARTH 8770. Seminar: Art of India. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) 
Selected problems and issues in history of 
South Asian art. Topic varies by offering. 
prereq: 3 cr art history, instr consent

ARTH 8783. Art, Diplomacy, and Empire. (3 cr.; A-F only; Periodic Fall & Spring) 
This course examines the mobility and 
agency of objects and people in diplomatic 
practice. An emerging body of scholarship 
within Renaissance and early modern studies 
explores the exchange and global circulation 
of objects and their role in cultural encounters. 
The possibilities offered by this 'material turn' highlight the potential of objects to 
enable cultural contact, conversion, and 
exchange across traditional political and 
cultural boundaries. At the same time, recent 
innovative and interdisciplinary approaches 
to exchange highlight cultural aspects of the 
diplomatic encounter. As a result, the roles 
of diplomats, interpreters, merchants as well 
as various types of objects and services 
continue to be interpreted in new ways. This 
course will introduce students to canonical 
texts associated with gift-exchange and 
reciprocity, and will explore their relevance 
to the disciplines of history and art history, 
particularly with regard to imperial encounters 
and exchanges.

ARTH 8888. Thesis Credit: Doctoral. (1-24 
prereq: max 16 cr per semester or summer; 24 cr required

ARTH 8920. Seminar: Film History and 
Criticism. (3 cr.; max 12 cr.; Student 
Option; Every Fall & Spring) 
Selected topics in film history and theory, 
including specific directors, genres, 
movements, periods, and critical issues (e.g., 
violence). prereq: instr consent

ARTH 8950. Seminar: Issues in the History of 
Art. (3 cr.; max 12 cr.; Student Option; 
Every Fall & Spring) 
Theoretical or topical issues. Topics vary. 
prereq: 3 cr art history, instr consent

ARTH 8970. Directed Studies. (1-3 cr.; max 12 cr.; 
Student Option; Every Fall, Spring & Summer) 
tbd prereq: instr consent

**Arts and Cultural Leadership (ACL)**

ACL 5100. Topics in Arts and Cultural Leadership. (1-4 cr.; max 24 cr.; A-F or Audit; Periodic Fall, Spring & Summer) 
Topics in Arts and Cultural Leadership.

ACL 5211. Trends and Impacts in Arts and Cultural Leadership and Management. (3 cr.; max 6 cr.; A-F or Audit; Every Fall) 
Through discussion and analysis, research 
and peer presentation projects, this seminar 
will investigate and question the theoretical 
uantages from which nonprofit arts and cultural 
organizations are built and the practical 
influences that affect them daily. Leadership 
in the cultural sector is evolving rapidly; 
textbook strategies are being re-evaluated 
or re-inventing themselves in creative ways in response to current social 
and economic conditions. Emphasis is placed on 
current events, immediate and long-term 
trends and research into what is happening 
now. Topics include the role of arts and cultural 
organizations within the community; past, 
current and future concepts in organizational 
structures; and the application of traditional 
and integrated relationship-based strategies.

ACL 5221. Creative Entrepreneurship and Resource Development. (3 cr.; A-F or Audit; Every Spring) 
An entrepreneurial approach to developing 
resources (including financial, human, and 
partnership) for arts and culture based 
enterprises whether using a nonprofit, for-

**University of Minnesota Twin Cities Catalog**

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
and advancing movements, and the need for arts entities to know how to navigate policy arenas in their enlightened self interest and to support social change movements, makes for a dynamic study of how artists, arts organizations, governments, and social change movements intersect.

**ACL 5950. Special Topics.** (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer) Special topics. prereq: dept consent

**ACL 5993. Directed Studies.** (1-4 cr. [max 15 cr.]; A-F only; Every Fall, Spring & Summer) Guided individual reading or study for qualified graduate students. prereq: Grad student, dept consent

**ACL 8001. Introduction to Critical and Cultural Inquiry in Arts and Culture.** (2 cr.; A-F only; Every Fall) This seminar, required for ACL students, introduces research frameworks, methods, standards, and practice as well as critical thinking appropriate for arts and cultural research.

**ACL 8002. Capstone: Applied Research Project.** (1 cr.; S-N only; Every Fall) Course provides an environment that will motivate, support, and assist students in the completion of their Capstone Project through development of a Project Proposal. Student projects explore personal, organizational, community, and/or systems change and as such generate valuable experiences and insights. There will be a minimum of five classroom meetings of students and instructor. Additional one-on-one meetings with the instructor are required. The instructor is also available for individual consultation as needed.

**ACL 8003. Capstone: Reflections and Presentation.** (2 cr.; S-N only; Every Spring) Course provides an environment that will motivate, support, and assist students in the completion of an excellent Capstone Paper that reflects knowledge and skills acquired during the course of study in the Arts and Cultural Leadership Program and places them in a meaningful and theoretical context. Past student projects explored personal, organizational, community, and/or systems change and as such generated valuable experiences and insights. There will be a minimum of five classroom meetings of students and instructor in addition to a final presentation event. Additional one on one meetings with the instructor are required. The instructor is also available for individual consultation as needed.

**ACL 8201. Creative Leadership in Practice.** (2 cr.; A-F only; Every Summer) Students will reflect on how their personal passions, skills, and strengths align with different situations arts and cultural leaders face. Students will explore their own leadership strengths. Students will be broken into three case presentation teams where they will explore specific arts leadership styles. During these class periods, a local arts leader will join the class for the case discussion as well as to share their background and experiences. Finally, students will write a final synthesis paper identifying their career and leadership aspirations, personal mission and values, and how they intend to apply and develop their leadership strengths over the remainder of their engagement in the ACL program.

**ACL 8202. Service Leadership and Board Pracitcum.** (1-2 cr.; A-F only; Every Fall) Effective chief executives of nonprofit arts and cultural organizations differ most from their less effective counterparts in the ways in which they work with their boards of directors, their staff and their artistic leadership, not in their fundraising prowess or their management expertise. In fact, the degree to which nonprofit executives work in genuine partnership with their boards, staff and artistic leadership often makes the difference between successful and unsuccessful organizations. Complicating matters is the fact that while nonprofits are increasingly in need of experienced, qualified board members, there are limited opportunities for preparing new or prospective board members for board service or for developing more experienced board members into effective board leaders. Often it is the chief executive who must train the board. This practicum has two primary areas of focus: The first is on continuing to develop your own leadership skills and values, and establishing practices that can be sustained after you graduate from the program. The second is on the role of the chief executive in determining the effectiveness of his or her board of directors and in engaging board members in meaningful governance as well as their respective roles and responsibilities. It will be our goal to build upon the voluntary leadership and life experiences of each individual class member and to explore ways in which students can increase their own leadership competencies during the course and then throughout their careers. The course will cover the changing roles of arts and cultural organizations in today’s world, the funding environments affecting arts nonprofit governance, review basic roles and responsibilities of the chief executive in relation to the board as well as the roles and responsibilities of arts board membership. Particular attention will be paid to board dynamics, especially those between the board as a whole, the board’s key leadership and the nonprofit’s executive leadership and how our own life and leadership experiences affect our ability to work in concert with others in voluntary capacities.

**Asian American Studies (AAS)**

**AAS 1101. Imagining Asian America.** (DSJ,SOCS; 3 cr.; Student Option; Every Fall) Issues in Asian American Studies. Historical/recent aspects of the diverse/multifaceted vision of “Asian America,” using histories, films, memoirs, and other texts as illustrations.

**AAS 1201. Racial Formation and Transformation in the United States.** (DSJ,SOCS; 3 cr.; Student Option; Every Fall) How aggrieved racialized groups struggle over identity, culture, place, and meaning. Histories of racialization. Strategies toward rectification of historical injustices from dispossession, slavery, exploitation, and exclusion.

**AAS 3001. Contemporary Perspectives on Asian America.** (DSJ; 3 cr.; Student Option; Every Fall) Interdisciplinary overview of Asian American identities. Post-1965 migration/community. History, cultural productions, and concerns of Americans of Chinese, Japanese, Korean, South Asian, Filipino, and Southeast Asian ancestry.

**AAS 3211W. American Race Relations.** (DSJ, WI; 3 cr.; A-F or Audit; Every Fall & Spring) This course is designed to provide students with an understanding of the contours of race in the post-civil rights era United States. This course will focus on race relations in today’s society with a historical overview of the experiences of various racial and ethnic groups in order to help explain their present-day social status. The class will also class consider the future of race relations in the U.S. and evaluate remedies to racial inequality.

**AAS 3251W. Sociological Perspectives on Race, Class, and Gender.** (DSJ, WI, SOCS; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Race, class, and gender as aspects of social identity, and as features of social organization. Experiences of women of color in the United States. Family life, work, violence, sexuality, and reproduction. Possibilities for social change.

**AAS 3301. Asian America Through Arts and Culture.** (AH, DSJ; 3 cr.; Student Option; Spring Every Year) The course focuses on the close analysis and interpretation of individual works by a range of modern and contemporary artists. Students will analyze, critique, and interpret these works in light of the historical and social contexts in which they were produced, their creation and uses of aesthetic form, and their impact on individuals and communities. Discussion, writing assignments, and oral presentations will focus on different ways of encountering and evaluating artistic work; for instance, students will write critical analyses and production reviews as well as dialogue more informally through weekly journal entries and online discussion forums. We will examine what it means to define artists and their work as being “Asian American” and explore how other categories of identity such as gender, sexuality, or class intersect with race. We will study how art works not only as individual creativity but also as communal and social practice; for instance, we look at the history of theaters, such as East-West Players or Pan Asian Repertory Theatre, that have sustained Asian Americans as actors, playwrights, and designers.

**AAS 3303W. Writing Differences: Literature by U.S. Women of Color.** (DSJ, WI, LITR; 3 cr.; Student Option; Fall Odd Year) Interpret/analyze poetry, fiction, drama of U.S. women minority writers. Relationship of writer's
history, ethnicity, race, class, gender to her writings.

AAS 3311. Asian American Theater. (3 cr.; Student Option; Periodic Fall & Spring) Through submerging students in both theater history and practice, this class brings students closer to the history, experiences, and politics of Asian Americans. Why are Asian American stories needed and how do we tell them? What are the artistic and social agendas driving the making of Asian American theater? How have the styles of performance shifted? While we will be actively working on readings and original theater projects, you don't need to be a theater expert to enjoy this class. Topics will include reading plays by Frank Chin, David Henry Hwang, Wakako Yamauchi, Naomi Iizuka, and others; looking at the history of Asian American theater companies; discussing creative approaches to casting, acting, directing, and design; and building collaborations among companies, audiences, and communities.

AAS 3341. Asian American Images. (AH.DSJ; 3 cr.; Student Option; Periodic Fall & Spring) From 19th-century anti-Chinese political cartoons to Harold and Kumar, visual representations of Asians in the United States have long influenced how Asian Americans are seen and treated. What are some of the ways that photography, graphic arts, and digital culture have pictured Asian Americans as aliens, citizens, immigrants, workers, family and community members, entertainers, and artists? Course topics will relate visual images to particular historical moments, including the early exclusion period and the "yellow peril" stereotype; WWII Japanese American incarceration and the drawings of Min? Okubo, and photo-journalism documenting U.S. military involvement in Southeast Asia and its aftermath. How do photographic and other images work to counter historical amnesia, heal traumatic loss, and document social injustice? Other weeks of the class will explore the ways that individuals, families, and communities use photographs, video, and other visual media to preserve a sense of connection and belonging. We will also look at how contemporary Asian American photographers such as Tseng Kwong Chi, Nikki Lee, and Wing Young Huie experiment with visual images to raise questions of racial and national identity, social inequality, gender, sexuality, and political agency. The course also includes a digital storytelling project that encourages students to create video images and sound reflecting Asian American immigration stories from local communities.

AAS 3351. Asian Americans and Popular Culture. (AH.DSJ; 3 cr.; Student Option; Periodic Fall & Spring) Over the past few decades, Asian Americans have become increasingly visible both as the subjects and producers of popular culture in the United States. This course will explore how this new recognition of Asian Americans in popular literature, cinema, television, and entertainment is related both to longer histories of Asian immigration and racial exclusion and to post-1960s efforts to forward racial awareness, community activism, and social justice. Our first unit will look at how particular stereotypes such as the yellow peril or the wartime enemy encouraged anti-Asian feeling and violence and legal restrictions on immigration and naturalization. We will then examine how throughout history, Asian immigrants and their descendants used song, dance, theater, writing, and other forms of popular culture to express personal desires and foster collective ties. Our final unit concentrates on contemporary popular culture and its relationship to the changing identities of Asian Americans. How do Asian Americans influence the current essays, films, and videos that are consumed by millions today? How are increasingly pan-ethnic, inter racial, multiracial, transnational, and global experiences reflected in popular culture?

AAS 3361. Asian Americans and Food. (3 cr.; Student Option; Periodic Fall) Asian Americans have always been intimately connected to food practices and institutions in the American imagination. Food is the medium through which Asian American cultural difference—including their status as "perpetual foreigners" or their "model minority character"—are typically expressed and disseminated. Historically, Asian migration to the United States was fueled by labor needs particularly in the agricultural sector. In addition, Asian labor has been stereotypically linked to food service and preparation such as the ubiquitous Chinese take-out place and more recently, the sushi and Korean fusion joints. This course is an introduction to the interdisciplinary study of food to better understand the historical, social, and cultural aspects of Asian American food preparation, distribution and consumption. Students will investigate the politics and poetics of Asian American foodways by examining social habits, and rituals around food in restaurants, homes and other public venues. The course texts include ethnographic essays, fictional works, memoirs, magazines, and television shows.

AAS 3409W. Asian American Women's Cultural Production. (AH.WI.DSJ; 3 cr.; Student Option; Every Fall) Diversity of cultures designated "Asian American." Understanding women's lives in historical, cultural, economic, and racial contexts.

AAS 3483. Hmong History Across the Globe. (+ 3 cr.; Student Option; Fall Odd, Spring Even Year) Hmong interaction with lowland Southeast Asian states (Laos, Vietnam) and Western colonial powers (French, American) since 19th century. Changes to religious, social, political, and gender institutions. Aspirations for political autonomy.

AAS 3486. Hmong Refugees from the Secret War: Becoming Americans. (3 cr.; Student Option; Spring Odd Year) Socio-economic, political, gender, cultural/religious changes in Hmong American community during last three decades. How Hmong are racialized in American society. Impact to first/second generations.

AAS 3503. Asian American Identities, Families, & Communities. (DSJ,SOCS; 3 cr.; Student Option; Periodic Spring) This course provides a sociological overview of Asian American identities, families and communities. To place these experiences within a broader historical, structural, and cultural context the course will begin with a brief introduction to the history of Asians and Asian Americans in the United States and sociological theories about incorporation and racial stratification. We will then examine the diversity of Asian American communities and families, highlighting ethnic, gender, and class variations. Other lenses of focus include racialization and discrimination, education, ethnic enclaves, family and intergenerational relationships, identity, media, culture, and politics and social action. We will then apply theories and data to understanding two specific cases with particular relevance for Minnesota: Hmong immigrant experiences and transnational adoption. Throughout the course we will consider the ways in which society affects individuals, and how in turn, individuals affect society.

AAS 3601W. War and Empire: Asian American Perspectives. (GP.WI; 3 cr.; Student Option; Periodic Spring) This course examines the reach of war and empire in Asia America since the turn of the twentieth century. Starting with US wars in the Philippines (1898-1910) and the formation of the colonial state, the course will track the ascendency of US empire in Asia and paths toward wars against imperialist Japan (1941-1945), in Korea (1950-53), and in Vietnam (1955-1975). The course will address the relevance of the unending Global War on Terrorism (2001-) in contemporary Asian America. Together, the course explores how these wars have shaped and continue to inform the lives and memories of Asian immigrants and refugees, their children, and other Asian Americans.

AAS 3862. American Immigration History. (DSJ,HIS; 3 cr.; A-F or Audit; Every Spring) Global migrations to U.S. from Europe, Asia, Latin America, and Africa, from early 19th century to present. Causes/cultures of migration. Migrant communities, work, and families. Xenophobia, assimilation/integration, citizenship, ethnicity, race relations. Debates over immigration. Place of immigration in America's national identity.

AAS 3866. Arab American Experiences. (3 cr.; A-F Only; Fall) Arab diasporic experiences in the West, and in America in particular, have been mediated by popular depictions of "the Arab" as violent terrorist, oppressor of/ oppressed woman, religious fanatic, and myriad other negative stereotypes, heightened since September 11, 2001. How do Arabs in America, especially youth, navigate the superimposition of these images upon them? How do they relate to the multiple locations of "home" between the West and the Arab world? To what extent are they perpetually "out of place," and what strategies have they developed to navigate
their liminal and often marginalized social position? Through the examination of memoirs, novels, film, music, and even food, this course will use Arab American cultural production as a lens through which to explore these questions.

**AAS 3875W. Comparative Race and Ethnicity in U.S. History.** (DSJ,WI,HIS; 3 cr. ; A-F or Audit; Periodic Fall & Spring)

This writing-intensive course examines the racial history of modern America. The focus is on how African Americans, Native Americans, and immigrants from Europe, Asia, and Latin America struggle over identity, place, and meanings of these categories in society where racial hierarchy not only determined every aspect of how they lived, but also functioned as a lever to reconstitute a new nation and empire in the aftermath of the Civil War. We are interested in studying how these diverse groups experienced racialization not in the same way but in various and distinct ways in relation to each other.

**AAS 3877. Asian American History, 1850 to Present.** (DSJ,WI,HIS; 3 cr. ; Student Option; Every Fall & Spring)

Asian American history and contemporary issues, from 1850 to present. Immigration, labor, anti-Asian movements, women/families, impact of World War Two, new immigrant/refugee communities, civil rights, Asian American identity/culture.

**AAS 3920. Topics in Asian American Studies.** (; 2-4 cr. ; max 8 cr.) ; Student Option; Every Fall & Spring)

Topics specified in Class Schedule.

**AAS 3993. Directed Studies in Asian American Studies.** (; 1-9 cr. ; Student Option; Every Fall, Spring & Summer)

Guided individual reading or study. prereq: instr consent

**AAS 4231. Color of Public Policy: African Americans, American Indians, Asian Americans & Chicano/as in the U.S..** (3 cr. ; Student Option; Periodic Fall)

Structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

**AAS 4232. American Drama by Writers of Color.** (; 3 cr. ; A-F or Audit; Periodic Fall & Spring)

Selected works by Asian American, African American, American Indian, Latino, and Chicano playwrights. How racial/ethnic differences are integral to shaping different visions of American drama. History of minority/ethnic theaters, politics of casting, mainstreaming of the minority playwright.

**AAS 4311. Asian American Literature and Drama.** (DSJ,LITR; 3 cr. ; A-F or Audit; Fall Odd Year)

Literary/dramatic works by Asian American writers. Historical past of Asian America through perspective of writers such as Sui Sin Far and Carlos Bulosan. Contemporary authors such as Frank Chin, Maxine Hong Kingston, David Henry Hwang, and Han Ong. Political/historical background of Asian American artists, their aesthetic choices.

**AAS 5920. Topics in Asian American Studies.** (; 1-4 cr. ; max 12 cr.) ; Student Option; Periodic Fall & Spring)

Topics specified in Class Schedule.

**AAS 5993. Directed Readings.** (; 1-4 cr. ; max 8 cr.) ; Student Option; Periodic Fall & Spring)

Directed reading--must be set up with individual instructor.

**AAS 5996. Graduate Proseminar.** (; 1 cr. ; max 4 cr.) ; S-N only; Every Fall & Spring)

Discussions/presentations from various disciplinary perspectives on research, activism, and performance in Asian American/Diasporic Studies. Students engage in dialogue, observe models of scholarly engagement, and reflect on issues within Asian American/disporic studies.

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**Asian Languages and Literature (ALL)**

**ALL 1001. Asian Film and Animation.** (AH,GP; 3 cr. ; Student Option; Every Fall)


**ALL 1201. Arrow, Fist, and Sword: Conceptions of the Hero in Asian Cultures.** (GP,LITR; 3 cr. ; A-F only; Periodic Fall & Spring)

Conceptions of the “hero” in Chinese, Korean, and Japanese cultures: How did various societies in these countries define the ethos of the “hero” and his relationship to the community? How did versions of the hero change over time, and how was the hero redefined in the context of modern nationalism? What part have traditional gender roles played in defining the hero, and is a “female” hero possible within these traditions? And how has popular film allowed modern Asian societies to reinterpret their traditional conceptions of the hero? Specific explorations: the Chinese assassin, the hachan and their evolution into the martial artist of popular culture; Mulan and the Chinese female warrior; Korean figures of the Three Kingdoms period; the Korean hero Hong Gildong; and shifting Japanese constructions of the samurai from medieval war tales to modern times.

**ALL 1912. Fashioning Islam in Literature and Culture.** (; 3 cr. ; A-F only; Periodic Fall & Spring)

Over the last few decades, the image of the Muslim veil has been variously idealized and politicized around the globe. This excessive (in)visibility has triggered multiple scholarly and public conversations about the relationship between collective faith and individual choice in Islam. The objective of this course is to investigate and go beyond these debates about veiling and unveiling to uncover complex aesthetic and political acts of self-fashioning undertaken by Muslim writers, filmmakers, and artists as they engage with and re-define processes of Islamic piety and global modernity. Through innovative readings of film, literature, and popular culture from a range of geographical sites and historical periods, this course highlights the importance of clothing and adornment in the formation of gendered identities, religious beliefs, and nationalist politics. From the Turkish Fez to the Indian Sari, we will explore how dress practices stitch together structures of power, displays of masculinity, and questions of women’s agency in different times and places. These explorations will be guided by an interest in identifying unconventional cultural sites for the staging and un-staging of “Muslim dress” and assessing the importance of fashion in stimulating gendered consumption and aesthetics.

**ALL 3001. Reading Asian Cultures.** (; 3 cr. ; A-F or Audit;)

Introduction to primary Asian texts in translation. Emphasizes introducing/applying various methods of interpretation to a particular text in sequence. Close reading, methodological rigor. Practice, application.

**ALL 3014W. Art of India.** (AH,WI,GP; 4 cr. ; Student Option; Every Fall, Spring & Summer)

Indian sculpture, architecture, and painting from the prehistoric Indus Valley civilization to the present day.

**ALL 3110. Study of an Asian Language.** (; 1-5 cr. ; max 10 cr.) ; Student Option; Every Fall & Spring)

Study of an Asian language in another country or at other non-campus locations. Students study in situations complementary to regular University course offerings. prereq: dept consent

**ALL 3232W. “Short” Poetry in China and Japan.** (WI; 3 cr. ; Student Option; Spring Even Year)


**ALL 3250. Topics in Asian Film and Media.** (; 3 cr. ; max 6 cr.) ; A-F only; Periodic Fall & Spring)

Examines theme, problem, region, style or filmmaker in Asian cinema. Focuses on (geo)political and socioeconomic contexts in relation to artistic and interpretive frameworks.

**ALL 3261W. Writing (in) East Asian Cultures: From Oracle Bones to Tattoos.** (AH,WI; 3 cr. ; Student Option; Fall Even Year)

History, materiality, practice of writing Chinese characters (hanzi/kanjihanja) in cultural venues in East Asia, including contemporary society. Sites/practices where writing takes on high cultural value. Oracle bone writing, calligraphy, advertisements, tattooing. Identity construction, nationalism. prereq: One year in Chinese or Japanese or Korean language or similar exposure to East Asian writing systems

**ALL 3265W. The Fantastic in East Asia: Ghosts, Foxes, and the Alien.** (LITR,WI; 3 cr. ; Student Option; Periodic Fall & Spring)

How the strange/foreign is constructed in premodern Chinese/Japanese literature. East
This course examines the history of Taiwan film from the Japanese colonial period to the early 21st century along with the increased (though still quite limited) availability of pre-1980s films on DVD with English subtitles. We will cover topics such as dialect films; Nationalist propaganda; "healthy realism;" connections with the Hong Kong, Hollywood, and mainland Chinese film industries; the aesthetics of New Taiwan Cinema; the imagination of Taiwan as a postcolonial Southeast Asian rather than East Asian or Chinese polity; and the battle for commercial viability in the global film market. Throughout the course, we will closely analyze cinematic form and narrative structure in addition to broader issues of nation, society, politics, and ecology.

ALL 3361W. Maps, Pictures, and Writing in the Representation of Taiwan. (AH,WI,GP; 3 cr.; A-F or Audit; Spring Odd Year) Survey of texts in different genres, from 8th to early 19th centuries, with attention to issues such as "national" identity, gender/sexuality, authorship, popular culture. No knowledge of Japanese necessary.

ALL 3343W. Traditional Japanese Literature in Translation. (AH,WI; 3 cr.; A-F or Audit; Fall Odd Year) Survey of ideas/styles of recent Japanese literature. Writers include Dazai Osamu, Ibusuki Masuji, Kenzaburo Oe, Mishima Yukio, and Yoshimoto Banana. All readings in English translation. prereq: Basic knowledge of modern Japanese language not required.

ALL 3437. The Japanese Novel. (GP,LITR; 3 cr.; F or Audit; Periodic Fall & Spring) Survey of the principal authors of the period spanning Japan’s opening to the West (1860s) to World War II. Writers include Natsume Soseki, Shiga Naoya, Kawabata Yasunari, Edogawa Rambo, Hayashi Fumiko, and Tanizaki Junichiro.

ALL 3457. War and Peace in Japan Through Popular Culture. (GP; 3 cr.; F or Audit; Periodic Fall & Spring) Themes, stylists, and genres of Japanese cinema through work of classic directors (Kurosawa, Mizoguchi, and Ozu) and more recent filmmakers (Itami, Morita). Focuses on representations of femininity/masculinity.

ALL 3458. Japanese Animation. (GP; 3 cr.; F or Audit; Spring Even Year) This course takes up the technologies, genres, and themes of Japanese animation. By examining the works of important directors alongside media theories and other related writings, the course will cover not only the
major genres and recurrent themes of anime, but also the cultural and critical contexts for apprehending anime.

**ALL 3466. Japanese Popular Culture in a Global Context.** (3 cr.; Student Option; Periodic Spring)

What happens when one nation's popular culture begins to permeate others? Japanimation, manga, fashion, and music. Relationships of popular culture to nation(alism), ethnicity, gender, and identity. Effects of popular culture on consumers, socialization. Ways that consumption affects us personally.

**ALL 3467. Science Fiction, Empire, Japan.** (3 cr.; A-F only; Fall Even Year)

Premised on its historical position as a non-Western colonial empire, this course takes up Japan as a focal point for examining the relations between science fiction and imperialism. Discussions center on the colonial underpinnings of Japanese science fiction and how particular motifs (future war, time travel, posthuman bodies) critically interrogate this history.

**ALL 3468. Environment, Technology and Culture in Modern Japan.** (ENV; 3 cr.; Student Option; Fall Even Year)

Read/view historical, literary, visual texts to discover guiding ideas about nature, environment, technology use in Japan. No prior knowledge of Japan is necessary.

**ALL 3478. Modern Japan, Meiji to the Present (1868-2000).** (HIS; 3 cr.; Student Option; Every Fall & Spring)


**ALL 3536. Modern Korean Literature.** (GP,LITR; 3 cr.; Student Option; Every Fall)

Modern Korean literature in English translation from the colonial period until the 1990s. Read literary texts critically, using genre categories, theories of narrative voice, different understandings of modern literary subjectivity, and historical contextualization.

**ALL 3556. Korean Film.** (AH,GP; 3 cr.; Student Option; Every Spring)

Introduction to Korean film from the Japanese colonial period to the present day, with a particular emphasis on the last two decades.

**ALL 3576. Language & Society of the Two Koreas.** (3 cr.; A-F only; Every Fall)

This course is designed to offer an introduction and contrastive analysis of the language and society of the two Koreas; the Republic of Korea (better known as South Korea) and the Democratic People's Republic of Korea (better known as North Korea). This course will introduce the growing divide of the past 70 years between North and South Korea in the areas of language, society, and culture.

**ALL 3586. Cold War Cultures in Korea.** (3 cr.; A-F only; Every Fall)

In this course we will analyze the Cold War (1945-1989) not only as an era in geopolitics, but also as a historical period marked by specific cultural and artistic forms. We focus on the Korean peninsula, looking closely at the literary and film cultures of both South Korea and North Korea. We discuss how the global conflict between U.S.-centered and Soviet-centered societies affected the politics, culture, and geography of Korea between 1945 and 1989, treating the division of Korea as an exemplary case extending from the origins of the Cold War to the present. We span the Cold War divide to compare the culture and politics of the South and the North through various cultural forms, including anti-communist and socialist realist films, biography and autobiography, fiction, and political discourse. We also discuss the legacy of the Cold War in contemporary culture and in the continued existence of two states on the Korean peninsula. The primary purpose is to be able to analyze post-1945 Korean cultures in both their locality and as significant aspects of the global Cold War era.

**ALL 3637W. Modern Indian Literature.** (GP,W,LITR; 3 cr.; A-F or Audit; Periodic Fall & Spring)

Survey of 20th century literature from South Asian countries, including India, Pakistan, and Sri Lanka. All readings in English. Focuses on colonialism, post-colonialism, power, and representation.

**ALL 3638. Islam and Tradition in Modern South Asia.** (3 cr.; A-F only; Periodic Fall & Spring)

This course explores the multiple genealogical trajectories of Islamic thought in South Asia through the varied lens of its literary traditions. For centuries, literature has remained an important site for the expression of Islamic identity and its interaction with the larger history of the subcontinent. Muslim writers have traversed diverse domains of human experience through multiple genres: while poetry has been a widely celebrated genre for the expression of private love, drama has emerged as a crucial site for public politics and activism. In this course, students will read texts that have circulated across South Asia and interpret them in relation to enduring questions about power, justice, identity, community and love (both human and divine) in Islam. Reading a wide array of works from diverse temporal and spatial locations, this course examines how the aesthetic and discursive world of South Asia provides a terrain on which the Islamic "souls" of the region has come to define itself in a unique manner. In addition, we also investigate how these literary cultures at different historical junctures-articulated a secular ethos to define Hindu-Muslim relations in the subcontinent. Writers, filmmakers, and other creative art practitioners from almost every corner of this living world use the figure of the ghost to address questions of ethics, justice, violence, and repression. This course focuses on India's modern ghosts as well as ghosts and spirits from classical Indian literature. In every sphere of our lives, public and private, we are chased by various ghosts that often appear in forms of memory, remembrance, nostalgia, and forgetfulness. Ghosts scare us, enchant us, and capture our imagination. Our intellectual engagement will consist of theorizations around the figure of the ghost and its various conceptual offshoots (hauntology, specter, the uncanny, etc.) as encountered through literary and filmic texts. The course will also connect these ghostly tales with issues of nationalism, gender, communal and ethnic violence, and capitalism.

**ALL 3671. Hinduism.** (3 cr.; Student Option; Periodic Fall & Spring)

Development of Hinduism focusing on sectarian trends, modern religious practices, myths/rituals, pilgrimage patterns/religious festivals. Interrelationship between Indian social structure/Hinduism.

**ALL 3672. Buddhism.** (GP; 3 cr.; Student Option; Summer Even Year)

Historical and contemporary account of the Buddhist religion in Asia/world in terms of its rise, development, various schools, practices, philosophical concepts, and ethics. Current trends in the modern faith and the rise of "socially engaged" Buddhism.

**ALL 3673. Survey of India: Languages, Literature, and Film.** (GP; 3 cr.; A-F or Audit; Every Spring)

Survey course of Indian languages and literatures that explores the languages of India from genealogical, linguistic, typological, historical and sociological perspectives. Diachronic analysis of the languages of India in relation to some structural features will be also investigated. This course will also provide an overview of literatures of several main South Asian languages with a focus on Hindi - Urdu literatures. We will address the origin of Hindi-Urdu literatures, periodization, and naming of each period. We will also examine the important writers and their representative work, along with the literary trends and influences of each period, including political, social, and cultural situations which helped to shape the writers and their work. Among the representative literary works in Hindi-Urdu, some have been made into films.

**ALL 3676. Culture and Society of India.** (GP,SOC3; 3 cr.; Student Option; Fall Odd, Spring Even Year)

Contemporary society/culture in South Asia from anthropological perspective with reference to nationalism; postcolonial identities; media and public culture; gender, kinship, and politics; religion; ethnicity; and Indian diaspora.

**ALL 3771. History of Southeast Asia.** (GP; 3 cr.; A-F or Audit; Every Fall & Spring)


ALL 3772. Hmong Language and Culture Immersion in China. (4 cr. ; A-F only; Every Summer) This instructor-led study abroad course in Kunming, China, focuses on Hmong language and culture in the trans-historical context of China. Students will gain a deeper understanding of the intricate differences within the Hmong linguistic and cultural diaspora through a comparative approach examining the complexity of Hmong dialects and regional cultural shifts. Instructors will work with all student levels, and instruction is oriented towards helping students learn to use the language effectively. All aspects of linguistic performance - speaking, reading, writing and listening - will be addressed. Open to all students interested in Hmong language and culture, regardless of language level.

ALL 3776. Hmong History Across the Globe. (3 cr.; Student Option; Fall Odd, Spring Even Year) Hmong interaction with lowland Southeast Asian states (Laos, Vietnam) and Western colonial powers (French, American) since 19th century. Changes to religious, social, political, and gender institutions. Aspirations for political autonomy.

ALL 3820. Topics in Arab Culture. (3 cr. [max 9 cr.]; A-F only; Periodic Fall & Spring) Topics specified in Class Schedule.

ALL 3832. The Politics of Arabic Poetry. (GP; LITR; 3 cr. ; A-F only; Every Spring) This course engages with Arabic poetry in its socio-political context. How have Arab poets from the pre-Islamic era till the present time used their verse as a tool to affirm the structure of their society, or to struggle with it? What roles did Arabic poetry play at the Abbasid imperial courts? How does Arabic poetry participate in the constitution and promulgation or subversion of political ideologies? And what presence has it had in Arab peoples' struggles for independence or reform, historically and today as part of the Arab Spring?

ALL 3856. Palestinian Literature and Film. (GP; 3 cr.; A-F only; Every Spring) This course examines modern literature and film of the Palestinian people both for artistic significance and interactions with the broader historical and political situations confronted by Palestinians. We will ask how cultural production, namely literature and film, interacts with, responds to, and even anticipates historical and political events. At the same time, we will problematize a strictly historicist and political reading of literary and cinematic texts, which reduces such artistic works to mere sociological documents, overlooking their creative and artistic achievements. Ultimately, this leads us to a number of questions: what is the relationship between history/politics and art? Can artistic texts transcend the historical and political contexts in which they are produced? How has artistic production functioned within the context of Palestinian statelessness, exile, and anti-colonial struggle? All texts covered in the course will be in English translation, however those able to read texts in the original Arabic are encouraged to do so.

ALL 3866. Arab American Experiences. (3 cr.; A-F only; Every Fall) Arab diasporic experiences in the West, and in America in particular, have been mediated by popular depictions of "the Arab" as violent terrorist, oppressor of oppressed woman, religious fanatic, and myriad other negative stereotypes, heightened since September 11, 2001. How do Arabs in America, especially youth, navigate the superimposition of these images upon them? How do they relate to the multiple locations of "home" between the West and the Arab world? To what extent are they perpetually "out of place," and what strategies have they developed to navigate their liminal and often marginalized social position? Through the examination of memoirs, novels, film, music, and even food, this course will use Arab American cultural production as a lens through which to explore these questions.

ALL 3867. Orientalism and the Arab World. (3 cr.; A-F only; Periodic Fall & Spring) This course explores the various manners in which "the Arab World" is constructed and represented in western discourses. Through scholarly writings such as Samuel Huntington's "The Clash of Civilizations" thesis and popular media such as television's Homeland, this course illuminates how the idea of a monolithic "Arab World" and quintessential "Arab" subject are constructed and re-produced for western consumption. Crucially, moreover, this course also examines how this re-production of the "Arab World/Subject" is integral to the construction of western identity itself, serving as a foil to western self-conceptualization. This course also examines how individuals and peoples who are the object of the orientalist gaze have attempted to respond to and subvert orientalist discourses and stereotypes, as well as scholarly critiques of Edward Said's orientalism thesis itself.

ALL 3871. Islam: Religion and Culture. (3 cr.; Student Option; Every Fall) This course is a brief survey of the religion and civilization of Islam. It introduces students to 1) Islamic history from its inception in the seventh century CE to the present, with emphasis on the life of the Prophet Muhammad and the early Caliphate; 2) The authoritative texts of Islam, i.e. the Quran and Prophetic traditions (Hadith); 3) The institutions and discourses characteristic of Islamic civilization; and 4) The transformation of Muslim life and thought in the modern period. By taking this course, students become familiar with the chief ideas, characters, narratives, rites, localities, and movements associated with Islam. prereq: Soph or jr or sr

ALL 3872. The Cultures of the Silk Road. (3 cr.; Student Option; Every Fall & Spring) Past/present state of cultures that flourished in Central Asia (present-day CA republics, Iran, Afghanistan) after Alexander the Great. Decline with opening of sea routes.

ALL 3900. Topics in Asian Literature. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

ALL 3920. Topics in Asian Culture. (3 cr. [max 9 cr.]; A-F only; Every Fall & Spring) Topics specified in Class Schedule.

ALL 3990. Directed Study. (1-4 cr.; max 16 cr.) (Student Option; Every Fall & Spring) Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses. Prereq-instr consent, dept consent, college consent.

ALL 4901W. Capstone Project in Asian Languages & Literatures. (WI; 3 cr.; A-F or Audit; Every Spring) The capstone project in the department of Asian Languages and Literatures is meant to demonstrate the cumulative language, critical thinking, and analysis skills developed by students over the course of their undergraduate studies. It consists of a thesis of at least 6000 words, in which students must synthesize research in primary language sources (i.e. texts, films, or other forms of cultural production in the original language of student's declared subplan) with secondary research. prereq: ALL major, sr

ALL 5250. Advanced Topics in Asian Film and Media. (3 cr. [max 6 cr.]; A-F only; Periodic Fall & Spring) Examines theme, problem, region, style or filmmaker in Asian cinema. Focuses on (geo)political and socioeconomic contexts in relation to artistic and interpretive frameworks.

ALL 5261. Work of Translation: Theory, Function, and Practice. (3 cr.; A-F only; Periodic Fall & Spring) Issues surrounding translation. Theories of representation. Ideological work. Readings/discussion of both historical/contemporary writing on translation. Actual translation tasks. prereq: [Native or near-native] speaker of English, advanced speaker/reader of at least one other [classical or vernacular] language

ALL 5276. Liberalism and Its Critics: Global Perspectives. (3 cr.; A-F only; Fall Odd Year) Survey of liberal political thought and various critics of it that arose in extreme left/right political perspectives, including those in colonial contexts and within non-Western religious formations, especially Hindu and Muslim.

ALL 5277. Space and Modernity in Asia. (3 cr.; Student Option; Periodic Fall & Spring) Examines methods, vocabularies, and theories necessary to articulate new spatial approaches to modern Asian cultural texts, including literature, films, and urban spaces. Special focus on Soja, Lefebvre, Winichakul, Henry, Ai, Zhang, and Furuhata.

ALL 5351. Chinese New Media. (3 cr.; A-F only; Every Fall) This course explores new media and intermediality from specific moments in the history of modern China. The new visuality of the late Qing Dynasty offers examples
of how new forms of visual culture became both reflexive and constitutive of modernity. Later, silent cinema of the Republican era both drew upon and defined itself against existing Chinese dramatic forms, particularly opera. In the 1930s, the arrival of sound in cinema provided a space for phonographic modernity to be expressed through film. In the People’s Republic, the productive interplay between traditional art forms and cinema entered a new era, culminating in the cinematic adaptations of the ?model plays? of the Cultural Revolution. Finally, recent years have seen the explosive growth of digital cinema, computer animation, internet culture, and gaming communities.

ALL 5359. Early Shanghai Film Culture. (3 cr.; Student Option; Spring Even Year)
Shanghai film culture, from earliest extant films of 1920s to end of Republican Era in 1949. Influences on early Chinese film, from traditional Chinese drama to contemporary Hollywood productions. Effects of leftist politics on commercial cinema. Chinese star system, material film culture.

ALL 5374. The Monkey King and Transcultural China: Chinese Myth, Legend, and Ideology. (3 cr.; Student Option No Audit; Periodic Fall & Spring)
Early Chinese myths/legends/historical narratives about the Monkey King. Cultural formations from later periods, including contemporary popular culture and Asian American literature. Construction of China/Chinese in 20th Century seen through the Monkey as a figure of otherness and in-betweenness in relation to globalization and cross-cultural identity.

ALL 5426. Literature by 20th-Century Japanese Women in Translation. (3 cr.; Student Option; Periodic Fall)
Literary/historical exploration of selected works by Japanese women writers in variety of genres. All literary texts read in English.

ALL 5446. Kabuki: A Pop, Queer, and Classical Theater in Japan. (3 cr.; A-F only; Spring Odd Year)
Kabuki, an all-male theater of “song (ka)/dance (bu)/acting (ki)” that came into being in the 17th century, still boasts popularity in Japan. This course explores kabuki in several contexts: historical, theatrical, literary, and theoretical. It aims to historicize this performing art in its four-hundred-year dynamic trajectory against the backdrop of Japan’s development from a national, high culture. No less importantly, we inquire into theoretical implications of subject matter, such as citationality, gender construction, and the like. Furthermore, this course attends to what is usually marginalized and overlooked in kabuki historiography: koshihaji (unlicensed small troupes of kabuki); onna yakusha (women kabuki actors who mastered the acting techniques established by male kabuki actors—including the technique of female impersonation). Open to anyone with an interest, no previous knowledge of Japanese studies, theater studies, or Japanese is required. All of the readings will be available in English. Audio-visual materials will be used whenever available and appropriate.

ALL 5486. Images of “Japan”. (3 cr.; A-F only; Fall Even Year)
This course examines non-Japanese texts that deploy the imagination of “Japan” in their narratives. Discussions will take up such focal points as: ethnographic cinema, the politics of travel and translation, the intersections of race and gender, the cultural politics of alternate histories, and the ramifications of technointer subject discourses.

ALL 5571. Hinduism. (3 cr.; Student Option; Periodic Fall & Spring)
Development of Hinduism focusing on sectarian textures, modern religious practices, mythic/ritual, pilgrimage patterns, religious festivals. Interrelationship between Indian social structure/Hinduism.

ALL 5820. Topics in Arab Culture. (3 cr.; Periodic Fall & Spring)
Topics specified in Class Schedule.

ALL 5866. Gender and Sexuality in Modern Arabic Literature. (3 cr.; Student Option; Every Spring)
Survey of modern Arabic literature's key role in the articulation, construction, and subversion of gendered subjectivities. Explores the construction of masculine and feminine subjectivities, as well as the blurring of the dichotomy between the two. Also explores how homoerotic desire is presented in modern Arabic novels. Engages the complex interplay between the gender politics of literary texts, and the broader historical and political contexts from which they emerge. All texts covered in this course will be in English translation, however those able to read texts in the original Arabic are encouraged to do so.

ALL 5900. Topics in Asian Literature. (3 cr.; [max 12 cr.]; Student Option; Every Fall & Spring)
Topics specified in Class Schedule.

ALL 5920. Topics in Asian Culture. (3 cr.; [max 12 cr.]; A-F only; Every Fall)
Topics specified in Class Schedule.

ALL 5990. Directed Study. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses. Prereq-instr consent, dept consent, college consent.

ALL 8001. Critical Approaches to Asian Literary and Cultural Studies. (3 cr.; Student Option; Fall Odd Year)
Constructions of national identity, its consolidation in current disciplinary/academic structures.

ALL 8002. Critical Approaches to Asian Studies. (3 cr.; Student Option; Spring Odd Year)

ALL 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
x prereq: Master’s student, [adviser, DGS] consent

ALL 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
x prereq: Doctoral student, [adviser, DGS] consent

ALL 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
/topics only; Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ALL 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)

ALL 8920. Topics in Asian culture. (1-3 cr. [max 9 cr.]; Student Option; Every Fall & Spring)
Topics specified in Class Schedule.

ALL 8990. Directed Readings. (1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring)
Directed readings in foreign language(s) of specialty, where appropriate. prereq: PhD student

Astronomy (AST)

AST 1001. Exploring the Universe. (ENV,PHYS; 4 cr.; Student Option; Every Fall, Spring & Summer)
The human place in the Universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe and our relationship to it.

AST 1005. Descriptive Astronomy. (3 cr.; Student Option; Every Fall, Spring & Summer)
Twentieth century astrophysics, current frontiers of astrophysical research. prereq: non-science major

AST 1011H. Exploring the Universe, Honors. (ENV,PHYS; 4 cr.; A-F only; Every Fall & Spring)
Human place in universe. Earth, other planets, sun, stars, galaxies. Background/fragility of life on Earth. Scale, origin, history of universe, our relationship to it. Honors version of 1001. prereq: High school trigonometry, [high school physics or chemistry]

AST 1905. Freshman Seminar. (2 cr. [max 6 cr.]; Student Option No Audit; Every Fall & Spring)
Topics vary. See Class Schedule.

AST 1910. The Ultimate Questions. (2 cr.; A-F only; Periodic Fall & Spring)
Why are we here? Not here at the U, or even on Earth, but why do intelligent beings even exist in the universe? How did it all begin? And how is it going to end? Did the universe have to turn out the way it did, or are we simply the lucky one of an infinite number of universes

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existing across space and time? Of course, we won't answer any of these questions, but their exploration makes for a fascinating journey. Our guidebooks will be two intriguing works by Paul Davies, "The Goldilocks Enigma" and "The Mind of God," anchoring our discussions which are guaranteed to keep you up at night.

**AST 1911. Nothing. (2 cr.; A-F only; Periodic Fall & Spring)**
"Nothing" too wonderful to be true, as the great eighteenth century physicist Michael Faraday pondered? Following the Bard, in this seminar we will make much ado about "nothing." From the birth of the Universe ex-nihilo, to the philosophies that find meaning in nothing, to the tangled history of zero over the centuries, to our beginnings as seen by theologies when even nothing was not. In our journey through the teeming vacuum, "nothing" is sacred, and will be both ventured and gained. Caution is advised, however, in telling people that you've signed up for "nothing!"

**AST 2001. Introduction to Astrophysics. (4 cr.; Student Option; Every Fall & Spring)**
Physical principles and study of solar system, stars, galaxy, and universe. How observations/conclusions are made. prereq: [One yr calculus, PHYS 1302] or instr consent

**AST 2990. Directed Studies. (1-5 cr. [max 10 cr.]; Student Option; Every Fall & Spring)**
Independent, directed study in observational and theoretical astrophysics. Arranged with faculty member. prereq: 2001, instr consent

**AST 5012. The Interstellar Medium. (4 cr.; Student Option; Periodic Fall & Spring)**
Large-scale structure/history of universe. Introduction to Newtonian/relativistic world models. Physics of early universe, cosmological tests, formation of galaxies. prereq: [2001, Phys 2601] or instr consent

**AST 5201. Methods of Experimental Astrophysics. (4 cr.; Student Option; Spring Even Year)**
Contemporary astronomical techniques and instrumentation. Emphasizes data reduction and analysis, including image processing. Students make astronomical observations at O'Brien Observatory and use department's computing facilities for data analysis. Image processing packages include IRAF, AIPS, IDL, MIRA. prereq: Upper div CSE or grad or instr consent

**AST 8001. Radiative Processes in Astrophysics. (4 cr.; Student Option; Periodic Fall & Spring)**
Introduction to classical/quantum physics of electromagnetic radiation as it applies to astrophysics. Emphasizes radiative processes (e.g., emission, absorption, scattering) in astrophysical contexts (e.g., ordinary stars, ISM, neutron stars, active galaxies). prereq: instr consent

**AST 8011. High Energy Astrophysics. (4 cr.; Student Option; Periodic Fall)**
Energetic phenomena in the universe. Radiative processes in high energy regimes; supernovae, pulsars, and X-ray binaries; radio galaxies, quasars, and active galactic nuclei. prereq: instr consent

**AST 8021. Stellar Astrophysics. (4 cr.; Student Option; Periodic Fall)**
Stellar structure, evolution, and star formation. Emphasizes contemporary research. prereq: instr consent

**AST 8031. Astrophysical Fluid Dynamics. (4 cr.; Student Option; Periodic Fall)**
Introduction to physics of ideal/non-ideal fluids with application to problems of astrophysical interest. Steady/unsteady flows, instabilities, turbulence. Conducting fluid flows. Magnetohydrodynamics. prereq: instr consent

**AST 8041. Comparative Planetology. (4 cr.; Student Option; Periodic Fall)**
Overview of current knowledge of the solar system. Formation history of protostellar nebula, physical properties of major planetary bodies/moons. Sun and fossils of epoch of planetary system formation: comets, asteroids, minor bodies. prereq: instr consent

**AST 8051. Galactic Astronomy. (4 cr.; Student Option; Periodic Fall)**
Content, structure, evolution, and dynamics of Milky Way Galaxy. Emphasizes recent observations from space-/ground-based telescopes. prereq: instr consent

**AST 8061. Radio Astronomy. (4 cr.; Student Option; Periodic Fall)**

**AST 8071. Infrared Astronomy. (4 cr.; Student Option; Periodic Fall)**

**AST 8081. Cosmology. (4 cr.; Student Option; Periodic Fall)**
Role of gravity in cosmology. Background, recent research advances. prereq: instr consent

**AST 8110. Topics in Astrophysics. (4 cr.; A-F or Audit; Periodic Fall & Spring)**
The course will concentrate on two topics in cosmology: formation of the large scale structure in the Universe, and gravitational lensing and its applications. The course will cover the evolution of structure in the early Universe, growth of super- and sub-horizon sized perturbations, transfer function, linear theory of gravitational instability, evolution of mass clustering, statistics of discrete objects, Cold, hot and warm dark matter, and means of measuring mass inhomogeneities. Gravitational lensing is a rapidly growing and wide-reaching field within modern astrophysics and cosmology. In the last 2 decades it has grown from a niche topic to a versatile and indispensable tool. It is now utilized in the studies of planets/finding exoplanets using microlensing), stars (measuring limb darkening, masses, radii, motions of stars), galaxies and clusters of galaxies (mapping out detailed distribution and clumpiness of
dark matter, and constraining properties of dark matter particles), and the distribution of mass on the largest cosmological scales (using distant galaxies, and Cosmic Microwave Background as sources). Lensing is often used for its magnifying power to examine highest redshift galaxies (using clusters of galaxies as telescopes), as well as accretion disks around supermassive black holes (using microlensing by stars in external galaxies). About half of the course will be lectures (interspersed throughout the semester), the rest will be seminar-style discussions of current literature, lead by students.

AST 8120. Topics in Astrophysics. (3 cr.; Student Option; Periodic Fall) N/A prereq: instr consent

AST 8200. Astrophysics Seminar. (3 cr.; Student Option; Every Fall & Spring) TBD prereq: instr consent

AST 8333. FTE: Master's. (3 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

AST 8444. FTE: Doctoral. (3 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

AST 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

AST 8777. Thesis Credits: Master’s. (1-18 cr.; max 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

AST 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

AST 8990. Research in Astronomy and Astrophysics. (1-4 cr.; Student Option; Every Fall & Spring) Research under supervision of a graduate faculty member. prereq: instr consent

Biochemistry (BIOC)


BIOC 2011. Biochemistry for the Agricultural and Health Sciences. (3 cr.; Student Option; Every Fall & Spring) Survey of organic chemistry and biochemistry outlining structure and metabolism of biomolecules, metabolic regulation, principles of molecular biology. prereq: Chem 1015, Bio 1009

BIOC 3021. Biochemistry. (3 cr.; Student Option; Every Fall, Spring & Summer) Fundamentals of biochemistry. Structure/ function of proteins, nucleic acids, lipids, and carbohydrates. Metabolism/regulation of metabolism. Quantitative treatments of chemical equilibria, enzyme catalysis, and bioenergetics. Chemical basis of genetic information flow. recommended prerequisitets: Introductory Biology (BIOL 1009 or BIOL 2003 or equivalent) and Organic Chemistry (CHEM 2301 or CHEM 2081/2085 or equivalent) enforced prereq: not a CBS student

BIOC 3022. Biochemistry for Life Scientists. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) This course provides an introduction to biochemistry including discussion of the structure and functions of biomolecules (proteins, carbohydrates, lipids, and nucleic acids), central metabolic pathways, and the mechanisms of enzyme action. This course is for students in the College of Biological Sciences who have completed Biol 3020 ? Molecular Biology and Society?, and does not cover molecular biology. Students from other Colleges should register for BioC 3021, which includes an introduction to molecular biology.

BIOC 4025W. Laboratory in Biochemistry. (WI; 2 cr.; Student Option; Every Fall & Spring) Theory, principles, and use of fundamental techniques in modern biochemistry labs. prereq: 3021 or 4331 or equiv

BIOC 4125. Laboratory in Molecular Biology and Biotechnology. (3 cr.; A-F or Audit; Every Spring & Summer) Basic recombinant DNA techniques: methods for growing, isolating, and purifying recombinant DNA and cloning vectors. DNA sequencing and sequence analysis, gene expression, Polymerase Chain Reaction (PCR), other current techniques. prereq: [3021 or Biol 3021 or Biol 4003], [4025 or GCD 4015 or GCD 4025 or MicB 3301]

BIOC 4185. Laboratory in Molecular Genetics. (3 cr.; A-F or Audit; Every Summer) Basic recombinant DNA techniques. Methods for growing, isolating, and purifying recombinant DNA and cloning vectors. DNA sequencing, sequence analysis. Gene expression, Polymerase Chain Reaction (PCR). Current techniques. prereq: Enrollment in Life Sciences Summer Undergraduate Research Program

BIOC 4225. Laboratory in NMR Techniques. (1 cr.; S-N only; Every Summer) Practical aspects of nuclear magnetic resonance (NMR) spectrometry. Hands-on experience with 500/600 MHz instruments. Sample preparation/handling, contamination sources, tube/probe options, experiment selection, experimental procedures, software, data processing. prereq: 4331; 4521 recommended; intended for biochemistry majors

BIOC 4325. Laboratory in Mass Spectrometry. (1 cr.; S-N only; Every Spring) Hands-on experience with techniques/ instruments. Sample preparation/handling, 2-dimensional gels, MS-MS, MALDI-TOF, electrospray/LC-MS, experiment selection/ procedures, software, data processing. prereq: 4332, 4521

BIOC 4331. Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems. (4 cr.; Student Option; Every Fall & Spring) Advanced survey of structure/catalysis, metabolism/bioenergetics. prereq: (BIOL 1009 or BIOL 2003 or equiv) AND (Chem 2302 or CHEM 2081/2085 or equiv)

BIOC 4332. Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression. (4 cr.; Student Option; Every Fall & Spring) Advanced survey of molecular biology. Mechanisms of gene action/biological regulation. prereq: 4331 or instr consent

BIOC 4351. Protein Engineering. (3 cr.; A-F only; Every Fall) Key properties of enzymes/molecular basis, computer modeling strategies, mutagenesis strategies to create protein variants, expression/screening of protein variants. Evaluate research papers, identify unsolved practical/theoretical problems, plan protein engineering experiment. prereq: 4331 or instr consent

BIOC 4521. Introduction to Physical Biochemistry. (3 cr.; Student Option; Every Fall & Spring) Physical chemical principles, their applications in biochemistry. Thermodynamics, kinetics, spectroscopy, solution dynamics as applied to biochemical reactions/ biopolymers. prereq: 4331 recommended, (Chem 1062/1066 or CHEM 1082/1086 AND (Physics 1202 or 1302)

BIOC 4793W. Directed Studies: Writing Intensive. (WI; 1-7 cr.; S-N or Audit; Every Fall, Spring & Summer) Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report. prereq: instr consent, dept consent

BIOC 4794W. Directed Research: Writing Intensive. (WI; 1-6 cr.; max 42 cr.; S-N or Audit; Every Fall, Spring & Summer) Laboratory or field investigation of selected areas of research, including written report. prereq: instr consent, dept consent

BIOC 4960. Special Topics in Biochemistry. (3 cr.; A-F only; Every Spring) In-depth study of a topic in biochemistry. prereq: [3021 or equiv], CHEM 2301] or instr consent
BIOC 4993. Directed Studies. (1-7 cr.; S-N or Audit; Every Fall, Spring & Summer) Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature; prereq: instr consent, dept consent

BIOC 4994. Directed Research. (1-6 cr. [max 42 cr.]; S-N or Audit; Every Fall, Spring & Summer) Laboratory or field investigation of selected areas of research. prereq: instr consent, dept consent

BIOC 5002. Critical Evaluation of Biochemistry Research. (1 cr.; S-N only; Every Fall & Spring) Bio 5002 guides advanced undergraduates and new graduate students as they learn how to design experiments and to critically evaluate a wide variety of cutting-edge research projects, both as readers and as researchers. Introductory lectures include peer review, experimental design, critical thinking and the psychology of judgment and decision-making. This is followed by a series of guest speakers who will guide students as they develop their skills in evaluation of current research papers.

BIOC 5213. Selected Topics in Molecular Biology. (3 cr.; A-F only; Every Fall) Cutting edge areas in molecular biology. Topics focus on the “3 R’s” of DNA: repair, replication, and recombination. Faculty who are experts in these areas teach modules on specific topics, including discussion of their research interests. prereq: 4332 or 8002 or [3021, BIOL 4003] or instr consent

BIOC 5216. Current Topics in Signal Transduction. (3 cr.; A-F only; Every Spring) Principles of cell signaling. Important signaling pathways/experimental approaches to study signal transduction. Discussion of current issues/unanswered problems in field. prereq: BioC 4332 or Biol 4004 or instr consent

BIOC 5225. Graduate Laboratory in NMR Techniques. (1 cr.; S-N only; Every Spring) Practical aspects of nuclear magnetic resonance (NMR) spectrometry. Hands-on experience with 500/600 MHz instruments. Sample preparation/handling, contamination sources, tube/probe options, experiment selection, experimental procedures, software, data processing. prereq: 8001 or instr consent

BIOC 5309. Biocatalysis and Biodegradation. (3 cr.; S-N only; Every Spring) Fundamentals of microbial enzymes/molecular basis of environmental pollutants/biosynthesis for making commodity chemicals. Practical examples. Guest speakers from industry.

BIOC 5351. Protein Engineering. (3 cr.; A-F only; Every Fall) Key properties of enzymes/molecular basis, computer modeling strategies, mutagenesis strategies to create protein variants, expression/screening of protein variants. Evaluate research papers, identify unsolved practical/theoretical problems, plan protein engineering experiment.

BIOC 5352. Biotechnology and Bioengineering for Biochemists. (3 cr.; A-F or Audit; Periodic Spring) Protein biotechnology. Microorganisms used as hosts for protein expression, protein expression, and engineering methods. Production of enzymes of industrial interest. Applications of protein biotechnology in bioelectronics. Formulation of therapeutic biopharmaceuticals. prereq: [3021 or 4331 or BIOL 3021 or MCB 4111, [BIOL 3301 or MCB 3301]] or instr consent

BIOC 5361. Microbial Genomics and Bioinformatics. (3 cr.; Student Option; Every Fall & Spring) Introduction to genomics. Emphasizes microbial genomics. Sequencing methods, sequence analysis, genomics databases, genome mapping, prokaryotic horizontal gene transfer, genomics in biotechnology, intellectual property issues. Hands-on introduction to UNIX shell scripting, genomic data analysis using R and Excel in a computer lab setting. prereq: College-level courses in [organic chemistry, biochemistry, microbiology]

BIOC 5444. Muscle. (3 cr.; Student Option; Every Spring) Muscle molecular structure/function and disease. Muscle regulation, ion transport, and force generation. Muscular dystrophy and heart disease. prereq: 3021 or BIOL 3021 or 4331 or BIOL 4333 or PHSL 3061 or instr consent

BIOC 5527. Introduction to Modern Structural Biology. (4 cr.; Student Option; Every Fall) Methods employed in modern structural biology to elucidate macromolecular structures. Primary focus on X-ray diffraction, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. Principles underlying structural biology and structure/function relationships. prereq: [intro biochemistry, intro physics] or physical chemistry or instr consent

BIOC 5528. Spectroscopy and Kinetics. (4 cr.; Student Option; Every Spring) Biochemical dynamics from perspectives of kinetics and spectroscopy. Influence of structure, molecular interactions, and chemical transformations on biochemical reactions. Focuses on computational, spectroscopic, and physical methods. Steady-state and transient kinetics. Optical and magnetic resonance spectroscopies. prereq: [intro physical chemistry or equiv; intro biochemistry recommended]

BIOC 5535. Introduction to Modern Structural Biology – Diffraction. (2 cr.; A-F or Audit; Every Fall) Theory and practice in the determination of three-dimensional structures of macromolecules using x-ray and neutron diffraction and electron microscopy. prereq: [Introductory biochemistry, introductory physics, college calculus] or physical chemistry or instr consent

BIOC 5536. Introduction to Modern Structural Biology - Nuclear Magnetic Resonance. (2 cr.; Student Option; Every Fall) Theory and practice in the determination of three-dimensional structures of macromolecules using NMR. prereq: [Introductory biochemistry, introductory physics, college calculus] or physical chemistry or instr consent

BIOC 5960. Special Topics in Biochemistry. (3 cr.; A-F only; Every Spring) In-depth study of topics in biochemistry. prereq: [3021 or equiv, CHEM 2301] or instr consent

BIOC 6011. Biochemistry for Dental Students. (4 cr.; A-F or Audit; Every Fall) Survey of chemical properties, biosynthesis, catabolism, structure/function of biomolecules. Fundamentals of molecular biology/metabolic regulation. prereq: Dental student


BIOC 8001. Biochemistry: Structure, Catalysis, and Metabolism. (3 cr.; Student Option; Every Fall) Protein structure, methods to determine structure, protein folding, forces stabilizing macromolecular structure, protein engineering, design. Dynamic properties of proteins/ enzymes, enzyme substrate complexes, mechanism of enzyme catalysis. Enzymology of metabolic regulation and cell signaling. prereq: BMBB or MCD Bio concurrent registration is required (or allowed) in G grad student or instr consent

BIOC 8002. Molecular Biology and Regulation of Biological Processes. (3 cr.; A-F only; Every Fall) Classical to current topics in molecular biology. Aspects of DNA, RNA, and protein biology. DNA replication, repair, and recombination. RNA transcription, editing, and regulation. Protein translation/modification. Technologies such as deep-sequencing micro-RNA and prions. prereq: [BMBB or MCD BB] grad student or instr consent

BIOC 8005. Biochemistry: Structure and Catalysis. (2 cr.; A-F or Audit; Every Fall) Protein structure, methods to determine structure, protein folding, forces stabilizing macromolecular structure, protein engineering, design. Dynamic properties of proteins/ enzymes, enzyme substrate complexes, mechanism of enzyme catalysis.

BIOC 8006. Biochemistry: Metabolism and Control. (2 cr.; A-F or Audit; Every Fall) Enzymology of metabolism, metabolic regulation, metabolic control and cell signaling.

BIOC 8007. Molecular Biology of DNA. (2 cr.; A-F or Audit; Every Fall) Structure and organization of genes. Replication. Transcription. Epigenetic
modification of chromatin. Genome editing.
Deep sequencing.
Cellular adhesion mechanisms. prereq: BMBB or MCDB
concurrent registration is required (or allowed) in G grad student or instr consent

BIOC 8008. Molecular Biology of RNA. (2 cr.; A-F or Audit; Every Fall)
Translation. RNA editing. Epigenetics and long non-coding RNA. MicroRNAs and RNA interference. Pre-mRNA processing.

BIOC 8084. Research and Literature Reports. (1 cr. [max 5 cr.]; S-N or Audit; Every Fall & Spring)
Current developments. prereq: Grad BMBB major or instr consent

BIOC 8184. Graduate Seminar. (1 cr. [max 5 cr.]; S-N or Audit; Every Fall & Spring)
Reports on recent developments in the field and on research projects in the department. prereq: grad BMBB major or DGS consent

BIOC 8216. Signal Transduction and Gene Expression. (3 cr.; Student Option; Every Fall & Spring)
Cell signaling, metabolic regulation in development. Procaryotic/eucaryotic systems used as models for discussion. Literature-based course. prereq: 8002 or instr consent

BIOC 8290. Current Research Techniques. (1-3 cr. [max 9 cr.]; S-N or Audit; Every Fall & Spring)
Research project carried out in laboratory of a staff member. prereq: Grad BMBB major

BIOC 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

BIOC 8401. Ethics, Public Policy, and Careers in Molecular and Cellular Biology. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring)
Ethics of scientific investigation from viewpoint of western scientific enterprise. Relationship between science, culture, and public policies. Careers in molecular/cellular biology. Nontraditional career tracks. Invited speakers, case studies, small-group discussions, lectures. prereq: Grad student in [BMBB or MCDB] concurrent registration is required (or allowed) in G

BIOC 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

BIOC 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

BIOC 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)

Bioethics, Center for (BTHX)

BTHX 5000. Topics in Bioethics. (1-4 cr.; A-F only; Spring & Fall)
Bioethics topics of contemporary interest. Topics specified in Class Schedule.

BTHX 5010. Bioethics Proseminar. (2 cr.; Every Fall)
Introduction to topics in bioethics. prereq: Bioethics grad student or grad minor

BTHX 5100. Introduction to Clinical Ethics. (2 cr.; Student Option; Every Fall & Spring)
Most frequent ethical problems faced by clinicians, patients/families, and ethics consultants. Forging life sustaining treatment, decisional capacity, informed consent, treatment refusals, death/dying, pediatric ethics, reproductive issues, research ethics, psychiatric illness. Real cases.

BTHX 5110. Ethical Issues in Pediatrics. (2 cr.; Student Option; Every Spring)
Bioethics concerns the identification, analysis, and resolution of ethical problems that arise in planning for the care of patients in biomedical research, and in relation to the natural world. This course deals with ethical problems that occur frequently in pediatrics settings, in clinical and public health venues, in research and in the environment. The course emphasizes the ethical responsibilities of laypersons, health professionals, researchers and policy makers in planning for and resolving bioethics issues in pediatrics, including the prenatal and perinatal period. Issues addressed include reproductive issues, death and dying, forging life sustaining treatment, conflicts and war, research with children and pregnant women, genetics, public and global health, social justice and other topics.

BTHX 5120. Dying in Contemporary Medical Culture. (2 cr.; Student Option; Every Fall)
Examines practices of dying and death in contemporary U.S. culture, moral problems associated with these practices, possible solutions, and practical applications. Readings will consist of cultural critiques, bioethics literature, and empirical research.

BTHX 5210. Ethics of Human Subjects Research. (3 cr.; Student Option; Fall Even Year)
Issues in ethics of human subjects research. prereq: Grad student or instr consent

BTHX 5220. Standards for Research with Human Participants: A Lecture Series for Researchers. (1 cr.; Student Option; Fall Even Year)
This series of lectures presents various legal and regulatory standards that apply to research using human participants. Some are of general interest (e.g., Informed Consent); others will interest more specialized researchers (e.g., International Research).

BTHX 5300. Foundations of Bioethics. (3 cr.; Student Option; Every Spring)
Overview of major contemporary frameworks used to approach ethical issues in bioethics. prereq: Grad student or instr consent

BTHX 5325. Biomedical Ethics. (1-3 cr.; Student Option; Every Fall & Spring)
Major topics/issues in biomedical ethics. Patients’ rights/duties, informed consent, confidentiality, ethical issues in medical research, initiation/termination of medical treatment, euthanasia, abortion, allocation of medical resources. prereq: Jr or sr grad student or instr consent

BTHX 5400. Intro Ethics in Hlth Policy. (3 cr.; Student Option; Spring Even Year)
Topics vary to reflect issues of current significance. Relates to law/politics as appropriate but focuses on moral analyses of policy issues. prereq: Grad student or professional student or instr consent

BTHX 5411. Health Law and Policy. (3 cr.; A-F or Audit; Spring Even Year)

BTHX 5453. Law, Biomedicine, and Bioethics. (3 cr.; A-F only; Spring Even Year)
Law/bioethics as means of controlling important biomedical developments. Relationship of law and bioethics. Role of law/bioethics in governing biomedical research, reproductive decisionmaking, assisted reproduction, genetic testing/screening, genetic manipulation, and cloning. Definition of death. Use of life-sustaining treatment. Organ transplantation. prereq: Grad student or instr consent

BTHX 5510. Gender and the Politics of Health. (3 cr.; Student Option; Periodic Fall & Spring)
Significance of gender to health and health care. Feminist analysis regarding moral/political importance of gender, possibly including contemporary western medicine? s understanding of the body, childhood, and reproductive technologies; cosmetic surgery; chronic illness; disability; participation in research; gender and classification of disease. Care work, paid/non-paid. Readings from feminist theory, history, social science, bioethics, and moral philosophy.

BTHX 5520. Social Justice and Bioethics. (3 cr.; Student Option; Fall Even Year)
This course explores matters of social justice related to health. Readings from multiple disciplinary perspectives ground examination of how to understand social justice in this context. Class sessions will predominantly focus on specific practical issues such as health disparities, the politics of inclusion and exclusion in clinical research, resource

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This course is an examination of ethical issues pertaining to disability, with an emphasis on discussion and consideration of widely contrasting perspectives. Issues discussed include physician-assisted suicide, euthanasia, selective abortion, cochlear implant technology, sterilization, special versus inclusive education, Universal Design/Universal Instructional Design, disability accommodations, and built and social environments, examined within social, legal, policy, and cultural environments. Assignments include, readings, viewings, journaling, field projects, and research papers.

**BTHX 5710. Ethical Issues in Global Health.**

(3 cr. ; Student Option; Fall Even Year)

This course examines ethical issues related to global health. Topics may include religion, morality, public policy, and the connection between health and human rights. Open to juniors, seniors, graduate and professional students.

**BTHX 5900. Independent Study in Bioethics.**

(1 cr. [max 16 cr.]; Student Option; Spring Even Year)

The student and the faculty member directs and evaluates student’s work. Faculty member directs student’s work and evaluates project. prereq: instr consent

**BTHX 8100. Advanced Theory & Practice of Clinical Ethics.**

(2 cr.; Student Option; Spring Even Year)

This graduate seminar examines the principles and practices of health care ethics consultation. Focuses on the Core Competencies for Health Care Ethics Consultation promulgated by the American Society for Bioethics and Humanities. Topics include the nature and goals of health care ethics consultation, methods and processes of health care ethics consultation, evolving standards of clinical practice, core skills and core knowledge for ethics consultation, consultation evaluation, accountability, and institutional relationships, and special obligations of ethics consultants and institutions. The course serves graduate students in bioethics, ethics committee members (including community/lay members) and ethics consultants, clinical staff and faculty, law students, student clinicians, and students of the social and behavioral sciences and other disciplines. prereq: BTHX 5100 or instr consent

**BTHX 8110. Ethical Issues in Pediatrics.**

(2 cr.; Student Option; Every Spring)

Bioethics concerns the identification, analysis, and resolution of ethical problems that arise in planning for and resolving bioethics issues in pediatrics, including the prenatal and perinatal period. Issues addressed include reproductive issues, death and dying, forgoing life-sustaining treatment, conflicts and war, research with children and pregnant women, genetics, public and global health, social justice and other topics.

**BTHX 8114. Ethical and Legal Issues in Genetic Counseling.**

(; 3 cr.; A-F or Audit; Every Spring)

Professional ethics. Ethical/legal concerns with new genetic technologies. prereq; [MCDG MS, genetic counseling specialization] or instr consent

**BTHX 8120. Dying in Contemporary Medical Culture.**

(2 cr.; Student Option; Every Fall)

Examines practices of dying and death in contemporary U.S. culture, moral problems associated with these practices, possible solutions, and practical applications. Readings will consist of cultural critiques, bioethics literature, and empirical research.

**BTHX 8331. The Psychology of Morality.**

(3 cr.; A-F or Audit; Fall Even Year)

Current research topics in socio-political moral judgment and moral development prereq; Grad consent

**BTHX 8333. FTE: Master's.**

(; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)

tbd prereq: Master's student, adviser consent, DGS consent

**BTHX 8500. Practicum in Bioethics.**

(1-4 cr. ; Student Option No Audit; Every Fall & Spring)

Supervised placement to apply knowledge/ skills from core courses. Individualized plan is developed between student, bioethics adviser or DGS, and mentor at practicum site. prereq: Bioethics grad [major or minor] or instr consent

**BTHX 8510. Gender and the Politics of Health.**

(3 cr.; Student Option; Spring Even Year)

Significance of gender to health and health care. Feminist analysis regarding moral/ political importance of gender, possibly including contemporary western medicine? s understanding of the body, childbirth, and reproductive technologies; cosmetic surgery; chronic illness; disability; participation in research; gender and classification of disease. Care work, paid/non-paid. Readings from

BTHX 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)

tbd

BTHX 8800. Animal Ethics. (3 cr.; Student Option: Periodic Fall & Spring)

Human relationships with animals are changing and this course offers a venue for exploring some of the ethical issues in these evolving relationships. The course will discuss the differences between animal ethics and animal welfare and examine the morality and ethics of human-animal interactions in various contexts. These include cultural and historical views of animals; animals as companions; the use of animals in scientific research, entertainment, and service work; euthanasia; animal production and sustainability; and conservation issues.

BTHX 8900. Advanced Independent Study in Bioethics. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)

Students propose area for individual study with faculty guidance. Students write proposal, which includes outcome objectives and work plan. Faculty member directs student's work and evaluates project. Prereq: instr consent

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Bioinformatics (BINF)

BINF 5490. Topics in Bioinformatics. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

Independent or group study in bioinformatics. Prereq: instr consent

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Biology (BIOL)

BIOL 1001. Introductory Biology: Evolutionary and Ecological Perspectives. (BIOL; 4 cr.; Student Option; Every Fall & Spring)

A one-semester exploration of the genetic, evolutionary, and ecological processes that govern biological diversity from populations to ecosystems. We explore how these processes influence human evolution, health, population growth, and conservation. We also consider how the scientific method informs our understanding of biological processes. Lab. This course is oriented towards non-majors and does not fulfill prerequisites for allied health grad programs.

BIOL 1001H. Introductory Biology I: Evolutionary and Ecological Perspectives. (BIOL; 4 cr.; A-F only; Every Fall)

A one-semester exploration of the genetic, evolutionary, and ecological processes that govern biological diversity from populations to ecosystems. We explore how these processes influence human evolution, health, population growth, and conservation. We also consider how the scientific method informs our understanding of biological processes. Lab. This course is oriented towards non-majors and does not fulfill prerequisites for allied health grad programs.

BIOL 1003. Evolution and Biology of Sex. (BIOL; 4 cr.; Student Option; Every Fall & Spring)

This course is designed as a one-semester exploration of biology from the standpoint of the evolution and biology of sex. It emphasizes scientific processes, evolution, sexual behavior, reproductive biology, and diversity with respect to sexual orientation, reproductive strategies, and gender identity. Lab activities complement these topics. This course does not fulfill prerequisites for allied health grad programs.

BIOL 1009. General Biology. (BIOL; 4 cr.; Student Option; Every Fall, Spring & Summer)

A comprehensive introduction to biology - includes molecular structure of living things, cell processes, energy utilization, genetic information and inheritance, mechanisms of evolution, biological diversity, and ecology. Includes lab. This comprehensive course serves as a prerequisite and requirement in many majors.

BIOL 1009H. Honors: General Biology. (BIOL; 4 cr.; A-F only; Every Spring)

A comprehensive introduction to biology - includes molecular structure of living things, cell processes, energy utilization, genetic information and inheritance, mechanisms of evolution, biological diversity, and ecology. Includes lab. This comprehensive course serves as a prerequisite and requirement in many majors.

BIOL 1012. Human Biology: Concepts and Current Ethical Issues. (BIOL; 4 cr.; Student Option; Every Fall & Spring)

One-semester exploration of human anatomy, physiology and medical ethics; topics such as human cells, genetics, organs, disease and reproduction. Weekly debates/discussions on ethical issues. Active learning format. Animal dissections required. Suitable for students in any major. Does not fulfill prerequisites for allied health grad programs.

BIOL 1015. Human Physiology, Technology, and Medical Devices. (BIOL,T5; 4 cr.; Student Option; Every Fall & Spring)

Course is organized around homeostasis, information flow, and other concepts in physiology. For non-biology majors who wish to explore interests in health care or medical device engineering. Active learning format. Labs focus on data collection and simple organ dissections. Does not fulfill prerequisites for most biomedical graduate programs.

BIOL 1020. Biology Colloquium. (1 cr. [max 2 cr.]; S-N or Audit: Every Fall & Spring)

Introduction to the diverse fields of biology through seminars, lab tours, trips to Itasca Biological Station, and interaction with other biology students and faculty. Course may be repeated once.

BIOL 1052. Environmental Biology: Science and Solutions. (ENV; 3 cr.; Student Option; Every Fall)

This course explores the science behind environmental topics. It delves into the

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interface of science and policy, environmental decision-making and ethics. Topics include biodiversity, environmental toxicology, food production, and global climate change. Students working to fulfill the liberal education requirement—Biological Sciences with Lab in this topic should take Biology 1055.

BIOL 1055. Environmental Biology: Science and Solutions with Laboratory. (BIOL, ENV, 4 cr.; S-N only; Every Fall & Spring) Explores science behind environmental topics. Delves into the interface of science and policy, environmental decision-making and ethics. Topics include biodiversity, env. toxicology, food production, and climate change. In lab students conduct the work of biologists, proposing hypotheses, conducting experiments, and analyzing/interpreting data. This course is intended to engage non-biology majors in the work of biology, studying current biological knowledge through evidence-based discussions of what is currently known, and by addressing science that is unknown to the students (and, at times to the biological community) through the generation and testing of hypotheses, collection and analysis of data, and practice of making data-informed conclusions.

BIOL 1093. Biology Colloquium: Directed Study. (1 cr.; S-N or Audit; Every Fall & Spring) Individual study or research undertaken by a student concurrently enrolled in BIOL 1020 with oversight by a faculty sponsor. prereq: BIOL 1020 and concurrent registration is required (or allowed) in BIOL 1020.

BIOL 1101. Genetics and Society. (CIV: 3 cr.; Student Option; Every Spring) Principles of heredity and their social and cultural implications. prereq: No cr if taken after 4003 or GCB 3022.

BIOL 1301. Dean’s Scholar: Introduction to Leadership. (1 cr.; S-N only; Every Fall) Leadership theory/concepts. Personal views on leadership. Characteristics for effective leadership. Course uses experiential teaching methods, self-reflection, prereq: Dean’s Scholar.

BIOL 1805. Nature of Life: Introducing New Students to the Biological Sciences. (0.5 cr.; S-N or Audit; Every Fall & Spring) Biological sciences, from molecules to ecosystems and from laboratory science to field biology. Introduction to the College of Biological Sciences community and opportunities. Held at Itasca Biological Station and Laboratories. Transportation, board, and lodging fee. prereq: Fr in College of Biological Sciences.

BIOL 1806. Nature of Life, Part Two. (0.5 cr.; S-N only; Every Spring) Second semester of Nature of Life with focus on building intentional pathway in CBS/student success/engagement. prereq: BIOL 1020.

BIOL 1911. Curing Cancer. (1 cr.; A-F only; Every Fall) The objective of this seminar is to develop a basic understanding of the molecular origins of cancer, how it is currently treated, and the exciting efforts to develop new, more effective anti-cancer drugs. We will read and discuss two recent books, The Emperor of all Maladies by Siddhartha Mukherjee and The Immortal Life of Henrietta Lacks. Each class session will involve interactive discussions and a lively exchange of thoughts and ideas.

BIOL 1912. Photographing the University Community. (2 cr.; A-F only; Every Fall) This seminar will provide students and faculty an opportunity to explore the art of photojournalism and/or documentary photography. Students and faculty will take photographs on the University campus or the surrounding neighborhoods and then each person will assemble their photographs into a coherent essay. The seminar will include social themes, and will have a strong writing component, as well as the obvious focus on photography.

BIOL 1913. Understanding the Evolution-Creationism Controversy. (1 cr.; A-F only; Every Fall) This seminar has two goals: 1) to help you succeed at the University of Minnesota, and 2) to help you develop your own understanding and appreciation of the evolution-creationism controversy. We’ll discuss the many aspects of the evolution-creationism controversy, including its history, legacy, relevance, and key people. We will also discuss a variety of issues related to the controversy, including those involving court decisions, public opinion, racism, politics, etc. Many people are emotional and opinionated about the evolution-creationism controversy. Although this seminar is not focused on opinions, we will talk about why so many people feel strongly about this issue, and why the controversy persists. You will be interested in?and probably surprised by?what you learn. Each week we will also talk about concerns and/or questions you have about life at the University. Although I can’t fix your parking tickets, I can offer advice about what you’ll need to do to succeed here.

BIOL 1915. Genomics in Your Current and Future Life. (1 cr.; A-F only; Every Fall & Spring) In this seminar, DNA and genomes will be discussed in many contexts, including medical science (diagnosing a disease and finding miracle cures), crime scene investigation, ethics, the modification of life at every level on the planet, etc. Students will discuss their thoughts on a variety of controversial issues both online and in class. In addition to learning about how our understanding of DNA and genomes has infiltrated every aspect of society, students will develop their process of thinking about complex problems by writing short opinions and evaluating those of others in class. ?Clickers? are used intensively in the course to determine how participants feel about certain positions on controversial subjects and to stimulate discussion of different points of view. All reading material will be furnished online, but students must buy their own clicker from the bookstore or elsewhere.

BIOL 1916. Visualizing Results. (2 cr.; A-F only; Every Fall) Much of research is focused on generating and analyzing data. But effectively displaying this data is key to communicating one’s results. Effective visualizations can help communicate major results and can be quite convincing. Poor visualizations can confuse and even mislead the audience. This course will consider best practices in the visual presentation of scientific and empowers students to evaluate the presentation of data and to generate effective figures using modern computational software.

BIOL 1917. Experimental Evolution. (1 cr.; A-F only; Every Fall) Life originated over four billion years ago. Since that time, evolution has shaped living systems, generating tremendous biological diversity. Experimental evolution is a dynamic approach to investigating life, examining how and why biological systems change over evolutionary time. We will focus on how experimental evolution is done, what we have already learned, and the bright future for new research. Topics will include adaptive radiation, infectious diseases, the genetic basis of phenotypes, speciation, and the evolution of multicellularity. Readings will be primary literature and review articles, to be discussed every meeting. Toward the end of the semester, students will propose their own experimental evolution study based upon the readings, class discussions, and meetings with faculty.

BIOL 1918. Evolutionary Perspectives on Agriculture and Human Health. (1 cr.; A-F only; Every Fall) Crops, humans, pests, and pathogens have evolved and continue to evolve, largely by natural selection (non-random differences in reproduction and survival among random genetic variants). Weeds and insect pests readily evolve resistance to our control methods, from crop rotation to chemical pesticides. Human pathogens evolve resistance to antibiotics. Can we slow such harmful evolution? Also, can the evolutionary history of crops help guide plant breeding? Can our own evolutionary history suggest ways to improve health-care in humans? In this seminar, students will read a scientific paper every two weeks and discuss it in weekly sessions. Writing assignments will be frequent but short, such as “choose one of the figures in the paper and explain it in your own words” or “pick one of the assumptions this paper makes, and outline an experiment that would test the assumption (i.e., potentially prove it wrong, if it is wrong).”

BIOL 1919. Native Plants and Native Foods. (1 cr.; A-F only; Every Fall & Spring) This seminar will encourage students to explore plants native to your culture. Are these plants well-known and readily available or are they heritage plants, part of an endangered tradition? As we examine plant/food use from biological, historical, and cultural perspectives, you will research a plant, analyze multidisciplinary research, and construct a video. Students can also look forward to guest speakers and field trips that will introduce you to broader University plant resources.
BIOL 1921. The Nexus Between Art and Biology. (2 cr.; A-F only; Every Fall) This seminar will explore the many and diverse interactions between art and biology. The topics covered range from the portrayal of biology in classic art, to the use of artistic venues for studying and remediating environmental problems, to the utility of photography, painting, sculpture, and other art forms to explore levels of biology ranging from molecular and cellular structures to landscapes. The course includes hands-on creation of artistic biological objects. Topics will be explored using recorded media and presentations by students, the instructor, and invited speakers to cover novel topics at the art/biology interface.

BIOL 1922. You Contain Multitudes: Living in the Age of the Microbiome. (1 cr.; A-F only; Every Fall) The recent discovery that each of us is home to a unique collection of microbes raises many questions about how this "microbiome" affects our health, nutrition, and even mood. Scientific research on the microbiome, fueled by improvements in DNA sequencing technology, has moved beyond classifying who has what microbes and is now beginning to answer questions about how microbes and multi-cellular life co-evolve and co-exist. In this course, we will primarily read and discuss "I Contain Multitudes" by Ed Yong and complete short writing assignments that explore differences between styles of science writing. No prior knowledge of (micro)biology is assumed or required--only a desire to change the world through science communication.

BIOL 1923. Fake! The Value of Authenticity. (1 cr.; A-F only; Every Fall) Fake art, fake diamonds, fake friends, fake news? What is fake and how do we know what is real? Are things that are fake automatically worthless (or worth less)? In this freshman seminar we will explore what fake means in different contexts, from nature to art to society. Through readings, discussions, guest speakers, and activities we will discover aspects of "fake" from flowers that pretend to be insects to imitation food, from counterfeit designer clothes to forged money or paintings. What motivates people to create fake objects? And why do we feel cheated when we learn that something is not what it pretends to be?

BIOL 1942. Science and Politics of Genetics and Reproduction. (TS; 3 cr.; A-F only: Every Fall) In this seminar, students will read, discuss, debate, and generally engage with a myriad of issues surrounding the science of genetics and the application of revolutionary technologies to human reproduction. Students will explore topics and controversies relating to the past, present, and future of human sexual activity and human reproduction, and how reproductive technologies (such as in vitro fertilization) have helped shape our modern society. Through the use of both fiction and non-fiction literature, students will learn the details of current scientific breakthroughs such as "designer babies." This seminar aims to engage students in an exploration of their personal beliefs about the roles of science, the government, and also religious institutions on human reproductive rights.

BIOL 1951. Foundations of Biology Lecture I for Biological Sciences Majors. (BIOL; 4 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; calculus I or equiv recommended

BIOL 1951H. Foundations of Biology Lecture I for Biological Sciences Majors. (BIOL; 4 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; calculus I or equiv recommended

BIOL 1961. Foundations of Biology Lab I for Biological Sciences Majors. (BIOL; 2 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; prereq or coreq: BIOL 1951 or BIOL 1951H, calculus I or equiv recommended

BIOL 1961H. Foundations of Biology Lab I for Biological Sciences Majors. (BIOL; 2 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; prereq or coreq: BIOL 1951 or BIOL 1951H, calculus I or equiv recommended

BIOL 1951. Foundations of Biology Lecture I for Biological Sciences Majors. (BIOL; 4 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; calculus I or equiv recommended

BIOL 1951H. Foundations of Biology Lecture I for Biological Sciences Majors. (BIOL; 4 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; calculus I or equiv recommended

BIOL 1961. Foundations of Biology Lab I for Biological Sciences Majors. (BIOL; 2 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; prereq or coreq: BIOL 1951 or BIOL 1951H, calculus I or equiv recommended

BIOL 1961H. Foundations of Biology Lab I for Biological Sciences Majors. (BIOL; 2 cr.; A-F only; Every Fall & Spring) Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications, prereq: [CHEM 1021 or 1061 or 1081 or equiv], CBS major or dept consent; prereq or coreq: BIOL 1951 or BIOL 1951H, calculus I or equiv recommended

BIOL 2001. Career Planning for Biologists. (1 cr.; S-N or Audit; Every Fall & Spring) Introduction to career planning. Students assess their strengths, interests, values, and motivations. Decision making, campus/community resources, developing an action plan. Online modules/assessments, in-class discussions, presentations, one-to-one consultations.

BIOL 2003. Foundations of Biology for Biological Sciences Majors, Part II. (3 cr.; A-F only; Every Fall & Spring) Second of two courses. Biological concepts, from biomolecules to ecosystems. Ecology/biochemistry concepts within problem solving/application.

BIOL 2003H. Foundations of Biology for Biological Sciences Majors, Part II. (3 cr.; A-F only; Every Fall & Spring) Second of two courses. Biological concepts, from biomolecules to ecosystems. Ecology/biochemistry concepts within problem solving/application.

BIOL 2005. Animal Diversity Laboratory. (2 cr.; Student Option; Every Fall, Spring & Summer) Dissection, direct observation of representatives of major animal groups.

BIOL 2007. Marine Animal Diversity Laboratory. (1 cr.; A-F only; Every Fall & Spring) Survey of marine animal diversity. Understanding major animal groups, how they relate to one another, how they differ in structure, how each group achieves survival/reproduction in diverse environments. Lab includes dissections, including vertebrates, such as fish. prereq: Introductory biology with lab

BIOL 2012. General Zoology. (4 cr.; Student Option; Every Fall & Spring) Major animal groups (phyla). Applications of morphological, physiological, and developmental characteristics to define evolutionary relationships. Parasitic forms affecting human welfare. Lab requires dissection, including mammals. prereq: One semester of college biology

BIOL 2100. Brewing: The Biology, History, and Practice. (3 cr.; A-F only; Periodic Fall & Spring) Rigorous look at the history of brewing, microbiology, biochemistry, and biological concepts associated with brewing, such as competition, and practical aspects of modern brewing. This lecture/laboratory hybrid course will teach students the components used in brewing and how they contribute to the final product as well as the process of brewing using hands on laboratory. Textbook is online and will be posted on the Canvas site. prereq: BIOL 1001 or 1009 or 1951 or 2002 or 2003 or 2004 Students must be 21 by the first day of class (Jan. 17, 2018) to register, we will check IDs on the first day of class. There are three required field trips. Field trips are on Fridays and are scheduled for: Mar 23rd, Mar 30th and likely a Friday in February. For the field trips students meet in McNeal Hall at 1:00pm and return approximately at 5pm to McNeal Hall.

BIOL 2301. Dean’s Scholar: Critical Service Learning. (2 cr.; S-N only; Every Fall & Spring) Importance of service in leadership. How personal experiences influence perspectives on social issues. Techniques for group work. Service project with community organization related to biological sciences. prereq: 1301, CBS Dean’s Scholar

BIOL 2800. Understanding the Environment: Ecology for Educators. (5 cr.; A-F only; Every Summer) Ecology/earth systems science content, concepts, and investigation skills that environmental educators, science communicators, and natural history interpreters should be proficient in when addressing respective audiences about science, environmental issues, and nature studies.

BIOL 2905. Nature of Life, Part III. (0.5 cr.; S-N only; Every Fall)
Reflect on aspirations, personal characteristics, experiences. Resources/practical tools to reach educational/professional goals. Special focus on developing personal/professional goals, articulating personal experiences in light of aspirations. prereq: 1805, 1806

**BIOL 2906. Nature of Life, Part IV.** (0.5 cr.; S-N only; Every Spring) Reflect on aspirations, personal characteristics, experiences. Resources/practical tools to reach educational/professional goals. Special focus on developing personal/professional goals, articulating personal experiences in light of aspirations. prereq: 2905

**BIOL 2960H. Exploring Research in the Biological Sciences.** (1 cr.; A-F only; Every Fall) Explore areas of biological research. Learn where/how to access research papers. Prepare in-depth review paper. prereq: CBS, Honors program, soph, dept consent

**BIOL 3001. Nature of Science and Research.** (1 cr.; S-N only; Every Fall) Explore how to read/use research papers. Role of research ethics. Financial, legal, regulatory oversight on research/other topics. **This course is for new CBS transfer students from other institutions. prereq: College-level biology

**BIOL 3004. Foundations of Biology for Biological Sciences Majors, Part II Laboratory.** (3 cr.; A-F only; Every Fall & Spring) Accompanies 2003. Students design and perform research projects that will require an additional 4 to 6 hours of lab work per week; times to be arranged. Each section is devoted to either Pseudomonas adaptive radiation, zebrafish environmental toxicology, or microbiome/bioinformatics research. If you have taken BIOL 2002 before Fall 2015, you should register for a Pseudomonas or zebrafish research project; only students with previous command line coding experience should apply for a bioinformatics research project. All projects involve relationships between biology and other sciences, and applying quantitative skills, scientific method, and modern biological tools to real-world questions. BIOL (2002 or 2002H or 1961or 1961H) and CBS major

**BIOL 3004H. Foundations of Biology for Biological Sciences Majors, Part II Laboratory.** (3 cr.; A-F only; Every Fall & Spring) Accompanies 2003H. Students design and perform research projects that will require an additional 4-6 hours of lab work per week; times to be arranged. Each section is devoted to either Pseudomonas adaptive radiation, zebrafish environmental toxicology, or microbiome/bioinformatics research. If you have taken BIOL 2002 before Fall 2015 you should register for a Pseudomonas or zebrafish research project; only students with previous command line coding experience should apply for a bioinformatics research project. All projects involve relationships between biology and other sciences, and applying quantitative skills, scientific method, and modern biological tools to real-world questions. prereqs BIOL (2002 or 2002H or 1961or 1961H) and honors

**BIOL 3211. Physiology of Humans and Other Animals.** (3 cr.; Student Option; Every Fall & Spring) Study of the various solutions to common physiological problems faced by humans, other vertebrates, and invertebrates. Core concepts in physiology including flow down gradients, homeostasis, cell-cell communication, interdependence of body systems, cell membrane dynamics, and mathematical modeling of physiological processes. Active learning format. prereq: [1009 or 2003], [CHEM 1062/1066 or 1082/1086], [2005 is recommended]

**BIOL 3270. Introduction To Systems Biology.** (3 cr.; A-F only; Every Spring) Emergent properties of metabolic networks; Computational modeling of metabolism; Parameter estimation from high-throughput measurements; Prediction of metabolic phenotypes for knockout mutants; Flux balance analysis; Metabolic control analysis. prereq: Recommended prereq MATH1241, BIOC3021

**BIOL 3272. Applied Biostatistics.** (4 cr.; A-F only; Every Fall & Spring) Conceptual basis of statistical analysis. Statistical analysis of biological data. Data visualization, descriptive statistics, significance tests, experimental design, linear model, simple/multiple regression, general linear model. Lectures, computer lab. prereq: High school algebra; BIOL 2003 recommended

**BIOL 3272H. Applied Biostatistics.** (4 cr.; A-F only; Every Fall & Spring) Conceptual basis of statistical analysis. Statistical analysis of biological data. Data visualization, descriptive statistics, significance tests, experimental design, linear model, simple/multiple regression, general linear model. Lectures, computer lab. prereq: High school algebra; BIOL 2003 recommended

**BIOL 3303. Dean’s Scholar: Peer Leadership Development.** (1 cr.; S-N only; Every Fall) This course teaches theoretical frameworks, principles, and practices of effective peer leadership. As a Dean’s Scholars Peer Mentor, you are in a peer leadership role that requires you to serve as a support, resource, connection, and bridge between first year students and their campus experience. This course will teach you in-depth, academic frameworks about the theory behind peer leadership; how it impacts the college student experience, why it works, and tools and practices that distinguish role modeling from exceptional peer leadership. The course also offers a learning laboratory for you to reflect and synthesize various aspects of your student leadership experience with a community of fellow leaders.

**BIOL 3503. Biology of Aging.** (2 cr.; A-F only; Periodic Fall) Age-related changes in individuals/populations. Evolution of senescence. Genes that influence aging. Interventions. Prospects for an aging human society. prereq: 1002 or 1009 or 2003 or equiv

**BIOL 3600. Directed Instruction.** (1-2 cr.; [max 6 cr.]; S-N or Audit; Every Fall & Spring) Students assist with biology colloquium. prereq: 1020, upper div, application, instr consent; up to 4 cr may apply to major

**BIOL 3610. Internship: Professional Experience in Biological Sciences.** (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer) Matches student's academic or career goals with opportunities in industry, non-profit organizations, and government agencies. Prereq-Acceptance into CBS Internship Program, internship workshop, college consent.

**BIOL 3700. Undergraduate Seminar.** (1-3 cr.; max 9 cr.; Student Option; Every Fall & Spring) Faculty members lead students in discussions on topics of interest.

**BIOL 3960H. Communicating in the Biological Sciences.** (1 cr.; A-F only; Every Fall) Oral reports on topics of current interest to biologists. Progress reports on lab and field research by students.

**BIOL 4003. Genetics.** (3 cr.; Student Option; Every Fall, Spring & Summer) Genetic information, its transmission from parents to offspring, its expression in cells/organisms, and its course in populations. prereq: Biol 3020 or BioC 3021 or BioC 4331 or grad MSB

**BIOL 4004. Cell Biology.** (3 cr.; Student Option; Every Fall, Spring & Summer) Processes fundamental to cells. Emphasizes eukaryotic cells. Assembly/function of membranes/organelles. Cell division, cell form/movement, intercellular communication, transport, secretion pathways. Cancer cells, differentiated cells. prereq: BIOL 3020 or BIOL 4003 or grad MSB

**BIOL 4201. Teaching in the Biology Laboratory.** (1 cr.; max 2 cr.; S-N only; Every Fall & Spring) Pedagogical underpinnings for teaching in lab. prereq: Student who is teaching in CBS lab course

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
BIOL 4321W. Deconstructing Research: Writing about Biological Research for Non-scientists. (WI; 2 cr.; Student Option; Every Spring)
Deconstructing Biology Research is designed to help majors in the College of Biological Sciences improve their skills in selecting primary research papers, understanding the experimental approaches taken by the authors of those papers, and evaluating the results and conclusions. Students will then share that knowledge by writing effective deconstructions that explain the research approaches and results for different audiences, including the public at large. Prereq: BIOL 2003 and BIOL 3004

BIOL 4590. Coral Reef Ecology. (2 cr.; A-F only; Every Fall)
Contemporary issues in tropical reef ecology from diverse perspectives. Option of two-credit seminar during fall semester plus additional two-credit field option (BIOL 4596) to involve SCUBA diving/snorkeling on tropical reef. Prereq: Introductory biology course with lab

BIOL 4596. Coral Reef Ecology (Dive Trip). (2 cr.; A-F only; Every Fall)
SCUBA diving/snorkeling on tropical reef. Conduct primary research/writing. Prereq: Introductory biology with lab, valid passport, and SCUBA certification.

BIOL 4793W. Directed Studies: Writing Intensive. (WI; 1-6 cr. [max 36 cr.]; S-N only; Every Fall, Spring & Summer)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature or literature on biology education. Prereq: instr consent, dept consent

BIOL 4794W. Directed Research. (WI; 1-6 cr. [max 36 cr.]; S-N only; Every Fall, Spring & Summer)
Lab or field investigation of selected areas of research. Prereq: instr consent, dept consent

BIOL 4850. Special Topics in Biology. (1-5 cr. [max 10 cr.]; A-F only; Periodic Summer)
Offered at Itasca Biological Station and Laboratories. Metagenomics, telemetry/animal behavior, aquatic botany, field evolution, parasite and disease ecology. Prereq: Beginning biology

BIOL 4950. Special Topics in Biology. (1-4 cr. [max 12 cr.]; Student Option; Periodic Spring)
In-depth study of special topic in life sciences.

BIOL 4960H. Thesis Writing in the Biological Sciences: Developing the Literature Review. (1 cr.; A-F only; Every Fall)
In the Fall semester of the two-semester capstone thesis support course, CBS honors students will develop and refine the literature review introduction component of the honors thesis. The course will focus on conceptualizing the gap in knowledge, drafting the literature review, and revising in response to peer and outside reader feedback. We will use the literature to unpack the conventions of authentic scientific writing so that students can begin to draft other sections of their thesis (methods, results narrative, publication ready figures, legends) By the end of the term, students will have developed and peer-workshopped at least one draft module of each data-related thesis section and they will have a revised version of the thesis introduction/literature review to deliver to their faculty research mentor for feedback before the start of the Spring term. Students should be in a research lab and have started their research project before the start of the semester. Students who have not yet fulfilled an upper division WI course in the biological sciences should wait until the Spring (final) semester to register for their major’s version of WI directed research. Options for WI directed studies (for example, MCB 4794W or 4793W). The completed and approved thesis will count for the WI.

BIOL 4961H. Thesis Writing in the Biological Sciences: Conveying and Contextualizing Results. (1 cr.; A-F only; Every Spring)
Continue work in BIOL 4960H to develop/draft/revise results/methods/discussion sections of honors thesis. Prepare and present professional research poster. Complete thesis assessed against standards outlined in CBS Thesis Assessment Rubric. Prereq: honors, CBS student or interdisciplinary major with life sciences focus

BIOL 4993. Directed Studies. (1-6 cr. [max 36 cr.]; S-N only; Every Fall, Spring & Summer)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature or literature on biology education. Prereq: instr consent, dept consent

BIOL 4994. Directed Research. (1-6 cr. [max 36 cr.]; S-N only; Every Fall, Spring & Summer)
Lab or field investigation of selected areas of research. Prereq: instr consent, dept consent

BIOL 5272. Applied Biostatistics. (4 cr.; A-F only; Every Fall & Spring)

BIOL 5309. Molecular Ecology And Ecological Genomics. (3 cr.; Student Option; Fall Every Year)
Application of molecular tools (PCR, sequencing, AFLP, SNPs, QTL) and analyses of molecular data for understanding ecological/evolutionary processes. Strengths/weaknesses of techniques/analyses. Questions molecular tools are used to answer. Prereq: BIOL 3407 or BIOL 3409 or BIOL 4003

BIOL 5407. Ecology. (3 cr.; Student Option; Every Fall & Spring)
Principles of population growth/interactions and ecosystem function applied to ecological issues, including regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, and biodiversity. Lab. Prereq: [One semester college biology, [MATH 1142 or MATH 1271 or MATH 1281 or equiv], grad student] or instr consent

BIOL 5409. Evolution. (3 cr.; Student Option; Every Fall)
Diversity of forms in fossil record and in presently existing biology. Genetic mechanisms of evolution. Examples of ongoing evolution in wild/domesticated populations and in disease-causing organisms. Lab. Prereq: One semester of college biology, grad student

BIOL 5910. Special Topics in Biology for Teachers. (1-4 cr. [max 12 cr.]; Student Option; Every Spring & Summer)
Courses developed for K-12 teachers depending on topics or subtopics which might include any of the following: plant biology, animal biology, genetics, cell biology, biochemistry, microbiology. Prereq: BA or BS in science or science education or elementary education or K-12 licensed teacher

BIOL 5950. Special Topics. (1-4 cr. [max 8 cr.]; Student Option; Periodic Fall, Spring & Summer)
In-depth study of special topic in life sciences.

BIOL 6793. Directed Studies. (1-7 cr.; S-N or Audit; Every Fall, Spring & Summer)
Individual study on selected topics/problems. Emphasizes either readings/use of scientific literature or laboratory/field techniques. Prereq: MBS, 7 cr max, instr consent

BIOL 6989. Capstone Project. (2 cr.; S-N or Audit; Every Fall, Spring & Summer)
Independent, original investigation of a relevant subject, challenge, or issue within biological sciences. Project takes approximately 120 hours. Prereq: MBS, instr consent

BIOL 8100. Improvisation for Scientists. (1 cr.; S-N or Audit; Every Fall)
This is a 7-week course designed to practice a wide array of strategies in order to gain awareness and control over your personal expression. Students will develop more effective ways to expand their ability to manage their personal expression in front of others. Students will use improvisation as a tool to expand their ability to navigate the stress generally associated with delivering content in front of others. By learning how to manage their personal expression more effectively, students will be able to use specific tools in order to adapt their expression to various settings (large audiences, small groups, or one on one interviews/counseling). Adapting exercises from techniques such as即席演奏 and storytelling, this class will provide a comfortable and safe environment for students who want to expand their confidence when presenting for others.
Biomedical Engineering (BMEN)

BMEN 1601. Biomedical Engineering Undergraduate Seminar I. (1 cr.; A-F only; Every Fall)
Introduction to biomedical engineering from academic/industrial perspectives. Survey of current/emerging areas. Prereq: CSE student

BMEN 1602. Biomedical Engineering Undergraduate Seminar II. (1 cr.; A-F only; Every Spring)
Continuation of 1601. Emphasizes biomedical engineering design and numerical analysis. Prereq: CSE student

BMEN 2101. Biomedical Thermodynamics. (; 3 cr.; A-F only; Every Spring)
Introduction to thermodynamics with biological emphasis. First Law, Boltzmann distribution, reaction equilibrium, random walks, friction, diffusion in fluids, entropy, free energy, Maxwell relations, phase equilibria, chemical forces, self-assembly, cooperative transitions, molecular machines, membranes. Introduction to statistical mechanics. Prereq: 2501, CHEM 1022, MATH 2373, concurrent registration is required (or allowed) in MATH 2374

BMEN 2151. Introductory Medical Device Prototyping. (3 cr.; A-F only; Every Spring)
Engineering drawing with SolidWorks; CAM and 3D FDM printing; Lathe, mill, and other shop instruction; Biomaterials & biocompatibility; Digital and analog electronics, SPICE and test equipment; Programming in C; and Microcontrollers, sensors and actuators.

BMEN 2401. Programming for Biomedical Engineers. (2 cr.; A-F only; Every Fall)
Introduction to structured programming in biomedical engineering. Development of programming skills/logic relevant for numerical methods used for analyzing biomedical signals and solving algebraic/differential equations using Matlab. Programming logic/structured programming, introduction to scientific computation motivated by signal representations. Weekly lecture, computer lab modules. Prereq: MATH 1272, PHYS 1302, CSE student

BMEN 2501. Cellular and Molecular Biology for Biomedical Engineers. (BIOL; 4 cr.; A-F or Audit; Every Fall)
Fundamentals of cellular/molecular biology. Chemistry of proteins, lipids, and nucleic acids. Applications to biomedical engineering. Function/dynamics of intracellular structures and differentiated animal cells. Application of physical/chemical fundamentals to modeling cellular/subcellular processes. Lecture/lab. Prereq: concurrent registration is required (or allowed) in CHEM 1022, concurrent registration is required (or allowed) in MATH 1372, concurrent registration is required (or allowed) in PHYS 1302, CSE student

BMEN 3151. Medical Device Practicum. (1 cr.; A-F only; Every Summer)
Lab accompanies BMEN 3111 Biomedical Transport Processes. Prereq: [3011, concurrent registration is required (or allowed) in 3111]. [BMEN upper div or dept consent]

BMEN 3155. Medical Device Practicum. (1 cr.; A-F only; Every Summer)
BMEN 3155 "Medical Device Practicum" allows students to use the skills they learned in BMEN 2151 "Introductory Medical Device Prototyping" for making an actual medical device prototype. Weekly seminars introduce advanced medical device topics that will be fundamental to senior design. Students will become acquainted with the following topics: Design opportunities in medicine, conceiving and vetting a medical device, FDA regulations and guidance, intellectual property, commercialization licensing and entrepreneurship, and building a medical device prototype.

BMEN 3211. Bioelectricity and Bioinstrumentation. (3 cr.; A-F or Audit; Every Fall)
Principles of electrical phenomena, instruments relevant to biomedical applications. Lecture/discussion. Prereq: BME Upper Div or dept consent

BMEN 3215. Bioelectricity and Bioinstrumentation Lab. (1 cr.; A-F or Audit; Periodic Fall)
Lab accompanies BMEN 3211 Bioelectricity/ Bioinstrumentation. Prereq: [BMEN Upper Div or dept consent], concurrent registration is required (or allowed) in 3211

BMEN 3311. Biomaterials. (3 cr.; A-F or Audit; Every Spring)

BMEN 3315. Biomaterials Lab. (1 cr.; A-F or Audit; Every Spring)
Lab accompanies BMEN 3311 Biomaterials. Prereq: [2101, concurrent registration is required (or allowed) in 3311], [BMEN Upper Div or dept consent]

BMEN 3411. Biomedical Systems Analysis. (3 cr.; A-F or Audit; Every Spring)
Quantitative analysis of physiological/biological systems. First/second order systems, linear time-invariant systems, systems classification/identification. Linear control theory/controller synthesis. Electrical, mechanical, thermal, chemical/biomedical control systems. Prereq: 3211, [BMEN Upper Div or dept consent]

BMEN 3415. Biomedical Systems Analysis Lab. (1 cr.; A-F or Audit; Every Spring)
Lab accompanies BMEN 3411 Biomedical Systems Analysis. Prereq: [3211, concurrent registration is required (or allowed) in 3411], [BMEN Upper Div or dept consent]

BMEN 3601. Biomedical Engineering Careers and Practice in the Med Tech Industry. (1 cr.; A-F only; Every Spring)
Local industry speakers describe various job roles available to BBmE graduates at

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University of Minnesota Twin Cities Catalog

BMEN 4001W. Biomedical Engineering Design I. (WI; 3 cr.: A-F or Audit; Every Fall) Introduction to biomedical engineering and medical technologies. Students work in teams on open ended design projects, present completed work at design show. Prereq: 2501, 3001, 3101, 3201, 3301, 3701

Continuation of 4001W. Prereq: 4001W

BMEN 4011. CAD/CAD of Biomedical Devices. (1 cr.; A-F or Audit; Every Fall) Simulation, analysis, design of industry common Biomedical Devices with using CAD software. Allium Designer CAD/LT Spice. Prereq: [3211, 3215] or instr consent

BMEN 4013. CAD of Biomechanical/transport Devices. (1 cr.; A-F or Audit; Every Fall) Introduction to CAD modeling/analysis for medical device engineers using SOLIDWORKS CAD platform. Emphasis on practical applications of CAD for engineers using real-world examples from actual industry projects. Prereq: BME Upper Division or instr consent

BMEN 4015. CAE of Biomechanical/transport Devices. (1 cr.; A-F or Audit; Every Fall) Analyze transport/mechanical problems involving biomedical engineering/medical devices. Prereq: 3011, 3015, 3111, 3115

BMEN 4710. Directed Research. (1-4 cr. [max 6 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent laboratory research under faculty supervision. Prereq: instr consent, dept consent

BMEN 4720. Directed Study. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer) Directed study under faculty supervision. Prereq: instr consent, dept consent

BMEN 4794H. Directed Research Honors. (1-4 cr. [max 24 cr.]; A-F only; Every Fall, Spring & Summer) Independent laboratory research under faculty supervision. Prereq: BME UD, UHP student, instr consent, dept consent

BMEN 4896. Industrial Assignment I: Co-op Program. (2 cr.; A-F only; Every Summer) Industrial assignment in co-op program. Industrial work assignment in engineering intern program. Evaluation based on student's formal written report covering semester's work assignment. Please visit the Engineering Co-op Program's website for the full syllabus and course information: http://co-op.umn.edu Prereq: BMEn upper div, completion of required courses in BMEn prog through spring sem of 3rd yr, registered in co-op prog Prereq: BMEn upper div, completion of required courses in BMEn prog through spring sem of 3rd yr, registered in co-op prog

BMEN 4996. Industrial Assignment II: Co-op Program. (3 cr.; A-F only; Every Spring) Industrial Assignment in co-op program. Formal written final report on assignment. Prereq: 4896, registration in co-op prog

BMEN 5001. Advanced Biomaterials. (3 cr.; A-F or Audit; Every Fall) Commonly used biomaterials. Chemical/physical aspects. Practical examples from such areas as cardiovascular/orthopedic applications, drug delivery, and cell encapsulation. Methods used for chemical analysis and for physical characterization of biomaterials. Effect of additives, stabilizers, processing conditions, and sterilization methods. Prereq: 3301 or MatS 3011 or grad student or instr consent

BMEN 5031. Engineering Extracellular Matrices. (3 cr.; A-F only; Every Fall) This class explores the complex set of fibrous and linking proteins of tissues, namely the extracellular matrix (ECM). The ECM is crucial not only for maintaining the structure of tissues but also for guiding and maintaining cellular functions and fate processes. The purpose of the course is to become acquainted with ECM proteins and to investigate how control or manipulation of ECM proteins impacts on cell and tissue function with an emphasis on impacts for regenerative medicine. In the course of this study, we will apply fundamentals of physics, chemistry, and mathematics to make predictions, solve problems and optimize outcomes related to ECM engineering. Required prerequisits: Upper Division Undergraduate or Graduate level student standing in CSE. Recommended prerequisits: BMEn 2501, 3011/3015, 3111/3115, 3301/3315, or equivalents (introduatory cell/molecular biology, biomaterials, biotransport, biomechanics).

BMEN 5041. Tissue Engineering. (3 cr.; Student Option; Every Fall) Fundamentals of wound healing and tissue repair; characterization of cell-matrix interactions; case study of engineered tissues, including skin, bone marrow, liver, vessel, and cartilage; regulation of biomaterials and engineered tissues. Prereq: CSE upper div or grad student or med student or instr consent

BMEN 5101. Advanced Bioelectricity and Instrumentation. (3 cr.; Student Option; Periodic Spring) Instrumentation, computer systems, and processing requirements for clinical physiological signals. Electrode characteristics, signal processing, and interpretation of physiological events by ECG, EEG, and EMG. Measurement of respiration and blood volume/flow. Prereq: [CSE upper div, grad student] or instr consent

BMEN 5111. Biomedical Ultrasound. (3 cr.; Student Option; Every Spring) Introduction to biomedical ultrasound, including physics of ultrasound, transducer technology, medical ultrasound imaging, photoacoustic imaging, applications of non-linear acoustics, and high-intensity ultrasound. Prereq: [PHYS 1302 or equiv], [MATH 2374 or equiv] or instr consent

BMEN 5131. Introduction to BioMEMS and Medical Microdevices. (2 cr.; A-F or Audit; Every Spring) Design/microfabrication of sensors, actuators, drug delivery systems, microfluidic devices, and DNA/protein microarrays. Packaging, biocompatibility, ISO 10993 standards. Applications in medicine, research, and homeland security. Prereq: CSE sr or grad student or medical student

BMEN 5201. Advanced Biomechanics. (3 cr.; Student Option; Periodic Fall & Spring) Introduction to biomechanics of musculoskeletal system. Anatomy, tissue material properties. Kinematics, dynamics, and control of joint/limb movement. Analysis of forces/motions within joints. Application to injury, disease. Treatment of specific joints, design of orthopedic devices/implants. Prereq: [(3001 or equiv), [CSE upper div or grad student]] or instr consent


BMEN 5321. Microfluidics in Biology and Medicine. (3 cr.; A-F or Audit; Every Fall) Fundamentals of microfluidics. Fluid mechanics/transport phenomena in microscale systems. Pressure/surface driven flows. Capillary forces, electrokinesis, hydraulic circuit analysis. Finite element modeling for microfluidic systems. Design/fabrication methods for microfluidic devices. Prereq: [3111, AEM 4201, CHEN 400S, [ME 3331 or ME 3332 or CSE grad student or instr consent]

BMEN 5351. Cell Engineering. (3 cr.; Student Option; Periodic Fall & Spring) Engineering approaches to cell-related phenomena important to both tissue engineering, Receptor/ligand binding. Trafficking/signaling processes. Applications to cell proliferation, adhesion, and motility. Cell-matrix interactions. Prereq: [2401, 2501 or concurrent registration is required (or allowed) in 5501, [MATH 2243 or MATH 2373]] or CSE upper div or grad student or instr consent

BMEN 5361. 3D Bioprinting. (2 cr.; A-F only; Every Fall) 3D Bioprinting has recently emerged as a new biofabrication technology that merges many engineering fields (eg. BME, MechE, ChemE) with other disciplines such as Materials Science, Stem Cell Biology, Physiology, Surgery and Pharmacology. This course serves as an introduction to the field and how its disciplines interface, while providing the student with knowledge of many of the most common bioprinting methods and applications being developed today through lectures by experts in the field (academia and industry) as

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BMEN 5401. Advanced Biomedical Imaging. (3 cr.; A-F or Audit; Every Fall)
Functional biomedical imaging modalities. Principles/applications of technologies that offer high spatial/temporal resolution. Bioelectromagnetic and magnetic resonance imaging. Other modalities. prereq: CSE upper div or grad student or instr consent

BMEN 5411. Neural Engineering. (3 cr.; Student Option; Every Fall)
Theoretical basis. Signal processing techniques. Modeling of nervous system, its response to stimulation. Electrode design, neural modeling, cochlear implants, deep brain stimulation. Prosthetic limbs, micturition control, prosthetic vision. Brain machine interface, seizure prediction, optical imaging of nervous system, place cell recordings in hippocampus. prereq: 3401 recommended

BMEN 5412. Neurormodulation. (3 cr.; A-F or Audit; Every Fall)
Fundamentals of bioengineering approaches to modulate the nervous system, including bioelectricity, biomagnetism, and optogenetics. Computational modeling, design, and physiological mechanisms of neurormodulation technologies. Clinical exposure to managing neurological disorders with neurormodulation technology.

BMEN 5413. Neural Decoding and Interfacing. (3 cr.; A-F or Audit; Every Spring)
Neural interface technologies currently in use in patients as well as the biophysical, neural coding, and hardware features relating to their implementation in humans. Practical and ethical considerations for implanting these devices into humans. prereq: 5411, [3201 or 3401 or equiv recommended]

BMEN 5421. Introduction to Biomedical Optics. (3 cr.; A-F or Audit; Periodic Spring)
Biomedical optical imaging/sensing principles, laser-tissue interaction, detector design, noise analysis, interferometry, spectroscopy. Optical coherence tomography, polarization, birefringence, flow measurement, fluorescence, nonlinear microscopy. Tours of labs. prereq: CSE or grad student

BMEN 5501. Biology for Biomedical Engineers. (3 cr.; Student Option; Periodic Fall & Spring)
Concepts of cell/tissue structure/function. Basic principles of cell biology. Tissue engineering, artificial organs, prereq: Engineering upper div or grad student

BMEN 5601. Cardiovascular Devices. (1 cr.; A-F or Audit; Every Spring)
Design of cardiovascular devices with experts from local medtech companies. Discussion of clinical need, the generic design (emphasizing use of engineering principles), typical testing and validation methods, and major limitations of the available devices. Design, analysis, and testing of these and related devices. prereq: BMEN 3011, 3111, 3211, or equivalents with instr consent

BMEN 5701. Cancer Bioengineering. (3 cr.; A-F or Audit; Every Fall)
Cancer-specific cell, molecular/genetics events. Quantitative applications of bioinformatics/systems biology, optical imaging, cell/matrix mechanics. Drug transport (with some examination of design of novel therapeutics). prereq: [Upper division CSE undergraduate, CSE graduate student] or instr consent

BMEN 5910. Special Topics in Biomedical Engineering. (3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring)
Special topics in biomedical engineering.

BMEN 5920. Special Topics in Biomedical Engineering. (1-3 cr.; max 6 cr.; Student Option; Every Fall)
Special topics in biomedical engineering.

BMEN 8001. Polymeric Biomaterials. (3 cr.; A-F or Audit; Every Spring)
Introduction to polymeric biomaterial research. Molecular engineering, characterization of properties, material-cell interaction, biocompatibility/bioactivity. Applications in biology and medicine. prereq: [S001, [CHEN 4214 or MATS 4214 or equiv]] or instr consent

BMEN 8041. Advanced Tissue Engineering Lab. (3 cr.; A-F or Audit; Every Spring)
Tissue engineering refers to the generation of biological substitutes to restore, maintain, or improve tissue function. Toward this end, tools and knowledge from several disciplines might be applied including biological sciences (molecular, cellular and tissue anatomy and physiology), engineering (transport phenomena, material science, mechanical characterization) and biotechnology (cell culture, gene transfer, metabolomics). This course will cover some introductory and advanced lab techniques used in tissue engineering.

BMEN 8101. Biomedical Digital Signal Processing. (3 cr.; A-F or Audit; Every Fall)
Signal processing theory for analyzing real world digital signals. Digital signal processing and mathematically derived algorithms for analysis of stochastic signals: Spectral analyses, noise cancellation, optimal filtering, blind source separation, beamforming techniques. prereq: [(MATH 2243 or MATH 2373), [MATH 2263 or MATH 2374]] or equiv

BMEN 8151. Biomedical Electronics and Implantable Microsystems. (3 cr.; Student Option; Every Spring)
This class is about bioelectronics and the synergy between electronics and biomedical applications. It discusses how to architect robust ultra-low-power electronics with applications in implantable, noninvasive, wireless, sensing, and stimulating biomedical systems. Half of the classes span feedback systems, transistor device physics, noise, and circuit-analysis techniques to provide a circuit foundation. The other half are research papers that describe the utilization of these circuits in implantable and wearable systems. Some of these systems include cochlear implants for the deaf, brain implants for the blind and paralyzed, cardiac devices for noninvasive medical monitoring, and biomolecular sensing systems. Prerequisites: BMEN 5101 or equivalent background in bioinstrumentation and electrical circuits.

BMEN 8201. Advanced Tissue Mechanics. (3 cr.; A-F or Audit; Every Spring)
Tissues exist in dynamic mechanical environments where they must maintain a fine balance between applied loads and internal tension. Active adaptability of biological materials can significantly complicate measurement of their mechanical behavior. This course will cover fundamental continuum approaches for determining the complex stress states of actively responsive tissues as well as the force-feedback relationships that drive early development and allow mature tissues to maintain mechanical equilibrium. Topics will include theoretical approaches for active force generation, soft tissue finite growth, extracellular matrix remodeling, and constrained mixtures. These methods are applicable to a wide range of biomechanical systems. In this course, they will be applied to mechanics of two model systems: arterial growth and remodeling in hypertension and sheet folding in early organogenesis and morphogenesis. prereq: 3011 or AEM 2021 or equiv

BMEN 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
Lab rotation in neuroengineering. prereq: Grad student in CSE or neuroscience

BMEN 8335. Neuroengineering Practicum. (3 cr.; max 6 cr.; A-F only: Every Spring)
Topics/issues in neuroengineering. Ethics, professional conduct, conflicts, plagiarism, copyright, authorship, research design considerations, IRB, intellectual properties, review process, professional presentations, proposal writing, prereq: PhD student in BMENs, EE, ME, or NSci or instr consent

BMEN 8381. Bioheat and Mass Transfer. (3 cr.; Student Option; Periodic Spring)
Analytical/numerical tools to analyze heat/mass transfer phenomenon in cryobiological, hyperthermic, other biomedically relevant applications. prereq: CSE grad student, upper div transport/fluids course; [physics, biology] recommended

BMEN 8401. New Product Design and Business Development. (4 cr.; A-F or Audit; Every Fall)
Student teams work with CSE and CSOM faculty and company representatives to develop a product concept for sponsoring company. Assignments include concept/detail design, manufacturing, marketing, introduction strategy, profit forecasting, production of product prototype. prereq: BME graduate student, some design experience; 8401, 8402 must be taken same yr
BMEN 8402. New Product Design and Business Development. (4 cr.; A-F or Audit; Every Spring)
Student teams work with CSE and CSOM faculty and company representatives to develop a product concept for sponsoring company. Assignments include concept/design, manufacturing, marketing, introduction strategy, profit forecasting, production of product prototype. prereq: 8401

BMEN 8411. Neuroengineering Seminar. (2 cr. [max 4 cr.]; S-N only; Every Fall & Spring)
Lectures presented by researchers in the field of neuroengineering. Students will discuss speaker papers in advance of the talks and meet with presenters afterwards. Each student will also deliver one seminar presentation per semester.

BMEN 8421. Biophotonics. (3 cr.; A-F or Audit; Every Spring)
Understanding light microscopy and the interaction of light with biological materials is widely applicable to numerous research programs. In fact, it is a fundamental approach to addressing critical questions at the cellular and subcellular scales. This course will emphasize the fundamentals of light microscopy and microscopes, fundamentals of fluorescence and fluorescence microscopy (transitions, quantum yield, bleaching, lifetime etc.) and practical applications of fluorescence microscopy (confocal microscopy for optical sectioning, multiphoton microscopy, harmonic generation, FRET, FRAP, and fluorescence lifetime in the time and frequency domains). Course material will span theory, practical applications of microscopy and published literature, prereq; Graduate students in physical sciences (engineering, physics, chemistry etc.), or graduate students with an undergraduate degree in the physical sciences or mathematics, or consent of instructor. In addition to previous course work in engineering and/or physics, a working understanding of microscopy is recommended. Although not required, concurrent or previous enrollment in BMEN 5421 (Biomedical Optics) is recommended.

BMEN 8431. Controlled Drug and Gene Delivery: Materials, Mechanisms, and Models. (4 cr.; A-F or Audit; Every Spring)
Physical, chemical, physiological, mathematical principles underlying design of delivery systems for drugs. Small molecules, proteins, genes. Temporal controlled release. prereq: Differential equations course including partial differential equations or instr consent

BMEN 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Doctoral student, advisor and DGS consent

BMEN 8450. Dynamical Systems in Biology. (3 cr.; A-F or Audit; Every Fall)
Nonlinear dynamics with specific emphasis on behavior of excitable systems (neurons/cardiac myocytes), prereq: Grad student in engineering or physics or math or neuroscience

BMEN 8502. Physiological Control Systems. (3 cr.; A-F only; Every Spring)
Simulation, identification, and optimization of physiological control systems. Linear and non-linear systems analysis; stability analysis, system identification, and control design strategies, including constrained, adaptive, and intelligent control. Analysis and control of physiological system dynamics in normal and diseased states. prereq: 8101 or equiv

BMEN 8511. Systems and Synthetic Biology. (3 cr.; A-F or Audit; Every Fall)
Systems/synthetic biology methods used to characterize/engineer biological systems at molecular/cellular scales. Integration of quantitative experimental approaches/mathematical modeling to elucidate biological design principles, create new molecular/cellular functions.

BMEN 8601. Biomedical Engineering Seminar. (1 cr.; S-N or Audit; Every Fall)
Lectures and demonstrations of university and industry research introducing students and faculty to methods and goals of biomedical engineering.

BMEN 8602. Biomedical Engineering Seminar. (1 cr.; S-N or Audit; Every Spring)
Lectures and demonstrations of university and industry research introducing students and faculty to methods and goals of biomedical engineering.

BMEN 8611. Professional Skills and Ethics for Biomedical Engineers. (2 cr.; Student Option; Every Fall)
This course covers a number of practical aspects surrounding research, including: how to prepare a fellowship application (or more generally a proposal); how to write a manuscript; how to give a seminar; career advice for non-academic career paths; how to network with companies; research ethics; data management; research integrity. The format of the course will be a two hour meeting each week. The first hour will cover specific issues using historical literature references with the second hour devoted to a guest lecture presentation on topics relevant to the themes of the course. Students will be required to complete the online Responsible Conduct of Research (RCR) Core Curriculum for Engineering and Technology and pass the final assessment as part of this course.

BMEN 8630. Biomedical Engineering Graduate Student Seminar. (1 cr. [max 3 cr.]; S-N or Audit; Periodic Fall)
Student presentations of current thesis research or other areas of biomedical engineering, prereq: Grad BMEN major

BMEN 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

BMEN 8710. Directed Research. (1-4 cr.; Student Option; Every Fall, Spring & Summer)

BMEN 8720. Internship in Biomedical Engineering. (1-3 cr. [max 6 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Supervised lab or industrial experience unrelated to student's normal academic or employment experience. prereq; Grad BMEN major

BMEN 8777. Thesis Credits: Master’s. (1-18 cr.; [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
No description prereq; Max 18 cr per semester or summer; 10 cr total required [Plan A only]

BMEN 8820. Plan B Project. (2-3 cr.; Student Option; Every Fall, Spring & Summer)
Project chosen by student and adviser to satisfy M.S. Plan B project requirement. Written report required. prereq: BMEN MS student

BMEN 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Thesis credit: doctoral. prereq: PhD student in biomedical engineering; max 14 cr per semester or summer; 24 cr required

BMEN 8900. Special Topics in Biomedical Engineering. (1-4 cr. [max 8 cr.]; A-F or Audit; Periodic Fall & Spring)
Topics in biomedical engineering.

BMEN 8910. Independent Study. (1-3 cr.; Student Option; Every Fall, Spring & Summer)
Research or study of a topic determined by interests of student in consultation with faculty supervisor. Requires approval by faculty supervisor and director of graduate studies. prereq; Grad BMEN major

Biomedical Science (BMSC)

BMSC 8990. Research: Biomedical Sciences. (1-17 cr. [max 42 cr.]; S-N or Audit; Periodic Fall)
Content determined by interest of student in consultation with staff. prereq; Enrollment in MD/PhD program

Bioproducts and Biosystems Eng (BBE)

BBE 1001. Bioproducts and Biosystems Engineering Orientation. (1 cr.; S-N or Audit; Every Fall)
Academic programs/careers related to bioproducts and biosystems engineering. Required field trip.

BBE 1002. Biorenewable Resources. (TS; 3 cr.; A-F or Audit; Every Spring)
Environmental/social impacts of materials used to make a product. Biorenewable resources, using wood and agriculture-based biomass. Environmental, technological, social, and economic implications of the use of these resources.

BBE 2001. Mechanics and Structural Design. (4 cr.; A-F or Audit; Every Fall)
Fundamental treatment of statics, dynamics, and principles of structural design. Techniques for individual components, including trusses, beams, and columns. Using conventional lumber products, engineered wood products, and steel. Lab. Prereq: [MATH 1272 or MATH 1372], [PHYS 1101 or PHYS 1301]

**BBE 2003. Computer Applications in Bioproducts and Biosystems Engineering.**
(3 cr.: A-F or Audit; Every Fall)
Applications of computational methods for solving practical problems in Bioproducts and Biosystems Engineering. Applications of computer software, for instance, Matlab, R, and Excel, in assisting engineering calculations and designs in Bioproducts and Biosystems Engineering. Prereq: [Math 1271 or Math 1371, Math 1272 or Math 1372, Concurrent registration in ([Math 2243 or 2373) OR (Math 2263 or 2374))] CSE Lower division or CSE Upper Division BBE Majors or CFANS Pre-BBE (Premajor) or instructor consent.

**BBE 2201. Renewable Energy and the Environment.**
(TS; 3 cr.: Student Option; Every Fall, Spring & Summer)
Tired of high energy bills? Should you be investing in solar energy? Are you wondering what the connection is between climate and energy? What is wrong with our current energy system? What really is “renewable energy”?

**BBF 3002. Introduction to Engineering Design.**
(3 cr.: A-F only; Every Fall)
Identify, formulate, develop/complete open-ended designs in bioproducts & biosystems engineering at the conceptual level; engineering economics principles, safety/health considerations, and ethics for design project. Written, graphical, and oral presentations. Prereq: [MATH 1271 or MATH 1371, CHEM 1021, BBE lower div (soph) or upper div (jr), freshman writing req] or instructor consent.

**BBE 3012. Transport in Biological Processes I.**
(4 cr.: A-F Only; Every Fall)

**BBE 3013. Engineering Principles of Molecular and Cellular Processes.**
(3 cr.: A-F or Audit; Every Fall)
Applied engineering principles in biological processes. Classification of microbes of industrial importance. Parameters for cellular control. Modeling of cell growth/metabolism, enzymatic catalysis, bioreactor design, product recovery operations design. Case studies. Prereq: BIOL 1009, [concurrent registration is required (or allowed) in CHEM 1062 or equiv], [concurrent registration is required (or allowed) in CHEM 1066 or equiv], [MATH 1372 or equiv], [BIOC 2011 or CHEM 2201], or instructor consent.

**BBE 3023. Ecological Engineering Principles.**
(3 cr.: Student Option; Every Fall)
Physical, thermal, texture, strength, moisture properties of soil. Saturated/unsaturated moisture movement. Quantitative descriptions of mass/energy flux/storage in ecosystems. Distribution of vegetation in landscapes. Engineering/management impacts on soil-water-plant systems. Prereq: BIOL 1009, [3012 or concurrent registration is required (or allowed) in 3012] or instructor consent.

**BBE 3033. Material and Energy Balances in Biological Systems.**
(3 cr.: A-F or Audit; Every Spring)
Basic principles of materials and energy balances, their applications in biological systems. Prereq: [CHEM 1062 or equiv], [CHEM 1066, or equiv], [MATH 1372 or equiv], [PHYS 1302W or equiv] or instructor consent.

**BBE 3043. Biological and Environmental Thermodynamics.**
(3 cr.: A-F or Audit; Every Spring)
Laws of thermodynamics for energy, environmental and biological sciences. First/second laws of thermodynamics in representing phase change, biochemical reactions, metabolic cycles, and photosynthesis. Prereq: BIOL 1009, [CHEM 1061 or equiv], [CHEM 1065, or equiv], [MATH 1372 or equiv], [PHYS 1302 or equiv] or instructor consent.

**BBE 3093. Directed Studies.**
(1-5 cr.: Student Option; Every Fall & Spring)
Independent study of topic(s) involving physical principles as applied to agricultural production and land resources. Prereq: instructor consent.

**BBE 3101. Introductory Statics and Structures for Construction Management.**
(3 cr.: A-F or Audit; Every Fall & Spring)
Statics, engineering wood design principles, mechanical properties of wood. Design techniques for individual components. Trusses, beams, columns. Using conventional lumber products, engineered wood products, and steel. Simple structures explored through examples, assignments, prereq: Working knowledge of [trigonometry, geometry, algebra] or instructor consent.

**BBE 3201. Sustainability of Food Systems: A Life Cycle Perspective.**
(GP; 3 cr.: A-F only; Every Fall & Spring)
Consequences of global food system. Diversity in food systems. Current topics in food sustainability.

**BBE 3393. Directed Study.**
(1-3 cr.: max 12 cr.)
Student Option: Every Fall & Spring
Opportunity to pursue projects not available through independent study or extra credit. In consultation with an adviser, students develop a prospectus and complete progress reports and a final report on the project. Prereq: instructor consent.

**BBE 3396. Industry Assignment.**
(1 cr.: A-F or Audit; Every Fall & Spring)
Students participating in industrial or experiential learning assignment. Evaluation based on formal final report; coordinated with faculty and industry advisor.

**BBE 3480. Special Topics.**
(1-4 cr. ; max 12 cr.: Student Option; Every Fall & Spring)
Topics specified in Class Schedule.

**BBE 4001. Chemistry of Biomass and Biomass Conversion to Fuels and Products.**
(ENV; 4 cr.: A-F or Audit; Every Fall)
Chemistry of biomass and its sustainable utilization for biofuels and bioproducts, including bio-based materials. Chemicals/energy and their environmental implications within the context of chemical principles and associated reactions underlying the structure, properties, processing, and performance of plant materials. Prereq: CHEM 2301 or instructor consent.

**BBE 4013. Transport in Biological Processes II.**
(3 cr.: A-F or Audit; Every Spring)
Applications of thermodynamics, fluid flow, heat/mass transfer to design problems. Biological processes/materials at cell, organism, system level. Agricultural, environmental, food, bioprocess applications. Solution of equations involving computer programming assignments. Prereq: 3012, 3043, [upper div CSE or instr consent]

**BBE 4023W. Process Control and Instrumentation.**
(WI; 3 cr.: A-F or Audit; Every Fall)
Measurement of motion, force, pressure, flow, temperature, size, shape, color, texture, rheology, moisture, water mobility, fat, and pH. Linking physical and biological control systems. Prereq: Upper div CSE or grad student.

**BBE 4301. Applied Surface and Colloid Science.**
(3 cr.: Student Option; Every Fall & Spring)
Introduction to surface/colloid science concepts. Surface tension, wetting, adsorption, capillarity. Formation/stability of solids, emulsions, and foams. Water solubility. Partition coefficients of organic species. Properties of both surfactants and water soluble polymers. Focuses on interdisciplinary applications. Prereq: 3043 or BMEN 2101 or CHEN 3101 or CHEM 4501 or instructor consent.

**BBE 4302. Biodegradation of Bioproducts.**
(3 cr.: Student Option; Every Spring)
Organisms of importance to bio-based products. Deterioration, control, bioprocesses for benefit. Prereq: 1002 or instructor consent.

**BBE 4303. Introduction to Bio-based Materials Science.**
(3 cr.: A-F or Audit; Every Spring)
Principles of materials science, their application to bio-based materials. Prereq: 2001 or instructor consent.

**BBE 4305. Pulp and Paper Technology.**
(3 cr.: Student Option; Every Spring)
pulp preparation, secondary fiber, de-inking, wet end additives. Lab problems/exercises, lectures. Online course. prereq: Junior or senior or instr consent

BBE 4333. Off-road Vehicle Design. (4 cr.; A-F or Audit; Every Spring)
Mechanics involved in designing/testing off-road vehicle. Vehicle mechanics, traction, and performance. Complexity/modeling of vehicle interaction with soil, muskeg, and snow. prereq: [(2001, 4303) or [AEM 2021, AEM 3031), [3012 or CEGE 3502 or concurrent registration is required (or allowed) in CEGE 3502], upper div CSE] or instr consent

BBE 4401. Bioproducts Separation and Purification Processes. (3 cr.; A-F or Audit; Every Fall)
Unit operations of bioproducts engineering/manufacture; separations and purification processes.

BBE 4402. Bio-based Products Engineering Lab II. (1 cr.; A-F or Audit; Every Fall)
Lab exercises in bio-based products engineering. prereq: BBE 3033 and CHEM 2301, [jr or sr or instr consent]

BBE 4403. Bio-based Products Engineering Lab I. (1 cr.; A-F or Audit; Every Fall)
Lab exercises in bio-based products engineering. prereq: CHEM 2301, [jr or sr or instr consent]

BBE 4404. Biopolymers and Biocomposites Engineering. (3 cr.; A-F or Audit; Every Fall)
Structure/properties of biopolymers. Engineering of composites from these biopolymers or plant-based materials. prereq: [BBE/CSE upper division] or instr consent

BBE 4491. Independent Study. (1-4 cr.; Student Option; Every Fall & Spring)
Independent study in student's area of interest. prereq: CSE or CFANS students, Upper Division; instructor permission

BBE 4502W. BBE Capstone Design. (WI; 4 cr.; A-F or Audit; Every Spring)
Students develop, select, formulate, and complete an open-ended, comprehensive engineering process/product design project. This course should be taken during the last spring semester before graduation. prereq: 2002, sr

BBE 4523. Ecological Engineering Design. (3 cr.; A-F or Audit; Every Spring)
Application of ecological engineering to design of remediation systems. Artificial ecosystems, ecosystem/wetland restoration, constructed wetlands. Biological engineering for slope stability. Waste treatment. Restoring ecological service of watersheds. prereq: [CHEM 1002 or [CHEM 1062, CHEM 1066], 3012, upper div CSE] or instr consent

BBE 4533. Sustainable Waste Management Engineering. (3 cr.; A-F or Audit; Every Spring)
Sources/characteristics of agricultural wastes. Livestock, food processing, domestic wastes. Physical, biological, chemical, rheological, microbiological properties. Effects on environment. Collection, storage, treatment (aerobic/anaerobic), use/disposal. Land application. prereq: 3023, upper div CSE

BBE 4535. Assessment and Diagnosis of Impaired Waters. (3 cr.; A-F only; Every Fall)
Assessing impaired waters and developing TMDL for conventional pollutants. Preparing/communicating legal, social, and policy aspects. TMDL analysis of real-world impaired water problem. Field trip to impaired waters site, prereq: Upper division CSE or CFANS or CBS student or instr consent

BBE 4608. Environmental and Industrial Microbiology. (3 cr.; A-F only; Every Fall)
Use of organisms in remediation of waste and pollution problems related to bio-based product industries. Types, characteristics, identification of useful microorganisms. Applications of microbes to benefit industrial processes of wood and fiber. prereq: [BIOL 1001 or BIOL 1009], CHEM 1011

BBE 4713. Biological Process Engineering. (3 cr.; A-F or Audit; Every Spring)
Material/energy balances. Homogeneous reactions of bioprocess engineering/biological systems. Fermentation engineering, reactor design. Filtration, centrifugation, separation, absorption, extraction, chromatography. Biorefining. Conversion of biomass. prereq: [3033, [4013 or concurrent registration is required (or allowed) in 4013], upper div CSE] or instr consent

BBE 4723. Food Process Engineering. (3 cr.; A-F or Audit; Every Spring)
Material/energy balance, fluid dynamics, heat/mass transfer in refrigeration, freezing, psychometrics, dehydration, evaporation, non-thermal processing, and separation. Development control for production of food products. prereq: [4013 or concurrent registration is required (or allowed) in 4013], upper div CSE] or instr consent

BBE 4733. Renewable Energy Technologies. (TS; 3 cr.; A-F or Audit; Every Spring)

BBE 4743. Nanobioengineering & Nanobiotechnology. (3 cr.; Student Option; Every Spring)
This course will educate on the interdisciplinary areas of biotechnology/nanotechnology and nanobioengineering, including engineering principles and inherent technological applications. Prereq: Upper division in CSE or seniors in physical sciences, biological sciences and engineering (including CBS and CFANS) or equivalent or instructor consent.

BBE 4744. Engineering Principles for Biological Scientists. (4 cr.; A-F or Audit; Every Fall)
Material/energy balances applied to processing systems. Principles of fluid flow, thermodynamics, heat, mass transfer applied to food and bioproducts engineering. Lab problems/exercises, lectures. Online course. prereq: Math 1142 or Math 1271, Phys 1101; intended for non engineering students

BBE 4753. Air Quality and Pollution Control Engineering. (3 cr.; A-F or Audit; Every Spring)
Air quality and pollution control engineering systems. Air pollutant sources, emissions, transformations, dispersion, fate and impacts. Introduction to air quality and pollution laws, regulations and permits. Control technologies including energy conservation, cyclones, electrostatic precipitators, fabric filters, absorbers, adsorbers, incinerators and biofilters. prereqs: BBE 3012, 3043, upper division CSE, graduate student or instructor consent. Credit will not be granted if credit has been received for CEGE 5561

BBE 4801H. Honors Research. (2 cr.; A-F or Audit; Every Fall & Spring)
First semester of independent research project supervised by faculty member. prereq: BBE upper div honors, instr consent

BBE 4802H. Honors Research. (2 cr.; A-F or Audit; Every Fall & Spring)
Complete honors thesis. Oral report. prereq: BBE upper div honors, instr consent

BBE 4900. Intern Reports. (4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Students participating in industrial or experiential learning assignment. Evaluation based on formal final report; coordinated with faculty and industry advisor. prereq: [CSE or CFANS] student in BBE, instr consent

BBE 5001. Chemistry of Biomass and Biomas Conversion to Fuels and Products. (4 cr.; A-F or Audit; Every Fall)
Chemistry of biomass. Sustainable utilization for biofuels/bioproducts. Bio-based materials, chemicals, energy, Environmental implications. Chemical principles/reactions underlying the structure, properties, processing, and performance of plant materials. prereq: Grad student or instr consent

BBE 5023. Process Control and Instrumentation. (3 cr.; Student Option; Every Fall)
Fundamental principles in system dynamics/control. Emphasizes process systems and problems faced by process engineers. prereq: Grad student or instr consent

BBE 5095. Special Problems. (1-5 cr.; Student Option; Every Fall, Spring & Summer)
Advanced individual-study project. Application of engineering principles to specific problem. prereq: instr consent

BBE 5301. Applied Surface and Colloid Science. (3 cr.; Student Option; Every Fall)
Properties of both surfactants and water soluble polymers. Focuses on interdisciplinary applications.

BBE 5302. Biodegradation of Bioproducts. (3 cr.; Student Option; Every Spring) Organisms and their importance to bio-based products: deterioration, control, bioprocesses for benefit. prereq: Grad student or instr consent

BBE 5303. Introduction to Bio-based Materials Science. (3 cr.; Student Option; Every Spring) Principles of materials science, their application to bio-based materials. Project required.


BBE 5333. Off-road Vehicle Design. (4 cr.; A-F only; Every Spring) Mechanics involved in designing/testing off-road vehicles. Vehicle mechanics, traction, performance. Complexity/modeling of vehicle interaction with soil, muskeg, snow. Case study or literature review. Develop paper for publication. prereq: [(2001, 4303) or [AEM 2021, AEM 3031], [3012 or concurrent registration is required (or allowed) in 3012 or CEGE 3502 or concurrent registration is required (or allowed) in CEGE 3502], upper div CSE] or instr consent

BBE 5401. Bioproducts Separation and Purification Processes. (3 cr.; A-F or Audit; Every Fall) Unit operations of bioproducts engineering/manufacture. Project required. prereq: Grad student or instr consent

BBE 5402. Bio-based Products Engineering Lab I. (1 cr.; A-F or Audit; Every Fall) Laboratory exercises in bio-based products engineering.

BBE 5403. Bio-based Products Engineering Lab II. (1 cr.; A-F or Audit; Every Fall) Laboratory exercises in bio-based products engineering. prereq: Grad student or instr consent

BBE 5404. Biopolymers and Bionanocomposites Engineering. (3 cr.; A-F or Audit; Every Fall) Structure/properties of biopolymers. Engineering of composites from biopolymers/plant-based materials. prereq: grad student or instr consent

BBE 5480. Special Topics. (1-4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Topics specified in Class Schedule.

BBE 5513. Watershed Engineering. (3 cr.; A-F or Audit; Every Fall) Application of engineering principles to managing surface runoff from agricultural, range, and urban watersheds. Design of facilities and selection of land use practices for controlling surface runoff to mitigate problems of flooding and degradation of surface-water quality. prereq: 3023, upper div CSE

BBE 5523. Ecological Engineering Design. (3 cr.; A-F only; Every Spring) Application of ecological engineering to design of remediation systems. Artificial ecosystems, ecosystem/wetland restoration, constructed wetlands, biological engineering for slope stabilization, wetland treatments. Restoring stabilographical services of watersheds. prereq: [CHEM 1022 or CHEM 1062, CHEM 1066], BBE 3012, grad student or instr consent

BBE 5535. Assessment and Diagnosis of Impaired Waters. (3 cr.; A-F only; Every Fall) Assisting impaired waters and developing TMDL for conventional pollutants. Preparing/communicating legal, social and policy aspects. TMDL analysis of real-world impaired waters problem. Field trip to impaired waters site. prereq: Grad student or instr consent

BBE 5568. Environmental and Industrial Microbiology. (3 cr.; A-F only; Every Fall) Use of microbes/enzymes to detoxify contaminants in field or in containment facilities. Contaminants, sources, fate. Biological organisms, pathways, catalysts utilized in bioremediation. Site inspection practices, bioremediation technologies, application in real-world situations. prereq: [BIOL 1001 or BIOL 1009], CHEM 1011

BBE 5713. Biological Process Engineering. (3 cr.; A-F only; Every Spring) Material/energy balances. Homogeneous reactions of bioprocess engineering and biological systems. Fermentation engineering, reactor design fundamentals. Filtration, centrifugation, separation, absorption, extraction, chromatography. Biorefining. Conversion of biomass into bioenergy, biochemicals, and biomaterials. prereq: 3033, 4013 or concurrent registration is required (or allowed) in 4013, or instr consent

BBE 5723. Food Process Engineering. (3 cr.; A-F or Audit; Every Spring) Food processing engineering. Applications of material balance, energy balance, fluid dynamics, and heat/mass transfer to refrigeration, freezing, psychometrics, dehydration, evaporation, non-thermal processing, and separation. Development/control for food products. prereq: [4013 or concurrent registration is required (or allowed) in 4013], or instr consent

BBE 5733. Renewable Energy Technologies. (3 cr.; A-F or Audit; Every Spring) Energy security and its environmental, economic and societal impacts. Current and emerging technologies for production and use, characteristics of renewable energy, key methods for efficient production, current and probable future, and impact on sustainable development. prereq: Grad student or instr consent

BBE 5743. Nanobiotechnology & Nanobiomaterials. (3 cr.; Student Option; Every Spring) This course will educate on the interdisciplinary areas of bionanotechnology/nanobiotechnology and nanobi engineering, including engineering principles and inherent technological applications. prereq: Instructor consent

BBE 5753. Air Quality and Pollution Control Engineering. (3 cr.; A-F or Audit; Every Spring) Air quality and pollution control engineering systems. Air pollutant sources, emissions transformations, dispersion, fate and impacts. Introduction to air quality and pollution laws, regulations and permits. Control technologies including energy conservation, cyclones, electrostatic precipitators, fabric filters, absorbers, adsorbers, incinerators and biofilters. Course Prerequisites Graduate student or instructor consent Credit will not be granted if credit has been received for CEGE 5561

BBE 8001. Seminar I. (1 cr.; A-F only; Every Fall) Presentation/discussions on current research topics, research philosophy/principles, proposal writing, professional presentations.

BBE 8002. Seminar II. (1 cr. [max 2 cr.]; A-F only; Every Fall) Organization/critique of seminars on new developments in biosystems and agricultural engineering. prereq: 8001 or concurrent registration is required (or allowed) in 8001 or equiv

BBE 8003. Research Seminar II. (1 cr. [max 2 cr.]; S-N or Audit; Every Spring) Moderate and critique seminars in biosystems and agricultural engineering. prereq: 8002 or equiv

BBE 8005. Supervised Classroom or Extension Teaching Experience. (2 cr.; S-N or Audit; Every Fall & Spring) Teaching experience is offered in the following departments: Biosystems and Agricultural Engineering; Agronomy and Plant Genetics; Horticultural Science; Soil, Water, and Climate; Plant Pathology. Discussions about effective teaching to strengthen skills and develop a personal teaching philosophy. prereq: instr consent

BBE 8013. Parameter Estimation in Biosystems and Agricultural Engineering. (3 cr.; A-F or Audit; Periodic Fall & Spring) Procedures for estimating parameter values and parameter uncertainty from experimental data. Values and interpretation of linear and nonlinear models using ordinary and weighted least-square methods. Design of experiments. Application to biosystems and agricultural engineering problems. prereq: Stat 3021 or equiv, computer programming course

BBE 8094. Advanced Problems and Research. (2-6 cr.; Student Option; Periodic Fall & Spring) tbd prereq: 5095

BBE 8300. Research Problems. (1-10 cr.; Student Option; Every Fall & Spring) Independent research under faculty guidance. prereq: instr consent
BBE 8303. Machinery Modeling. (3 cr.; Student Option; Periodic Fall & Spring) Machinery systems modeling using multibody dynamics simulation software (MBS). Review models presented in literature. Report on limitations of modeling approaches used. Models developed in students’ areas of interest. prereq: [3012 or CEGE 3502], AEM 2021

BBE 8304. Advanced Topics in Wood Drying. (2 cr.; Student Option; Every Fall) Rheological behavior of first-dried solid wood. Significance of creep to stress-strain pattern, shrinkage, and degrade development in lumber drying. Interpretation/evaluation of schedules, processes, and primary/auxiliary equipment used in commercial drying processes. Energy consideration in drying processes. prereq: 4303

BBE 8307. Advances and Methods in Forest Products Pathology and Preservation. (2 cr.; Student Option; Every Spring) Principles of wood protection, methods of evaluating preservatives. Emphasizes international developments. prereq: 4303

BBE 8311. Mechanics of Wood and Wood Composites. (2 cr.; Student Option; Every Spring) Advanced topics on behavior of wood composites. prereq: instr consent

BBE 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

BBE 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

BBE 8513. Hydrologic Modeling of Small Watersheds. (3 cr.; Student Option; Spring Even Year) Study/representation of hydrologic processes by mathematical models. Stochastic meteorological variables, infiltration, overland flow, return flow, evapotranspiration, channel flows. Approaches for model calibration/evaluation. prereq: [3012 or CEGE 3502], hydrology course

BBE 8523. Coupled Heat, Moisture, and Chemical Transport in Porous Media. (3 cr.; A-F or Audit; Periodic Fall) Mathematical study of coupled heat, moisture, and chemical transport in porous media. Derivation of governing equations for coupled heat, moisture, and chemical transport. Derivation of numerical solution techniques to solve coupled equations. Comparison of numerical solutions to analytical solutions. prereq: [CSci 5301 or equiv], [Math 5512, Math 5513] or equiv], [Soil 5232 or equiv], computer programming

BBE 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

BBE 8703. Managing Water in Food and Biological Systems. (3 cr.; Student Option; Periodic Fall) Qualitative and quantitative analysis of water in foods and biological materials using NMR and MRI. Water and chemical reactivity, microbial activity, physiochemical properties and changes, and structural properties and changes in foods and biological materials. prereq: Chem 3501 or FScN 5451 or MatS 3011 or instr consent

BBE 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

BBE 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Business Administration (BA)

BA 999. Immersion Core. (12 cr.; A-F only; Every Fall & Spring) Includes FINA 3001, MKTG 3001, SCO 3001, and MGMT 3004. Students enroll as a cohort during their sophomore or junior year, completing the four courses with same group of students. This is a signature experience for all Carlson School undergraduate students. prereq: Microecon, macroecon, calculus, accounting, statistics, Carlson School [soph or jr]

BA 1001. Introduction to Analyzing Business Problems using Excel. (1 cr.; A-F only; Every Fall & Spring) BA 1001 introduces students to basic skills for analyzing data and presenting recommendations to management. In this class students work extensively with Microsoft Excel and are better prepared to use this popular tool in internships and upper division classes.

BA 3000. Career Skills. (1 cr.; S-N only; Every Fall, Spring & Summer) Career planning. Use of Carlson School of Management’s Business Career Center. Awareness, knowledge, skills associated with career/job search process. prereq: CSOM [soph or upper div] major, MACC, MBT

BA 399H. Honors Topics. (1-4 cr. [max 8 cr.]; A-F only; Periodic Fall & Spring) Topics vary.

BA 3998. Directed Study. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Student-initiated project or directed study. prereq: CSOM major, instr consent

BA 3999. Internship Seminar. (1 cr. [max 3 cr.]; S-N only; Every Fall, Spring & Summer) This course helps students integrate internship experiences with relevant assignments to create helpful next steps toward their career learning and development. prereq: Approved internship, instr consent

BA 4501. Carlson Funds Enterprise: Growth. (3 cr. [max 9 cr.]; A-F only; Every Fall & Spring) Lectures, assignments, modules. Hands-on real-money experience through Golden Gopher Growth Fund. prereq: concurrent registration is required (or allowed) in MBA 6501, CSOM [jr or sr], approved application

BA 4502. Carlson Funds Enterprise: Fixed Income. (3 cr. [max 9 cr.]; A-F only; Every Fall & Spring) Lectures, assignments, modules. Hands-on real-money experience through Golden Gopher Growth Fund. prereq: concurrent registration is required (or allowed) in MBA 6501, CSOM [jr or sr], approved application

BA 4503. Carlson Ventures Enterprise. (2-3 cr. [max 6 cr.]; Student Option No Audit; Every Fall & Spring) Modeled after early stage venture capital funds. Due diligence process. Starting/growing high-growth ventures. University-based technologies, start-up companies, and experts. Business analysis/development. Assistance to non-University-based start-up companies seeking initial equity capital. prereq: concurrent registration is required (or allowed) in MBA 6503, CSOM [jr or sr], approved application

BA 4504. Carlson Consulting Enterprise. (3 cr. [max 6 cr.]; Student Option No Audit; Every Fall & Spring) Connects cutting-edge ideas/technologies from classroom to real problems presented by clients. Students work collaboratively with clients to integrate strategy/technology. How to lead complex change initiatives. prereq: concurrent registration is required (or allowed) in MBA 6504, CSOM [jr or sr], approved application

BA 4505. Brand Enterprise. (3 cr. [max 6 cr.]; Student Option No Audit; Every Fall & Spring) Students assist companies/organizations with marketing/brand challenges. Applying theory and industry best practices. Working collaboratively in real world environment. Critical thinking, applied marketing skills. prereq: concurrent registration is required (or allowed) in MBA 6505, CSOM [jr or sr], approved application

BA 4990H. Honors Thesis Seminar I. (2 cr.; A-F only; Every Spring) Conducting rigorous academic research. How to develop honors thesis from initial question of interest. Honors thesis proposal, research question, review of literature, study design. prereq: CSOM honors, 2nd sem jr

BA 4991H. Honors Thesis Seminar II. (2 cr.; A-F only; Every Spring) Students refine research methodology, develop results, and derive preliminary conclusions. Draft of honors thesis, with preliminary results and clear agenda for final analysis. prereq: 4990H, CSOM honors, sr

BA 4994H. Directed Research. (1-4 cr.; A-F only; Every Fall & Spring)
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Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

Honors directed research. prereq: Honors

BA 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)

No description prereq: Doctoral student, adviser and DGS consent

BA 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)

TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr.; dept consent for 3rd/4th registrations, up to 24 combined cr.; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

BA 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)

No description prereq: Max 18 cr per semester or summer; 24 cr required

Business Law (BLAW)

BLAW 3058. The Law of Contracts and Agency. (4 cr.; A-F or Audit; Every Fall & Spring)

Origin of law, its place in and effect on society; history and development of law; system of courts; legal procedure. Law of contracts as the basic law affecting business transaction. Laws affecting the sale of goods and contracts and the law of agency.

BLAW 3059. Real Estate Law. (2 cr.; A-F only; Every Fall)

Every business owner or manager inevitably will be involved with purchasing, selling, owning, leasing, zoning, taxing, mortgaging and financing real estate. This course provides the basic tools to understand all aspects of real estate and to spot issues that require legal counsel.

BLAW 6158. The study of laws affecting private business and publicly-traded companies. (2 cr. [max 4 cr.]; A-F only; Every Spring)

This course highlights topics that are important to any business manager, with particular emphasis on areas of interest for those aspiring to high level executive/management positions with publicly-traded companies. General topics include: contracts, real estate law, the law of agency, employment law, certain discrimination laws (including Minnesota's fairly recent protections for women in the workplace), and forms of business entity. Public company subjects include: pros and cons of going public, the IPO process, federal securities laws and SEC regulations regarding public company reporting requirements, insider trading, the Sarbanes-Oxley Act of 2002 and its impact on corporate governance, trends in shareholder democracy rights and shareholder activism, and the role of boards and audit committees. Throughout the course, we will examine the impact of the Supreme Court on American business. prereq: MBA student

BLAW 1501. Introduction to Photography. (3 cr.; Student Option; Every Fall, Spring & Summer)

This course is designed for beginning students in photography, and specifically presents digital camera techniques as a means of personal expression. Observing/capturing, digital process, printing and screen presentation will be addressed in relation to specific subjects, intentions and aesthetic judgements. The particular study abroad experience of each student will be one of the main focuses throughout the semester. Students are expected to bring a digital camera and a laptop with some means of editing (although computers and basic Photoshop is available in the computer lab.)

BLAW 3001. Nationalism in Comparative Perspective. (3 cr.; Student Option; Every Fall, Spring & Summer)

This course studies the relationship between states and nations in both a theoretical and comparative perspective with a particular focus on the Catalan, Basque and Spanish experiences. It analyzes state building processes and the development of nationalism, as well as the social, economic and technological conditions behind its emergence, transformation and contrasting discourse. The course aims at providing a solid theoretical background on the subject of nationalism as well as introducing the students into the social and political reality that permeates in Spain's daily life and shapes Spaniard's political mind-frames and identities.

BLAW 3002. Global Marketing. (3 cr.; Student Option; Every Fall, Spring & Summer)

This course provides an exploration of basic knowledge of global marketing, focusing on the impact of environment on the strategies used by firms, and the understanding of consumer behavior management as it relates to the development and implementation of global marketing strategies. Worldwide business represents real opportunities for a firm but also creates difficulties, challenges and new ways of implementing marketing. Global marketing is a specific kind of marketing applied to inter-national firms in order to implement the same strategy within the entire market taking into account cultural, economic, social, political, etc., specificities for each area. This course will provide the basic knowledge of global marketing focusing on the impact of environment on the firm strategy, the development and implementation of a global marketing strategy and the understanding of consumer behavior management in a global strategy. Case studies applied to worldwide business contexts as well as more specific European contexts will provide concrete illustrations for the students.

BCLA 3003. Intercultural Management. (3 cr.; Student Option; Every Fall, Spring & Summer)

This course is designed to introduce students to concepts and fundamentals of international management. The course will consider aspects of management within an international and culturally complex environment, while considering the business influences within the global workplace. Students with or without prior international management knowledge will benefit from the course. Organizational effectiveness demands that personnel do the right things efficiently. Therefore, the role of management is to strive for and maintain the goals of the organization. Being an effective manager is not just telling others what to do. It is also about effective leadership, training, and communication. Having effective managers can be a cost saving tool for all organizations of all sizes. Corporation executives, supervisors, and managers are aware of the importance of and difficulty in finding and retaining highly skilled employees (a time-consuming role of management). Today's managers need a systems-view of the organization. This course will help you think of the organization as a system rather than as a work unit where tasks are performed. Most of you will, after graduating, become supervisors and managers and be required to provide training and leadership for your personnel. In just about any organization, you will be working with people who will have a different cultural background that your own, you may be working as an expatriate in a different country or you may experience any of a number of multicultural challenges. This course will help you prepare for these eventualities.

Carlson Executive MBA (CMBA)

CMBA 5554. International Residency. (1.5 cr.; A-F only; Every Spring)

Students travel to an international location for nine days, engage in discussions with international colleagues, to apply program concepts and develop broader sensitivity to cultural/social differences. Pre-trip preparation, on-site discussion, and trip assignment are also required. Held in late March.

CMBA 5625. Entrepreneurship and Innovation. (3 cr.; A-F only; Every Spring)

Entrepreneurial role of employee/management in increasing organizational value through creation/formation of new businesses, products, or markets within entities ranging from early stage companies to social ventures to F500 corporations.

CMBA 5710. Leadership. (1.5 cr.; A-F only; Every Fall)

Self-awareness/insight concerning personal leadership/core values. Increase capabilities to understand potential personal derailment patterns/create effective strategies to address challenges. Develop lifelong executive leadership practices/habits for high performance in demanding circumstances.

CMBA 5711. Negotiation. (3 cr.; A-F only; Every Fall)

Securing agreements between two or more parties who are interdependent and are seeking to maximize their own outcomes. Negotiation in various settings. Simulations, role-playing, cases.

CMBA 5712. Information Technology. (1.5 cr.; A-F only; Every Fall)
Course prepares you with an inside-out and an outside-in perspective of how information technology is disrupting a variety of industries, how to compete in such an environment and how to strategically manage the IT function within companies to have an efficiency-innovation duality. Key principles covered in the class are developing a state-of-the-art IT strategy, getting first-hand exposure to ERP systems and learning the organizational changes involved in implementing such systems, applying disruptive and big-bang theories of IT enables disruption and learning the nuances of platform competition and multi-sided markets to fight such disruption.

**CMBA 5713. Managerial Accounting.** (3 cr.; A-F only; Every Fall)

**CMBA 5714. Advanced Marketing.** (3 cr.; A-F only; Every Fall)

**CMBA 5715. Advanced Financial Management.** (3 cr.; A-F only; Every Fall)
Executive-level corporate financial policy. Rigorous case-oriented approach. Students apply principles of finance on their own initiative.

**CMBA 5721. Advanced Management Topics.** (1.5 cr. [max 3 cr.]; A-F only; Every Spring)
Topics reflect strengths, talents, and interests of class. Topics integrate different aspects of curriculum while not being limited by specific area/paradigm.

**CMBA 5722. International Business.** (3 cr.; A-F only; Every Spring)

**CMBA 5723. Ethics.** (1.5 cr.; A-F only; Every Fall & Spring)

**CMBA 5724. International Residency.** (1.5 cr.; A-F only; Every Spring)
Students travel to international location for 11 days. Discussions with international colleagues. Applying program concepts. Sensitivity to cultural/social differences. Pre-trip preparation, on-site discussion, trip assignment.

**CMBA 5810. Introduction to Statistics and Business Analytics.** (3 cr.; A-F only; Every Fall)
This course focuses on the use of data to solve business problems and the development of skills necessary to (1) formulate a management problem as a statistical problem; (2) collect appropriate data and perform fundamental procedures of statistical analysis; and (3) to interpret, critically evaluate, and implement the results of the statistical analysis. In particular, the student should be able to: generate and use basic graphical and numerical descriptive methods; apply basic estimation and testing procedures; estimate and interpret the parameters of simple and multiple regression model; to test the utility of the model and for estimation and prediction; think statistically about issues facing her/his organization; recognize when statistical methods are effective, and when they are not; and to translate, communicate, and critically evaluate the results of statistical analyses.

**CMBA 5811. Financial Accounting.** (3 cr.; A-F only; Every Fall)
Students learn about the accounting system used by firms to measure and report their economic performance and financial position to external parties. Students analyze corporate financial reports to discover the impact of significant economic events. Discussions and cases focus on the role of financial reporting standards in informing financial intermediaries and contributing to the efficient allocation of capital in a modern economy.

**CMBA 5812. Organizational Behavior.** (3 cr.; A-F only; Every Fall)
Course’s main purpose is to prepare you to successfully engage and lead people to achieve organizational goals. Effective managers must not only develop winning strategies, but they must also implement them. Doing so requires a thorough understanding of organizational behavior. Broadly speaking, organizational behavior is the systematic study of how people behave in organizational settings. This course is designed to develop your understanding of the complexity of orgs and how they affect behavior, build your self-knowledge and people-leadership skills, and help you learn and apply appropriate tactics and tools to improve organizational functioning and facilitate personal career success. Course topics include: organizational (e.g. structure and culture), interpersonal (e.g. power and influence, social networks, conflict), and individual (e.g. decision making, motivation) aspects of organizational behavior.

**CMBA 5813. Competing In The Digital Age.** (1.5 cr.; A-F only; Every Fall)
Course prepares you with an inside-out and an outside-in perspective of how information technology is disrupting a variety of industries, how to compete in such an environment and how to strategically manage the IT function within companies to have an efficiency-innovation duality. Key principles covered in the class are developing a state-of-the-art IT strategy, getting first-hand exposure to ERP systems and learning the organizational changes involved in implementing such systems, applying disruptive and big-bang theories of IT enables disruption and learning the nuances of platform competition and multi-sided markets to fight such disruption.

**CMBA 5814. Economics.** (1.5 cr. [max 3 cr.]; A-F only; Every Fall)
The goal is to improve corporate decision-making by developing better understanding of the economic environment. Emphasis is strategic, not theoretic (this is not a standard macro course.) We shall consider two primary kinds of economic phenomena (and models): i. long-run economic growth; ii. business cycles. Also and importantly, we will learn about what a central bank does and spend some time on the current world financial/macroeconomic mess. How could we do otherwise? Students will learn appropriate tools to analyze these phenomena and apply them to their own decision-making environs, both organizational and personal.

**CMBA 5815. Marketing Management.** (3 cr.; A-F only; Every Spring)
This is a study of management of the marketing function. We strive for an understanding of foundational marketing concepts and of the skills needed for strategy development. We also consider the importance of integrating financial data, operational factors, and human resource issues along with marketing research pertaining to product offering decisions, distribution channels, pricing and communication.

**CMBA 5816. Strategic Management.** (3 cr.; A-F only; Every Spring)
Course provides an integrated, top management viewpoint for business students. It frames the functional courses in the CE MBA curriculum by providing a ‘total’ business perspective. The course objective is to develop analytic skills and deep understandings in identifying key issues and formulating and implementing appropriate strategies for creating and sustaining a competitive edge in complex business situations. The course will familiarize students with the most current theories, concepts, and techniques of strategic management using a combination of readings, case discussions, presentations and videos. Student progress will be assessed through class participation, an in-class exam, and a group project comparing the strategies of two competing firms.

**CMBA 5817. Financial Management.** (3 cr.; A-F only; Every Spring)
Students apply concepts of risk, return, and valuation to decisions that a corporate financial officer or person in small business must make about sources/uses of funds during changing financial markets.

**CMBA 5818. Supply Chain and Operations.** (3 cr.; A-F only; Every Spring)
A majority of the people and physical assets of a company are involved in operations. The operations function represents the physical core of every company: The systems and processes that generate the goods and services to be sold to customers. World-class operations can lead to a significant and enduring competitive advantage. Failing operations mean low productivity and
In this course we explore the many faces of global competition. We challenge the assumptions that global strategy is a precursor to success by exploring a set of complex forces that drive firms to internationalization. The course places special emphasis on emerging markets, given that they are home to most of the global growth and population, as well as institutional voids. We focus on factors that determine strategic choices firms make as they build their international presence, by exploring how firms: build international presence by selecting countries, and modes of entry; benefit from national competitive advantage in developed and emerging markets; diagnose and address cultural challenges of working across borders, organize to share knowledge across borders; build and sustain their multifaceted global legitimacy; collaborate across borders; prepare their managers to address cultural, personal, and career challenges in expatriate roles and on global teams.

CMBA 5820. Negotiation Strategies: Creative Solutions for Difficult Problems. (3 cr.; A-F only; Every Fall)
Negotiation is the art and science of securing agreements between two or more parties who are interdependent and who are seeking to maximize their own outcomes. As such, this course deals with understanding the behavior of individuals, groups, and organizations in the context of competitive situations. We focus on understanding both the theory and process of negotiation in a variety of settings. This course is designed to be relevant to the broad spectrum of negotiation problems that are faced by managers and professionals. It is designed to complement the technical and diagnostic skills learned in other courses in the program. A basic premise of the course is that while a manager needs analytical skills to discover optimal solutions to problems, a broad array of negotiation skills are needed to get these solutions accepted and implemented. This course will allow participants the opportunity to develop these skills experientially and to understand negotiation in useful analytic frameworks. As such, considerable emphasis will be placed on simulations, role-playing, and cases.

CMBA 5821. Managerial Accounting. (3 cr.; A-F only; Every Fall)
This course provides the topic of management accounting in depth. The purpose of management accounting is to provide information to management for costing products and decision making as well as for planning, controlling, and evaluating business activities. The student who successfully completes this class will be able to identify a managerial issue and create a solution to the problem.

CMBA 5822. Applied Leadership. (1.5 cr.; A-F only; Every Fall)
The course objectives are to build stronger self-awareness and insight concerning personal core values, increase capabilities to understand potential personal derailment patterns and create effective strategies to address these challenges, better nurture and leverage strengths for executive leadership performance, effectively coach and motivate others as a key executive leadership attribute, and develop deeper lifelong executive leadership practices and habits for high performance in demanding circumstances. Prereq: CMBA student

CMBA 5823. Competing Globally. (3 cr.; A-F only; Every Fall)
Financial Management introduced the theory of corporate finance and the application of value creation principles to, mainly, business operating decisions at the level of the project or initiative. This course moves on to consider decisions at the firm level. Among the questions addressed in this course are how best to measure overall firm performance, how to best finance the company, including debt versus equity questions, when to include options in the firm’s financing arrangements, when to lease resources rather than buy them, when to pay a dividend and/or repurchase shares and whether mergers and acquisitions generate value added.

CMBA 5826. Corporate Strategy. (1.5 cr.; A-F only; Every Spring)
This course focuses on the strategic management of firm scope (i.e., choosing what your firm does and does not do). It provides understanding of buyer behavior which is critical to the successful formulation and implementation of marketing strategy. To that end, this course is designed to provide prescriptive general managers the intellectual tools necessary to design actionable marketing strategies. There will be a strong emphasis on managerial action and multiple theoretical perspectives will be discussed.

CMBA 5827. Advanced Financial Management. (3 cr.; A-F only; Every Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
of areas from entrepreneurship/innovation, strategy, IT, and others.

Carlson School of Management (CSOM)

CSOM 8101. Methods and Topics in Applied Economics. (2-4 cr.; Student Option; Every Spring) Intermediate methods/topics in business research.

Center for Allied Health Prog (CAHP)

CAHP 5110. Foundations of Interprofessional Communication and Collaboration. (1 cr.; S-N only; Every Fall) Interprofessional approach to health care. Directed group activities in five two-hour sessions: personal/professional image; teamwork, self/peer assessment; health professions; professional identity/integrity; relationships between professions and those they serve. Includes online modules. prereq: Enrolled CLSAP or OT student.

Chemical Engineering (CHEN)

CHEN 1001. Advances in Chemical Engineering and Materials Science. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall) Survey of important advances in chemical engineering, materials science/engineering. Design problems, career opportunities. Lectures, demonstrations, interactive exercises. prereq: Recommended for [chemical engineering, materials science/engineering] majors.

CHEN 2001. Material and Energy Balances. (4 cr.; A-F or Audit; Every Fall) Description/analysis of chemical engineering systems. Units/dimensions, materials balances on systems with/without chemical reactions, elementary phase equilibria/diagrams, energy balances. Elementary treatment of multistage steady-state equilibrium operations. prereq: concurrent registration is required (or allowed) in CHEM 2301 or equiv., concurrent registration is required (or allowed) in MATH 2374 or equiv., concurrent registration is required (or allowed) in PHYS 1302 or equiv., CSE student, C- or better in all pre-reqs.

CHEN 2594. Directed Research Lower Division. (1-4 cr. [max 6 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Independent lab research under faculty supervision for students not yet taking junior level ChEn courses. prereq: instr consent, DUGS consent.

CHEN 3005. Transport Phenomena: Momentum and Heat. (4 cr.; A-F only; Every Fall) Fluid statics/dynamics. Applications to chemical engineering systems, conduction, diffusion. Principles/applications of heat transfer in chemical engineering systems. prereq: [2001 or [transfer student, dept consent]], [Math 2373 or equiv.], upper div ChEn major, C- or better in all pre-reqs.

CHEN 3006. Mass Transport and Separation Processes. (4 cr.; A-F only; Every Spring) Introduction to principles of mass transfer. Mass transfer operations used in separation processes, unit operations. prereq: [2001 or 4001], [3005 or 4005], [3101 or 4101], [upper div ChEn major or dept consent], C- or better in all pre-reqs.

CHEN 3041. Industrial Assignment I. (2 cr.; A-F only; Every Fall, Spring & Summer) Industrial work assignment in engineering co-op program. Formal report on technical project related to industrial work. prereq: ChEn upper Div., completion of required courses in ChEn prog through fall sem of 3rd yr, GPA of at least 2.80, registered in co-op prog.

CHEN 3045. Chemical Engineering Industrial Internship. (1 cr. [max 2 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Industrial internship, three to eight months. Formal report on technical project related to industrial work. prereq: ChEn Upper Division. GPA of at least 2.8.

CHEN 3101. Chemical Engineering Thermodynamics. (4 cr.; A-F only; Every Fall) Applications of thermodynamics/chemical equilibrium to problems in chemical engineering. prereq: 2001, CHEM 4501, [Math 2373 or equiv.], [upper div ChEn major or dept consent], C- or better in all pre-reqs.

CHEN 3102. Reaction Kinetics and Reactor Engineering. (4 cr.; A-F only; Every Spring) Chemical equilibrium/chemical kinetics applied to chemical engineering systems. Behavior/design of chemical reactors, interaction between chemical/physical rate processes. Mathematical modeling, design of reactors. prereq: [2001 or 4001], [3101 or 4101], [upper div ChEn major or dept consent], C- or better in all pre-reqs.

CHEN 3201. Numerical methods in ChEn applications. (3 cr.; A-F only; Every Spring) Numerical methods/applications in heat/mass transfer, advanced chemical engineering applications. prereq: [2001 or 4001], [3005 or 4005], [3006 or 4006 or concurrent registration is required (or allowed) in 4006], [upper div ChEn major or dept consent], C- or better in all pre-reqs.

CHEN 3401W. Junior Chemical Engineering Lab. (WI; 2 cr.; A-F only; Every Spring) Efficient design, structure, measurement, planning, analysis, presentation of experiments/results. Energy balances, fluid flow, heat/mass transfer. Design of new systems using data obtained in lab. Oral/written presentations. prereq: Writ 1301 or eq., Chem 2121, 2311, ChEn 2001, 3005, 3101, and [pre-req or concurrent registration in 3201, 3102 3006]; upper div ChEn major (C- in all prerequisites).

CHEN 3701. Introduction to Biomolecular Engineering. (3 cr.; A-F or Audit; Every Fall) Fundamentals of biological systems, from biomolecules to interplays of biomolecules that give rise to processes of life. Students apply chemical engineering principles to analysis of living systems. prereq: 2001, [ChEn 2302 or concurrent registration is required (or allowed) in Chem 2302 or equiv.], [Math 2373 or equiv.]; high school biology recommended; C- or better in all pre-reqs.

CHEN 4041. Industrial Assignment II. (2 cr.; A-F only; Every Fall, Spring & Summer) Industrial assignment in engineering co-op program. Application of chemical engineering principles to engineering design problems related to industrial work. Formal written report and presentation. prereq: 3041, GPA of at least 2.80, registration in co-op prog.

CHEN 4214. Polymers. (3 cr.; A-F or Audit; Every Spring) Polymer structure-property relations: structure/morphology of crystalline/amorphous states. Crystallization kinetics. Vitrification and the glass transition. Mechanical properties, failure, permeability, optical/ electrical properties, polymer composites. effect of processing on properties. prereq: [MATS 3011, [3101 or MATS 3001], [upper div MatS or ChEn]] or instr consent.

CHEN 4223W. Polymer Laboratory. (WI; 2 cr.; Student Option; Every Spring) Synthesis, characterization, and physical properties of polymers. Free radical, condensation, emulsion, anionic polymerization. Infrared spectroscopy/gel permeation chromatography. Viscoelasticity, rubber elasticity, crystallization.

CHEN 4401W. Senior Chemical Engineering Lab. (WI; 3 cr.; A-F only; Every Fall) Principles/techniques of efficient design, structure, measurement, planning, analysis, presentation of experiments. Energy balances, fluid flow, heat transfer, mass transfer, Design of new systems using experimental data obtained in lab. Oral/written presentations. prereq: [3005 or 4005], [3006 or 4006], [3101 or 4101], [3102 or 4102], [2001 or 4001], [3201 or 4201], [3401, CHEM 2311], [2121 or CHEM 4121], [English composition requirement, upper div ChEn major] or dept consent, C- or better in all pre-reqs.

CHEN 4501W. Chemical Engineering Design I. (WI; 3 cr.; Student Option; Every Fall) Engineering economics of process evaluation, including time/bases for cost estimation. Engineering design through group projects. Case studies. prereq: [2001, 3005, 3006, 3101, 3102, 3201, 3401W, CHEM 2311, CHEM 2211, fr writing requirement, upper div ChEn major] or dept consent, C- or better in all pre-reqs.

CHEN 4502W. Chemical Engineering Design II. (WI; 2 cr.; A-F or Audit; Every Spring) Introduction to product design. Case studies, special topics. prereq: 4401W, 4501W, upper div ChEn major or dept consent], C- or better in all pre-reqs.

CHEN 4593. Directed study. (1-4 cr. [max 6 cr.]; Student Option No Audit; Every Fall, Spring & Summer)
Directed study under faculty supervision. prereq: ChEn major upper division, instr consent

CHEN 4594. Directed Research. (.1-4 cr. [max 6 cr.]; Student Option No Audit; Every Fall, Spring & Summer)
Independent lab research under faculty supervision. prereq: Upper div ChEn major

CHEN 4594H. Directed Research - Honors. (.1-4 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Independent lab research under faculty supervision for upper division students wanting honors experience. prereq: instr and DUGS consent, upper div ChEn major

CHEN 4601. Process Control. (.3 cr.; A-F only; Every Fall)
Analysis of dynamic behavior/design of linear control systems for chemical processes. Dynamic response/stability of linear ODE systems, tuning of PID controllers, synthesis of feedback, feedforward/feedback controller. prereq: [3102 or 4102], [upper div ChEn major or dept consent], C- or better in all pre-reqs

CHEN 4701. Applied Math. (.3 cr.; A-F only; Every Fall)
Integrated approach to solving linear mathematical problems (linear algebraic equations, linear ordinary/partial differential equations) using theoretical/numerical analysis based on linear operator theory. Undergraduate version of 8201. prereq: [3102 or 4102], ChEn major upper div

CHEN 4702. Advanced Undergraduate Rheology. (.2 cr.; A-F only; Every Spring)
Deformation/flow of non-Newtonian/viscoelastic fluids, plastic materials, perfectly elastic solids. Phenomenological/molecular interpretation of rheology of elastomers, polymer melts, polymer solutions. Application of rheology to polymer processing. prereq: [3005 or 4005], instr consent

CHEN 4704. Advanced Undergraduate Physical Rate Processes I: Transport. (.3 cr.; A-F only; Every Fall & Spring)
Mass transfer, dilute/concentrated diffusion, Brownian motion. Diffusion coefficients in polymers, of electrolytes, at critical points. Multicomponent diffusion. Correlations/predictions. Mass transfer, chemical reaction. prereq: [3005 or 4005], ChEn major upper div

CHEN 4707. Advanced Undergraduate Statistical Thermodynamics and Kinetics. (.3 cr.; A-F only; Every Fall)
Introduction to statistical mechanical description of equilibrium/non-equilibrium properties of matter. Emphasizes fluids, classical statistical mechanics. prereq: ChEn 3005 or 4005, 3101 or 4101, CHEM 3501, CHEM 3502, ChEn major upper div

CHEN 4708. Advanced Undergraduate Chemical Rate Processes: Analysis of Chemical Reactors. (.3 cr.; A-F only; Every Spring)
Design of reactors for heat management, with catalytic processes. Analysis of steady state, transient behavior. Polymerization, combustion, solids processing, environmental modeling. Design of multiphase reactors. prereq: [3102 or 4102], ChEn major upper div

CHEN 5531. Electrochemical Engineering and Renewable Energy. (.3 cr.; A-F only; Every Fall)

CHEN 5751. Biochemical Engineering. (.3 cr.; A-F or Audit; Every Spring)
Chemical engineering principles applied to analysis/design of complex cellular/enzyme processes. Quantitative framework for design of cells for production of proteins, synthesis of antibodies with mammalian cells, or degradation of toxic compounds in contaminated soil. prereq: [3005 or 4005], concurrent registration is required (or allowed) in 3006 or concurrent registration is required (or allowed) in 4006, [concurrent registration is required (or allowed) in 3102 or concurrent registration is required (or allowed) in 4102]

CHEN 5753. Advanced Biomedical Transport Processes. (.3 cr.; A-F or Audit; Every Spring)

CHEN 5771. Colloids and Dispersions. (.3 cr.; A-F or Audit; Every Fall)
Preparation, stability, coagulation kinetics or colloidal solutions. DLVO theory, electrokinetic phenomena. Properties of micelles, other microstructures. prereq: Physical chemistry

CHEN 8101. Fluid Mechanics I: Change, Deformation, Equations of Flow. (.3 cr.; A-F or Audit; Every Fall)
Equations of change of mass, momentum, angular momentum. Kinematics of deformation, convective transport. Applications to fluid statics/dynamics of Newtonian fluids. Examples of exact solutions of Navier-Stokes equations, useful simplifications. prereq: Chemical engineering grad student or instr consent

CHEN 8102. Principles and Applications of Rheology. (.2 cr.; A-F or Audit; Periodic Spring)
Deformation and flow of non-Newtonian and viscoelastic fluids, plastic materials, and perfectly elastic solids. Phenomenological and molecular interpretation of rheology of elastomers, polymer melts and polymer solutions, application of rheology to polymer processing. prereq: 8101

CHEN 8103. Fluid Mechanics III: Porous Media. (.3 cr.; A-F or Audit; Periodic Fall)
Geometry/topology of porous materials. Fundamentals of flow, transport, and deformation. One-/two-phase Darcy flows, convective dispersion in microporous materials. Relations of macroscopic properties/behavior to underlying microscopic structures/mechanisms. Nanoporous materials, prereq: chemical engineering grad student or instr consent

CHEN 8104. Coating Process Fundamentals. (.2 cr.; A-F or Audit; Every Spring & Summer)

CHEN 8112. Rheology Laboratory Project. (.1 cr.; A-F or Audit; Every Spring)
How to make rheological lab measurements. Students select/characterize rheologically interesting material with help of instructor. Oral/write report. Half-semester course. prereq: 8101, [4702 or concurrent registration is required (or allowed) in 4702 or 8102 or concurrent registration is required (or allowed) in 8102]

CHEN 8115. Electron Microscopy of Soft Matter. (.2 cr.; A-F or Audit; Periodic Fall)
Operation principles of transmission electron microscope (TEM) and scanning electron microscope (SEM). How these instruments are applied in study of soft materials (e.g., liquid, semi-liquid material systems). Unique specimen preparation techniques, low image contrast, electron-beam radiation-damage, and limited signal-to-noise ratio. TEM/SEM digital imaging, prereq: Chemical engineering or materials science/engineering grad major or instr consent

CHEN 8201. Applied Math. (.3 cr.; A-F or Audit; Every Fall)
Integrated approach to solving linear mathematical problems. Linear algebraic equations. Linear ordinary and partial differential equations using theoretical/numerical analysis based on linear operator theory. prereq: Chemical engineering grad student or instr consent

CHEN 8202. Applied Mathematics II: Nonlinear Analysis. (.2 cr.; A-F or Audit; Every Spring)
Nonlinear mathematical problems. Nonlinear ordinary and partial differential equations using theoretical/numerical analysis. prereq: [Grad-level course in linear algebra, chemical engineering grad major] or instr consent

CHEN 8211. Physical Chemistry of Polymers. (.4 cr.; Student Option; Every Spring)
Chain conformations. Thermodynamics of polymer solutions, blends, copolymers. Light, neutron, X-ray scattering. Dilute solutions,

CHEN 8221. Synthetic Polymer Chemistry. (3 cr.; A-F or Audit; Every Fall) Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties. prerequisite: [Undergraduate organic chemistry course, undergrad physical chemistry course] or instr consent


CHEN 8302. Physical Rate Processes II: Mass Transfer. (3 cr.; A-F or Audit; Periodic Fall) Applications of mass transfer. Membranes, including gas separation and reverse osmosis. Controlled drug release. Dispersion, including examples of pollution modeling. Adsorption/ chromatography. Coupled heat/mass transfer, including cooling towers. Double-diffusive effects. prerequisite: Chemical engineering grad student or instr consent

CHEN 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Master's student, adviser and DGS consent

CHEN 8401. Physical and Chemical Thermodynamics. (3 cr.; A-F or Audit; Every Fall) Principles of thermodynamics with emphasis on solving problems encountered in chemical engineering and materials science. An organized exposition of fundamental concepts that will help students understand and analyze the systems they are likely to encounter while conducting original research. This course is for students who seek a much deeper understanding than a typical undergraduate course provides. prerequisite: Undergraduate engineering course or chemistry course in thermodynamics. Chemical Engineering graduate student, or instructor consent.

CHEN 8402. Statistical Thermodynamics and Kinetics. (3 cr.; A-F or Audit; Every Spring) Introduction to statistical mechanical description of equilibrium and non-equilibrium properties of matter. Emphasizes fluids, classical statistical mechanics. prerequisite: Chemical engineering grad student or instr consent

CHEN 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Doctoral student, adviser and DGS consent


CHEN 8502. Process Control. (3 cr.; A-F or Audit; Periodic Fall) For linear systems: stability, controllability, observability, pole-placement via state feedback state observers, output feedback, and robustness of control systems. For nonlinear systems: solution properties, stability analysis, singular perturbations, feedback linearization via state feedback, and direct synthesis via output feedback. prerequisite: Chemical Engineering grad major or instr consent

CHEN 8503. Chemical Rate Processes: Homogeneous Reactions. (3 cr.; A-F or Audit; Periodic Fall) Description_characterization of chemically reacting systems. Theories of elementary reactions. Experimental methods for investigating elementary reactions. Applications of chemical kinetics to complex reactions, such as combustion, flames, and the atmosphere. prerequisite: Chemical engineering grad student or instr consent

CHEN 8555. Chemical Engineering Teaching Practicum. (1.5 cr.; [max 24 cr.]; S-N only; Every Fall, Spring & Summer) Experience in instruction including grading of student work, holding of office hours, and in special cases, lecturing. Students will work with and receive feedback from a faculty member in CEMS. prerequisite: Grad ChEn major and DGS permission

CHEN 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) tbd prerequisite: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr


CHEN 8754. Systems Analysis of Biological Processes. (3 cr.; Student Option; Every Spring) Relating biological processes at molecular level to physiological level of cells/organisms/ populations. Methodology for analyzing data. Quantification of molecular interplays. prerequisite: Grad student in [life sciences or chemical physical sciences or engineering]; ChEn students must take A/F

CHEN 8771. Interfaces and Colloids. (3 cr.; A-F or Audit; Every Fall) Interfacial tension/thermodynamics, capillarity, contact angle wettability, adhesion, preparation_stability of colloids. DLVO theory, electrokinetic phenomena, micelles, rheology of dispersions. prerequisite: Physical Chemistry

CHEN 8777. Thesis Credits: Master's. (1-18 cr.; [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

CHEN 8888. Thesis Credit: Doctoral. (1-24 cr.; [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Max 18 cr per semester or summer; 24 cr required

CHEN 8900. Seminar. (1 cr.; S-N or Audit; Every Fall) Presentation and discussion of papers concerning newer developments in chemical engineering, materials science, and related fields.

CHEN 8901. Seminar. (1 cr.; [max 9 cr.]; S-N only; Every Spring) Presentation and discussion of papers concerning the newer developments in chemical engineering.

CHEN 8902. Seminar: Finite Element Methods of Computer-aided Analysis. (1 cr.; A-F or Audit; Every Spring) Fundamentals of finite element method as applied mathematics. How to construct finite element codes and put them into operation. prerequisite: Chemical engineering grad student or instr consent

CHEN 8993. Directed Study. (1-12 cr.; Student Option; Every Fall, Spring & Summer)

CHEN 8994. Directed Research. (1-12 cr.; Student Option; Every Fall, Spring & Summer)

CHEN 8995. Special Topics. (1-4 cr.; Student Option; Every Fall, Spring & Summer) New or experimental courses offered by department or visiting faculty

Chemical Physics (CHPH)

CHPH 8081. M.S. Plan B Project I. (4 cr.; A-F only; Every Fall, Spring & Summer) Topic arranged by student adviser. Written report required. prerequisite: Grad chem phys major

CHPH 8082. M.S. Plan B Project II. (4 cr.; A-F only; Every Fall, Spring & Summer) Topic arranged by student adviser. Written report required. prerequisite: Grad chem phys major

CHPH 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
University of Minnesota Twin Cities Catalog  
Fall, 2018

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

CHEM 1015. Introductory Chemistry: Lecture. (PHYS; 3 cr.; Student Option; Every Fall, Spring & Summer) Matter/energy, atoms, compounds, solutions, chemical reactions, mole/chemical calculations, gases, liquids, solids, chemical bonding, atomic/molecular structure, acids, bases, equilibria. Physical/chemical properties of hydrocarbons and organic compounds. Problem solving. Prereq: [High school chemistry or equiv], two yrs high school math, not passed chem placement exam, high school physics recommended; Students who will go on to take CHEM 1061/1065 should take CHEM 1015 only. Students who will NOT be continuing on to CHEM 1061/1065 and need to fulfill the Physical Science/Lab core requirement need take the 1-credit lab course CHEM 1017 either concurrently or consecutively. This course will NOT fulfill the Physical Science/Lab core requirement unless the CHEM 1017 lab course is completed either concurrently or consecutively. Requires (or allowed) in 1066; registration for 1061 or equiv, concurrent registration is required (or allowed) in 1065; registration for 1065 must precede registration for 1061

CHEM 1065. Chemical Principles I Laboratory. (PHYS; 1 cr.; A-F only; Every Fall, Spring & Summer) Basic laboratory skills while investigating physical and chemical phenomena closely linked to lecture material. Experimental design, data collection and treatment, discussion of errors, and proper treatment of hazardous wastes. Prereq: concurrent registration is required (or allowed) in 1065

CHEM 1066. Chemical Principles II Laboratory. (PHYS; 1 cr.; A-F only; Every Fall, Spring & Summer) Basic laboratory skills while investigating physical and chemical phenomena closely linked to lecture material. Experimental design, data collection and treatment, discussion of errors, and proper treatment of hazardous wastes. Prereq: concurrent registration is required (or allowed) in 1062

CHEM 1061. Chemical Principles I. (PHYS; 3 cr.; Student Option; Every Fall, Spring & Summer) Atomic theory, periodic properties of elements. Thermochemistry, reaction stoichiometry. Behavior of gases, liquids, and solids. Molecular/ionic structure/bonding. Organic chemistry and polymers. Energy sources, environmental issues related to energy use. Prereq/Grade of at least C- in [PHYS; 1011 or 1015] or [passing placement exam, concurrent registration is required (or allowed) in 1065]; intended for science or engineering majors; concurrent registration is required (or allowed) in 1065; registration for 1065 must precede registration for 1061


CHEM 1076. Honors Chemistry Laboratory. (PHYS; 1 cr.; A-F only; Every Fall) Develop laboratory skills while investigating physical and chemical phenomena closely linked to lecture material. Experimental design, data collection and treatment, discussion of errors, and proper treatment of hazardous wastes. Prereq: concurrent registration is required (or allowed) in 1071H, honors student, permission of University Honors Program.

CHEM 1075. Honors Chemistry I Laboratory. (PHYS; 1 cr.; A-F only; Every Fall) Develop laboratory skills as experiments become increasingly complex. Data collection/treatment, discussion of errors, proper treatment of hazardous wastes, experiment design. Prereq: concurrent registration is required (or allowed) in 1072H

CHEM 1071. Chemistry for the Life Sciences I. (PHYS; 3 cr.; Student Option; Every Fall) The topics of atomic theory, molecular structure, bonding and shape, energy and enthalpy, gases, properties of solutions, and equilibrium will be presented along with their application to biological systems. Intended to provide a strong chemistry background for students pursuing life science related majors or careers in life science related fields. Prereq: grade of a C- or better in CHEM 1015 or passing chemistry placement exam. This course is recommended for CBS majors.

CHEM 1072. Chemistry for the Life Sciences II. (3 cr.; Student Option; Every Spring) The topics of acids, bases and equilibrium, kinetics, nucleophilic substitution and elimination reactions, free radicals, electrochemistry, and alkene addition reactions will be presented along with their application to biological systems. Intended to provide a strong chemistry background for students pursuing life science related majors or careers in life science related fields. Prereq: grade of a C- or better in CHEM 1081 (lecture) and CHEM 1085 (lab).
One may argue about its causal role in these ideas in popular books, articles, and web sites concerning religion, mythology, and philosophy.

CHEM 2081. Chemistry for the Life Sciences III Laboratory. (2 cr.; Student Option; Every Fall) Experimental techniques and instrumentation applied to the study of chemical reactions and related biological systems. Techniques include spectroscopy, isolation, kinetics and thermodynamics, green chemistry, oxidations, enzymatic reductions, drug discovery, prereq: grade of a C- or better in CHEM 1082 (lecture) and CHEM 1086 (lab). This course is recommended for CBS majors.

CHEM 2094. Directed Research. (; 1-3 cr.; Student Option; Every Fall, Spring & Summer) Learning experience in areas not covered by regular courses. Individually arranged with faculty member, prereq: instr consent

CHEM 2101. Introductory Analytical Chemistry Lecture. (; 3 cr.; Student Option; Every Fall & Summer) Primarily for chemistry majors. Methods/concepts of measurement by chemical/instrumental analysis, including titrimetry, quantitative spectrophotometric analysis, chromatographic separations, equilibrium/rate methods. prereq: 1062/1066 or equiv

CHEM 2111. Introductory Analytical Chemistry Lab. (; 2 cr.; Student Option; Every Fall & Summer) Lab for 2101. High precision methods, acidimetry and complexometry, single and multicomponent analysis by spectrophotometry, analysis of mixtures by ion exchange and gas chromatography, enzymatic and rate methods. prereq: 2101 or concurrent registration is required (or allowed) in 2101

CHEM 2121. Process Analytical Chemistry. (; 3 cr.; A-F or Audit; Every Spring) Strategies/techniques for analysis. Use of modern instruments, including spectrophotometry, chromatography, and electrochemistry, prereq: [2302 or concurrent registration is required (or allowed) in 2302], [4501 or concurrent registration is required (or allowed) in 4501], CSE student

CHEM 2301. Organic Chemistry I. (; 3 cr.; Student Option; Every Fall, Spring & Summer) Organic compounds, constitutions, configurations, conformations, reactions. Molecular structure. Chemical reactivity/properties. Spectroscopic characterization of organic molecules, prereq: C- or better in 1062/1066 or 1072H/1076H

CHEM 2302. Organic Chemistry II. (3 cr.; Student Option; Every Fall, Spring & Summer) Reactions, synthesis, and spectroscopic characterization of organic compounds, organic polymers, and biologically important classes of organic compounds such as lipids, carbohydrates, amino acids, peptides, proteins, and nucleic acids. prereq: Grade of at least C- in 2301

CHEM 2311. Organic Lab. (4 cr.; Student Option; Every Fall, Spring & Summer) Lab techniques in synthesis, purification, and characterization of typical organic compounds, prereq: Grade of at least C- in [2302, 2304] or [concurrent registration is required (or allowed) in 2302, concurrent registration is required (or allowed) in 2304]

CHEM 2312H. Honors Organic Lab. (; 5 cr.; A-F only; Every Fall) Honors organic chemistry lab. prereq: [2301 or concurrent registration is required (or allowed) in 2301], [Chem or ChemE or BioC] major, instr consent

CHEM 2331H. Honors Elementary Organic Chemistry I. (3 cr.; A-F only; Every Fall) Important classes of organic compounds, their constitutions, configurations, conformations, reactions. Relationships between molecular structure/chemical properties/reactivities. Spectroscopic methods/method of characterization of organic molecules. prereq: At least B+ in 1072H, UHP student

CHEM 2332H. Honors Elementary Organic Chemistry II. (; 3 cr.; A-F only; Every Spring) Continuation of 2331H. Reactions, synthesis, and spectroscopic characterization of organic compounds, organic polymers, and their role in biologically important classes of organic molecules such as lipids, carbohydrates, amino acids, peptides, proteins, and nucleic acids. prereq: At least C- in 2331H, UHP student

CHEM 2910. Special Topics in Chemistry. (1 cr. [max 6 cr.]; S-N or Audit; Every Fall) Topics in chemistry. Opportunities and current research. prereq: 1 sem 1xxx chemistry or instr consent

CHEM 2920. Special Topics in Chemistry. (1 cr. [max 6 cr.]; S-N or Audit; Every Spring) Topics in chemistry. Opportunities and current research. prereq: 1 sem 1xxx chemistry or instr consent

CHEM 4001. Chemistry of Biomass and Biomass Conversion to Fuels and Products. (4 cr.; A-F or Audit; Every Fall)
Chemical principles underlying structure, properties, processing, performance of plant materials. prereq: 2301, [jr or sr or instr consent]

CHEM 4011. Mechanisms of Chemical Reactions. (3 cr.; Student Option; Every Fall)

CHEM 4021. Computational Chemistry. (3 cr.; Student Option; Every Spring)

CHEM 4066. Chemistry of Industry. (3 cr.; Student Option; Every Spring)
Industrial and polymer chemistry technology. Relation of basic properties to industrial utility. Economics, social problems, industrial environment. prereq: Chem sr or grad student or instr consent

CHEM 4094V. Directed Research. (WI; 1-5 cr. [max 75 cr.]; Student Option; Every Fall, Spring & Summer)
Learning experience in areas not covered by regular courses. Individually arranged with faculty member.

CHEM 4094W. Directed Research. (WI; 1-5 cr. [max 75 cr.]; Student Option; Every Fall, Spring & Summer)
Learning experience in areas not covered by regular courses. Individually arranged with faculty member. prereq: Any 3xxx or 4xxx chem course, instr consent

CHEM 4101. Modern Instrumental Methods of Chemical Analysis. (3 cr.; A-F or Audit; Every Spring)
Basic electronic, optical, computer technologies in design of chemical instrumentation. Advanced topics in spectroscopy (e.g., FT-nmr, FT-IR, atomic absorption/emission). Electrochemistry. Mass spectrometry. prereq: 2101, 2111

CHEM 4111W. Modern Instrumental Methods of Chemical Analysis Lab. (WI; 2 cr.; A-F or Audit; Every Spring)
Instrumental techniques, including spectroscopic methods, electrochemical methods, and analysis based on separation. Use of computers in data collection and reduction. prereq: 4101 or concurrent registration is required (or allowed)

CHEM 4201. Materials Chemistry. (3 cr.; Student Option; Every Fall)
Crystal systems/unit cells, phase diagrams, defects/interfaces, optical/dielectric properties, electrical/thermal conductivity, X-ray diffraction, thin film analysis, electronic structure, polarons/phonons, solid state chemistry, liquid/molecular crystals, polymers, magnetic/optical materials, porous materials, ceramics, piezoelectric materials, biomedical materials, catalysts. prereq: [4502 or equiv, 4701] or instr consent

CHEM 4214. Polymers. (3 cr.; A-F or Audit; Every Spring)
Structure/morphology of crystalline/amorphous states. Crystallization kinetics. Vitrification, glass transition. Mechanical properties, failure, permeability, optical/electrical properties, polymer composites, effect of processing. prereq: [MATS 3011, CHEN 3101 or CHEM 4101 or MATS 4101], [upper div MatsS or ChEn or CHEM] or instr consent

CHEM 4221. Introduction to Polymer Chemistry. (3 cr.; Student Option; Every Fall)
Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties. prereq: [2302, 4501] or instr consent

CHEM 4223W. Polymer Laboratory. (WI; 2 cr.; Student Option; Every Spring)
Synthesis, characterization, and physical properties of polymers. Free radical, condensation, emulsion, anionic polymerization. Infrared spectroscopy/gel permeation chromatography. Viscocelasticity, rubber elasticity, crystallization. prereq: 4221 or 4214 or CHEM 4214 or MATS 4214 or instr consent

CHEM 4301. Applied Surface and Colloid Science. (3 cr.; Student Option; Every Fall)
Introduction to surface/colloid science concepts. Surface tension, wetting, adsorption, capillarity. Formation/stability of soils, emulsions, and foams. Water solubility. Partition coefficients of organic species. Properties of both surfactants and water-soluble polymers. Focuses on interdisciplinary applications. prereq: 3043 or BMEN 2101 or CHEM 3101 or CHEM 4501 or instr consent

CHEM 4311W. Advanced Organic Chemistry Lab. (WI; 4 cr.; Student Option; Every Fall & Spring)
Reactions, techniques, and instrumental methods in synthetic organic chemistry. prereq: 2311

CHEM 4321. Organic Synthesis. (3 cr.; Student Option; Every Fall)
Fundamental concepts, reactions, reagents, structural/stereochemical issues, mechanistic skills for organic chemistry. prereq: [2302 or equiv], 4501, instr consent

CHEM 4322. Advanced Organic Chemistry. (3 cr.; Student Option; Every Spring)
Topics vary by instructor. Examples: natural products, heterocycles, asymmetric synthesis, organometallic chemistry, polymer chemistry. prereq: [2302 or equiv; 4501, instr consent

CHEM 4352. Physical Organic Chemistry. (3 cr.; Student Option; Every Spring)
Fundamental concepts and mechanistic tools for analysis of organic reaction mechanisms.

CHEM 4361. Interpretation of Organic Spectra. (3 cr.; Student Option; Every Fall)
Application of nuclear magnetic resonance, mass, ultraviolet, and infrared spectral analyses to organic structural problems. prereq: [2302 or equiv], 4501, instr consent

CHEM 4411. Introduction to Chemical Biology. (3 cr.; Student Option; Every Fall)
Chemistry of amino acids, peptides, proteins, lipids, carbohydrates, and nucleic acids. Structure, nomenclature, synthesis, reactivity. Techniques to characterize biomolecules. prereq: [2302 or 2081 equiv]

CHEM 4412. Chemical Biology of Enzymes. (3 cr.; Student Option; Periodic Spring)
Enzyme classification with examples from current literature. Strategies to decipher enzyme mechanisms. Chemical approaches to control enzyme catalysis. prereq: [2302 or equiv], 4501

CHEM 4423W. Foundations of Chemical Biology Laboratory. (WI; 2 cr.; Student Option; Every Fall & Spring)
Experimental techniques from all areas of chemistry applied to biological problems. Experiments to highlight techniques and concepts used in modern Chemical Biology research. Emphasis on connections between classroom/laboratory learning and experimental science, health, disease and medical research. prereq: [2302 or 2304], 2311, 2111

CHEM 4501. Introduction to Thermodynamics, Kinetics, and Statistical Mechanics. (3 cr.; A-F or Audit; Every Fall & Spring)
Physical chemistry as it relates to macroscopic descriptions of chemical systems. Chemical thermodynamics, phase equilibria, chemical equilibria. Statistical mechanics. Phenomenological reaction kinetics. Kinetic theory of gases. Collision, statistical theories of reaction rates. prereq: [1062/1066 or 1071H/1075H], [MATH 2263 or concurrent registration is required (or allowed) in MATH 2263 or MATH 2374 or concurrent registration is required (or allowed) in MATH 2374], [PHYS 1302 or PHYS 1402V or PHYS 1502V]

CHEM 4502. Introduction to Quantum Mechanics and Spectroscopy. (3 cr.; A-F or Audit; Every Fall & Spring)
Microscopic descriptions of chemical systems. Quantum theory. Applications to atomic/molecular structure. Molecular spectroscopy. Quantum statistical mechanics. Discussion of solutions to several differential equations. prereq: [1062/1066 or 1072H/1076Hf or 1082/1086], [MATH 2263 or concurrent registration is required (or allowed) in MATH 2263 or MATH 2374 or concurrent registration is required (or allowed) in MATH 2374, [PHYS 1302 or PHYS 1402V or PHYS 1502V]
CHEM 4511W. Advanced Physical Chemistry Lab. (WI; 3 cr.; Student Option; Every Fall) Experiments illustrating principles and methods of thermodynamics, reaction kinetics, and quantum mechanics. prereq: 4501, 4502, chemistry major

CHEM 4601. Green Chemistry. (ENV; 3 cr.; Student Option; Every Spring) Survey key aspects of green chemistry in modern research and development both in academia and industry, as well as relevant implications for the environment, technology, and public policy. prereq: [2302, 4501] or equiv

CHEM 4701. Inorganic Chemistry. (3 cr.; Student Option; Every Fall & Spring) Periodic trends. Structure/bonding in compounds where s and p electrons are important. Descriptive chemistry of solids and transition metal compounds. Transition metal chemistry. Topics in main group and materials chemistry. prereq: [2311 or concurrent registration is required (or allowed) in 2311], [4501 or concurrent registration is required (or allowed) in 4501 or 4502 or concurrent registration is required (or allowed) in 4502]

CHEM 4711W. Advanced Inorganic Chemistry Lab. (WI; 3 cr.; A-F or Audit; Every Spring) Lab experiments in inorganic/organometallic chemistry illustrating synthetic/spectroscopic techniques. prereq: 4701, chem major

CHEM 4715. Physical Inorganic Chemistry. (3 cr.; Student Option; Every Fall) Physical methods (e.g., IR, UV-VIS, ESR, Mossbauer and mass spectroscopy, magnetic measurements, X-ray diffraction) and concepts applied to inorganic and organometallic systems. prereq: 4701 or equiv, chem major or instr consent

CHEM 4725. Organometallic Chemistry. (3 cr.; Student Option; Periodic Fall) Synthesis, reactions, structures, and other properties of main group and transition metal organometallic compounds; electronic and structural theory, emphasizing their use as stoichiometric and homogenous catalytic reagents in organic and inorganic systems. prereq: 4701 or equiv, chem major or instr consent

CHEM 4735. Bioinorganic Chemistry. (3 cr.; Student Option; Periodic Fall) Role of metal ions in biology. Emphasizes structure, function, and spectroscopy of metalloproteins and their synthetic analogs. prereq: 4701 or equiv, chem grad or instr consent

CHEM 4745. Advanced Inorganic Chemistry. (3 cr.; Student Option; Periodic Spring) Topics in main group and transition metal chemistry. Emphasizes synthesis, structure, physical properties, and chemical reactivity. prereq: 4701, chem major, instr consent

CHEM 4894H. Senior Honors Thesis. (1-3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Written thesis under direction of chemistry project advisor. prereq: Honors student, instr consent

CHEM 5210. Materials Characterization. (4 cr.; Student Option; Every Spring) Modern tools/techniques for both bulk- and thin-film characterization. Topics may include in-situ interactions, Rutherford back scattering, secondary ion mass spectrometry, solid-state NMR, x-ray photoelectron spectroscopy, small-angle x-ray/neutron scattering, transmission/scanning electron/ probe microscopy, near-field scanning optical microscopy, porosimetry, adsorption techniques, and ellipsometry. prereq: grad student or instr consent

CHEM 5245. Introduction to Drug Design. (3 cr.; A-F or Audit; Periodic Fall) Concepts that govern design/discovery of drugs. Physical, bioorganic, medicinal chemical principles applied to explain rational design and mechanism of action drugs. prereq: 2302 or equiv

CHEM 5755. X-Ray Crystallography. (4 cr.; A-F or Audit; Every Spring) Essentials of crystallography as applied to modern, single crystal X-ray diffraction methods. Practical training in use of instrumentation in X-ray crystallography facility in Department of Chemistry. Date collection, correction/refinement, structure solutions, generation of publication materials, use of Cambridge Crystallographic Structure Database. prereq: Chem grad student or instr consent

CHEM 8011. Mechanisms of Chemical Reactions. (4 cr.; Student Option; Every Fall) Reaction mechanisms and methods of study. Mechanistic concepts in chemistry. Gas phase reactions to mechanisms, "electron pushing" mechanisms in organic reactions, mechanism of enzymatic reactions. Kinetic schemes and other strategies to investigate mechanisms. prereq: 2302 or equiv


CHEM 8066. Professional Conduct of Chemical Research. (1 cr.; S-N or Audit; Every Fall & Spring) Builds sensitivity to ethical issues in chemical research. Readings/case studies, small-group/large-group discussion, summarizing comments from instructors/guests/panels having special expertise, Weekly seminar. prereq: Chem grad student

CHEM 8081. M.S. Plan B Project I. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer) Satisfies project requirement for Plan B master's degree. May appear on M.S. degree program, but does not count toward 14-credit minimum in major field. Topic arranged by student adviser; written report required. 8081 required; 8082 optional. prereq: grad chem major

CHEM 8082. M.S. Plan B Project II. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer) Satisfies project requirement for Plan B master's degree. May appear on M.S. degree program, but does not count toward 14-credit minimum in major field. Topic arranged by student adviser; written report required. 8081 required; 8082 optional. prereq: grad chem major

CHEM 8151. Analytical Separations and Chemical Equilibria. (4 cr.; Student Option; Every Fall & Spring) Advanced treatment of principles of analytical chemistry, chemical equilibria, and dynamics. Chromatographic and other modern analytical scale separation techniques. Emphasizes column dynamics and retention mechanisms. prereq: instr consent

CHEM 8152. Analytical Spectroscopy. (4 cr.; Student Option; Every Fall) Survey of analytical spectroscopic methods. Design/application of spectroscopic instruments, including signal generation, acquisition, and interpretation. May include nuclear magnetic resonance, electron paramagnetic resonance, infrared and ultraviolet/visible spectroscopy, and mass spectrometry. prereq: grad chem major or instr consent

CHEM 8153. Extracting Signal From Noise. (5 cr.; A-F or Audit; Every Spring) Use of analog/digital electronics and computational methods in experiments. Passive circuits, operational amplifiers, filters, oscillators and Laplace transform techniques in analysis, domain conversion for data acquisition/control, statistics, experimental design. Introduction to chemometrics, Fourier analysis, convolution/deconvolution, curve fitting. prereq: [4101 or equiv], differential equations course

CHEM 8155. Advanced Electroanalytical Chemistry. (4 cr.; Student Option; Every Spring) Thermodynamics/kinetics of electron/ion transfer, electric double layer, mass transfer by diffusion/migration. Ion-selective potentiometry, chronamperometry, chronocoulometry, cyclic voltammetry, pulse voltammetry, ion-transfer voltammetry, impedance spectroscopy, bioelectroanalysis, rotating disk electrodes, microelectrodes, chemically modified electrodes. Scanning electrochemical microscopy. EC-STM, quartz crystal microbalance.


CHEM 8159. Nuclear Magnetic Resonance Spectroscopy. (4 cr.; Student Option; Periodic Fall) Detailed understanding of relaxation processes, chemical exchange, quadrupolar effects, NMR, NMR hardware, and solid state NMR. NMR imaging and Pulsed
CHEM 8180. Special Topics in Analytical Chemistry. (4 cr.; Student Option; Periodic Fall) Topics (and availability) vary by year depending on instructor and development of the field. prereq: Grad chem major or instr consent

CHEM 8201. Materials Chemistry. (4 cr.; A-F or Audit; Every Fall) Crystal systems/unit cells, phase diagrams, defects/interfaces, optical/dielectric properties, electrical/thermal conductivity, X-ray diffraction, thin film analysis, electronic structure, polarons/phonons, solid state chemistry, liquid/molecular crystals, polymers, magnetic/optical materials, porous materials, ceramics, piezoelectric materials, biomedical materials, catalysts. prereq: [4701, 3502] or instr consent


CHEM 8221. Synthetic Polymer Chemistry. (4 cr.; Student Option; Every Fall) Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties. prereq: [Undergrad organic chemistry course, undergrad physical chemistry course] or instr consent

CHEM 8280. Special Topics in Materials Chemistry. (2-4 cr.; Student Option; Periodic Fall & Spring) Topics (and availability) vary by year depending on instructor and development of the field. prereq: Grad chem major or instr consent

CHEM 8321. Organic Synthesis. (4 cr.; Student Option; Every Fall) Core course; fundamental concepts, reactions, reagents, structural and stereochemical issues, and mechanistic skills necessary for understanding organic chemistry. prereq: 2302 or equiv

CHEM 8322. Advanced Organic Chemistry. (4 cr.; Student Option; Every Spring) Modern studies. Topics, which vary by year, include natural products, heterocycles, asymmetric synthesis, organometallic chemistry, and polymer chemistry. prereq: 2302 or equiv

CHEM 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

CHEM 8352. Physical Organic Chemistry. (4 cr.; Student Option; Every Spring) Fundamental concepts, mechanistic tools for analyzing organic reaction mechanisms. Solvation, reactive intermediates, gas phase chemistry, photochemistry, strained-ring chemistry. prereq: 4011 or 8011

CHEM 8361. Interpretation of Organic Spectra. (4 cr.; Student Option; Every Fall) Practical application of nuclear magnetic resonance, mass, ultraviolet, and infrared spectral analyses to solution of organic structural problems. prereq: 2302 or equiv

CHEM 8380. Special Topics in Organic Chemistry. (4 cr.; Student Option; Periodic Spring) Topics (and availability) vary by year depending on instructor and development of the field. prereq: grad chem major or instr consent

CHEM 8411. Introduction to Chemical Biology. (4 cr.; Student Option; Periodic Spring) Enzyme classification with representative examples from current literature. Strategies used to decipher enzyme mechanisms. Chemical approaches for control of enzyme catalysis. prereq: 2302 or equiv

CHEM 8412. Chemical Biology of Enzymes. (4 cr.; Student Option; Periodic Spring) Chemistry of amino acids, peptides, proteins, lipids, carbohydrates, and nucleic acids. Structure, nomenclature, synthesis, and reactivity. Overview of techniques used to characterize these biomolecules. prereq: 2302 or equiv

CHEM 8413. Nucleic Acids. (4 cr.; Student Option; Periodic Fall) Chemistry and biology of nucleic acids: structure, thermodynamics, reactivity, DNA repair, chemical oligonucleotide synthesis, antisense approaches, ribozymes, overview of techniques used in nucleic acid research, interactions with small molecules and proteins. prereq: 2302 or equiv

CHEM 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CHEM 8480. Special Topics in Biological Chemistry. (2-4 cr.; Student Option; Periodic Spring) Topics (and availability) vary by year, depending on instructor and development of the field. prereq: Grad chem major or instr consent

CHEM 8541. Dynamics. (4 cr.; Student Option; Periodic Fall) Mathematical methods for physical chemistry. Classical mechanics/dynamics, normal modes of vibration. Special topics such as rotational motion, Langevin equation, Brownian motion, time correlation functions, collision theory, cross sections, energy transfer, molecular forces, potential energy surfaces, classical electrostatics, Shannon entropy. prereq: Undergrad physical chem course

CHEM 8551. Quantum Mechanics I. (4 cr.; Student Option; Every Fall) Review of classical mechanics. Postulates of quantum mechanics with applications to determination of single particle bound state energies and scattering cross-sections in central field potentials. Density operator formalism with applications to description of two level systems, two particle systems, entanglement, and Bell inequality. prereq: Undergraduate physical chem course

CHEM 8561. Thermodynamics, Statistical Mechanics, and Reaction Dynamics I. (4 cr.; Student Option; Every Fall) Two-part sequence. Thermodynamics, equilibrium statistical mechanics, ensemble theory, partition functions. Applications, including ideal gases/crystals. Theories of simple liquids, Monte Carlo, and molecular dynamics simulations. Reaction dynamics from microscopic viewpoint. prereq: Undergraduate physical chem course

CHEM 8562. Thermodynamics, Statistical Mechanics, and Reaction Dynamics II. (4 cr.; Student Option; Every Spring) Two-part sequence. Thermodynamics, equilibrium statistical mechanics, ensemble theory, partition functions. Applications, including ideal gases/crystals. Theories of simple liquids, Monte Carlo, and molecular dynamics simulations. Reaction dynamics from microscopic viewpoint. prereq: 8561

CHEM 8563. Molecular Simulations. (2 cr.; Student Option; Every Spring) Principles of Monte Carlo/molecular dynamics simulations. Algorithms, simulation set-up/analysis, applications to chemical systems. Hands-on computational project that requires writing of computer code. prereq: grad chem major or instr consent

CHEM 8564. Laser Spectroscopy. (2 cr.; Student Option; Every Spring) Fundamentals of light-molecule interactions/manifestation in spectroscopic observables. Time correlation functions, spectroscopic lineshapes, linear/nonlinear material responses, material susceptibilities. Role of lasers in measuring quantities. prereq: grad chem major or instr consent

CHEM 8565. Chemical Reaction Dynamics. (2 cr.; Student Option; Periodic Spring) Fundamentals of chemical reaction dynamics including potential energy surfaces, collision theory, statistical mechanical background and transition state theory, variational transition state theory, activation energy, tunneling, unimolecular reactions, energy transfer, reactions in solution, solvation free energy, potential of mean force, quasithermodynamic treatment, reactions in solution, diffusion control, Kramers’ theory, and photochemistry
CHEM 8566. Spin Dynamics. (2 cr.; Student Option; Periodic Spring)
Chemistry 8566 is a 1/2-semester course on spin dynamics. The course prerequisites are described in the CSE Bulletin. Briefly, they are: one year of college-level chemistry, one year of college-level physics, and one year of college-level calculus. All of the prerequisites should have been completed before enrollment in this course. Students who do not satisfy the course prerequisites, please contact the instructor.

CHEM 8567. Biophysical Chemistry. (2 cr.; Student Option; Periodic Spring)
CHEM 8567 is a graduate level course which emphasizes how macromolecular and membrane structure and dynamics impact biological function. Topics to be covered include high-resolution structure determination, biomolecular spectroscopy, and microscopy as applied to folding, solvation, and reaction dynamics. The objectives for this course are to become well-versed in the language of biophysics, at a level sufficient to understand and critically evaluate the literature and to understand fundamental concepts related to structure determination and structure-function relationships of biomolecules, and to be able to apply those concepts to a variety of biological systems.

CHEM 8568. Chemical Bonding at Surfaces. (2 cr.; Student Option; Periodic Spring)
A brief overview of surface science, chemical reactions at surfaces, and interactions of surfaces with light. Students will also be exposed to physical principles of chemical reactions such as transition-state theory and kinetics in within the framework of surface science.

CHEM 8569. Special Topics in Physical Chemistry. (; 2-4 cr. [max 8 cr.]; Student Option; Periodic Spring)
Topics (and availability) vary depending on instructor and development of the field. prerq: grad chem major or instr consent

CHEM 8600. Seminar: Modern Problems in Chemistry. (; 1 cr.; S-N or Audit; Every Fall & Spring)
Weekly seminar series on modern chemical topics. prerq: grad chem major or instr consent

CHEM 8601. Seminar: Modern Problems in Chemistry. (; 1 cr.; A-F or Audit; Every Fall & Spring)
Weekly seminar series on modern chemical topics. prerq: grad chem major or instr consent

CHEM 8602. Seminar Presentation: Modern Problems in Chemistry. (; 1 cr.; A-F or Audit; Every Fall & Spring)
Weekly seminar series on modern chemical topics presented by students. prerq: grad chem major or instr consent

CHEM 8606, Doctoral Pre-Thesis Credits. (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prerq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CHEM 8715. Physical Inorganic Chemistry. (; 4 cr.; Student Option; Every Fall)
Physical methods and concepts applied to inorganic and organometallic systems, including many of the following methods: NMR, IR, UV-VIS, ESR, M[?]sbauer and mass spectroscopy, magnetic measurements, X-ray diffraction. prerq: 4701 or equiv, grad chem major or instr consent

CHEM 8725. Organometallic Chemistry. (; 4 cr.; Student Option; Periodic Fall)
Synthesis, reactions, structures, and other important properties of main group and transition metal organometallic compounds; treatment in terms of modern electronic and structural theory; emphasis on their use as stoichiometric and homogeneous catalytic reagents in organic and inorganic systems. prerq: 4701 or equiv, grad chem major or instr consent

CHEM 8735. Bioinorganic Chemistry. (; 4 cr.; Student Option; Periodic Fall)
Survey of role of metal ions in biology; emphasizes structure, function, and spectroscopy of metalloproteins and their synthetic analogs. prerq: 4701 or equiv, grad chem major or instr consent

CHEM 8745. Advanced Inorganic Chemistry. (; 4 cr.; Student Option; Periodic Spring)
Survey of topics in main group and transition metal chemistry; emphasizes synthesis, structure, physical properties, and chemical reactivity. prerq: 8715, grad chem major or instr consent

CHEM 8777. Thesis Credits: Master’s. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prerq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

CHEM 8800. Special Topics in Inorganic Chemistry. (; 2-4 cr.; Student Option; Periodic Fall)
Topics (and availability) vary by year depending on instructor and development of the field. prerq: Grad chem major or instr consent

CHEM 8800. Special Topics in Chemistry. (; 2-4 cr.; Student Option; Every Spring)
Topics (and availability) vary depending on instructor and development of the field. prerq: Grad chem major or instr consent

CHEM 8888. Thesis Credit: Doctoral. (; 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prerq: Max 18 cr per semester or summer; 24 cr required

Chicano Studies (CHIC)
and art produced by both Latinxs and non-Latinxs. Students will engage with performance theory and feminist theory to learn to read and critique how race, ethnicity, gender, sexuality, and narratives of intersectionality are curated and represented in mainstream and independent media. The course will query: What are the most popular narratives about Latinxs represented in mainstream media? How are stereotypes about Latinxs perpetuated by the media? How do Communication Studies and Latinx Studies scholars critique one-dimensional representations of Latinxs in the media and in popular culture? How do Latinxs represent themselves as multi-dimensional when they create their own art or media? How is Latinx intersectionality represented in the media and in Latinx/x-created art-forms? The course will incorporate performances and workshops led by locally and nationally-renowned Latinx/o artists.

**CHIC 3212. Chicana Studies: La Chicana in Contemporary Society.** (AH,DSJ; 3 cr.; Student Option; Every Fall & Spring) Scholarly/creative work of Chicanas or politically defined women of Mexican American community. Interdisciplinary. Historical context, cultural process, and autoethnography.

**CHIC 3213. Chicano Music and Art.** (AH,DSJ; 3 cr.; A-F or Audit; Every Spring) Survey of diverse forms of cultural expressiveness in Mexican American music/art. History of various types of artistic production and musical forms in their regional specificity. Social/economic implications of several genres, styles, and traditions.

**CHIC 3216W. Chicana and Chicano Art.** (AH, WI, CIV; 3 cr.; Student Option; Periodic Fall & Spring) A Chicana/o has been described as a Mexican-American with a political sense of identity that emerges from a desire for social justice. One journalist bluntly stated, “A Chicano is a Mexican-American with a non-Ange image of himself” (Ruben Salazar, Los Angeles Times, 1970). This identity emerged through the Chicano Movement, a social and political mobilization that began in the 1960s and 1970s. The Chicano Movement witnessed the rise of community-based political organizing to improve the working conditions, education, housing opportunities, health, and civil rights for Mexican-Americans. For its inception, the Chicano Movement attracted artists who created a new aesthetic and framework for producing art. A major focus of Chicana/o artists of the 1960s and 1970s was representation of the right to self-determination, and the role of art in fostering civic and public engagement. This focus continues to inform Chicana/o cultural production. Social intervention, empowerment, and institutional critique remain some of the most important innovations of American art of the last several decades, and Chicana/o artists played a significant role in this trend.

**CHIC 3221. Introduction to Chicana/o Cultural Studies: Barrio Culture and the Aesthetics of Everyday Life.** (AH,DSJ; 3 cr.; Student Option; Every Spring) Cultural studies approach to investigating aesthetic dimensions of experience that inform and are informed by dynamic relationship between culture, class, ethnicity, and power.

**CHIC 3223. Chicana/o and Latina/o Representation in Film.** (AH,DSJ; 3 cr.; Student Option; Every Spring) Introduction to Chicana/o and Latina/o visual representation. Depiction of Latina/o experience, history, and culture in film. Analyzing independent/commercial films as texts that illuminate deeply held beliefs around race, class, ethnicity, gender, and national origin.

**CHIC 3275. Service Learning in the Chicano/Latino Community.** (CIV; 3 cr.; A-F only; Every Fall & Spring) Normative/applied ethics used to reflect on personal/societal responsibilities and to analyze U.S. educational systems. Institutional/social constraints on equitable educational opportunities for Chicano/Latino students. Models of inclusive/just education. Students tutor/mentor Chicanos/Latinos, dialogue with Chicano/Latino educators.

**CHIC 3352. Transnational Chicana/o Theory: Global Views/Borderland Spaces.** (3 cr.; Student Option; Fall Even Year) Demographic realities, political/economic shifts, cultural exchanges that characterize U.S.-Mexico borderland spaces in global economy. Historically contextualized, transnational approach to cultures, politics, and economics of U.S.-Mexico Borderlands. Dynamics of borderland spaces.

**CHIC 3374. Migrant Farmworkers in the United States: Families, Work, and Advocacy.** (CIV; 4 cr.; Student Option; Every Spring) Socioeconomic/political forces that impact migrant farmworkers. Effects of the laws and policies on everyday life. Theoretical assumptions/strategies and advocacy groups. Role/power of consumer. How consuming cheap food occurs at expense of farmworkers.

**CHIC 3375. Folklore of Greater Mexico.** (DSJ; 3 cr.; Student Option; Every Fall & Spring) Scholarly survey and exploration of the sociocultural function of various types of folklore in Greater Mexico. Ways in which folklore constructs and maintains community, as well as resists and engenders cultural shifts.

**CHIC 3412. Comparative Indigenous Feminisms.** (GP; 3 cr.; Student Option; Periodic Fall & Spring) The course will examine the relationship between Western feminism and indigenous feminism as well as the interconnections between women of color feminism and indigenous feminism. In addition to exploring how indigenous feminists have theorized from ‘the flesh’ of their embodied experience of colonialism, the course will also consider how indigenous women are articulating decolonization and the embodiment of autonomy through scholarship, cultural revitalization, and activism.

**CHIC 3423. Central American Revolutions.** (3 cr.; A-F or Audit; Every Fall & Spring) Social, political, and economic issues that have shaped Central American history for nearly two centuries. Colonial histories, capitalist development, ethnic/racial conflict, foreign intervention. Catholic Church, civil war throughout region. Readings/discussions cover events in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama.

**CHIC 3425. History of Modern Mexico.** (3 cr.; A-F or Audit; Every Fall) Mexico, from independence to present. Struggles for land, liberty, and equality. Ethnicity, gender and class. Economic growth, nationalization, and globalization. Urbanization, immigration, demographic transition.

**CHIC 3444. Chicana and Chicano History: 1821-1945.** (DSJ,HIS; 3 cr.; Student Option; Every Fall) Experiences of people of Mexican descent in the United States. Important eras in histories of Mexico, the United States, and Mexican Americans. Central role of Chicana/os in U.S. history, culture, and politics.

**CHIC 3446. Chicana/o History II: WWII, El Movimiento, and the New Millennium.** (DSJ,HIS; 3 cr.; Student Option; Every Spring) Experiences of people of Mexican descent in the U.S. Notions of citizenship from WWII. Chicano civil rights movement. Impact of immigration patterns/legislation. Cultural wars, changing demographics. Social, economic, and political changes that influenced day-to-day life of Mexican Americans. Meaning of racialized “Mexican” identity. How different groups of Mexicans have understood their relationships to other Americans and other Latino groups.

**CHIC 3452. Xicana/Indigena Studies: History, Culture, and Politics.** (DSJ; 3 cr.; Student Option; Every Spring) Historical, cultural, and political processes involving Chicanas/os and their understanding of being indigenous to the North American continent. History, culture, and identity formation as dynamic processes intimately related to present and future constructions of Mexican American identities and sociopolitical perspectives.

**CHIC 3507W. Introduction to Chicana/o Literature.** (DSJ, WI,LITR; 3 cr.; Student Option; Every Fall & Spring) Cultural, intellectual, and sociopolitical traditions of Mexican Americans as they are represented in creative literature. Genres of forms of creative cultural expression and their significance as representations of social, cultural, and political life in the United States. Novels, short stories, creative non-fiction, drama, essay, poetry, and hybrid forms of literature.

**CHIC 3672. Chicana/o Experience in the Midwest.** (DSJ; 3 cr.; Student Option; Every Spring) Experiences of people generally defined as Chicanos or Latinos, living in the Midwest. Individual/group identity. Focuses on construction of Chicano-Latino experience. How identity affirmation, migration stories,
immigration status, historical memory, and cultural traditions are impacted by being in the Midwest.

CHIC 3752. Chicana(s) and Chicanos in Contemporary Society. (DSJ; 3 cr.; Student Option; Every Spring) Introduction to sociological analysis of theoretical/methodological approaches to Chicano/a and Latina/o communities. Socioeconomic conditions, education, cultural change, the family, gender relations, political experiences. Theories, issues, methods of sociological research. Debates regarding qualitative/quantitative research methods.

CHIC 3771. Latino Social Power and Social Movements in the U.S. (3 cr.; Student Option; Periodic Fall) How Latinos have collectively resisted social domination. Theories of social power/movements. Resistance by Latinos during 60s/70s. Current organized efforts to curb immigration, establish English as official language, and limit immigrant rights.

CHIC 3852. Chicana/o Politics. (DSJ, SOCS; 3 cr.; Student Option; Every Fall & Spring) Theory/practice of Chicana/o politics through an analysis of Mexican American experience, social agency, and response to larger political systems and behaviors using social science methods of inquiry. Unequal power relations, social justice, and the political economy.

CHIC 3862. American Immigration History. (DSJ, HIS; 3 cr.; A-F or Audit; Periodic Fall) Global migrations to U.S. from Europe, Asia, Latin America, and Africa, from early 19th century to present. Causes/cultures of migration. Migrant communities, work, and families. Xenophobia, assimilation/integration, citizenship, ethnicity, race relations. Debates over immigration. Place of immigration in America’s national identity.

CHIC 3888. Immigration and the U.S. Latina/o Experience: Diaspora, Identity, and Community. (DSJ, HIS; 3 cr.; Student Option; Every Fall) Experiences of migrants from Latin America to the United States in 20th/21st century. Migrant engagements with US society. Pre-existing Latina/o and other ethnic communities. Experiences within political, economic, and social aspects of life at local/global level.

CHIC 3900. Topics in Chicano Studies. (3 cr.; max 6 cr.; A-F only; Every Fall & Spring) Topics vary by section of course.

CHIC 3993. Directed Studies. (1-9 cr.; max 16 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading, research, and study. Students often do preliminary readings and research in conjunction with plans for education abroad programs. prereq: instr consent

CHIC 4231. Color of Public Policy: African Americans, American Indians, Asian Americans & Chicanos in the U.S. (3 cr.; Student Option; Periodic Fall) Examination of the structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

CHIC 4232. Chicana/o - Latina/o Gender and Sexuality Studies. (AH, DSJ; 3 cr.; Student Option; Fall Odd, Spring Even Year) Critical thinking of Chicanas/os and Latinas/os around construction of gender. Politics of sexual identity. How the self is gendered in relationship to sexual, racial, class, and national identities under different social structural conditions. Way in which the "bounds" that define/confine sexual norms shift over time.

CHIC 4275. Theory in Action: Community Engagement in a Social Justice Framework. (CIV; 3 cr.; Student Option; Every Fall) Theoretical frameworks of social justice and community engagement for work outside classroom with/in Latina/o community. Worker issues/organizing. Placements in unions, worker organizations. Policy initiatives on labor issues.

CHIC 4401. Chicana/Latina Cultural Studies. (AH, DSJ; 3 cr.; Student Option; Fall Even Year) Readings in Chicana/Latina cultural studies. TV, film, art, music, dance, theatre, literature. Identity/sexuality. Production of culture/theory.

CHIC 4901W. Senior Paper. (WI; 3 cr.; A-F only; Every Spring) Capstone experience. Students produce original research paper or creative project on a topic determined in consultation with a faculty adviser.


CHIC 5412. Comparative Indigenous Feminisms. (GP; 3 cr.; Student Option; Periodic Fall & Spring) The course will examine the relationship between Western feminism and indigenous feminism as well as the intersections between women of color feminism and indigenous feminism. In addition to exploring how indigenous feminists have theorized from ‘the flesh’ of their embodied experience of colonialism, the course will also consider how indigenous women are articulating decolonization and the embodiment of autonomy through scholarship, cultural revitalization, and activism.

CHIC 5920. Topics in Chicana(o) Studies. (3 cr.; Student Option; Every Fall & Spring) Multidisciplinary themes in Chicanas(o) studies. Issues of current interest.

CHIC 5993. Directed Studies. (1-3 cr.; max 16 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading, research, and study for completion of the requirements for a senior paper or honors thesis. prereq: instr consent

Child & Adolescent Psychiatry (CAPY)

CAPY 5660. ADHD Throughout the Life Span: Perspectives on Diagnosis, Assessment, and Developmental Course. (1-2 cr.; Student Option; Every Fall & Summer) ADHD, from its earliest presentation to its later adult manifestations. Clinical depression, diagnostic criteria. Disorders that commonly coexist with ADHD. Standard assessment procedures for making a diagnosis. Developmental changes in clinical procedures. prereq: Upper div

CAPY 5672. Children’s Exposure to Domestic Violence: Effects on Child Functioning, Treatment Implications. (1 cr.; Student Option; Periodic Spring) Effects of exposure to domestic violence in context of development, from infancy to late adolescence. Assessment strategies, best practices in intervention/prevention for vulnerable children and adolescents. Multidisciplinary approaches to working with children exposed to violence (e.g., judicial, medical, law enforcement partnerships).

CAPY 7201. Diagnostic Practicum in Child and Adolescent Psychiatry. (1-6 cr.; H-N or Audit; Every Fall, Spring & Summer) Multidisciplinary evaluations of children, adolescents, and their families are presented for discussion, dynamic and diagnostic formulations, and disposition planning in a conference setting. Consultation to schools, residential treatment centers, and community agencies may be included. prereq: instr consent

CAPY 7202. Child and Adolescent Psychiatry Internship: Fairview-University Medical Center. (1-6 cr.; O-N or Audit; Every Fall, Spring & Summer) Assessment/therapeutic interventions with children, adolescents, and families in child/adolescent psychiatric settings. prereq: instr consent

CAPY 7521. Outpatient Clinical Child and Adolescent Psychiatry for Primary Care Physicians. (2-12 cr.; O-N or Audit; Every Fall, Spring & Summer) Supervised diagnostic and therapeutic experiences in an outpatient setting. Consultation to schools, residential treatment centers, and community agencies may be included. prereq: cr ar, reg med

CAPY 7602. Introductory Readings and Research Methods in Child, Adolescent, and Family Psychiatry. (2-6 cr.; H-N or Audit; Every Fall, Spring & Summer) Child development, diagnostic/therapeutic techniques, psychopathology. Readings/discussions with faculty. prereq: Med student, instr consent

CAPY 7603. Clinical Child Psychiatry. (4 cr.; H-N only; Every Fall, Spring & Summer)
In this elective, the student will have an opportunity to experience the clinical practice of child and adolescent psychiatry across settings. Students will be exposed to a broad range of child and adolescent disorders and will assume responsibility for patient management commensurate with their demonstrated ability and initiative.

**CAPY 7609. Directed Study, Anesthesia Project: Clinical.** (2-12 cr.; H-N or Audit; Every Fall, Spring & Summer) tbd

### Child Psychology (CPSY)

**CPSY 1334. Global Issues on Children and Youth in Society.** (CIV: 3 cr.; A-F or Audit; Every Spring) Study of hot topic issues currently faced by children around the world. Provides an introduction to science, ethics, and ramifications in civic life of controversial issues concerning child or youth development in contemporary societies. Examines topics of ethical and civic concern and interest to parents, society, and young people and how developmental science informs these issues and policies as well as the decisions and actions of citizens in society. Students gain a basic understanding of how developmental research and theory inform policy and practices of societies as well as the individual decisions of parents, teachers, community members, and other citizens that influence the lives of children and youth. This course also examines how social issues influence science and its translation to action. Students will be exposed to a wide range of issues about children and youth that currently confront many societies around the world, and the state of the research evidence pertinent to these issues. Students will also learn how research is translated and disseminated so that it can inform policy and practice.

**CPSY 2301. Introduction to Child Psychology.** (Socs: 4 cr.; Student Option; Every Fall & Spring) This course will examine normative physical, social, and cognitive development from the prenatal period through adolescence. The major goals include fostering an understanding of the usefulness of a developmental approach to psychological issues, familiarizing students with research and methodology in child psychology, and engaging students in the experiences of developmental psychology through observation and analysis of child behavior. PSY majors should take the cross-listed course CPSY 3301.

**CPSY 3308W. Introduction to Research Methods in Child Psychology.** (WI: 4 cr.; A-F or Audit; Every Fall & Spring) Explore developmental research methodology by learning about observational research and experimental designs. Critically evaluate research articles, learn to report research, and understand the difference between science and pseudoscience. Gain awareness of the ethical and practical issues that developmental psychologists face when they work with children. prereq: CPSY 2301 / 3301 or equiv

**CPSY 3360H. Child Psychology Honors Seminar.** (2 cr.; A-F or Audit; Every Fall) Acquaints students with the various research projects and activities in the Institute for Child Development and in related departments. Faculty are invited to discuss their research projects with seminar participants. prereq: CPSY honors student

**CPSY 3601. Introduction to Child Life Theory and Practice.** (3 cr.; A-F or Audit; Every Fall & Spring) This course will provide an introduction to the child life profession with a strong focus on patient and family-centered care. This course will meet the required topics of study as identified by the Child Life Council. The major learning objectives include 1) gaining an understanding of the fundamental theories that support patient and family-centered care and child life practice, 2) identifying how illness, injury and hospitalization impacts a child's development and their family, 3) gaining an understanding of the Official Documents of the Child Life Council, 4) examining the elements of therapeutic play in a clinical setting, and 5) identifying techniques to prepare a child and their family for healthcare encounters. prereq: any introductory course in CPSY, PSY, or FSOS

**CPSY 4302. Infant Development.** (3 cr.; A-F or Audit; Every Fall) Perceptual, motor, emotional, social, and cognitive development during the first two years of life; the developing infant in his or her social and physical environment. prereq: CPSY 2301 or equivalent or instructor consent

**CPSY 4303. Adolescent Psychology.** (3 cr.; A-F or Audit; Every Fall & Spring) Overview of development in the teenage years/second decade of life. Interactions of adolescents with family, school, and society. prereq: PSY 1001 or equivalent


**CPSY 4313W. Disabilities and Development.** (WI: 4 cr.; Student Option; Every Spring) Surveys all areas of exceptionality. Mental, hearing, vision, physical, speech, language handicaps. Learning disabilities. Autism. Emotional/behavior disorders. Giftedness. prereq: CPSY 2301 / 3301 or equiv

**CPSY 4331. Social and Personality Development.** (3 cr.; A-F or Audit; Every Fall & Spring) Development of social relations and personality: research, methodology, and contrasting theoretical perspectives. Survey of findings on interpersonal relationships, the concept of self, prosocial and antisocial behavior, and acquisition of social roles. prereq: CPSY 2301 / 3301 or equiv

**CPSY 4334W. Children, Youth in Society.** (WI: 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Child development principles relative to social policy decision making. Issues in applying theories, findings to problems (e.g., media influences, mainstreaming, day care, child abuse, effects of peers), prereq: CPSY 2301

**CPSY 4336. Development and Interpersonal Relationships.** (3 cr.; A-F or Audit; Every Fall) Processes and functions of interactions with personal relationships across the lifespan; analysis of theory and research on developmental changes and influences.

**CPSY 4341. Perceptual Development.** (3 cr.; Student Option; Every Fall) Study how children learn to perceive and experience the world. Explore different approaches to studying brain function and the development of the sensory and perceptual systems and processes with focus on infant perception and the neurobiology of how the senses work. Cover a variety of developmental disorders of sensation and perception: learn about normal brain function by studying abnormal brain function, prereq: CPSY 2301 / 3301 or equiv

**CPSY 4343. Cognitive Development.** (3 cr.; A-F or Audit; Every Fall & Spring)
Introduction to the scientific study of cognitive development (children's thinking) from infancy through adolescence. Focus on research and practical applications. Specific topics include infant perception and cognition, attention and memory development, language and symbolic thinking, social cognition, executive function. prereq: CPSY 2301 or 3301 or equivalent

CPSY 4345. Language Development and Communication. (3 cr. ; A-F or Audit; Every Fall & Spring) How do children acquire language? Learn about acquisition of phonology (the sound system of the language), semantics (the meaning of units in the language), syntax (the structure of sentences), morphology (the structure of words, phrases, and sentences), and pragmatics (language use). Study English learning along with the acquisition of other spoken and signed languages. prereq: CPSY 2301 / 3301 or equiv

CPSY 4347W. Senior Project. (WI; 2 cr. ; A-F or Audit; Every Fall & Spring) Current literature on self-selected developmental topic. Students write a literature review. prereq: CPsy sr

CPSY 4994. Directed Research in Child Psychology. (1-4 cr. ; max 16 cr. ; Student Option; Every Fall, Spring & Summer) Serve as a research assistant in an Institute of Child Development lab. Help plan/implement scientific studies, gain experience/expertise in methodology of research. Duties vary based on lab and student and are individually arranged with corresponding faculty member. To register: students must first secure their own placement in a faculty research lab. Then submit signed research contract to CPSY advisor for a permission number to register.

CPSY 4994V. Directed Research in Child Psychology (Honors Thesis). (WI; 1-6 cr. ; Student Option; Every Fall, Spring & Summer) Individual empirical investigation. Students help plan/implement scientific studies while gaining experience/expertise in research methodology. prereq: 4 cr in CPSy, CPsy honors, instr consent, dept consent

CPSY 4996. Field Study in Child Psychology. (1-4 cr. ; max 12 cr. ; S-N or Audit; Every Fall, Spring & Summer) Students secure an internship / volunteer / work opportunity in the community with children. Corresponding online coursework includes written reflections, journals, and career development activities. Credits are variable based on hours at your site. Students must submit a completed field study contract to the CPSY advisor in order to register.

CPSY 5171. Practicum: Applying Instructional Methods in the Elementary School. (2 cr. ; S-N only; Every Fall) Practicum: Applying Instructional Methods in Elementary School is a semester long, full day experience during which teaching candidates gradually increase teaching responsibilities through observation and guided practice in an elementary (grade K-3) classroom, in a co-teaching model. The practicum experience is taken in connection with the Elementary Methods Teaching Block. Methods course teaching assignments are done during the practicum experience.

CPSY 5181. Clinical Experience in Elementary School Teaching. (10 cr. (max 20 cr.); S-N or Audit; Every Fall, Spring & Summer) Students spend full days in the elementary classroom gradually assuming responsibility for teaching the class. Students prepare a portfolio based on criteria given. One seminar per week.

CPSY 5187. Capstone Project: Improvement of Teaching in Early Childhood Education. (2-4 cr. ; Student Option No Audit; Every Fall, Spring & Summer) This is the capstone for teaching candidates in the M.Ed. in Early Childhood Education. Students will complete an in-depth reflective teaching portfolio and parallel assignments. The course requires demonstration of the linking of child development theory, knowledge of developmentally appropriate teaching, and reflective practice. prereq: Completion of all requirements for Early Childhood Teacher Licensure, other than CI 5181, which is taken concurrently.

CPSY 5241. Practicum in Early Childhood Education. (3 cr. ; A-F only; Every Fall & Spring) This course offers a great introduction to the early childhood experience for those interested in working with young children. Helpful first course to explore Early Childhood major (can also count in CPSY BA). Students will review early development and learn how this knowledge is applied in educational and early care settings. Spend time observing early childhood programs through practicum experiences around the city.

CPSY 5251W. Social and Philosophical Foundations of Early Childhood Education. (WI; 3 cr. ; A-F only; Every Fall) This course traces the history of early childhood education from Plato to the present, as well as explores various program models and the standards movement, including the Minnesota Early Learning Indicators. The course includes lecture, discussion, videos and vignettes, assignments, and requires students to begin developing a personal teaching philosophy. It is also a writing intensive course which incorporates writing instruction and professional writing expectations throughout all course assignments and activities.

CPSY 5252. Facilitating Social and Emotional Learning in Early Childhood Education. (3 cr. ; A-F only: Every Spring) This course explores social and emotional development throughout the early childhood (0-8) years. Explore the variety of ways that social interactions and emotional understanding occur in young children with a special emphasis on the role of adults in facilitating these processes. Students will encounter a blend of theory and application as they learn to promote children's mental health, understand special circumstances such as trauma, and respond to challenging behaviors across early learning settings. prereq: CPSY 2301 or equiv or inst consent. For Early Childhood or ECSE students.

CPSY 5253. Facilitating Cognitive and Language Learning in Early Childhood Education. (3 cr. ; A-F only; Every Fall) Overview of cognitive and language characteristics of children ages 0-8 years and of how teachers can plan curriculum to facilitate children's development in these areas. prereq: CPSY 2301 or equiv or inst consent. For Early Childhood or ECSE students.

CPSY 5254. Facilitating Creative and Motor Learning in Early Childhood Education. (2 cr. ; A-F only; Every Spring) Learn how young children develop creativity and motor skills from birth - age 8. Engage in hands-on exploration of creative classroom materials and reflection. Complete action-oriented and applied assignments with small groups of children in early childhood education settings. prereq: CPSY 2301 or equiv or inst consent. For Early Childhood and ECSE students.

CPSY 5261. Early Learning in Infancy and Toddlerhood. (3 cr. ; Student Option; Periodic Summer) This course provides an understanding of infant and toddler development. It offers multiple perspectives and current research related to the timetable of infant and toddler development, as well as the role of caregivers, environment, and culture in development. Special attention will be given to policies/programming that concern infants, toddlers, and their families. Students will be expected to understand the nuanced and varied ways in which development unfolds, including areas of exceptionalities, as well as explore the roles of professionals and community members in supporting infant and toddler development.

CPSY 5281. Student Teaching in Early Childhood Education. (6-8 cr. ; S-N or Audit; Every Fall & Spring) Student teaching plus weekly seminar for students pursuing the Early Childhood teaching licensure. Application of theory/research relating to teaching preschool children. Student teach either 5 mornings per week (7:45-12:30) for 8 credits or 3 afternoons per week (11:45-4:30) for 6 credits. In addition, ALL students participate in weekly (Fridays 12:30-2) seminars. prereq: Early Childhood or ECSE student. Recommended completion of CPSY 5252, 5253, and 5254 prior to student teaching.

CPSY 5301. Advanced Developmental Psychology. (3 cr. ; A-F or Audit; Every Fall & Summer) This course is an exploration of life span development through the lenses of social, cultural, cognitive, biological, and learning theories and research. A primary emphasis of the class is on gaining better conceptual understanding of different perspectives on healthy development in order to support informed practical understanding of how to help children, adolescents, and adults progress through the developmental periods and to help
CPSY 5302. Cognitive and Biological Development. (3 cr.; Student Option; Every Fall)
This course concerns the development and function of thinking skills throughout the lifespan, touching upon several aspects of what makes humans unique. How are humans able to perceive, evaluate, interpret, infer, remember, symbolize, plan, evaluate, problem solve, and hypothesize? What influences the very emergence of such abilities and the nature of their function? What obstacles interfere with the development of the quality of cognitive processes? Brain development and other biological factors, and our relationships and other environmental factors influence our thinking and its development. Throughout this course, we will discuss how knowledge about cognitive development can influence our work with children, adolescents, and adults, in daily life, professional practice, and public policy.

Among the many applications of our knowledge of cognitive development, in this course we will focus on select examples relevant to parenting, education, and media exposure, and on topics initiated by students. The course will address individual differences and cultural differences in cognitive development, and how knowledge about variation in "typical" cognitive development provides an important foundation for understanding atypical cognitive development.

CPSY 5303. Social and Emotional Development. (3 cr.; Student Option; Every Spring)
What are the roots of becoming who we are, as individuals in society? What roles do others–parents, siblings, peers, teachers, and communities--play in the socialization of an individual, and how stable are the forces and outcomes of these influences? This course focuses on social development throughout the human lifespan, with an emphasis on how biology, culture, and relationships influence that development. Throughout this course, we will discuss how knowledge about social development can inform our interpretation of social issues and guide our reaction to them, in terms of behaviors, practices, and public policy. Among the many possible applications of social development, we focus in particular (but not exclusively) on positive psychology, widespread problems such as poverty and social disparities, and prevention science. We emphasize individual differences in social development, and attend to the interplay between social development and cognition, learning, and biological development.

CPSY 5304. Research Methods in Applied Child and Adolescent Development. (3 cr.; Student Option; Every Spring)
Applied child and adolescent development research builds upon on traditions of general, clinical, developmental, and educational psychology research, while focusing on efforts to address social needs, social problems, and public policy. Knowledge of scientifically sound and effective approaches to studying social problems and solutions will support those individuals who lead, contribute to, or use research. That is, knowledge gained from this course will support your development as an investigator or research associate, and it will also empower your role as a savvy consumer of the research you intend to apply to practice or policy.

CPSY 5306. Ethics and Professionalism in Applied Child and Adolescent Development. (2 cr.; A-F only; Every Fall)
This course concerns ethical principles, issues, and codes relevant to research and practice in applied developmental psychology. These ethical considerations pertain to the work of professionals and researchers in communities, school, medical, and social agencies that serve children, youth, families, and adults.

Throughout the course, we will consider the general principles that guide ethical behaviors and decision-making across settings, unique issues that might arise in specific settings, and the roles served by formal codes of conduct. We also consider the roots of ethical thinking, behavior, and decision-making, and the social and cultural influences on individual's developing sense of ethics.

CPSY 5310. Current Issues in Applied Child and Adolescent Development. (3 cr.; Student Option No Audit; Periodic Fall & Spring)
Applied Child and Adolescent Development (ACAD) evolved from social sciences? efforts to contribute to solving problems in society. At its inception in the early 1980s, Wertlieb described the applied developmental scientist as ??being increasingly called upon to participate as social change agents and public policy advisors?. (occupying) an important position in many health care, education, human service and public policy settings. ACAD also focuses on positive psychology, supporting healthy development as a preventative vs. only reactive approach to positive change; and appreciates the reciprocal relation between research and practice. This seminar course provides students with a sample of the wide range of current issues faced by applied developmental scientists.

CPSY 5360. Special Topics in Developmental Psychology. (1 cr. [max 3 cr.]; Student Option; Every Summer)
Study in specialized areas of developmental psychology. Topics/credits vary.

CPSY 5413. Early Childhood and Public Policy. (3 cr.; Student Option; Every Fall)
State, federal, and international policies and legislative activity touching first five years of a child's life. Family, community, and institutional roles in promoting children's social, cognitive, and emotional development. Issues related to health, mental health, poverty, developmental delays, and special needs.

CPSY 5414. Individualized Learning Experience in Early Childhood and Public Policy. (1-3 cr.; Student Option; Periodic Spring)
Individualized, applied learning experience. Focuses on early childhood policy development, research, or evaluation. Students attend an early childhood policy lecture series and participate in small discussion groups and follow-up activities. prereq: Early Childhood Policy Certificate student, instr consent

CPSY 5501. Foundations in Infant and Early Childhood Mental Health I. (3 cr.; A-F only; Fall Odd Year)
History, theory, research, concepts, and issues in infant mental health. Issues pertinent to difficulties in development. Readings, visual material. Expert guest lectures. prereq: [Baccalaureate degree in an early-childhood-related field from an accredited U.S. institution or documented equival], experience in early childhood [research or practice]

CPSY 5503. Development and Psychopathology in Early Childhood. (3 cr.; A-F only; Spring Odd Year)
History, theory, research, concepts, and issues in infant mental health. Typical development. Difficulties in development. Expert guest lectures. Readings, visual material. prereq: 5501

CPSY 5506. Infant Observation Seminar I. (1 cr.; S-N only; Spring Odd Year)
How an infant develops in context of family relationships over a 9-12 month period. Students observe an infant for one hour a week, write a narrative, and discuss observations.

CPSY 5508. Infant Observation Seminar II. (1 cr.; S-N only; Summer Odd Year)
How an infant develops in context of family relationships over a nine- to twelve-month period. Students observe an infant for one hour a week, write a narrative, and discuss observations.

CPSY 5511. Infant Observation Seminar III. (1 cr.; S-N only; Fall Even Year)
How an infant develops in context of family relationships over 9-12 month period. Students observe an infant for one hour a week, write a narrative, and discuss observations.

CPSY 5513. Early Childhood Assessment. (3 cr.; A-F only; Summer Odd Year)
The course introduces processes and evidence-based methods of early childhood assessment and diagnosis from a developmental, multi-disciplinary framework. prereq: [Baccalaureate degree in early-childhood-related field from accredited U.S. institution or documented equival], [experience in early childhood research or practice]

CPSY 5515. Assessment in Infant and Early Childhood Mental Health: NCAST. (2 cr.; S-N only; Summer Odd Year)
Achieving reliability in two observational measures of parent-child interaction: (1) nursing child assessment feeding (2) teaching Scales. Discussion, lecture, videotapes, listening/observation tasks. prereq: [Baccalaureate degree in early-childhood-related field from accredited U.S. institution or documented equival], [experience in early childhood research or practice]
CPSY 5518. Prevention and Intervention in Early Childhood: Principles. (3 cr.; A-F only; Fall Even Year)

Students design prevention/intervention programs and apply evidence-based strategies in workplace/practicum settings. Readings, in-class reflective practice groups. prerequisite: 5501, 5503, 5506, 5508

CPSY 5521. Prevention and Intervention in Early Childhood: Practice. (3 cr.; A-F only; Spring Odd Year)

Students design prevention/intervention programs and apply evidence-based strategies in workplace/practicum settings. Readings, in-class reflective practice groups.

CPSY 5523. Reflective Supervision in Infant and Early Childhood Mental Health: Community-based. (1 cr.; S-N only; Spring Even Year)

Principles/strategies of reflective supervision/consultation. Discussion, final assignment designated by instructor.

CPSY 5525. Reflective Supervision in Infant and Early Childhood Mental Health: Clinical. (1 cr.; S-N only; Spring Even Year)

Principles and strategies of reflective supervision/consultation. Discussion, final assignment designated by instructor.

CPSY 5601. Child Life Theory, Practice and Program Development. (3 cr.; A-F only; Every Fall)

With a strong foundation in the theory and science of child development, Child Life Specialists promote effective coping for children experiencing the stress and uncertainty of illness, injury, disability, and hospitalization. Child Life Specialists translate the theory of developmental science into practice and advocate for patient- and family-centered care in medical settings. This course will provide an overview of history, fundamental theories, relevant research, and application of the Child Life Professional Practice. The Official Documents of the Child Life Council (2011) will be analyzed as a source of guiding principles for professional practice. An introduction to Child Life program development is also examined in this course. This course must be taken prior to a child life internship.

CPSY 5602. Developmental Perspectives on Illness and Injury in Healthcare. (3 cr.; A-F only; Every Spring)

With a strong foundation in the theory and science of child development, Child Life Specialists promote effective coping for children experiencing the stress and uncertainty of illness, injury, disability, and hospitalization. Child Life Specialists translate the theory of developmental science into practice and advocate for patient- and family-centered care in medical settings. This course will provide an overview of developmental theories as they apply to children and adolescents experiencing illness and injury in healthcare. Child Life preparation, relaxation interventions, and patient support practices for ill children will be examined.

CPSY 5603. Therapeutic Play for Child Life Practice. (3 cr.; A-F only; Every Spring)

With a strong foundation in the theory and science of child development, Child Life Specialists promote effective coping for children experiencing the stress and uncertainty of illness, injury, disability, and hospitalization. Child Life Specialists translate the theory of developmental science into practice and advocate for patient- and family-centered care in medical settings. This course will provide an overview of the theoretical framework of play across childhood development and its role within pediatric healthcare settings and Child Life practice. Students will gain a professional understanding of the therapeutic process fundamental for facilitation of children’s coping and adjustment in various healthcare experiences.

CPSY 5604. Therapeutic Relationships: Supporting Children in Healthcare. (3 cr.; A-F only; Every Fall)

With a strong foundation in the theory and science of child development, Child Life Specialists promote effective coping for children experiencing the stress and uncertainty of illness, injury, disability, and hospitalization. Child Life Specialists translate the theory of developmental science into practice and advocate for patient- and family-centered care in medical settings. This course will provide an overview of the theoretical framework of play across childhood development and its role within pediatric healthcare settings and Child Life practice. Students will gain a professional understanding of the therapeutic process fundamental for facilitation of children’s coping and adjustment in various healthcare experiences.

CPSY 5605. Childhood Death and Bereavement. (3 cr.; A-F only; Every Fall)

With a strong foundation in the theory and science of child development, Child Life Specialists promote effective coping for children experiencing the stress and uncertainty of illness, injury, disability, and hospitalization. Child Life Specialists translate the theory of developmental science into practice and advocate for patient- and family-centered care in medical settings. This course will provide an overview of the theoretical framework of play across childhood development and its role within pediatric healthcare settings and Child Life practice. Students will gain a professional understanding of the therapeutic process fundamental for facilitation of children’s coping and adjustment in various healthcare experiences.

CPSY 5606. Cross-Cultural Experiences in Education and English Teaching in Brazil. (GP; 12 cr. [max 24 cr.]; S-N only; Periodic Fall & Spring)

This course provides an experiential introduction to the process of learning and teaching a second language to young children in an international setting. Students will engage in inquiry, planning, classroom teaching and reflection as they participate on a team developing curriculum in a partial day English immersion classroom. Through readings, videos, a homestay experience, small group projects, classroom observations, and participation as part of a team of English teachers in Brazil, students will gain an introduction to Brazilian culture, learn the basics of the local education system, and experience firsthand what it is like to learn a new language. Students will next be exposed to some of the basic elements of early childhood second language teaching, will help to plan and co-deliver relevant and appropriate curriculum, write lesson plans and engage in reflective practice with their teaching team. Finally, because of the cultural immersion element of the class, students will be supported to 1) reflect on their personal cultural adjustment process, 2) develop an effective working relationship with their co-teachers, and 3) consider the ethical dilemma present in the provision of educational opportunity to Brazil’s marginalized communities.

CPSY 5991. Independent Study in Child Development. (1-12 cr.; max 24 cr.; Student Option No Audit; Periodic Fall & Spring)

Independent study arranged with child development faculty member.

CPSY 5996. Field Experience in Applied Child and Adolescent Development. (1-12 cr.; max 24 cr.; S-N only; Periodic Fall, Spring & Summer)

Emphasizes field experiences focusing on the development of children and adolescents as individuals or members of groups; may include interactions with children and adolescents in natural settings, or research on applied topics or with atypical populations.

CPSY 8101. Graduate Fellowship Proposal Writing Seminar. (1 cr.; S-N only; Every Fall)

The primary purpose of this course is to prepare students to submit a competitive NSF Graduate Research Fellowship proposal. Students submitting to other organizations are welcome to join the course, but all of the assignments and focus will be on increasing NSF and predoctoral fellowship competitiveness. This course is intended primarily for doctoral students in their first or second year of study.

CPSY 8102. Writing Developmental Psych Grants for NIH and NSF. (1-3 cr.; max 4 cr.; A-F only; Spring Odd Year)

Research/identify potential funding sources at NIH/NSF, create right fit between proposals/agency program goals, address guideline of proposals, write effective key elements of proposal, understand review criteria, complete grant review, interpret feedback from reviews. prerequisite: Doctoral students in second year of study or beyond

CPSY 8301. Developmental Psychology: Cognitive Processes. (4 cr.; Student Option; Every Fall)

Perceptual, motor, cognitive, and language development, and biological bases of each. Conceptual framework of research issues. prerequisite: Doctoral student, instructor consent

CPSY 8302. Developmental Psychology: Social and Emotional Processes. (4 cr.; Student Option; Every Spring)

Normative issues and individual differences in social development from infancy through
adolescence. Emphasizes developmental psychopathology, life span considerations.
prereq: Doctoral student, instr consent

CPSY 8304. Developmental Research Methods. (3 cr.; Student Option; Every Spring)
Review of research strategies and designs for conducting research in developmental psychology, as well as strengths and weaknesses of each. Students will learn to (a) communicate about empirical research, (b) critically review methods used in empirical studies, and (c) design research to maximize knowledge gained, while recognizing its limitations.

CPSY 8307. Prelim Seminar. (1 cr.; S-N only; Every Spring)
Prepare for written preliminary examination during summer of second year of doctoral study. Critically discuss issues/ themes in field using key readings suggested by faculty/past readings from core child development doctoral courses. prereq: Child psychology PhD student in second year of study

CPSY 8311. Landmark Issues and Great Controversies in Child Development. (2 cr.; S-N or Audit; Every Fall)
History of developmental psychology and child development movement in context of conceptual/theoretical controversies. Presentations by students/instructor. prereq: CPSy doctoral student or instr consent

CPSY 8321. Seminar in Teaching Developmental Psychology. (1 cr.; Student Option; Every Fall)
Apprentices attend weekly seminar meetings covering all aspects of university teaching. Planning course coverage, teaching techniques, developing learning activities and examinations. Preparation for CPSY 8322. prereq: CPSy doctoral student or instr consent

CPSY 8322. Apprenticeship in Teaching Developmental Psychology. (1-3 cr.; S-N only; Every Spring)
Co-instruct a section of a CPSY undergraduate course. Plan syllabus, prepare/deliver lectures, devise active learning activities, prepare exams/assignments, and grade. Meet with apprenticeship supervisor to discuss teaching progress/issues. prereq: Child psychology doctoral student

CPSY 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

CPSY 8360. Special Topics in Developmental Psychology. (1-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Intensive study in specialized areas of developmental psychology. Topics/credits vary. prereq: Doctoral student

CPSY 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

CPSY 8606. Advanced Developmental Psychopathology. (3 cr.; Student Option; Every Fall)
Alternative formulation of childhood disorders, emphasizing competency training rather than medical nosology. prereq: Doctoral student or instr consent

CPSY 8607. Developmental Neurobiology of Stress and Emotion. (3 cr.; Student Option; Periodic Fall)
Maladaptive responses to stress are components of both the etiology and expression of many psychiatric disorders. In addition, individuals differ in their stress vulnerability, with some seeming to thrive despite the odds, and others succumbing to even relatively mild adversity. These individual differences are likely the interactions of genes and experiences; early experiences may be particularly noteworthy.

CPSY 8608. Clinical Intervention with Children. (3 cr.; Student Option; Periodic Spring)
This course is a graduate seminar designed to introduce students to child treatment theory and techniques. The course has two objectives: (1) to introduce students to current clinical theory and research, relevant to clinical practice with children, and (2) to teach students basic clinical skills and interventions that will prepare them for their first child psychotherapy case during their clinical practicum. The course will cover a variety of topics, including the therapeutic relationship and the therapeutic process, an introduction to different modalities of child psychotherapy (with a focus on cognitive-behavioral and behavioral interventions), and ?real life? clinical practice issues (working with minority populations, working in a managed care environment, and broader children?s mental health issues).

CPSY 8660. Advanced Developmental Psychology. (1-4 cr. [max 21 cr.]; Student Option; Periodic Fall & Spring)
Intensive study in advanced areas of developmental psychology. Topics/credits vary. prereq: Doctoral student

CPSY 8664. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CPSY 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

CPSY 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

CPSY 8980. Research Seminar in Child Psychology. (1-3 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer)
Participation in organized research group in developmental psychology. prereq: Doctoral student

CPSY 8993. Directed Study in Child Psychology. (1-4 cr.; Student Option; Every Fall & Spring)
tbd prereq: Doctoral student or instr consent

CPSY 8994. Research Problems in Child Psychology. (1-6 cr. [max 24 cr.]; Student Option; Every Fall & Spring)
Individual empirical investigation. prereq: Doctoral student or instr consent

CPSY 8996. Directed Field Experiences in Child Psychology. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer)
Emphasizes field experiences focusing on intellectual and/or social development of children as individuals or members of groups; may include interactions with children in natural settings, or research on applied topics or with atypical populations. prereq: Doctoral student, instr consent

China Executive MBA (CHMB)

CHMB 5800. Organizational Behavior. (3 cr.; A-F only; Every Fall)
Theories/frameworks for analyzing behavior of individuals, groups, and the organization itself. Emphasizes making decisions and developing action plans that enable managers to provide effective leadership. Personnel selection, reward/compensation systems, collective bargaining.

CHMB 5801. Financial Accounting. (3 cr.; A-F only; Every Fall)
External accounting system used by firms to measure their economic performance and financial position. Students analyze corporate financial reports to discover impact of significant economic events. Rise of financial reporting standards and financial intermediaries in efficient allocation of capital in a modern economy. Discussions, cases.

CHMB 5802. Statistics and Decision Making. (3 cr.; A-F only; Every Fall)
Exploratory data analysis, basic inferential procedures, statistical process control, regression analysis.

CHMB 5803. Operations Management. (3 cr.; A-F only; Every Fall)
How to manage operations function in manufacturing/service organizations. Emphasizes strategic impact of operations decisions. Operations strategy, process design, productivity improvement, quality management, business process re-engineering, service quality, forecasting, demand management, inventory management, production planning, project management, scheduling, supply chain management, international operations management.

CHMB 5804. Managerial Accounting. (3 cr.; A-F only; Every Spring)
Role that ethics can play in corporate strategy. Key concepts include stakeholder management, individual/collective responsibility, and international business ethics. Theoretical considerations applied to issues such as a business's responsibility to the environment, truthful/tasteful advertising, obligations to local community, and managing a diverse workforce.

CHMB 5815. International Human Resources Management. (3 cr.; A-F only; Every Spring)
Topics reflect the strengths, talents, and interests of the class. Integrates different aspects of the curriculum while not being limited by a specific area or paradigm.

CHMB 5816. International Residency. (6 cr.; A-F only; Every Fall & Spring)
Students travel to an international location for 11 days and engage in discussions with international colleagues, apply program concepts, and develop a broader sensitivity to cultural/social differences. Pre-trip preparation, on-site discussion, and trip assignment are required.

CHMB 5817. China's Economy. (1.5 cr.; A-F or Fall; every Spring)
Focusing on China's economy, this course is designed as a required course for all China Executive MBA students. prereq: China Executive MBA student

CHMB 5818. Law and Business. (3 cr. [max 6 cr.]; A-F only; Every Spring)
Legal/regulatory environment of business operations in China.

Chinese (CHN)

CHN 1011. Beginning Modern Chinese I. (6 cr.; Student Option No Audit; Every Fall & Summer)
Speaking/reading modern standard Chinese through structured practice.

CHN 1012. Beginning Modern Chinese II. (6 cr.; Student Option No Audit; Every Spring & Summer)
Speaking/reading modern standard Chinese through structured practice. prereq: 1011 or equiv or inst consent

CHN 1015. Accelerated Beginning Modern Chinese. (5 cr.; Student Option No Audit; Every Fall)
Mandarin Chinese. Reading, writing, standard pronunciation. Meets with 4005. prereq: Oral/aural skills or speaker of other Chinese dialect recommended

CHN 3021. Intermediate Modern Chinese I. (5 cr.; Student Option No Audit; Every Fall)
Modern standard Chinese skills developed further through conversations, writing, reading. prereq: 1012 or 1015 or equiv or inst consent

CHN 3022. Intermediate Modern Chinese II. (5 cr.; Student Option No Audit; Every Spring)
Modern standard Chinese skills developed further through conversation/reading. prereq: 3021

CHN 3031. Advanced Modern Chinese I. (4 cr.; Student Option No Audit; Every Fall)
Reading/analysis of 20th-century texts. prereq: 3022 or equiv or inst consent

CHN 3032. Advanced Modern Chinese II. (4 cr.; Student Option No Audit; Every Spring)
Reading/analysis of 20th-century texts. prereq: 3031 or equiv or inst consent

CHN 3161. Movies in Modern China. (3 cr.; Student Option No Audit; Periodic Summer)
Taught entirely in Chinese, this course introduces students to modern Chinese cinema. Each week, students will view and discuss Chinese movies (without subtitles) and learn the basic concepts of film studies, historical movements in Chinese cinema, key filmmakers in China, and how Chinese social issues are represented in the movies. This course is designed for students who have completed Chinese immersion school or have advanced proficiency in listening, reading, speaking, and writing in Mandarin Chinese. Not open to native Chinese speakers, except under special circumstances. Permission of instructor is required. Lectures and assignments are primarily online with one class meeting per week on the UMN campus.

CHN 3201. Chinese Calligraphy. (2 cr.; Student Option; Every Fall & Spring)
Appreciation and execution of Chinese calligraphy through guided practice.

CHN 3202. Intermediate Chinese Calligraphy. (2 cr.; Student Option; Every Spring)
Advanced techniques of composing Chinese characters using regular style of Chinese calligraphy. prereq: 3201 or inst consent

CHN 3203. Advanced Chinese Handwriting. (2 cr.; Student Option; Every Spring)
This course is designed for students participating in the Chinese Flagship program who have already completed CHN 3201 (Chinese Calligraphy). Students with a Chinese language background may also enroll with the instructor's permission. The course will be taught in Mandarin Chinese. Students will learn the proper methods of composing a Chinese character using pen/pencil. With this foundation, they will advance to writing ancient poetry, couplets, and classical and modern essays. As students learn to write beautiful characters in these texts, they will also gain a better understanding of Chinese culture and literature. Students will also have the opportunity to read and recognize characters

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
written in the Running Script and Casual Script. A deeper understanding of the intricacies in written script allows students to better appreciate the beauty of Chinese literature and engage with its diverse philosophies.

CHN 3290. Chinese Language Teaching Tutorial. (.1 cr. [max 2 cr.]; S-N only; Every Fall & Spring) Students tutor beginning students of Chinese and are part of department's Chinese language team. prereq: Grade of A in 3032

CHN 3920. Topics in Chinese Culture. (.1-2 cr. [max 6 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Selected topics in Chinese culture. Topics specified in the Class Schedule.

CHN 3993. Directed Studies. (.1-5 cr. [max 15 cr.]; Student Option No Audit; Every Fall & Spring) Guided individual study of Chinese language or linguistics. prereq: instr consent, dept consent, college consent

CHN 4001. Beginning Modern Chinese I for Graduate Student Research. (6 cr.; Student Option No Audit; Every Fall & Summer) Speaking/reading modern standard Chinese through structured practice. Meets with 1011.

CHN 4002. Beginning Modern Chinese II for Graduate Student Research. (6 cr.; Student Option No Audit; Every Spring & Summer) Speaking/reading modern standard Chinese through structured practice. Meets with 1012. prereq: 4001

CHN 4003. Intermediate Modern Chinese I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall & Summer) Modern standard Chinese skills developed through conversations, writing, reading. Meets with 3021. prereq: 4002

CHN 4004. Intermediate Modern Chinese II for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring) Modern standard Chinese skills developed through conversation/reading. Meets with 3022. prereq: 4003

CHN 4005. Accelerated Beginning Modern Chinese for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall) Mandarin Chinese. Reading, writing, standard pronunciation. prereq: Grad student, instr consent; oral/aural skills or other Chinese dialect recommended

CHN 4006. Accelerated Intermediate Modern Chinese for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring) Continuation of CHN 1015/4005. Mandarin Chinese course designed primarily for students with oral/aural skills but with little or no exposure to reading and writing. Also for speakers of other Chinese dialects and others with prior experience. Concentration on reading, writing, and standard pronunciation. Equivalent to two semesters, Chinese 3021-3022. Upon completion, student may enter Advanced Modern Chinese, Chinese 3031. prereq: 1012 or 1015; oral/aural skills or other Chinese dialect recommended

CHN 4007. Advanced Modern Chinese I for Graduate Student Research. (4 cr.; Student Option No Audit; Every Fall) Reading and analysis of 20th-century texts. Meets with 3031. prereq: 4004

CHN 4008. Advanced Modern Chinese II for Graduate Student Research. (4 cr.; Student Option No Audit; Every Spring) Reading and analysis of 20th-century texts. Meets with 3032. prereq: 4007

CHN 4040. Chinese Content-Based Instruction. (.1-3 cr. [max 9 cr.]; S-N or Audit; Every Fall & Spring) This course is designed for students of advanced Chinese (CHN 4041 and above) especially students in the Chinese Flagship program. It is intended to bridge their language learning experience to the cultural studies courses on modern Chinese literature, visual culture, popular music, and contemporary Chinese society (ALL 3336, 3337, and others). Content-based instruction addresses Chinese creative and cultural production as contextualized by the Cultural Revolution, during and after the Mao era, China's "opening and reform" as well as the commercialization and globalization of culture. Taught primarily in Mandarin Chinese, the course focuses on the discussion of materials and issues, not reading of texts. Students will be provided with bilingual materials, including vocabulary lists and original texts to aid in the discussions. Not open to native Chinese speakers, except under special circumstances. Permission of Instructor.

CHN 4041. Advanced Readings in Modern Chinese I. (4 cr.; Student Option; Every Fall) Writings of different styles. Short stories/essays written since 1949 that reflect Chinese society. Internet writing, use of language. Writings' reflection of contemporary Chinese society, its culture/philosophies. prereq: 3032 or instr consent

CHN 4042. Advanced Readings in Modern Chinese II. (4 cr.; Student Option; Every Spring) Writings of different styles. Short stories/essays written since 1949 that reflect Chinese society. Internet writing, use of language. Writings' reflection of contemporary Chinese society, its culture/philosophies. prereq: 3032 or instr consent

CHN 5011. Research Methods. (.4 cr.; Student Option; Periodic Fall) Introduction to the sources and approaches of research in language and literature. prereq: 3032 or 3112

CHN 5040. Readings in Chinese Texts. (.3 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Students read authentic materials of various types to increase reading/speaking ability. Topics specified in Class Schedule. prereq: 4042 or equiv or instr consent

CHN 5041. Media Chinese. (.3 cr.; A-F or Audit; Every Fall) Conducted 100% in Mandarin Chinese, this course trains students to comprehend media Chinese by listening to and viewing Chinese television programs and online/internet resources. Course content includes international and Chinese national news, social issues, historical events, and interpersonal relations relevant to modern Chinese society, history, and culture. Students must have taken 3-4 years of college-level Chinese or demonstrate the same level of Chinese proficiency.

CHN 5042. Contemporary Chinese Texts 1949-present. (.3 cr.; A-F or Audit; Periodic Fall & Spring) Advanced Chinese language course focused on contemporary Chinese short stories, novellas, and prose written since 1949, especially from 1978 to the present. These literary works explore various aspects of contemporary Chinese society, history, and culture including: social prejudices and discrimination against the mentally and physically disadvantaged, the Khmer Rouge, the Cultural Revolution, the drug problem, male-female relationships, education, parental love (and lack thereof), traditional Chinese views of life, rape and sex, influence from the West, and more. Class discussion focuses on the use of the language, the social interpretation of the texts, and the Chinese cultural and philosophical implications found in those works. prereq: CHN 4042 or instructor consent. Recommended: CHN 5041

CHN 5120. Topics in Chinese Linguistics. (.4 cr. [max 8 cr.]; Student Option; Periodic Fall) Studies of the structure and change in the Chinese language. prereq: 4121 or 4125

CHN 5211. Introductory Classical Chinese I. (3 cr.; Student Option; Periodic Fall) Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese/its importance in study of East Asian cultures. Taught in English, prenote: Twentieth Movement, the Cultural Revolution, the drug problem, male-female relationships, education, parental love (and lack thereof), traditional Chinese views of life, rape and sex, influence from the West, and more. Class discussion focuses on the use of the language, the social interpretation of the texts, and the Chinese cultural and philosophical implications found in those works. prereq: CHN 4042 or instructor consent

CHN 5212. Introductory Classical Chinese II. (3 cr.; Student Option; Periodic Spring) Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese/its importance in study of East Asian cultures. Taught in English. prereq: 5211 and two years of an East Asian language (Chinese, Japanese, Korean) or equivalent or instr consent

CHN 5213. Literary Chinese in the Analects. (3 cr.; Student Option No Audit; Every Fall) The "Analects" is a collection of the sayings of Confucius and his disciples. As one of the most revered classics in the Chinese tradition, it is essential for understanding Chinese cultural values, and contains complex philosophical themes for critical thinking. Linguistically, the "Analects" provides an excellent example of the classical Chinese language, and is the source of many common Chinese idioms. This class takes key passages from the "Analects" in the original and aims to equip students with a holistic understanding of Chinese language, culture, and history. Prerequisite: CHN 3022 or instructor consent.
CHN 5393. Directed Study. (1-5 cr. [max 18 cr.]; Student Option; Every Fall & Spring) Guided individual reading or study. Prereq: instr. consent, dept consent, college consent.

CHN 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

CHN 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CHN 8494. Directed Research. (1-5 cr.; max 16 cr.); Student Option; Every Fall & Spring) Individual study/research with guidance of a faculty member.

CHN 8566. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CHN 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

CHN 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Civil, Environ, and Geo-Engin (CEGE)

CEGE 1101. Introduction to Civil, Environmental, and Geo-Engineering. (1 cr.; A-F or Audit; Every Fall) Introduction to civil, environmental, and geotechnical practice and the risk role these fields play in our society. Presentations made by faculty and professional engineers include current and future challenges, research and career opportunities, and case studies of projects. prereq: Lower div

CEGE 1501. Environmental Issues and Solutions. (ENV, PHYS; 4 cr.; Student Option; Every Fall & Spring) Open to students from all colleges. Importance of science in understanding/solving various environmental problems. Case studies. Laboratory exercises. prereq: High school chemistry or equiv, one yr high school algebra

CEGE 3101. Computer Applications I. (3 cr.; A-F or Audit; Every Fall & Spring) Computer tools and computational methods for solving civil, environmental, and geo- engineering problems. Solving systems of linear/nonlinear equations, parameter estimation and engineering/model fitting, numerical differentiation/integration, numerical solution of ordinary and partial differential equations. prereq: MATH 1372, PHYS 1301, CSE or instructor consent

CEGE 3102. Uncertainty and Decision Analysis. (3 cr.; A-F or Audit; Every Fall & Spring) Stochastic models, their usefulness in reasoning about uncertainty in civil, environmental, and geo-engineering. Techniques for identifying, fitting, and validating models using data samples. Testing hypotheses about, and bounding uncertainty attached to, engineering parameters. Applications to civil, environmental, and geo-engineering. prereq: MATH 1372 or equiv

CEGE 3103. Engineering Ethics and Professional Practice. (1 cr.; A-F only; Every Fall & Spring) Introduction to ethical thinking, legal aspects of professional practice, codes of ethics for engineers, ethical problem-solving using case studies. Prereq: Civil Eng. or Environmental Eng. or Geoengineering Upper Division

CEGE 3111. ADD for Civil Engineers. (2 cr.; A-F only; Every Fall & Spring) Introduction to AutoCAD and Civil 3D software. Students complete all tasks to design two-lane roadways and subdivision using civil engineering design software, including topology, plan/profile, contours, cross sections, and quantity calculations. prereq: CEGE 3101

CEGE 3190. Curricular Practical Training Internship. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Work assignment involving advanced civil engineering. Reviewed by the director of undergraduate studies. prereq: CE, Envr, or Geo major

CEGE 3201. Transportation Engineering. (3 cr.; A-F or Audit; Every Fall & Spring) Applying laws of motion to vehicle performance, determining constraints for highway designs. Traffic flow principles, their relation to capacity and level of service. Geometric design, traffic control, pavement design, transportation planning. prereq: PHYS 1301, CEGE 3101, CEGE 3102

CEGE 3202. Surveying & Mapping. (2 cr.; A-F or Audit; Every Fall & Summer) Theory of precision measurements of distance, elevation, angle, and direction of points/lines above, on, or beneath earth’s surface. Establishing such points/lines. Elements of coordinate systems, datum planes, and maps. prereq: MATH 1271, MATH 1272, [CSE or Construction Mgmt]

CEGE 3301. Soil Mechanics I. (3 cr.; A-F or Audit; Every Fall & Spring) Index properties and soil classification. Effective stress, permeability and seepage. Elasticity theory. One-dimensional compression and consolidation; settlements. Compaction; cut and fill problems. prereq: upper division CSE, AEM 3031, CEGE 3101, or instructor consent

CEGE 3401. Linear Structural Analysis. (3 cr.; A-F or Audit; Every Fall & Spring) Analysis of determinate/indeterminate trusses and frames. Application of energy methods and virtual work technique in analysis of structural deformations. Force-based and displacement-based methods in analysis of indeterminate structures. Influence lines and critical load configurations. prereq: AEM 3031, upper division CSE or instructor consent

CEGE 3402W. Civil Engineering Materials. (WI; 3 cr.; A-F or Audit; Every Fall & Spring) Concepts and modeling of behavior mechanisms for civil engineering materials such as concrete, masonry, metals, asphalt, plastics, and wood. Standard specifications for material properties. Techniques for testing. prereq: AEM 3031

CEGE 3501. Introduction to Environmental Engineering. (ENV; 3 cr.; A-F or Audit; Every Fall & Spring) A quantitative approach to environmental problems, including the development of mass and energy balances and the application of fundamental principles of environmental chemistry and microbiology. Meets the University of Minnesota’s liberal education environment theme through the incorporation of environmental function, problems, and solutions throughout the course. prereq: Chem 1062, Phys 1302, Math 1372 or equivalent


CEGE 3541. Environmental Engineering Laboratory. (3 cr.; A-F only; Every Fall) Laboratory-based course focused on physical, chemical, and microbiological measurements used in analysis of air, water, and solid samples. Applications include water quality, water treatment, wastewater treatment, hazardous waste treatment/remediation, air pollution, and environmental sensing. prereq: CEGE 3501

CEGE 4000H. Honors Research Seminar. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring) Attend twelve (12) research seminars in civil, environmental, and geo-engineering given by faculty members and visiting scholars. Write and submit a summary of each attended seminar. Explicitly interact with four or more of the speakers. prereq: Upper div CE, Envr, GeoE, Enrolled in the University Honors Program or instructor consent
CEGE 4011. Special Topics. (1-4 cr. [max 12 cr.]; A-F only; Periodic Fall & Spring) Topics/credits vary. prereq: Upper div CSE

CEGE 4094H. Senior Honors Thesis. (2 cr.; A-F only; Every Fall) Writing thesis under direction of CE faculty member. prereq: Upper div CE

CEGE 4101. Project Management and Engineering Economics. (3 cr.; A-F only; Every Fall & Spring) Civil, Environmental, and Geo-engineering project management. Project planning, scheduling, and controlling. Project permitting. Financing, bidding, and contracts for public projects. Budgeting, staffing, task cost control. Critical path method and graphical project representations. Project management and leadership. Risk management. Engineering economics. Prerequisites: Civil Eng. or Environmental Eng. or Geoengineering upper division

CEGE 4102W. Capstone Design for Civil Engineering. (WI; 4 cr.; A-F or Audit; Every Fall & Spring) Teams formulate/solve civil engineering problems. From conceptual stage through preliminary planning, public hearings, design, environmental impact statements, final plans/specifications, and award of contracts. prereq: 4301, 4401, 4501, 4502

CEGE 4104W. Capstone Design for Geoenvironmental Engineering. (WI; 4 cr.; A-F or Audit; Every Fall & Spring) Team participation in formulation/solution of open-ended civil engineering problems, from conceptual stage through preliminary planning, public hearings, design, and environmental impact statements, to preparation of final plans/specifications and award of contracts. prereq: CE 4121, CE 4311, CE 4351, ESE 4501

CEGE 4121. Computer Applications II. (3 cr.; A-F or Audit; Every Spring) Advanced manipulation of computer tools/methods in solving ordinary/partial differential equations from civil engineering problems. Spreadsheet, Matlab programming. Methods may include finite differences, boundary element, finite element, and control volume finite element. prereq: CEGE 3101, MATH 2373 or equivalent, MATH 2374 or equivalent, upper division CSE or instructor consent

CEGE 4170. Independent Study I. (1-4 cr.; Student Option; Every Fall) Special studies in planning, designing, or analyzing civil engineering systems. Lab problems, literature studies, or reports supervised by staff. prereq: instr consent

CEGE 4180. Independent Study II. (1-4 cr.; Student Option; Every Spring & Summer) Special studies in the planning, design, or analysis of civil engineering systems. Individual lab research problems, literature studies, reports. Supervised by staff. prereq: instr consent

CEGE 4190. Engineering Co-op Assignment. (2-6 cr.; A-F only; Every Fall, Spring & Summer) Formal written report of work during six-month professional assignment. prereq: Upper div CE, approval of department co-op director

CEGE 4194H. Senior Honors Thesis. (2 cr.; A-F only; Every Fall) Writing thesis under direction of CE faculty member. prereq: Upper div CE

CEGE 4201. Principles of Highway Design. (3 cr.; A-F or Audit; Every Spring) Vertical and horizontal alignment, cross-sections and earthwork computations, roadside design, highway capacity, impact of vehicle type on geometric design, intersection design, safety impacts of highway design. prereq: upper division CSE student, CEGE 3201 or instr consent

CEGE 4211. Traffic Engineering. (3 cr.; A-F or Audit; Periodic Spring) Principles of vehicle/driver performance as they apply to safe/efficient operation of highways. Design/use of traffic control devices. Capacity/level of service. Trip generation, traffic impact analysis. Safety/traffic studies. prereq: CEGE 3201, CEGE 3102 or equivalent, upper division CSE or instructor consent

CEGE 4251. Pavement Analysis, Design, and Rehabilitation. (4 cr.; A-F or Audit; Periodic Fall) Concepts/principles in rigid/flexible pavement design. Traffic loads, soil considerations, material characteristics for highway/airport pavement design. Rehabilitating flexible/rigid pavement systems. prereq: [3201, 3301, 3402W, upper div CSE] or grad student or instr consent


CEGE 4352. Groundwater Modeling. (3 cr.; A-F or Audit; Periodic Spring) Analytic element method. Mathematical/computer modeling of single/multiple aquifer systems. Groundwater recovery. Field problems. Theory/application of simple contaminant transport models, including capture zone analysis. prereq: 4351, upper div CSE or grad student or instr consent

CEGE 4401. Steel and Reinforced Concrete Design. (4 cr.; A-F or Audit; Every Fall & Spring) Limit-states design. Steel: tension, compression, flexure, combined compression/flexure, connections. Reinforced concrete: beams (rectangular, T-sections, doubly reinforced) in flexure/shear, one-way slabs, serviceability, development length, reinforcement detailing, short columns, prereq: Grade of at least C- in 3401, concurrent registration is required (or allowed) in 3402, [upper div CSE or grad student]

CEGE 4411. Matrix Structural Analysis. (3 cr.; A-F or Audit; Every Spring) Analysis of linear structural systems by matrix methods, stiffness, and flexibility methods. Introduction to computerized structural analysis of trusses/frames, including coding. prereq: CEGE 3101, CEGE 4401, upper div CSE or grad student or instr consent

CEGE 4412. Reinforced Concrete II. (3 cr.; A-F or Audit; Every Spring) Advanced design of reinforced concrete structures: footings, retaining walls, columns with slenderness effects and biaxial loading, torsion, continuous systems, two-way floor systems. prereq: CEGE 4401, upper div CSE or instr consent; 4411 recommended

CEGE 4413. Steel Design II. (3 cr.; A-F or Audit; Every Fall) Design of steel and composite steel/concrete structures, including composite beams, plate girders, beam-columns, connections and multi-story frames. prereq: CEGE 4401, upper div CSE or instr consent; 4411 recommended


CEGE 4502. Water and Wastewater Treatment. (3 cr.; A-F or Audit; Every Fall & Spring) Theory and design of physical, chemical, and biological processes for the treatment of water and wastewater. prereq: 3501 or CHEN 2001
CEGE 4511. Hydraulic Structures. (3 cr.; A-F or Audit; Periodic Fall) Hydraulic design procedures for culverts, dams, spillways, outlet works, and river control works. Drop structures, water intakes, bridge crossings. Prereq: CEGE 4501, upper division CSE student, Grad student or instructor consent

CEGE 4512. Open Channel Hydraulics. (4 cr.; A-F or Audit; Periodic Fall & Spring) Theories of flow in open channels, including gradually varied and rapidly varied flows, steady and unsteady flows. Computational methods for unsteady open channel flows, applications to flood routing. Introduction to movable bed mechanics.

CEGE 4522. Review of Introductory Fluid Mechanics for Graduate Students. (3 cr.; A-F or Audit; Every Fall & Spring) This course will serve as an introduction to the topics of solid and hazardous waste management. Classes will incorporate information about prevention, treatment options, and the regulations surrounding solid and hazardous waste. They will also provide an opportunity to observe different methods of waste treatment in action.

CEGE 4562. Environmental Remediation Technologies. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theory and application of current and emerging technologies used to remediate contaminated soil and groundwater.

CEGE 5094. Civil Engineering Research. (1-4 cr.; Student Option; Every Fall & Spring) Research or independent study in concrete, structural steel, soils, hydraulics, hydrology/municipal, environmental, or transportation problems. Investigations, reports, tests, designs. Prereq: Instr consent

CEGE 5180. Special Topics. (1-4 cr.; A-F or Audit; Periodic Fall & Spring) Topics vary depending on faculty and student interests. Prereq: Instr consent

CEGE 5211. Traffic Engineering. (3 cr.; A-F or Audit; Periodic Spring) Principles of vehicle and driver performance as they apply to the safe and efficient operation of highways. Design and use of traffic control devices. Capacity and level of service. Trip generation and traffic impact analysis. Safety and traffic studies. Prereq: CEGE 3201, CEGE 3102 or equivalent, Grad Student

CEGE 5212. Transportation Policy, Planning, and Deployment. (3 cr.; Max 4 cr.; A-F or Audit; Every Fall) Techniques of analysis and planning for transportation services. Demand-supply interactions. Evaluating transportation alternatives. Travel demand forecasting. Integrated model systems. Citizen participation in decision-making. Prereq: 3201 or equiv, upper division CSE, or grad student

CEGE 5213. Transit Planning and Management. (3 cr.; A-F only; Every Fall) Principles/techniques related to transit systems. Historical perspective, characteristics of travel demand, demand management. Evaluating/benchmarking system performance. Transit-oriented development. Analyzing alternative transit modes. System design/finance. Case studies, field projects. Prereq: Upper Division CE, EnVe, or GeoE student, grad student, or instructor consent


CEGE 5341. Wave Methods for Nondestructive Testing. (3 cr.; A-F or Audit; Periodic Fall) Introduction to contemporary methods for nondestructive characterization of objects of civil infrastructure (e.g., highways, bridges, geotechnical sites). Imaging technologies based on propagation of elastic waves such as ultrasonic/resonant frequency methods, seismic surveys, and acoustic emission monitoring. Lecture, laboratory. Prereq: [AEM 2021, AEM 3031] or instr consent

CEGE 5351. Advanced Engineering Mathematics. (3 cr.; A-F or Audit; Periodic Fall) Emphasizes skills relevant for civil, environmental, and geo-engineers. Mathematical principles explained in an engineering setting. Applications from various areas in civil, environmental, and geo-engineering. Prereq: [Math 2374 or equiv], upper division CSE student or grad student) or instr consent

CEGE 5411. Applied Structural Mechanics. (3 cr.; A-F or Audit; Every Fall) Principal Stresses and strain analysis; failure criteria. Introduction to plane elasticity, energy methods, torsion of beams, and bending of unsymmetrical beams. Introduction to structural dynamics and stability. Prereq: AEM 3031, Upper div CSE or grad student or instr consent

CEGE 5414. Prestressed Concrete Design. (3 cr.; A-F or Audit; Every Fall) Design of prestressed concrete structures. Time dependent effects, behavior, flexure, shear, torsion, deflections, continuous systems. Prereq: CEGE 4401, upper div CSE or grad student or instr consent

CEGE 5415. Masonry Structures. (3 cr.; A-F or Audit; Periodic Fall) Masonry materials and their production. Mortars, grouts. Design of unreinforced and reinforced masonry structural systems. Walls, columns, lintels. Codes/specifications, testing. Prereq: CEGE 3401, upper div CSE or grad student or instr consent; 4401 recommended

CEGE 5511. Urban Hydrology and Water Quality. (4 cr.; A-F or Audit; Every Fall) Urban hydrology for small watersheds and the management of storm water quality and quantity. Prereq: CEGE 4501, upper division CSE or grad student or instructor consent

CEGE 5541. Environmental Water Chemistry. (3 cr. [Max 4 cr.]; A-F or Audit; Every Fall) Introduction to water chemistry. Physical chemical principles, geochemical processes controlling chemical composition of waters, behavior of contaminants that affect the suitability of water for beneficial uses. Prereq: CEGE 3501, Chem 1061, Chem 1062, upper division CSE or grad student or instructor consent

CEGE 5542. Experimental Methods in Environmental Engineering. (3 cr.; A-F or Audit; Periodic Spring) Tools necessary to conduct research in environmental engineering and chemistry. Theory of operation of analytical equipment. Sampling and data handling methods, statistical analyses, experimental design, laboratory safety. Lecture, laboratory, Prereq: CEGE 3501, CEGE 5441 recommended Chem 1022, upper division CSE or grad student or instructor consent

CEGE 5543. Introductory Environmental Fluid Mechanics. (4 cr.; A-F or Audit; Fall Odd Year) Environmental fluid mechanics is the study of the interaction of fluid flows that occur in aquatic ecosystems with the growth and behavior of living organisms. Prereq: CEGE 3502 or AEM 4201 or ChEn 3005, upper division CSE or grad students or instructor consent

CEGE 5551. Environmental Microbiology. (3 cr.; A-F or Audit; Every Fall) Role of microorganisms in environmental bioremediation, pollution control, water/wastewater treatment, biogeochemistry, and human health, Prereq: Upper div or grad student or instructor consent

CEGE 5552. Environmental Microbiology Laboratory. (1 cr.; A-F only; Periodic Fall) Basic microbiological techniques: isolation, identification/enumeration of bacteria, BOD, biodegradable kinetics, disinfection. Lab. Prereq: CEGE 5551 or concurrent registration is required (or allowed) in CEGE 5551

CEGE 5570. Design for Sustainable Development - India. (3-9 cr.; A-F only; Every Summer) In this interdisciplinary course in Bangalore (India's fast-growing mega-city and entrepreneurship hub) you will work in teams with local partners to research and design sustainable solutions to development challenges of water, energy, waste, agriculture,
transportation, and health. Prereqs: Open to graduate students from all majors

**CEGE 5582. Design for Sustainable Development - Nicaragua.** (3-9 cr.; A-F only; Every Summer)
His interdisciplinary course will introduce you to innovative approaches to complex sustainable development problems. You will work in teams to research and design solutions to real societies and environmental challenges while living with host families and developing your intercultural competence. Prereq: Open to graduate students from all majors.

**CEGE 5601. Experiential Education Abroad.** (1-1.5 cr.; [max 495 cr.]; S-N only; Every Fall, Spring & Summer)
Special engineering studies abroad. Studies/ reports supervised by staff.

**CEGE 8022. Numerical Methods for Free and Moving Boundary Problems.** (3 cr.; A-F or Audit; Periodic Fall)
Examples of free and moving boundary problems: metal solidification, filling, polymer molding, flow in porous media, ground freezing. Solutions: analytical, fixed finite difference, fixed finite element, front tracking schemes, general deforming finite element methods. Prereq: 8401 or instr consent

**CEGE 8094. Civil Engineering Research.** (1-4 cr.; [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Research or independent study in concrete, structural steel, soils, hydraulics, hydrology, and municipal, environmental, or transportational problems. Investigations, reports, tests, or designs. Prereq: instr consent

**CEGE 8200. Seminar: Transportation.** (1 cr.; [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Content depends on instructor and student. Sample topics: traffic safety, traffic flow theory, transportation materials, transportation planning, transportation economics.

**CEGE 8202. Networks and Places: Transportation, Land Use, and Design.** (4 cr.; A-F or Audit; Every Spring)
Relationship between land use and transportation. Developing synthetic design skills for linking land use transportation in urban/regional settlements. Economic, political, legal, institutional frameworks for planning. Parallel computer lab, practicum assignment.

**CEGE 8211. Theory of Traffic Flow.** (4 cr.; Student Option; Every Fall)

**CEGE 8212. Advanced Travel Demand Modeling and Supply Analysis.** (3 cr.; Student Option; Fall Odd, Spring Even Year)
Application of random utility theory to model travel demand; deterministic and stochastic trip assignment; network design problems; transportation planning software. Prereq: 5211 or equiv. Stat 3021

**CEGE 8213. Advanced Transportation Technologies Seminar.** (1 cr.; S-N or Audit; Periodic Fall & Spring)
Advanced technologies specifically related to transportation. Topics drawn from core science/technology areas of human factors, intelligent vehicles, traffic modeling/management, sensing, communications, and controls.

**CEGE 8214. Transportation Economics.** (4 cr.; A-F or Audit; Periodic Spring)

**CEGE 8215. Transportation Data Analysis.** (3 cr.; Student Option; Spring Even Year)
Maximum likelihood methods for generalized linear models, with logit/probit models. Linear regression as special cases. Applications to gap acceptance, discrete choice, speed/headway distributions, accident modeling. Introduction to Bayesian inference. Prereq: [8210 or 8211], [STAT 5021 or equiv]

**CEGE 8216. Urban Traffic Operations.** (3 cr.; Student Option;)
Capacity analysis techniques for urban streets, optimal traffic signal timing, coordination, real time control. Traffic signal hardware, including detectors/controllers. Operational techniques for traffic management. Use of computer program packages in traffic engineering practice. Freeway operations/control.

**CEGE 8217. Transportation Network Analysis.** (4 cr.; A-F only; Fall Odd Year)

**CEGE 8218. Dynamic Transportation Network Analysis.** (4 cr.; A-F or Audit; Fall Odd Year)

**CEGE 8231. Advanced Pavement Engineering.** (3 cr.; Student Option; Periodic Fall)
Advanced concepts in pavement analysis and design; computation of stresses and strains in flexible and rigid pavement systems; review of Bousseinesq theory, Burmeister model, and Westergaard model; load transfer in rigid pavements; temperature induced stresses; mechanics of drainage. Prereq: 4231 or instr consent

**CEGE 8233. Advanced Bituminous Materials Characterization.** (3 cr.; Student Option; Periodic Fall)
Applications of viscoelasticity, rheology, elastoplasticity, and fracture mechanics to bituminous materials characterization. Lectures, discussions of advanced research reading assignments, laboratory assignments. Prereq: [3402, grad student] or instr consent

**CEGE 8300. Seminar: Geomechanics.** (1-3 cr.; S-N or Audit; Every Fall & Spring)
Presentations on various topics.

**CEGE 8301. Fracture of Geomaterials.** (3 cr.; A-F or Audit; Periodic Fall)

**CEGE 8302. Soil/Rock Plasticity and Limit Analysis.** (4 cr.; A-F or Audit; Spring Even Year)

**CEGE 8311. Advanced Rock Mechanics.** (3 cr.; A-F or Audit; Periodic Fall)
Stress transformations; principal stresses and directions. Friction and behavior of rock joints; stability of frictional sliding. Elastic waves; acoustic emission and seismic measurements. Fragmentation and rock breakage. Prereq: CEGE grad student, 4311 or Geoe 4311 or instr consent

**CEGE 8321. Thermoporoelasticity.** (4 cr.; A-F or Audit; Periodic Fall)

**CEGE 8322. Storage and Flow of Granular Materials.** (3 cr.; A-F or Audit; Periodic Fall)
Plasticity of granular media. Static and dynamic method of slices. Storage and flow of granular materials in bins and hoppers. Stress concentrations, arching, piping. Experiments on granular material properties and flow. Prereq: CEGE grad student, 4301 or instr consent

**CEGE 8331. Modeling Geomechanical Processes.** (3 cr.; A-F or Audit; Periodic Fall)
Data-limited nature of problems in geomechanics. Dimensional analysis. Regimes of solution. Similarity of solutions. Elements of fracture mechanics, elastoplasticity, poroelasticity. Applications to stability of underground excavations, fluid flow in fracture, tool-rock interaction, hydraulic fracturing. prereq: CSE grad student, 5321 or GeoE 5321

CEGE 8333. FTE: Master’s. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

CEGE 8336. Boundary Element Methods I. (; 3 cr.; A-F or Audit; Fall Even Year) Introduction to boundary element methods for elastostatics; stress discontinuity, displacement discontinuity, and direct boundary integral methods. Derivation of basic mathematical solutions from the theory of elasticity. Applications in geomechanics. prereq: CSE grad student

CEGE 8337. Boundary Element Methods II. (; 3 cr.; A-F or Audit; Periodic Fall) Transient and nonlinear problems. prereq: 8336, GeoE 8336 or instr consent


CEGE 8352. Advanced Groundwater Mechanics II. (; 3 cr.; A-F or Audit; Periodic Fall) Applying complex methods, including conformal mapping, in groundwater mechanics; solving problems with free boundaries using the hodograph method; drains in aquifers with free boundaries; superposition of solutions with drains; singular Cauchy integrals; boundary elements. prereq: 4351, CSE grad student or instr consent

CEGE 8361. Engineering Model Fitting. (; 3 cr.; A-F or Audit; Fall Even Year) Parameter estimation and inverse modeling for civil and geological engineering. Formulating engineering model fitting problems; comparing and selecting various fit criteria; implementing numerical algorithms; analyzing and interpreting results using both statistical and qualitative tools; designing future measurement plans. prereq: CSE grad student or instr consent

CEGE 8400. Seminar: Structures. (; 1 cr.; [max 3 cr.]; S-N or Audit; Every Fall & Spring) Content depends on instructor and student. Sample topics: theory of elasticity, optimization, reliability, wave propagation, soil dynamics, experimental equipment, wind forces on structures, structural failures, modern construction practices.

CEGE 8401. Fundamentals of Finite Element Method. (; 3 cr.; A-F or Audit; Every Spring) Elements of calculus of variations; weak and strong formulations of linear continuum and structural problems. Isoparametric elements and numerical integration. Basic concepts of error analysis and convergence. Analysis of plates and shells. Introduction to mixed methods and time dependent problems. prereq: 4411 or instr consent

CEGE 8402. Nonlinear Finite Element Analysis. (; 3 cr.; A-F or Audit; Periodic Fall) Large strains and work conjugate stresses. Equilibrium and principle of virtual work for nonlinear problems. Nonlinear elasticity and plasticity. Finite element discretization and nonlinear algebraic equations. Linearization and solution algorithms for nonlinear problems. Structural stability. prereq: 8401 or instr consent; offered alt yrs

CEGE 8411. Plate Structures. (; 3 cr.; A-F or Audit; Periodic Fall) Analysis of plate structures based on the small-deflection elastic Kirchhoff-Love theory. Classical and numerical analysis methods. Skew and orthotropic plate structures. Elements of large deflection theory and stability of plates. prereq: 5411 or instr consent; offered alt yrs

CEGE 8412. Shell Structures. (; 3 cr.; A-F or Audit; Periodic Fall) Static analysis of thin elastic shells based on Love’s postulates. Membrane and bending theories. Thermal stresses in cylinders. Buckling of shells of revolution. Offered alternate years. prereq: CSE grad or instr consent

CEGE 8413. Fracture and Scaling. (3 cr.; A-F or Audit; Periodic Spring) Linear elastic fracture mechanics, cohesive fracture, scaling, strength statistics. prereq: 5411

CEGE 8421. Structural Dynamics. (; 3 cr.; A-F or Audit; Every Fall) Response of discrete/continuous systems to dynamic loading. Formulation/solution of problems of one or more degrees of freedom. Modal analysis. Numerical integration and transform techniques. Response of dynamic systems to base motion using response spectrum methods. prereq: [3401, AEM 2012] or instr consent; concurrent registration is required (or allowed) in 4411 recommended

CEGE 8422. Earthquake Engineering. (; 3 cr.; A-F or Audit; Periodic Spring) Introduction to earthquake engineering; response spectra; energy absorption capacity of structures; estimation of damping; earthquake resistant design; seismic design codes; base isolation; soil-structure interaction. Blast resistant design. Wind effects on structures. prereq: 8421 or instr consent

CEGE 8431. Structural Stability. (; 3 cr.; A-F or Audit; Periodic Fall & Spring) Classification of discrete/continuous conservative/nonconservative systems. Buckling analysis of, e.g., structural members, frameworks, and plates by classical/numerical methods. Offered alternate years. prereq: CSE grad student or instr consent

CEGE 8432. Analysis of Thin-Walled Members. (; 3 cr.; A-F or Audit; Periodic Fall) Analysis of thin-walled structural members based on Vlasov theory and its modifications. Members with open and closed cross sections. Second-order effects and buckling. Influence of inelastic material behavior on buckling. prereq: 5411 or instr consent; offered alt yrs

CEGE 8441. Ductile Behavior of Steel Structures. (; 3 cr.; A-F or Audit; Fall Even Year) Advanced topics in behavior of steel structures; Modeling techniques for material/geometric nonlinearity. Plastic analysis. Introduction to plasticity of continuum bodies. Computer methods. Seismic design, code provisions. prereq: 4411 or equiv

CEGE 8442. Analysis of Structural Systems. (; 3 cr.; A-F or Audit; Periodic Fall) Advanced theory and computational techniques for analyzing complex structural building systems. Using comprehensive geometric and material nonlinear analysis for designing steel and composite structures. prereq: 5411 or equivalent

CEGE 8443. Fracture of Materials and Structures. (; 3 cr.; A-F or Audit; Every Spring) Foundations of engineering fracture mechanics. Analytical, computational, and experimental tools to analyze/design solid structures and materials containing cracks. Predicting structural performance, designing experiments. Metals, concretes, rocks, ceramics, advanced composites, biological structures, micro-devices. prereq: 4401 or instr consent

CEGE 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CEGE 8451. Behavior of Reinforced Concrete Structures. (; 3 cr.; A-F or Audit; Every Fall & Spring) Advanced topics; experimental and theoretical background to design code provisions. Moment-curvature analysis of members. Shear;torsion; disturbed regions. Beam column joints; shear walls. Effects of earthquake loading. Limit analysis. prereq: 4412 or instr consent
CEGE 8461. Structural Reliability. (3 cr.; A-F or Audit; Periodic Fall)

CEGE 8480. Special Topics. (1-4 cr. [max 8 cr.]; A-F or Audit; Periodic Fall & Spring)
Topics vary depending on faculty and student interests. prereq: instr consent

CEGE 8500. Environmental Seminar. (1 cr.; S-N or Audit; Every Spring)
Broad coverage of topics in environmental engineering and science. Speakers consist primarily of graduate students in these areas, but presentations may also be given by University faculty and guest speakers. prereq: grad CE major or instr consent

CEGE 8501. Environmental Fluid Mechanics I. (4 cr.; A-F or Audit; Every Fall)
Basic laws of mass, energy, and momentum transport in environmental fluid flow. Exact and approximate solutions for viscous flow. Irrotational flow; gravity waves. Similitude and inspectional analysis. Laminar boundary layers and slender flows. Application to engineering and environmental problems. prereq: 3502 or equiv or instr consent

CEGE 8502. Environmental Fluid Mechanics II. (4 cr.; A-F or Audit; Every Fall & Spring)
Principles of intraphase and interfacial chemical processes in the environment, specifically the processes of diffusion, dispersion, and convection. Application to surface water and atmospheric mixing, dispersion in groundwater, and transport between these media. prereq: 3502, 3501 or equiv or instr consent

CEGE 8504. Theory of Unit Operations. (4 cr.; A-F or Audit; Periodic Fall & Spring)
Theoretical basis, design, operation of chemical/physical processes used in treating/controlling water quality. Adsorption, ion exchange, sedimentation, thickening, filtration, gas transfer, coagulation, flocculation, membrane processes, disinfection. prereq: 5541

CEGE 8505. Biological Processes. (3 cr.; A-F or Audit; Every Spring)
Theoretical principles underlying chemical and biological wastewater treatment processes, including aerobic and anaerobic treatment for organic carbon and nutrient removal. Mathematical models of microbial growth kinetics and mass transport in suspended growth and attached film applications are developed. prereq: 4502, 4501 or instr consent

CEGE 8506. Stochastic Hydrology. (4 cr.; A-F or Audit; Periodic Fall)
Analysis and synthesis of hydrologic series and systems; derived distributions; uncertainty and risk analysis; flood frequency analysis; multivariate time series analysis; correlation and spectral analysis; series of long-range dependence; linear estimation; geostatistics; sampling networks; hydrologic forecasting. prereq: Stat 3021 or equiv or instr consent

CEGE 8507. Advanced Methods in Hydrology. (4 cr.; A-F or Audit; Periodic Fall)
Notions of scale-invariance, scaling, and multiscaling in geophysical processes; methods of multiscale analysis; wavelet transforms; time-frequency-scale analysis and fractal analysis. Applications in atmospheric, hydrologic, and geomorphologic processes. prereq: 8506

CEGE 8508. Ecological Fluid Mechanics. (4 cr.; A-F or Audit; Every Fall)
Fluid mechanics of microbiological processes in lakes, rivers, and streams. Small-scale fluid motion, nutrient uptake, growth kinetics, ecosystem metabolism, scaling, lab/fiela microstructure measurements. prereq: 3502 or equiv

CEGE 8511. Mechanics of Sediment Transport. (3 cr.; A-F or Audit; Every Fall)
Particle motion in fluids. Criteria for incipient motion. Formulations for bedload and suspended load. Bedform mechanics and hydraulic resistance relations. Channel stability, aggradation and degradation, alluvial stream morphology. prereq: 3502 and 4501 or instr consent

CEGE 8521. The Atmospheric Boundary Layer. (4 cr.; A-F or Audit; Periodic Summer)
Land-atmosphere interactions and turbulent transport in the atmospheric boundary layer (ABL), the lowest part of the atmosphere. ABL, development and dynamics. Turbulence, surface energy balance, turbulent flux analysis, similarity theory. Flow over homogeneous and heterogeneous surfaces. Atmospheric stability, measurement, simulation of turbulent fluxes. prereq: CSE or COAFES grad student or instr consent

CEGE 8541. Aquatic Chemistry. (3 cr.; A-F or Audit; Periodic Spring)
Advanced course on water chemistry; physical chemical principles and geochemical processes controlling the chemical composition of natural waters, soil- and sediment-water interactions. Emphasizes behavior of inorganic contaminants in natural waters and engineered systems and dissolved natural organic matter. prereq: 4541 or instr consent

CEGE 8542. Chemistry of Organic Pollutants in Environmental Systems. (3 cr.; A-F or Audit; Periodic Fall)
Structural characteristics and physico-chemical properties of organic contaminants in aquatic systems. Emphasizes PCBs, PAHs, dioxins, insecticides, herbicides, and chlorinated solvents. Factors affecting their transport/ transformation. Structure- and property-activity relationships, their use in predicting organic chemical behavior. prereq: [4541, 5541] or instr consent

CEGE 8551. Environmental Microbiology: Molecular Theory and Methods. (4 cr.; A-F or Audit; Fall Even Year)
Introduction to microbial genetics and molecular phylogeny. Application of nucleic-acid techniques in environmental microbiology and microbial ecology.

CEGE 8552. Groundwater Microbiology: Laboratory. (4 cr.; A-F or Audit; Periodic Fall)
Subsurface microbial ecology, biogeochemical cycling, metabolic classification of subsurface bacteria, modeling bacterial transport, diagnosis of microbial induced fouling (MIF) events, bioremediation of contaminated aquifers. Lectures and four lab hours per week. prereq: grad CE major or instr consent, exposure to basic environ engr and microbiol

CEGE 8553. Biofilms. (3 cr.; A-F or Audit; Periodic Fall)
Science/engineering concepts to investigate formation/function of biofilms. Properties/composition of biofilms, transport/ transformation processes in biofilms, communication in biofilms, mathematical modeling. Applications in environmental engineering. prereq: 4551 or instr consent

CEGE 8556. Analysis and Modeling of Aquatic Environments I. (3 cr.; A-F or Audit; Every Spring)

CEGE 8562. Analysis and Modeling of Aquatic Environments II. (3 cr.; [max 6 cr.]; Student Option; Periodic Fall & Spring)
Models for transport/transformation of pollutants, nutrients, particulates, ecosystems, etc., from recently completed theses, articles, or research in progress. Students review assigned recent papers, make presentations, and analyze a topic of their choice. prereq: One sem grad work or instr consent

CEGE 8563. Industrial Waste Treatment. (3 cr.; A-F or Audit; Periodic Fall)
Introduction to industrial waste treatment. Individual industries, emphasizing constituents of the waste-stream and how best to recycle, recover, or reduce wastes. Cost concerns and regulations. Field trips to various industries to gain first-hand knowledge of processes involved in treatment. prereq: 3501, 4501, 4502, or equiv or instr consent

CEGE 8571. Hydraulic Measurements. (3 cr.; A-F or Audit; Periodic Fall)
Lab and field methods and instruments for measuring hydraulic pressure, velocity, and discharge. prereq: 3502 or instr consent

CEGE 8572. Computational Environmental Fluid Dynamics. (4 cr.; A-F or Audit; Periodic Spring)
Finite difference methods, their application to solution of one-/two-dimensional problems in environmental fluid dynamics. Stability, convergence, consistency, and accuracy of numerical schemes. Navier-Stokes equations, their physical meaning, and their numerical solution. Turbulence modeling: RANS and LES. prereq: grad student in CSE or COAFES or instr consent

CEGE 8681. Research and Professional Ethics in Water Resources and Environmental Science. (0.5 cr.; S-N or Audit; Every Spring) Ethics of water resources science and environmental engineering research/practice. Societal responsibility, plagiarism, recording-keeping, authorship, confidentiality, conflicts of interest, professional relationships, fraud, reporting misconduct. Meets during first eight weeks of spring semester. prereq: [Environmental engineering or water resource science] grad student or instr consent

CEGE 8601. Introduction to Stream Restoration. (3 cr.; A-F or Audit; Every Fall) Background material required to participate in a stream restoration project. How to assimilate geologic, hydrologic, and ecological data at watershed and reach scales to plan a restoration project and evaluate/critique existing stream restoration projects.

CEGE 8603. Stream Restoration Practice. (2 cr.; S-N only; Every Summer) Field experience, group design project. Students provide a stream restoration context for each other’s elective coursework, complete critical assessments of stream restoration projects, and design a stream restoration site. prereq: 8601 or Geo 8601

CEGE 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CEGE 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

CEGE 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Classical and Near Eastern Std

CNES 1002. World of Greece. (HIS; 3 cr.; Student Option; Every Fall & Spring) Ancient Greek civilization, from second millennium BCE to Roman period. Art/anthropology, philosophy, science, literature, social/political institutions. Focuses on connections with contemporary cultures corresponding to Ancient Near East.

CNES 1003. World of Rome. (HIS; 3 cr.; Student Option; Every Spring) Roman civilization, from Etruscan origins to late antiquity. Cultural diversity of Mediterranean civilization. Ways of life, social, and political institutions as evidenced by literature, art, architecture, history, and material culture.

CNES 1042. Greek and Roman Mythology. (AH; 4 cr.; Student Option; Every Fall, Spring & Summer) Introduction to stories/study of Greek/Roman mythology.

CNES 1042H. Honors Course: Greek and Roman Mythology. (AH; 4 cr.; A-F only; Every Fall & Spring) Introduction to stories/study of Greek/Roman mythology.

CNES 1082. Jesus in History. (HIS; 3 cr.; Student Option; Every Spring) Who was Jesus? While there has been some basic consistency in the depictions of Jesus throughout history, there has also been lots of variety. We will explore a whole host of portraits of Jesus at different points in history to demonstrate not only the varying ways that Jesus has been thought of but also to understand the relationship between these portraits and the historical and cultural contexts in which they were created. We will look at the gospels of the New Testament and some from outside the New Testament. We will look at ancient and medieval art. And we will look at modern film. Although we might not get to the bottom of who Jesus was, we might understand more fully how communities throughout history have thought about him. Intended as a course of interest to undergraduates in all colleges of the TC campus. Students of any, all, or no religious background are welcome.

CNES 1201. Bible: Context & Interpretation. (HIS; 3 cr.; Student Option; Every Fall) Introduces the student to the modern academic study of the Old Testament/Hebrew Bible in the historical context of literature from ancient Mesopotamia. Read Babylonian Epic of Creation, Epic of Gilgamesh, Hammurabi, Genesis, Exodus, Psalms. Stories of creation, law, epic conflict, and conquest. prereq: Knowledge of Hebrew required

CNES 1911. Silencing the Gods: The Divine and Human in the Hebrew Bible. (GP; 3 cr.; Student Option; Every Spring) This seminar attempts to “get behind” the overlay imposed by modern culture upon the Old Testament/Hebrew Bible and to read it on its own terms. In order to do so, we will explore the fascinating literature and religion of the ancient Near East by reading texts from ancient Mesopotamia, Canaan, and Israel, and discussing the ideas found in them and their literary artistry. After investigating the literature of Israel’s neighbors, we will read biblical literature in dialogue with these stories, intellectually analyzing the narratives of the creation of the world, the origin of life, the great flood story, the idea of divine revelation, and the significance of law. Specific topics to be dealt with include God, creation, fate, the point of human life, and the meaning of history.

CNES 1913. Homer’s Odyssey and Politics. (CIV; 3 cr.; Student Option; Periodic Fall) Homer’s Odyssey is the story of a man who returns from war to find a world much different from the one he left ten years earlier - and one that seems to have no place for him. On his way home, he lies to some, robs and murders others and, arguably through his own negligence, loses all his men. Once back on his native island of Ithaca, he re-establishes his authority as local strong-man through a mass killing of rivals. He is nonetheless emphatically a “hero” and the moral and political center of the story: what Odysseus does is (in the storyteller’s eyes, and those of most readers ever since) right and just. This seminar will use a close reading of the Odyssey, a study of Season One of House of Cards, and considerable discussion of contemporary political and social events to ask what sort of political and social world Homer’s poem imagines; how it formulates and discusses power and justice; and how it encourages its audience to accept judgments about human behavior and “what is right” that may, upon reflection, seem horrifying.

CNES 3061. “Bread and Circuses”: Spectacles and Mass Culture in Antiquity. (CIV,HIS; 3 cr.; Student Option; Fall Odd, Spring Even Year) Development of large-scale public entertainments in ancient Mediterranean world, from athletic contests of Olympia and dramatic festivals of Athens to chariot races and gladiatorial games of Roman Empire. Wider significance of these spectacles in their impact on political, social, and economic life of the societies that supported them.

CNES 3070. Topics in Ancient Religion. (3 cr. [max 18 cr.]; Student Option; Periodic Fall) Study of a specific aspect of religion in Classical and Near Eastern antiquity such as healing cults, magic and divination, Gnosticism, or prophecy and authority. Topics specified in the Class Schedule.

CNES 3071. Greek and Hellenistic Religions. (HIS; 3 cr.; Student Option; Fall Even Year) Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities, ritual performance, prayer/sacrifice, culinary practices, death and the afterlife, mystery cults, philosophical religion. Near Eastern salvation religions.

CNES 3076. Apostle Paul: Life, Letters, and Legacy. (3 cr.; Student Option; Fall Odd, Spring Even Year)
How what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.

CNES 3081W. Classical Epic in Translation. (LITR, WI; 3 cr.; Student Option; Fall Odd, Spring Even Year)

CNES 3082W. Greek Tragedy in Translation. (LITR, WI; 3 cr.; Student Option; Fall Even, Spring Odd Year)

CNES 3092. Jesus in History. (HIS; 3 cr.; Student Option; Every Spring)
Who was Jesus? While there has been some basic consistency in the depictions of Jesus throughout history, there has also been lots of variety. We will explore a whole host of portraits of Jesus at different points in history to demonstrate not only the varying ways that Jesus has been thought of but also to understand the relationship between these portraits and the historical and cultural contexts in which they were created. We will look at the gospels of the New Testament and some from outside the New Testament. We will look at ancient and medieval art. And we will look at modern film. Although we might not get to the bottom of who Jesus was, we might understand more fully how communities throughout history have thought about him. Intended as a course of interest to undergraduates in all colleges of the TC campus. Students of any, all, or no religious background are welcome.

CNES 3103. Ancient Greece: Alexander and the East. (HIS; 3 cr.; Student Option; Spring Even Year)
Achievements of Alexander the Great, their effect on Greek-speaking world. Greek colonization of Egypt. Hellenistic art, literature, philosophy.

CNES 3104. Ancient Rome: Kings and Consuls. (3 cr.; Student Option; Spring Even Year)
Roman Republic from origins to Caesar's death.

CNES 3105. Ancient Rome: The Age of Augustus. (3 cr.; Student Option; Periodic Fall)

CNES 3106. Ancient Rome: The Age of Nero. (3 cr.; Student Option; Periodic Fall)
The Roman Empire, "Silver Age" of Latin literature, rise of Christianity. Art/architecture.

CNES 3108. Age of St. Augustine of Hippo. (3 cr.; Student Option; Periodic Fall & Spring)
Cultural diversity A.D. 363 to circa 500 A.D. Replacement of Roman Empire in Western Europe by barbarian kingdoms, consolidation of Constantinople as capital in East. Literature, art, thought resulting from new dominance of Christianity, particularly Augustine of Hippo.

CNES 3121. Gender and Body in Early Christianity. (AH; 3 cr.; Student Option; Fall Odd Year)
Ancient Christians, like any other social group in the ancient world, represented themselves through images, stories, and discourses using the cultural tools available to them in their own contexts. We will explore the literature of early Christians with special attention to how representations of the body and gender served to communicate the nature of what it meant to be Christian for these authors. The study of ancient texts and social groups provides an opportunity to understand better some of the origins of modern Western culture, but it goes beyond issues of origins. The study of ancient material also offers a space to acquire the skills of critical analysis of body and gender dynamics closer to modern experience. The result of such a process is often quite eye-opening with respect to the roles that the body and gender play in shaping our sensibilities around self-identity, social interaction, and societal structures.

CNES 3152. Art and Archaeology of Ancient Greece. (HIS; 3 cr.; Student Option; Periodic Fall & Spring)
This course will provide an introduction to the history of Greek art, architecture and archaeology from the formation of the Greek city states in the ninth century BCE, through the expansion of Greek culture across the Mediterranean and Asia in the Hellenistic period, to the coming of Rome in the first century BCE. While this survey concentrates on the main developments of Greek art, an important sub-theme of this course is the changes Classical visual culture underwent as it served non-Greek peoples, including the role it played for Alexander and his successors in forging multicultural, globally minded empires in Western, Central and South Asia. No background in the time period or discipline is expected and therefore this class will also serve as an introduction to interdisciplinary study of art history and the classical world. A number of art historical methodologies will be introduced in order to not only give students a useful background in art history but to give them the tools to think as art historians and incorporate related visual and textual evidence meaningfully into their writing.

CNES 3162. Roman Art and Archaeology. (HIS; 3 cr.; Student Option; Fall Odd Year)
Introduction to art and material culture of Roman world: origin, change, continuity. Progress/decline in later empire, its legacy to modern world.

CNES 3182. Egypt and Western Asia: Art and Archaeology of Ancient Egypt and Western Asia. (AH; GP; 3 cr.; Student Option; Every Fall & Spring)
This course will provide students with foundational knowledge in the art, architecture, and archaeology of Egypt, East Africa, Asia Minor, Mesopotamia, Iran and Central Asia from the Neolithic through Late Antiquity (ca. 7,000 B.C.E. - 650 C.E.). Students will gain an understanding of the relationship between the visual material and the social, intellectual, political, and religious contexts in which it developed and functioned. In this regard, students will also gain an understanding of the evolution of, and exchanges and differences among, the visual cultures of these time periods and regions. It will also expose them to the preconditions for contemporary geopolitics in the region.

CNES 3201. The Bible: Context and Interpretation. (LITR; 3 cr.; Student Option; Every Fall)

CNES 3202. Bible: Prophecy in Ancient Israel. (3 cr.; Student Option; Every Spring)
Survey of Israelite prophets. Emphasizes Amos, Hosea, Isaiah, Jeremiah, Ezekiel, Second Isaiah. Prophetic contributions to Israelite religion. Personality of prophets. Politics, prophetic reaction. Textual analysis, biblical scholarship. Prophecy viewed cross-culturally. Prereq: [RelS 1001] or [CNES 1201 or JWST 1201 or RELS 1201 or CNES 3201 or JWST 3201 or RELS 3201]

CNES 3204. The Dead Sea Scrolls. (; 3 cr.; Student Option; Periodic Fall & Spring)
Introduction to Dead Sea Scrolls and Qumran. Contents of Dead Sea Scrolls, significance for understanding development of the Bible. Background of Judaism and Christianity. Archaeological site of Qumran.

CNES 3205. Women, Gender, and the Hebrew Bible. (AH; 3 cr.; Student Option; Spring Odd Year)
How men, woman, gender, sexuality is portrayed in Hebrew Bible. Social/religious roles/status of women in ancient Israel. Reading biblical texts from academic point of view.

CNES 3502. Ancient Israel: From Conquest to Exile. (3 cr.; Student Option; Periodic Fall)
Israelite history in context of what is known from Egyptian, Canaanite, Mesopotamian sources. Issues raised by archaeological data related to Israelite conquest of Canaan.

CNES 3504. Apocalypticism, Cosmic Warfare, and the Maccabees: Jewish Strategies of Resistance in Antiquity. (3 cr.; Student Option; Periodic Spring)
The rise of Hellenistic kingdoms in the ancient Mediterranean and Near East created a variety of responses from local, subjugated peoples, and some of the most documented cases are those of Jewish populations in Koele-Syria/Palestine. The main objective of this course is to analyze Jewish responses to imperial rule and military conflict during the Hellenistic and early Roman periods (c. 300 B.C.E. - 150 C.E.), but we will also spend time...
examining the broader picture of how local, ancestral groups fared under foreign rule. Along with discussing pertinent archaeological evidence, we will discuss Jewish literature and documents from this period, including, the sectarian documents of the Dead Sea Scrolls, the Book of Judith (a Jewish "novel"), the Books of Daniel and the Maccabees (all of which provide historical information about the Maccabean revolt and rise of the Hasmoneans), and the writings of Josephus (a Jewish writer who witnessed the Roman takeover of Palestine in the first century C.E.). This course will stay within the confines of the ancient evidence and not examine later interpretations when analyzing each historical period; it will begin with Ptolemaic control of the region and conclude with the Bar Kokhba revolt, its aftermath, and the resilience of Jewish populations in northern Palestine. Topics that will be examined in depth are messianism and apocalypticism, the Jerusalem Temple, Jewish ancestral traditions (which include biblical literature), and theoretical models used by scholars to analyze power relationships in antiquity.

CNES 3535. Death and the Afterlife in the Ancient World. (AH; 3 cr.; Student Option; Fall Odd Year)
Beliefs, attitudes, and behaviors related to death and the afterlife found in the cultures of the ancient Mediterranean and Near East. Literature, funerary art/epitaphs. Archaeological evidence for burial practices and care of dead.

CNES 3601. Sexuality and Gender in Ancient Greece and Rome. (AH; 3 cr.; Student Option; Spring Odd Year)
What we know (or think we know) about ancient Greek and Roman ideas about sexuality and gender roles. Evidence/methodologies by which it is analyzed.

CNES 3617. Pagans, Christians, Barbarians: The World of Late Antiquity. (3 cr.; A-F or Audit; Fall Odd Year)
Between classical and medieval, pagan and Christian, Roman and barbarian, the late antique world was a dynamic age. This course will focus on the Mediterranean region from the 2nd to the mid-7th century exploring such topics as the conversion of Constantantine, the fall of Rome, barbarian invasions, the spread of Christianity, and the rise of Islam.

CNES 3951W. Capstone. (WI; 4 cr.; Student Option; Every Fall & Spring)
Research project pertaining to ancient world, using documents or primary sources along with secondary sources. Students select project in consultation with faculty member. prereq: course is open to second semester juniors and seniors, major in CNES or RelSt, inst consent

CNES 3993. Directed Studies. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. prereq: instr consent

CNES 5013. Introduction to Roman Law. (3 cr.; Student Option; Periodic Fall & Spring)
Survey of Roman law from social and historical perspectives. Basic concepts of Roman private law and legal procedure. prereq: Grad student or instr consent

CNES 5070. Topics in Ancient Religion. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Specific aspect of religion in Classical and Near Eastern antiquity, such as healing cults, magic/divination, Gnosticism, or prophecy/authority. Topics specified in Class Schedule.

CNES 5071. Greek and Hellenistic Religions. (3 cr.; Student Option; Periodic Spring)

CNES 5072. The Birth of Christianity. (AH; 3 cr.; Student Option; Periodic Fall & Spring)

CNES 5080. New Testament Proseminar. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Study of some specific aspect of the New Testament and related literature. The class is organized as a discussion seminar. Topics specified in Class Schedule.

CNES 5185. Hellenistic and Iranian Asia: Art and Archaeology of Hellenistic, Scythian, Kushan, and Sogdian Asia. (3 cr.; Student Option; Every Fall & Spring)
Transformations of Greek architecture, sculpture, painting, mosaic, decorative arts beginning of eastern Mediterranean/ Hellenistic Asia. Art/archaeology of post-Hellenistic Iranian world. Religious, political, historical contexts of archaeological sites, monuments, art objects.

CNES 5192. Persia and the Ancient Iranian World: Art and Archaeology of Achaemenid to Sassanian Persia. (3 cr.; Student Option; Every Fall & Spring)
Art and archaeology of ancient Persia and the wider ancient Iranian world, from the rise of the Achaemenid empire in 650 BCE, to the advent of Islam in the seventh century CE.

CNES 5204. The Dead Sea Scrolls. (3 cr.; Student Option; Periodic Fall & Spring)
Introduction to Dead Sea Scrolls and Qumran. Contents of Dead Sea Scrolls, significance for development of Bible. Background of Judaism and Christianity. Archaeological site of Qumran. Open to graduate students across the region and conclude with the Bar Kokhba revolt, its aftermath, and the resilience of Jewish populations in northern Palestine. Topics that will be examined in depth are messianism and apocalypticism, the Jerusalem Temple, Jewish ancestral traditions (which include biblical literature), and theoretical models used by scholars to analyze power relationships in antiquity.

CNES 5513W. Scripture and Interpretation in Israelite Religion and Judaism. (WI; 3 cr.; A-F or Audit; Spring Odd Year)
Idea of divine revelation. Impact upon religion/literature. How history of Bible's creation, transmission, interpretation helps us think critically about role of revelation in history of religious traditions. prereq: At least one upper level course (3xxx or higher) in academic biblical or religious studies.

CNES 5713. Introduction to Ugaritic. (3 cr.; Student Option; Periodic Fall) Ugaritic alphabetic cuneiform script, morphology, and syntax. Reading of representative samples of Ugaritic literature. Attention to linguistic and cultural issues and links to biblical and other Ancient Near Eastern texts. prereq: Adv Hebrew, previous study of biblical texts or instr consent

CNES 5787. Visual Cultures in Contact: Cross-Cultural Interaction in the Ancient and Early Medieval Worlds. (3 cr.; Student Option; Fall Even Year)
Evaluate critical perspectives from variety of interdisciplinary conversations. Framework for studying cross-cultural interaction among ancient visual cultures that integrates practical, cognitive, object oriented approaches. Cross-continental movement/selection appropriation of objects/motifs.

CNES 5794. Introduction to Classical and Near Eastern Studies. (1 cr.; S-N or Audit; Every Fall)
Introduce to core research materials and reference materials in the various disciplines which make up classical studies. prereq: grad major or minor or instr consent

CNES 5796. Classical Texts: Approaches and Methods. (3 cr.; Student Option; Fall Odd Year)
Methods/approaches, from antiquity to present, for reading/interpreting Greek/Latin literary texts. prereq: CNES grad student or instr consent

CNES 5993. Directed Studies. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. Prereq-instr consent, dept consent, college consent.

CNES 5994. Directed Research. (1-12 cr.; Student Option; Every Fall & Spring)
Guided individual research. Prereq-instr consent, dept consent, college consent.

CNES 5996. Directed Instruction. (1-12 cr.; Student Option; Every Fall & Spring)
Guided individual research. Prereq-instr consent, dept consent, college consent.

CNES 8190. Seminar: Issues in Ancient Art and Archaeology. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Selected issues, with special attention to current scholarly disputes. Topics specified in [Class Schedule].

**CNES 8333. FTE: Master's.** (1 cr.; No Grade Associated; Every Fall & Spring) (No description) prereq: Master's student, adviser and DGS consent

**CNES 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall & Spring) (No description) prereq: Doctoral student, adviser and DGS consent

**CNES 8513. Scripture and Interpretation.** (3 cr.; A-F or Audit; Fall Even, Spring Odd Year) Ideas of divine revelation. Impact upon religion/literature. How history of Bible’s creation, transmission, interpretation helps us think critically about role of revelation in history of religious traditions. prereq: Grad student

**CNES 8530. Religions of the Ancient Mediterranean World.** (3 cr. [max 12 cr.]; A-F only; Periodic Fall & Spring) Intensive study of particular aspects of religious practice in the ancient Mediterranean world, often from a comparative perspective. Focus on scrutiny of primary sources and discussion of contemporary trends in scholarship. Topics specified in the Class Schedule.

**CNES 8550. Gender and Body in Ancient Religion.** (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) This topics course will offer a theoretically sophisticated and in-depth examination of conceptualizations of gender and the body in ancient culture, specifically instantiated in religious writings, activity, and thought. Students will gain a thorough working knowledge of current theoretical discussions of gender and the body, while at the same time exploring the role gender played in narratives, religious practice, and philosophical writings of the ancient world. Opportunities will be available to study various time frames (beginning of the first millennium BCE to 500 CE), specific local cultures (determined by geographical regions), and ethnic/religious groups (Israelites, Jews, Romans, Greeks, Christians, Egyptians, etc.). Students will be heavily involved in the weekly presentation of topics and discussion, and PhD students will be expected to produce research that will be headed toward use in their dissertations or a suitable for future publication. Topics specified in class schedule.

**CNES 8570. Readings in Religious Texts.** (3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Close reading of selected literary or epigraphical texts of importance for the history of ancient Mediterranean religions, along with critical discussion of trends in recent scholarship. The texts may be read in the original languages (such as Greek, Latin, Hebrew, etc.) but may also be accessed in translation where appropriate.

**CNES 8666. Doctoral Pre-Thesis Credits.** (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) To be determined prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**CNES 8777. Thesis Credits: Master's.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required (Plan A only)

**CNES 8794. Practicum for Future Faculty in Classics.** (1 cr.; S-N only; Every Spring) Workshop in professional development. Developing the dissertation. Preparing a portfolio to document/reflect on teaching the ancient world and its languages. Readings, workshops, peer teaching, reflective writing. prereq: Doctoral [major or minor] in Classical/Near Eastern studies

**CNES 8888. Thesis Credits: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

**CNES 8950. Topics in Classical & Near Eastern Studies.** (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topics such as slavery, women in antiquity, pagans and Jews, the taboo, and modern study of myth.

**Clinical Laboratory Sci Prog (CLSP)**

**CLSP 4092. Honors Program: Laboratory Methods.** (3 cr.; Student Option; Every Fall & Spring) Individual assignment to special projects or research in one of the clinical areas of chemistry, hematology, immunohematology, or microbiology. prereq: instr consent

**Clinical Laboratory Science (CLS)**

**CLS 5090. Special Laboratory Methods.** (1-2 cr.; A-F or Audit; Every Fall & Spring) Assignment on an individual basis to one of a variety of special areas of experience in the clinical lab. prereq: instr consent

**CLS 5100. Virology, Mycology, and Parasitology for Medical Technologists.** (2 cr.; A-F or Audit; Every Spring) Lab diagnosis of viral, fungal, and parasitic infections. Lecture. prereq: microbiology course with lab, biochemistry course

**CLS 5120. Seminar: Clinical Laboratory Science.** (1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring) Current literature. Presentation/discussion of research. prereq: instr consent

**CLS 5212. Journal Presentations.** (1 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring) Critical analysis, evaluation, discussion of current journal articles in student's specialty area. prereq: 1st yr CLS grad student

**CLS 5125. Practicum Teaching.** (1-2 cr.; A-F or Audit; Every Fall & Spring) Supervised teaching experience, develop skills using instructional materials, tests, and measurements. prereq: instr consent

**CLS 5129. Elements of Laboratory Administration.** (2 cr.; A-F or Audit; Every Fall & Spring) Leadership styles, employee selection and evaluation, communications, motivation, morale, discipline, job descriptions, record keeping, budgets, cost accounting, purchasing, product evaluation, lab safety, labor relations, government regulations. prereq: instr consent

**CLS 5130. Practicum in Laboratory Administration.** (2 cr.; A-F or Audit; Every Fall & Spring) Supervised experience and assignment of specific problems related to lab service and management in health care institutions. prereq: instr consent

**CLS 5140. Techniques for Teaching.** (2 cr.; A-F or Audit; Every Fall & Spring) Developing objectives, classroom activities, and evaluation criteria for medical technology education. prereq: instr consent

**CLS 5156. Advanced Clinical Immunohematology.** (3 cr.; A-F or Audit; Every Fall & Spring) Observation, study, and practice in special problems, advanced techniques, and methodology. prereq: instr consent

**CLS 5402. Molecular Diagnostics.** (1 cr.; A-F only; Every Fall) Basic theory/application of molecular diagnostics in clinical lab. Lecture, lab. prereq: instr consent

**CLS 5768. Advanced Hematology.** (5-10 cr. [max 30 cr.]; A-F or Audit; Every Fall, Spring & Summer) Practical experience collecting bone marrow from patients. Diagnosing hematological diseases by evaluating, classroom activities, and evaluation criteria from clinical specimens of bone marrow, peripheral blood, and, if applicable, lymph nodes. prereq: instr consent

**CLS 5864. Research Seminar.** (1 cr. [max 10 cr.]; S-N or Audit; Every Fall & Spring) Departmental research seminar series. prereq: instr consent

**CLS 5865. Departmental Seminar.** (1 cr. [max 10 cr.]; S-N or Audit; Every Fall & Spring) Departmental clinical lab research seminar series. prereq: instr consent

**CLS 8193. Advanced Topics in Clinical Chemistry.** (2 cr.; Student Option; Every Fall, Spring & Summer) Includes use of molecular approaches to diagnosis and risk assessment of selected diseases. prereq: instr consent

**CLS 8194. Research on Clinical Laboratory Problems.** (1-3 cr.; Student Option; Every Fall, Spring & Summer) Individual research project in a selected area. prereq: instr consent
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lab reviews theory and suture practice, this is followed by a spa & neuter clinic organized in the field or at BWRC. Students also have the opportunity to observe, and when possible, assist the BWRC veterinary staff during their daily operations.


CFAN 3513. The Natural History of Norway. (ENV,GP; 3 cr.; A-F only; Spring & Summer Odd Year) The program will be based in the Nord Trøndelag region of central Norway where students will learn about Norway’s physical geography, ecology, and management of natural resources, including its flora, fauna, and agricultural systems. Students will also gain an understanding of the region’s rich culture, history, and close ties to Minnesota. prereq: instructor consent

CFAN 3514. Machu Picchu: Biodiversity & Climate Change in Peru. (ENV,GP; 3 cr.; A-F only; Every Summer) Southeastern Peruvian Andes. Inca civilizations. Biodiversity assessment in headwaters of Amazon. What it means to be World Heritage Site.

CFAN 3516. Sustainable Food Systems of Italy. (ENV,GP; 3 cr.; A-F only; Every Spring & Summer) This course examines the concepts of sustainability in relation to food production and culture in a country and place where food is a fundamental component of the regional and national culture. The course incorporates intercultural development concepts to introduce students to past and present Italian culture through the cultural importance of food systems, the ethics of food consumption and production and the concepts of sustainability.

CFAN 3517. Shires, Shorthorns and Sheep: Exploring Livestock Systems in England. (GP; 3 cr.; A-F only; Spring & Summer Even Year) This embedded study abroad course will directly examine the similarities and differences of livestock production practices, regulatory policies, consumer (and export) demands and the ethics of animal agriculture in England and Minnesota while allowing students to explore the rich history and culture of England.

CFAN 3518. Environmental Issues in New Zealand. (GP; 3 cr.; A-F only; Every Spring) This Global Seminar, Environmental Issues in New Zealand, is open to any undergraduate or graduate students regardless of major. Priority for enrollment is given to University of Minnesota students, but students from other institutions may attend if space is available. There are no course prerequisites and all instruction is in English. New Zealand is a modern country with friendly people and awesome scenery. Our daily news is filled with reports on climate change, water scarcity and pollution, soaring energy costs, and food shortages. Solutions must consider environmental, economic, and social implications of our management strategies. Frequently there are trade-offs between benefits and costs. University students as future leaders of business, government, and social programs should understand how to analyze environmental issues. What are the issues? Who is affected? What alternatives exist to solve them? What are the environmental, economic, and social trade-offs between these alternatives? What are reliable sources of information? How can each of us contribute to solutions? New Zealand has undergone significant changes in its plant and animal composition following the invasion of humans and the exotic species they introduced. Alarmed by these changes, New Zealanders recently have made significant strides in recognizing environmental issues and seeking sustainable solutions. They offer valuable lessons for U.S. students to bring home and apply to our own environmental issues.

CFAN 3519. Bali: Water and Culture from Rainforests to Reefs. (ENV,GP; 3 cr.; Student Option No Audit; Every Spring) Travel to Bali, Indonesia as part of a Global Seminar to explore how culture and beliefs influence our relationship with water and the environment. Through field and cultural excursions and site visits, lectures, and personal observation and study, students will cultivate an awareness of their relationship to the natural world as influenced by their own culture and belief system.

CFAN 3520. Germany: Leading the Renewables Revolution. (GP,ENV; 3 cr.; A-F or Audit; Every Fall) A bilateral agreement between Minnesota and Germany to pursue best practices in clean energy offers a unique opportunity for students to participate in an international delegation. Students meet government, business, academia and civil society leaders and see Germany’s integrated approach to energy transition up close. prereq: instructor consent

CFAN 3900. Topics in International Agriculture. (; 1-4 cr. [max 40 cr.]; A-F or Audit; Every Fall & Spring) International, on-site, classroom, and field-study of agricultural systems. Sites vary. Can include language study. prereq: instr consent

CFAN 4293. Directed Study. (; 1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) Study and or project on topic of personal interest in consultation with faculty member. Initial proposal, reports of accomplishments. prereq: instr consent

CFAN 4801H. Honors Thesis. (; 3 cr.; A-F only; Every Fall & Spring) Students work closely with a faculty member to develop and complete the honors thesis. Available to all CFANS majors. prereq: Candidate for graduation with honors through CFANS in any major, college consent.

CFAN 5480. Topics in CFANS. (; 1-4 cr. [max 8 cr.]; Student Option; Periodic Fall, Spring & Summer) Lectures by visiting scholar(s) or regular faculty member. Topics specified in Class Schedule. prereq: Grad student

CFAN 5500. International Field Studies Seminar. (; 1-3 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) Interface of agriculture with natural resource, environmental, economic, food safety, public policy, ethical issues transcending national borders. Seminars take place in various countries/regions. Active learning, lectures, discussion tutorials, field trips, reports, exams. prereq: instr consent

CFAN 5501. Costa Rica--Sustainable Development. (; 3 cr.; A-F only; Every Spring) Costa Rica’s development strategy. Agriculture, tourism, energy, urbanization. Synergies/tension between economic, social, environmental impacts. How organizations maximize benefits associated with sustainable development. prereq: grad student, instr consent

CFAN 5518. Environmental Issues in New Zealand. (GP; 3 cr.; A-F only; Every Spring) This Global Seminar, Environmental Issues in New Zealand, is open to any undergraduate or graduate students regardless of major. Priority for enrollment is given to University of Minnesota students, but students from other institutions may attend if space is available. There are no course prerequisites and all instruction is in English. New Zealand is a modern country with friendly people and awesome scenery. Our daily news is filled with reports on climate change, water scarcity and pollution, soaring energy costs, and food shortages. Solutions must consider environmental, economic, and social implications of our management strategies. Frequently there are trade-offs between benefits and costs. University students as future leaders of business, government, and social programs should understand how to analyze environmental issues. What are the issues? Who is affected? What alternatives exist to solve them? What are the environmental, economic, and social trade-offs between these alternatives? What are reliable sources of information? How can each of us contribute to solutions? New Zealand has undergone significant changes in its plant and animal composition following the invasion of humans and the exotic species they introduced. Alarmed by these changes, New Zealanders...
recently have made significant strides in recognizing environmental issues and seeking sustainable solutions. They offer valuable lessons for U.S. students to bring home and apply to our own environmental issues.

**CFAN 8101. Professional Skills for Scientists.** (2 cr.; S-N only; Spring Odd Year) Presentations, discussions, and exercises in leading people and in managing money, time, operations, and projects within the context of research and development in the food, agricultural, and natural resource sciences.

**Coll of Science, Engineering (CSE)**

**CSE 1001. First Year Experience.** (; 1 cr.; A-F only; Every Fall) Resources and strategies for college success. Majors and career opportunities offered in the physical sciences, mathematics, and engineering. Personal responsibility, academic integrity, and level of academic rigor required for success. Personal action plan for achievement in CSE. Prereq: CSE, fr

**CSE 1002. CSE First Year Global Seminar - Taking CSE 1001 Internationally.** (; 1-2 cr.; A-F only; Every Spring) Learn abroad during 8-10 days of travel in winter break or during spring break of your first year. Get to know a faculty member and other students, earn one credit, and learn about a technical topic. Preparation begins fall semester. Registration and billing during spring semester. Led by faculty expert and a CSE professional. There are no language prerequisites.

**CSE 1012. Project-based Inquiry.** (; 2 cr.; A-F only; Every Spring) Faculty-mentored project. Individual or team study that aligns with instructor's interests. Negotiation of deliverables and conduct of open-ended investigation into topic of interest to develop model, conduct experiment, or fabricate design. Presentation of results/findings.

**CSE 1311. Engineering Basics.** (; 2 cr.; A-F only; Every Fall & Spring) Philosophy, tools, practice. Role of engineering in society. Engineering's relationship to science. Modeling, numerical analysis, software tools, hands-on design-and-build project. Students work in teams.

**CSE 1511. PLTW: Introduction to Engineering Design.** (3 cr.; S-N only; Every Fall, Spring & Summer) Students are introduced to the engineering design process, applying math, science, and engineering standards to identify and design solutions to a variety of real problems. They work both individually and in collaborative teams to develop and document design solutions using engineering notebooks and 3D modeling software.

**CSE 1512. PLTW: Principles of Engineering.** (3 cr.; S-N only; Every Fall, Spring & Summer) Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of materials and structures, automation, and motion. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation.

**CSE 1513. PLTW: Digital Electronics.** (3 cr.; S-N only; Every Fall, Spring & Summer) Open doors to understanding electronics and foundations in circuit design. Digital electronics is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras, high definition televisions, etc. Students learn the digital circuit design process to create circuits and present solutions that can improve people’s lives.

**CSE 1514. PLTW: Computer Integrated Manufacturing.** (3 cr.; S-N only; Every Fall, Spring & Summer) Manufacturing transforms ideas into products. This course provides an opportunity for students to develop a better understanding of this innovative and exciting industry. Students learn about manufacturing processes, product design, robotics, and automation. Students develop their knowledge and skills of Computer Aided Design and Manufacturing to produce products using a Computer Numerical Controlled (CNC) mill. Students apply the knowledge and skills gained in this course as they collaborate to design, build, and program factory system models.

**CSE 1515. PLTW: Overview of Civil Engineering and Architecture.** (3 cr.; S-N only; Every Fall, Spring & Summer) Students learn the fundamentals of building design, site design, and development. They apply math, science, and standard engineering practices to design both residential and commercial projects and document their work using 3D architectural design software.

**CSE 1516. PLTW: Computer Science Principles.** (3 cr.; S-N only; Every Fall, Spring & Summer) Students create apps for mobile devices, automate tasks in a variety of languages, find patterns in data, and interpret simulations. Students collaborate to create and present solutions that can improve people’s lives.

**CSE 2501. Ireland: Career Readiness for the STEM Industry.** (3 cr.; Student Option; Periodic Spring) In this global seminar, you will learn about Ireland, the STEM industry, what it takes to get and maintain a fulfilling career and more about you. You will discover the rich intellectual, cultural, and economic history of Ireland and how it shapes the business and organizational cultural of today. You will continue to develop your core career competencies through career and work related activities, such as business and organizational site visits, informational interviews, resume critiques, and interview practice. You will discover more about yourself and your own path toward career readiness.

**CSE 4096. Field Study; Internship, Industrial Assignment.** (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Provide students participating in academic-related experience, limiting ability to enroll for full-time status during semester, ability to maintain active student status with University.

**CSE 5101. Introduction to Engineering Design for Teachers.** (3 cr.; Student Option No Audit; Every Summer) History, career opportunities, portfolios, visualization, geometry, modeling, construction, analysis, documentation. Part of Project Lead the Way curriculum. Prereq-college consent.

**CSE 5102. Principles of Engineering for Teachers.** (3 cr.; Student Option No Audit; Every Summer) Communication/documentation, design process, engineering systems, strength of materials, testing, reliability, statics/dynamics. Part of Project Lead the Way curriculum. Prereq-college consent.

**CSE 5104. Civil Engineering and Architecture.** (3 cr.; Student Option No Audit; Every Summer) Overview of civil engineering and architecture, their interrelationship/dependence on each other. Students use software to solve real world problems. Project/site planning. Project documentation/presentation. Part of Project Lead the Way. Prereq-college consent.

**CSE 5105. Gateway to Technology.** (3 cr.; Student Option No Audit; Every Summer) Activity-oriented middle school curriculum to help students in grades six-eight explore math, science, and technology. Five independent, nine-week units: design/modeling, automation/robotics, magic of electronics, science of technology, and flight/space. Prereq-college consent.

**College of Liberal Arts (CLA)**

**CLA 1001. CLA First-Year Experience I.** (; 1 cr.; S-N only; Every Fall) In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals. Prereq: CLA

**CLA 1002. CLA First-Year Experience II.** (; 1 cr.; S-N only; Every Spring) In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals. Prereq: CLA

**CLA 1005. Introduction to Liberal Arts Learning.** (2 cr.; A-F only; Every Fall) This course is about you: your identity, your dreams, your goals, your values, your strengths, and your first year university experience. This course is also about “you” in the plural sense. More specifically, through a shared experience that includes dialogue, readings, videos, and a group project. We will explore how diverse US college students understand their college education, what they want from it, and how they negotiate and give meaning to their university experience. This course is designed to help you navigate the challenges of college, the workplace, and society and propel you towards personal excellence, fulfillment, and wellness. As active partners in the quest for educational

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and personal success, our teaching team will work with you to develop the knowledge and understanding of self, society, and the university required to successfully navigate college life in an increasingly diverse and interconnected world. Prereq: CLA Presidents Emerging Scholars, freshman

CLA 1007. CLA First-Year Experience: Independent Study. (1 cr. [max 2 cr.]; S-N only; Even Fall, Spring & Summer) Independent study version of CLA 100I/100Z. By permission number only.

CLA 1011. CLA First-Year Experience Abroad. (2 cr.; A-F only; Every Spring) Optional concurrent course to CLA 1002. Ten-day abroad experience during spring break. Locations vary by year. Prereq: CLA and FRFY

CLA 1051. CLA Freshman Research. (0 cr.; No Grade Associated; Every Spring) Freshman research or creative opportunity with faculty. Prereq: Available only to CLA freshmen receiving a CLA Research Opportunity.

CLA 1052. CLA Freshman Research. (1-2 cr.; Student Option; Every Spring) Freshman research or creative opportunity with faculty. Prereq: Only available to CLA freshmen receiving a CLA Research Opportunity.

CLA 1200. Topics. (1-5 cr. [max 20 cr.]; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

CLA 1201. BA MD Medical Education Seminar I. (1 cr.; Student Option No Audit; Every Fall) This is the first course in a series of 4 required courses for students enrolled in the BA/MD Joint Admissions Scholars Program. Students in the course will have the opportunity to be mentored and coached by Medical School faculty as they prepare for medical education.

CLA 1202. BA MD Medical Education Seminar II. (1 cr.; Student Option No Audit; Every Spring) This is the second course in a series of 4 required courses for students enrolled in the BA/MD Joint Admissions Scholars Program. Students in the course will have the opportunity to be mentored and coached by Medical School faculty as they prepare for medical education.

CLA 1911W. Issues in 21st Century America: Diverse Christian Perspectives. (WI; 3 cr.; Student Option No Audit; Periodic Fall & Spring) The media often paints Christianity as a monolithic belief system, which is outdated, opposed to science, and intolerant of opposing views. Such a characterization paints Christians in unfairly broad strokes, ignoring their diversity of views. If the media portrayal is inaccurate, how does Christianity really interact with the issues we face in American society today? This is the theme we will explore in this course. We will focus our study on Christian beliefs as grounded in the Bible. We will see that Christians understand their holy book in different ways and come to very different conclusions about its application to societal issues. We will explore different Christian perspectives, noting how conservative and liberal Christians both ground their beliefs in biblical texts, yet hold opposing views. Gender, gay rights, abortion, and immigration are just a few of the topics we will explore as we investigate the interaction of Biblical Christianity with 21st century American issues.

CLA 2005. Introduction to Liberal Education and Responsible Citizenship. (2 cr. A-F only; Every Spring) This course will focus on the themes of identity, community and civic engagement. We will focus on developing dimensions of personal and social responsibility to include contributing to a larger community and taking seriously the perspectives of others. This course will take on big questions such as: What does it mean to contribute to a larger community? What does a college education prepare you for? How can critical thinking skills be applied to real life case studies? How do you navigate your identity in the workplace, academic, and service-learning settings? What is responsible citizenships and engage in diverse and competing perspectives? In this course, we will turn to real-world stories and voices to explore our potential for greater understanding, compassion, empathy, resilience, democratic imagination, and critical citizenships. Prereq: [CLA 1005]; CLA Students Emerging Scholars, freshman

CLA 2200. Topics. (1-5 cr.; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

CLA 2501. Ireland: Career Readiness for the STEM Industry. (3 cr.; Student Option; Periodic Spring) In this global seminar, you will learn about Ireland, the STEM industry, what it takes to get and maintain a fulfilling career and more about you. You will discover the rich intellectual, cultural, and economic history of Ireland and how it shapes the business and organizational cultural of today. You will continue to develop your core career competencies through career and work related activities, such as business and organizational site visits, informational interviews, resume critiques, and interview preparation. You will discover more about yourself and your own path toward career readiness.

CLA 3001. CLA Transfer Semester Experience. (1 cr.; S-N only; Every Fall & Spring) This course will support first-semester College of Liberal Arts transfer students in making a smooth transition and connect them with campus resources. Although online, some in-person assignments are required (available at various times) to help students benefit from resources, meet people, and develop a sense of belonging on campus. Time will also be dedicated to major exploration and career/post-graduation planning, so that students are well-prepared to meet their individual goals. Some weekly lessons will carefully relate to CLA’s Career Readiness themes, and involve taking a personal assessment and finalizing a new resume. Prereq: Must be a new CLA transfer student in their first semester on the UMTC campus.

CLA 3500. Topics. (1-4 cr. [max 8 cr.]; Student Option; Every Fall & Spring) Topics specified in Class Schedule.

CLA 3501. Spanish History on the Camino de Santiago: A Hiking Adventure. (GP; 3 cr.; A-F only; Periodic Summer) This seminar will combine the history of Spain, the history of the Camino de Santiago, art history, and architectural history with the practice of travel for transformation. While we will travel together, each of us will have the opportunity to experience something that holds unique and individual meaning. It may be a spiritual awakening, an educational epiphany, or a transformative personal moment. There will be ample time for personal reflection and contemplation as well as group experiences. You will be encouraged to use your time on the camino to discover something that holds special meaning for you whether it is spiritual, a rite of passage, personal transformation or just openness to new experiences. We will all engage in reverent travel which is a practice that spans traditions and religions.

CLA 8000. Topics in Graduate Studies. (1-3 cr. [max 8 cr.]; Student Option; Periodic Fall, Spring & Summer) This is a topics course related to graduate students in CLA.

Common Engage Scholars Program (CESP)

CESP 3901. Community Engagement Scholars Program Integrative Capstone Seminar. (1 cr.; A-F only; Every Fall & Spring) This one-credit seminar is designed to complement the Integrative Community Engagement Project (ICEP) as a capstone experience for you as a Community Engage Scholars. The seminar will provide tools, guidance, support, and structure to help you successfully complete your ICEP. It will also provide opportunities for you to reflect on how your previous academic and community work have informed your ICEP, and how your experiences will inform and help prepare you for the next, post-graduation phase of your life. The first half of the semester will be focused primarily on project support, and the final half of the semester will be focused on reflection. Throughout the semester we are going to be preparing you to do a digital story as your Integration and Contextualization capstone reflection on your participation in the Community Engagement Scholars Program. During our seminar meetings, we will use a variety of teaching and learning strategies to achieve the course objectives, including: workshop space to discuss projects with your small group of peers, interactive reflection activities, and short readings. A number of our class periods will be spent using a learning method called learning circles. Learning circles are a form of democratic education in which participants share stories about their experiences around a common theme to identify connections and insights about our work. As part of our digital storytelling process we will be doing several activities throughout
COMM 1101. Introduction to Public Speaking. (CIV; 3 cr.; Student Option; Every Fall, Spring & Summer) Public communication processes, elements, and ethics. Criticism of and response to public discourse. Practice in individual speaking designed to encourage civic participation.

COMM 1101H. Honors: Introduction to Public Speaking. (CIV; 3 cr.; A-F only; Every Fall & Spring) Public communication processes, elements, and ethics. Criticism of and response to public discourse. Practice in individual speaking designed to encourage civic participation. prereq: Honors

COMM 1313W. Analysis of Argument. (WI; 3 cr.; Student Option; Every Fall & Spring) Strategies for analyzing, evaluating, generating arguments. Problems in listening/responding to argument.

COMM 1913. Religious Arguments. (3 cr.; Student Option; Periodic Spring) Religious arguments feature in a wide spectrum of global conflicts. In this seminar we will focus on the role that sacred texts play in justifying positions that religious groups take on such issues as the role of women, violence, the presence of evil, sexuality, attitude toward other religions, and the ultimate future of the earth. To examine these questions we must gain familiarity with standard analytical techniques and the assumptions, often unexamined, that both scholars and ordinary people use to amass sacred texts as evidence for their views. While centering on the role of the Bible in the major branches of Christianity, we will also discuss issues in Islam, the Sikhs, and the polytheistic religion of ancient Greece.

COMM 1914. Food, Media, and Culture. (3 cr.; Student Option; Every Fall) Food is intimately linked to media: meanings attached to what we eat are produced, distributed, and consumed via cookbooks, reality TV, restaurant reviews, social media, film, and advertisements. This seminar attempts to make visible what stories our culture tells itself about food. Therefore, as critical media theorists have argued, food media (and the rituals surrounding it) raise important questions in relation to power, identity, and ethics. Accordingly, food media are situated at the intersecting categories of race, class, gender, nationality, sexuality, and the environment. This course provides an introduction to the food and media nexus by drawing particular attention to the ways in which the political economy of the media, content analysis, ethnography, and audiences can lend unique insight into what we eat. Students will critically analyze food media across a wide-range of platforms and embark on field trips to restaurants and food-related sites in the Minneapolis-St. Paul area.

COMM 3110. Topics in Communication Studies. (3 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) Cases illustrating communication studies, theory, underlying issues.

COMM 3110H. Honors Topics in Communication Studies. (3 cr. [max 15 cr.]; A-F only; Every Fall, Spring & Summer) Cases illustrating communication studies, theory, underlying issues; prereq: Honors

COMM 3190H. Honors Course: Research Seminar in Communication. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Students conduct original research in rhetoric, communication theory, or media for honors thesis. Theory, methods, research writing. prereq: Honors candidate in comm, instr consent, dept consent

COMM 3201. Introduction to Electronic Media Production. (4 cr.; A-F or Audit; Every Fall, Spring & Summer) Students work as a team to plan, script, and shoot video productions in a hands-on multi-camera television studio. By creating their own productions and reviewing the productions of others, students learn how media aesthetics shape the presentation of themes and messages.

COMM 3202. Audio Production and Media Literacy. (3 cr.; Student Option; Every Fall) Experience with sound design/production. Models of media, audience, shared construction of reality. Sound/voice as medium of communication. What about sound is persuasive. How media producers use sound to make things seem realistic. Role sound plays in audience's construction of world. How people use sound in unexpected ways. How mode of delivery affects how content is produced/interpreted. Recording, Foley work, looping/ADR, production of radio play, prereq: 3201, able to meet outside of designated course window

COMM 3203. Introduction to Electronic Media Production. (4 cr.; A-F or Audit; Every Fall & Spring) Video as communicative medium integrating visual/aural aesthetics. Creation of broadcast-quality production integrating message creation, audience analysis, argument development, and visual/audio scripting. Utilization of media aesthetics to develop/shape production content. prereq: 3201 or instr consent

COMM 3211. Introduction to Media Studies. (3 cr.; Student Option; Every Fall, Spring & Summer) Historical development and current issues in electronic media technologies and programming. Effects of governmental, industrial, and public organizations on message content. Problem areas of electronic media.

COMM 3231. Reality TV: History, Culture, and Economics. (3 cr.; Student Option; Every Spring) Social, visual, cultural, economic, historical, and ethical dimensions of reality television.


COMM 3341. Asian American Images. (AH,DSJ; 3 cr.; Student Option; Periodic Fall & Spring) From 19th-century anti-Chinese political cartoons to Harold and Kumar, visual representations of Asians in the United States have long influenced how Asian Americans are seen and treated. What are some of the ways that photography, graphic arts, and digital culture have pictured Asian Americans as aliens, citizens, immigrants, workers, family and community members, entertainers, and artists? Course topics will relate visual images to particular historical moments, including the early exclusion period and the “yellow peril” stereotype; WWII Japanese American incarceration and the drawings of Min’ Okubo, and photo-journalism documenting U.S. military involvement in Southeast Asia and its aftermath. How do photographic and other images work to counter historical amnesia, heal traumatic loss, and document social injustice? Other weeks of the class will explore the ways that individuals, families, and communities use photographs, video, and other visual media to preserve a sense of connection and belonging. We will also look at how contemporary Asian American photographers such as Tseng Kwong Chi, Nikki Lee, and Wing Young Huie experiment with visual images to raise questions of racial and national identity, social inequality, gender, sexuality, and political agency. The course also includes a digital storytelling project that encourages students to create video images and sound reflecting Asian American immigration stories from local communities.

COMM 3351. Asian Americans and Popular Culture. (AH,DSJ; 3 cr.; Student Option; Periodic Fall & Spring) Over the past few decades, Asian Americans have become increasingly visible both as the subjects and producers of popular culture in the United States. This course will explore how this new recognition of Asian Americans in popular literature, cinema, television, and entertainment is related both to longer histories of Asian immigration and racial exclusion and to post-1960s efforts to forward racial awareness, community activism, and social justice. Our first unit will look at how particular stereotypes such as the yellow peril or the wartime enemy encouraged anti-Asian feeling and violence and legal restrictions on immigration and naturalization. We will
then examine how throughout history, Asian immigrants and their descendants used song, dance, theater, writing, and other forms of popular culture to express personal desires and foster collective ties. Our final unit concentrates on contemporary popular culture and its relationship to the changing identities of Asian Americans. How do Asian Americans influence the current essays, films, and videos that are consumed by millions today? How are increasingly pan-ethnic, interracial, multiracial, transnational, and global experiences reflected in popular culture?

COMM 3401. Introduction to Communication Theory. (3 cr.; Student Option; Every Fall, Spring & Summer) Social scientific theory in human communication. Logic of scientific communication theories in interpersonal, small group, organizational, intercultural, and mediated communication.

COMM 3402. Introduction to Interpersonal Communication. (3 cr.; Student Option; Every Fall, Spring & Summer) Nature and function of communication between individuals in formal and informal relationships. Communicative interactions from theoretical and practical viewpoints.

COMM 3409. Nonverbal Communication. (SOCS; 3 cr.; Student Option; Every Fall, Spring & Summer) Nonverbal communication in interpersonal communication process. Nonverbal codes (touch, space, smell, eye contact) and their communicative functions (impression management, flirting, persuading, lying) in relational contexts (intimate relationships, friendships, work relationship). Theories, practices.

COMM 3411. Introduction to Small Group Communication. (3 cr.; Student Option; Every Fall, Spring & Summer) Cooperative thinking in task-oriented groups. Planning, preparing for, and participating in small groups in private and public contexts.

COMM 3422. Interviewing and Communication. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Application of communication concepts in information interview. Planning, conducting, and evaluating informational, journalistic/elite, helping, persuasive, appraisal, and employment interviews. Class training, field experience.

COMM 3431. Persuasion Theories. (3 cr.; Student Option; Every Fall, Spring & Summer) Sociological, psychological, and communication perspectives. Theoretical knowledge applied to persuasion problems. Prereq: Soph recommended

COMM 3441. Introduction to Organizational Communication. (3 cr.; Student Option; Every Fall, Spring & Summer) Functions of communication in work groups, in organizational hierarchies, and between organizations.

COMM 3451W. Intercultural Communication: Theory and Practice. (WI; 3 cr.; Student Option; Every Fall, Spring & Summer) Theories of and factors influencing intercultural communication. Development of effective intercultural communication skills. Prereq: Planning an intercultural experience.

COMM 3452W. Communication and the Intercultural Reentry. (WI; 3 cr.; Student Option; Every Fall & Spring) Intercultural experience explored through stories and story telling, participant observation, and social scientific theory. Constructs include identity, learning styles, cultural adaptation, values, ethics. Prereq: Return from an intercultural experience.

COMM 3601. Introduction to Rhetorical Theory. (3 cr.; Student Option; Every Fall, Spring & Summer) Theoretical systems to explain/direct creation of public discourse. Traditional rhetoric to contemporary perspectives. Using theory to explain practice of public discourse.

COMM 3605W. Persuasive Speaking and Speech Writing. (WI; 3 cr.; Student Option; Every Fall, Spring & Summer) Performance/composition with critical inquiry into rhetoric theories. Writing, thinking, and speaking skills. Prereq: 1101, soph

COMM 3614. Advanced Public Policy and Debate. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Instruction in advanced theories and practices of both public and NDT/CEDA policy debate.

COMM 3615. Argumentation. (3 cr.; Student Option; Every Fall, Spring & Summer) Argument(s) in relation to logic, dialectics, and rhetorical performance. Structured reasoning, informal conversation, familial arguments, debates in technical professions, communication ethics, and public/social argumentation. Prereq: Soph

COMM 3625. Communication Ethics. (3 cr.; A-F or Audit; Every Fall & Spring) Applying concepts/theories from philosophy and social science to ethical issues in interpersonal, group, organizational, intercultural, and media communication.

COMM 3631. Freedom of Speech. (CIV; 3 cr.; Student Option; Every Fall, Spring & Summer) Communication theories and principles that underlie the concept of freedom of speech in the United States. A variety of contexts and practices are examined in order to understand how communicative interaction should be described and, when necessary, appropriately regulated.

COMM 3635W. Famous Speeches. (WI; 3 cr.; A-F only; Every Fall) Speeches that became famous because of the occasion, issue, or speaker. Students analyze texts, research the issue's history and the speaker's biography/opposition, and evaluate the speech's artistry, ethical principles, effects on society, and contribution to history of ideas.

COMM 3645W. How Pictures Persuade. (WI; 3 cr.; A-F only; Every Fall) How words/pictures interact in graphic memoirs, political cartoons, and science to create/communicate meaning. How this interaction bears on public advocacy. Reading examples of comprehensive cognitive model of visual communication.

COMM 3666. Greek Intellectual Revolution. (3 cr.; Student Option; Periodic Spring) This course is a three-week study abroad experience in Greece with the objective to examine how this ancient culture revolutionized its self-understanding of certain eternal human questions. Students will first acquire a degree of cultural competence in understanding the ancient culture, secondly understand how that revolution shaped our own western cultural foundations, and thirdly to use the ancient answers to provoke a critical assessment our answers to those same human questions.

COMM 3676W. Communicating Terrorism. (GP;WI; 3 cr.; Student Option; Every Fall) Terrorism as an ethical and international problem. Different cultures' historical trajectories for terrorism. Contrasts between Algerian, Irish, and Arab terrorism.


COMM 3682W. Communicating War. (AH,WI,CIV; 3 cr.; Student Option; Every Spring) Claim: if ethics (right/wrong) exists in war, then right/wrong exist everywhere. Students experience this claim through its expression in various arts/humanities media of history, memoir, philosophical meditation, and film.

COMM 3970. Directed Study. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq: One Comm course, instr consent, dept consent, college consent.

COMM 3980. Directed Instruction. (3 cr. [max 6 cr.]; S-N or Audit; Every Fall, Spring & Summer) Supervised planning/teaching of undergraduate courses. Prereq: instr consent, dept consent

COMM 3990. Research Practicum. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) How communication research is designed, implemented, and published. Focus is on working with senior faculty on their current research projects.

COMM 3995W. Major Project. (WI; 1-3 cr.; S-N or Audit; Every Fall, Spring & Summer) Individualized instruction leading to completion of senior project. Prereq: Comm major, instr consent

COMM 4204. Producing for Television: Theory and Practice. (4 cr.; Student Option; Every Fall)
Producing media content based on audience, design, and story. Developing a thematic design. Evaluating and choosing a projected audience based on story concept and program bible. Each student completes a television program, including writing a script, preproduction planning, and considering crew and talent needs. Media producer responsibilities. prereq: 3201, 3204

COMM 4221. Communication and Popular Music. (3 cr.; Student Option; Periodic Fall) A critical media studies perspective on the production, distribution, consumption, circulation, and regulation of popular music. prereq: 3211, Sr, instr consent

COMM 4235. Electronic Media and Ethnic Minorities--A World View. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Representation and involvement of various ethnic groups (e.g., African-Americans, Native Americans in United States and Canada, Maori, Turks in Europe) in radio, TV, cable, Internet. Roles of government, industry, public organizations, and minority groups in regulating, managing, and financing ethnic media activities.

COMM 4245. Critical Television Studies. (3 cr.; Student Option; Periodic Fall) Television as object of criticism, as cultural institution, and as omnipresent mode of commercialized popular culture. Aesthetics, semiotics, political economics, consumer culture/advertising, social representation, global television, televisuality, flow. Reception and everyday life. prereq: 3211

COMM 4250. Environmental Communication. (ENV; 3 cr.; A-F only; Every Spring) Historical, cultural, material contexts within which environmental communication takes place. Understand environmental communication as well as develop communication strategies that lead to more sustainable social practices, institutions, and systems.

COMM 4263. Feminist Media Studies. (DSJ; 3 cr.; A-F only; Every Spring) Issues, controversies, and practices of gender and their relationship to U.S. media. Ways in which gender is represented in and comes into play with media texts/institutions. Histories of feminism, theories/methods/political economy, case studies. prereq: 3211 or instr consent

COMM 4291. New Telecommunication Media. (3 cr.; A-F or Audit; Periodic Fall) Development and current status of new telecommunication media such as cable TV, satellites, DBS, MDS, and video disk/cassettes. Technology, historical development, regulation, and programming of these media and their influence on individuals, organizations, and society. prereq: 3211 or instr consent

COMM 4404W. Language Borderlands. (WI; 3 cr.; Student Option; Every Fall) Effect of multilingualism on self identity/sense of community. Subjective/social dimensions of being multilingual. Experience of language loss. Aspects of conflict common across types of relationships. Theories as alternative lenses to illuminate aspects of conflict. Communication strategies to manage or resolve conflict. prereq: 3401 or instr consent

COMM 4471. Communication in Marriage and Family. (3 cr.; Student Option; Periodic Fall & Spring) Contemporary theories of marriage/family communication using life-cycle approach. Role/function of communication in changing relational contexts. Ways of improving marriage/family relationships. prereq: 3401 or 3402 or instr consent

COMM 4602W. Contemporary Political Persuasion. (WI; 3 cr.; Student Option; Periodic Fall) Contemporary political speech. Ideologies in political persuasion. prereq: 1101, 3431 or instr consent

COMM 4616. African American Civil Rights Rhetoric. (3 cr.; Student Option; Every Spring) Uses the struggle of African Americans to explore and analyze philosophical concepts, political issues, moral complexities, and discursive characteristics of civil rights rhetoric. prereq: Jr

COMM 4621W. Rhetoric of Feminism. (DSJ; WI; 3 cr.; Student Option; Every Fall) History/criticism of rhetoric of feminism from 19th century to present. prereq: 3401 or 3402 or instr consent

COMM 4621W. Rhetoric of Feminism. (DSJ; WI; 3 cr.; Student Option; Every Fall) History/criticism of rhetoric of feminism from 19th century to present. prereq: 3401 or 3402 or instr consent

COMM 5110. Special Topics in Communication Theory. (3 cr.; Max 9 cr.; Student Option; Every Fall, Spring & Summer) Advanced theoretical problems. See department office for current offering.

COMM 5211. Critical Media Studies: Theory and Methods. (3 cr.; A-F only; Every Spring) Survey of theories, research methods, and scholars dominating critical media studies since late 1920s. prereq: Grad student or instr consent

COMM 5221. Media, Race, and Identity. (3 cr.; Student Option; Periodic Fall) Critical media studies perspective on cultural politics of race and ethnicity. Social construction of race, politics of racism, media representations of race. prereq: 3211 or instr consent

COMM 5321. Media Outlaws. (3 cr.; Student Option; Fall Every Year) People working outside of mainstream media institutions who find creative/provocative ways to use media as space for cultural, political, or economic critique/resistance.

COMM 5451W. Intercultural Communication Processes. (WI; 3 cr.; Student Option; Periodic Fall) Theory and research on cultural differences in values, norms, behaviors, and perceptions that affect communication across cultures internationally and domestically.

COMM 5451W. Intercultural Communication Processes. (WI; 3 cr.; Student Option; Periodic Fall) Theory and research on cultural differences in values, norms, behaviors, and perceptions that affect communication across cultures internationally and domestically.

COMM 5511. Survey of Rhetorical Theory. (3 cr.; Student Option; Periodic Fall) Rhetorical theory, from ancient to contemporary period. Application to public discourse.

COMM 5615W. Introduction to Rhetorical Criticism. (WI; 3 cr.; Student Option; Every Spring) Analysis of public discourse using various theoretical perspectives. prereq: 1101; 3601 recommended

COMM 5617. History and Criticism of U.S. Public Discourse: 1630-1865. (3 cr.; Student Option; Periodic Fall) How discourse has been used to establish or maintain power. Speeches and public debates

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
COMM 8110. Seminar: Communication Studies: History, Theory, Method. (3 cr.; Student Option; Every Fall, Spring & Summer) Qualitative research methods for studying media institutions, texts, audiences, and contexts.

COMM 8231. Seminar: National and International Electronic Media Systems. (3 cr.; Student Option; Periodic Fall) Historical and contemporary aspects of national and international electronic media systems. Roles of national and international regulatory bodies. Approaches to programming and evidence of effectiveness. Prereq: 4231 or instr consent

COMM 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) Prereq: Master's student, adviser and DGS consent

COMM 8402. Seminar: Interpersonal Communication. (3 cr.; Student Option; Every Fall, Spring & Summer) Evaluate and develop new perspectives for analyzing, diagnosing, and managing interpersonal communication problems. Prereq: 5402 or instr consent

COMM 8403. Seminar: Emotion and Communication. (3 cr.; Student Option; Every Fall, Spring & Summer) Major theories of emotion and the role of emotion in communication.

COMM 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) Prereq: Doctoral student, adviser and DGS consent

COMM 8451. Seminar: Intercultural and Diversity Research. (3 cr.; Student Option; Every Fall, Spring & Summer) Development of ideas/methods for research project, M.A. Plan B project, or Ph.D. dissertation. Prereq: instr consent

COMM 8452. Seminar: Methods of Intercultural/Diversity Facilitation. (3 cr.; Student Option; Every Fall, Spring & Summer) Theories of and techniques for managing effective intercultural communication and diversity. Intercultural training. Prereq: 4451 or 5452 recommended

COMM 8502. Seminar: Communication Theory Construction. (3 cr.; Student Option; Periodic Fall & Spring) Logic of communication theory development and modification from a social scientific perspective. Types of communication theories. Prereq: 5421 or instr consent

COMM 8504. Seminar: Rhetorical Criticism. (3 cr.; Student Option; Every Fall, Spring & Summer) Rhetorical criticism theories and methods. Rhetoric as applied to literary studies and the growth of hermeneutics as vantage points for reassessing rhetorical methods. Prereq: 5615 or instr consent

COMM 8606. Seminar: Rhetorical Analysis of Campaigns and Movements. (3 cr.; Student Option; Periodic Fall) Literature and methodology in historical and contemporary rhetorical campaigns and movements.

COMM 8611. Seminar: Rhetoric. (3 cr.; max 12 cr.) History/criticism of rhetorical theory. Research in rhetoric. Prereq: 5611 or instr consent

COMM 8625. Seminar: Communication Ethics. (3 cr.; A-F or Audit; Periodic Fall) Independent research on communication ethics in interpersonal, group, organizational, intercultural, and media settings. Theories of ethics and methods of analysis. Prereq: Ethics course or instr consent

COMM 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.) No Grade Associated; Every Fall, Spring & Summer) TBD Prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to 4 times, up to 60 combined cr

COMM 8777. Thesis Credits: Master's. (1-18 cr.; max 100 cr.) No Grade Associated; Every Fall, Spring & Summer) (No description) Prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

COMM 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.) No Grade Associated; Every Fall, Spring & Summer) (No description) Prereq: Max 18 cr per semester or summer; 24 cr required

COMM 8910. Advanced Topics in Communication Studies. (3 cr.; max 18 cr.) Student Option; Periodic Fall & Spring) Literature survey; evaluating research on topics; conducting independent research project on a particular topic.

COMM 8994. Directed Research. (1-3 cr.; max 6 cr.) Student Option; Every Fall, Spring & Summer) Supervised research project.

Compar Study in Discourse/Soc (CSDS) CSDS 5302. Aesthetics and the Valuation of Art. (3 cr.; Student Option; Periodic Fall & Spring)
Society, ideology, aesthetic value in light of recent critical theories of visual art, music, literature. Mediations of place, social class, gender, ideology on aesthetic judgment in post-renaissance Western culture.

CSDS 5305. Vision and Visuality: An Intellectual History. (3 cr.; A-F only; Periodic Fall & Spring) Central role of vision/visuality in modernity. Modern age as scopic regime. Ways that ideas/ideologies of perception have shaped aesthetic experience within social existence.

CSDS 5401. Origins of Cultural Studies. (3 cr.; Student Option; Periodic Fall & Spring) Intellectual map of the creation of cultural studies as a unique approach to studying social meanings. Key figures and concepts, including nineteenth- and early twentieth century precursors.

CSDS 5555. Introduction to Semiotics. (3 cr.; Student Option; Periodic Spring) Problems of the sign. Sign function/production. Signifying systems are articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Applying semiotics to various signifying practices (e.g., literature, cinema, daily life).

CSDS 5993. Directed Study. (1-3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Guided individual reading and study, prerequisite: instructor consent.

CSDS 8001. Basic Research Seminar: Comparative Studies in Discourse and Society I. (3 cr.; Student Option; Every Fall) Key texts, positions, problematics in field of comparative critical theory. Historical precursors, influential contemporary debates, disciplinary genealogies.

CSDS 8002. Basic Research Seminar in Comparative Studies in Discourse and Society II. (3 cr.; Student Option; Every Spring) Key texts, positions, problematics in field of comparative critical theory. Special attention to historical precursors, influential contemporary debates, disciplinary genealogies.

CSDS 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Master's student, adviser and DGS consent.

CSDS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Doctoral student, adviser and DGS consent.

CSDS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral Pre-Thesis Credits prerequisite: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

CSDS 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Max 18 cr per semester or summer; 24 cr required.

CSDS 8901. Intro to the Profession: Critical Methods of Research, Pedagogy, and Creative Work in the Humanities. (3 cr.; Student Option; Every Spring) Prepare graduate majors for teaching, issues of pedagogy. Preparing syllabi for specific courses that graduate instructors teach. Required for students planning to teach in Department of Cultural Studies and Comparative Literature. prerequisite: Grad CSDS major.

CSDS 8902. Methodologies Colloquium. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring) Presentations by CL/CSDS faculty. Methods in relation to field as a whole. Library component. Meetings with research librarians. prerequisite: CSDS grad major or instructor consent.

CSDS 8910. Advanced Topics in Comparative Studies in Discourse and Society. (3 cr. [max 24 cr.]; Student Option; Every Fall & Spring) Themes in comparative, sociohistorical analysis of discursive practices. Individually or team taught. Topics vary by instructor and semester.

CSDS 8920. Advanced Topics in Comparative Studies in Discourse and Society. (3 cr. [max 15 cr.]; Student Option; Every Fall) Practical applications of specific methodologies and theories to a determined area. Topics vary by instructor and semester.

CSDS 8993. Directed Study in Comparative Studies in Discourse and Society. (1-4 cr. [max 48 cr.]; Student Option; Every Fall & Spring) Directed Study in Comparative Studies in Discourse and Society prerequisite: instructor consent.

CSDS 8994. Directed Research in Comparative Studies in Discourse and Society. (1-4 cr.; Student Option; Every Fall & Spring) Directed Research in Comparative Studies in Discourse and Society prerequisite: instructor consent.

Comparative & Molecular Biosci (CMB)

CMB 5200. Statistical Genetics and Genomics. (4 cr.; A-F or Audit; Fall Even Year) Statistical issues in genomics. Gene detection, including statistical analysis/designs for linkage study and for mapping quantitative trait loci. Linkage analysis using pedigree data for codominant/dominant markers. Using radiation hybrid mapping and single cell typing. Design issues in linkage analysis, parentage testing, and marker polymorphism.


CMB 5571. Pathogenomics and Molecular Epidemiology - Learning to Fly. (3 cr.; A-F only; Every Spring) This course is designed provide an introduction to the use of molecular methods in our understanding of the pathogenesis, etiology, and transmission of infectious diseases that are important to both animals and public health. This is intended as a hands-on course for the student to learn techniques related to genome sequencing, pan-genome analysis, phylogenetic analysis, and metagenomic analysis, and then apply these techniques towards their own research.

CMB 5594. Directed Research in Comparative and Molecular Biosciences. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Independent study as determined by instructor. Usual activity includes conducting research in instructor's lab. prerequisite: Instructor consent.


CMB 5912. Creativity. (1 cr.; Student Option; Every Spring) Creativity will be explored and used to provide new perspectives on a variety of professional goals, activities and challenges. Lectures will be followed by a mixture of individual and group activities to provide a guided exploration of how these creative approaches can be applied to many situations. Students will learn skills to expand their vision, become more adept at problem solving, design more innovative research, inspire themselves and others and become more fascinated communicators.

CMB 5915. Essential Statistics for Life Sciences. (3 cr.; A-F or Audit; Every Fall) This course is a broad overview of the principles and methods of statistical analysis used in life sciences research, including biological, veterinary, and translational research, and provides the background a new researcher needs to understand and apply commonly used statistical methods and the preparation needed for more advanced coursework. Classes will include general instruction and background information, detailed examples of how to perform the analyses, with actual data sets, and discussion on how the topic has been applied in biological research, including reading and assessing papers in the field. Computing will be performed using the R software environment, though students may use alternate software with permission. Topics will include: descriptive statistics and exploratory graphics; understanding statistical inference and interpreting P-values and confidence intervals. One and two sample inference,
including t-tests, proportion tests, and non-parametric alternatives? Linear regression, including the effects of confounders? ANOVA methods, including pairwise comparisons and multiple comparisons

**CMB 8012. Basic Concepts in Skeletal Biology.** (; 2 cr. ; A-F only; Every Spring)
Cells (osteoblasts, osteoclasts, chondrocytes) that make up skeleton. Transcription/signaling networks regulating cell growth/differentiation. Mechanisms of bone remodeling. Regulation of bone by agents such as hormones. prereq: CMB grad student or instr consent

**CMB 8100. Research Rotation in Comparative and Molecular Biosciences.** (; 1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Current developments in faculty research. Topics specific to research adviser's area of interest. Eight weeks.

**CMB 8134. Ethical Conduct of Animal Research.** (; 3 cr. ; Student Option; Every Fall)
Ethical considerations in the use of animal subjects in agricultural, veterinary, and biomedical research. Federal, state, and University guidelines relating to proper conduct for acquisition and use of animals for laboratory, observational, epidemiological, and clinical research. Regulatory requirements. Bases for proper conduct. Societal impact on scientific investigations utilizing animal subjects.

**CMB 8202. Mechanisms of Animal Health and Disease II.** (3 cr. ; A-F only; Every Fall)
Multi-perspective approach to critically evaluating journal articles, as done for peer-reviewed journals. Aspects of host/pathogen interactions, including molecular/genetic mechanisms of host resistance/pathogenesis.

**CMB 8208. Neuropsychopharmacology.** (; 3 cr. ; A-F or Audit; Fall Even Year)

**CMB 8303. Comparative Models of Disease.** (; 2 cr. ; A-F only; Every Spring)

**CMB 8333. FTE: Master's.** (; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

**CMB 8344. Mechanisms of Hormone Action.** (; 2 cr. ; Student Option; Fall Even Year)
Mechanisms of hormone/cytokine action. Focuses on major signal transduction/apoptosis. Topics incorporate pharmacology, biochemistry, and cell biology of hormone action in relevant physiological systems. Lectures on basic principles. Specialized discussions. Lecture of primary literature. prereq: Course in biochemistry or cell biology or instr consent

**CMB 8361. Neuro-Immune Interactions.** (; 3 cr. ; Student Option; Fall Odd Year)
Regulatory systems (neuroendocrine, cytokine, and autonomic nervous systems) linking brain and immune systems in brain-immune axis. Functional effects of bidirectional brain-immune regulation. Offered fall of even-numbered years. prereq: [MICB 5218 or equiv]. [NSC 5561 or equiv]

**CMB 8371. Mucosal Immunobiology.** (; 3 cr. ; A-F or Audit; Periodic Fall)
Host immune processes at body surfaces. Innate/adaptive immunity at mucosal surfaces. Interactions/responses of various mucosal tissues to pathogens. Approaches to target protective vaccination to mucosal tissues. Lectures, journal. prereq: MiCa 8001 or equiv or instr consent

**CMB 8394. Research in Comparative Biomedical Sciences.** (; 1-6 cr. ; max 18 cr. ; Student Option; Every Fall, Spring & Summer)
Directed research determined by student's interests, in consultation with faculty mentor. prereq: Grad CMB major

**CMB 8444. FTE: Doctoral.** (; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**CMB 8481. Advanced Neuropharmaceutics.** (4 cr. ; A-F or Audit; Fall Even Year)
Delivery of compounds to central nervous system (CNS) to activate proteins in specific brain regions for therapeutic benefit. Pharmaceutical/pharmacological issues specific to direct drug delivery to CNS. prereq: instr consent

**CMB 8550. Comparative and Molecular Biosciences Seminar.** (; 1 cr. [max 8 cr.]; S-N or Audit; Every Fall & Spring)
Student/faculty presentations of their own research or a directed topic. prereq: Biol sciences grad student

**CMB 8560. Research and Literature Reports.** (; 1 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring)
Current developments in cellular and molecular mechanisms of animal health and disease.

**CMB 8571. Pathogenomics and Molecular Epidemiology - Learning to Fly.** (3 cr. ; A-F only; Every Spring)
This course is designed provide an introduction to the use of molecular methods in our understanding of the pathogenesis, etiology, and transmission of infectious diseases that are important to both animals and public health. This is intended as a hands-on course for the student to learn techniques related to genome sequencing, pangenome analysis, phylogenetic analysis, and metagenomic analysis, and then apply these techniques towards their own research.

**CMB 8777. Thesis Credits: Master's.** (; 1-18 cr. ; max 50 cr. ; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**CMB 8888. Thesis Credit: Doctoral.** (; 1-24 cr. ; max 100 cr. ; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

**CMB 8910. Statistical Principles of Research Design.** (3 cr. ; A-F or Audit; Every Spring)
This course is a broad overview of the principles and techniques of research design and methods used in veterinary and translational research, and provides the background a new researcher needs to understand the literature and make good decisions about what is appropriate for their research. prereq: intro grad level stats course or it's equivalent

### Comparative Literature (CL)

**CL 5302. Aesthetics and the Valuation of Art.** (3 cr. ; Student Option; Periodic Spring)
Society, ideology, aesthetic value in light of recent critical theories of visual art, music, literature. Mediations of place, social class, gender, ideology on aesthetic judgment in post-renaissance Western culture.

**CL 5305. Vision and Visuality: An Intellectual History.** (3 cr. ; A-F only; Periodic Fall & Spring)
Central role of vision/visuality in modernity. Modern age as scopic regime. Ways that ideas/ideologies of perception have shaped aesthetic experience within social existence.

**CL 5401. Origins of Cultural Studies.** (3 cr. ; Student Option; Periodic Fall & Spring)
Intellectual map of the creation of cultural studies as a unique approach to studying social meanings. Key figures and concepts, including nineteenth- and early twentieth century precursors.

**CL 5555. Introduction to Semiotics.** (; 3 cr. ; Student Option; Periodic Spring)
Problems of the nature of the sign; sign function; sign production; signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Applying semiotics to various signifying practices (e.g., literature, cinema, daily life).

**CL 5992. Directed Reading in Comparative Literature.** (; 1-3 cr. ; max 9 cr. ; Student Option; Every Fall & Spring)
Guided individual reading and study. prereq; instr consent

**CL 8001. Basic Research Seminar in Comparative Literature I.** (3 cr. ; Student Option; Every Fall)
Key texts, positions, problems in field of comparative critical theory. Historical precursors, influential contemporary debates, disciplinary genealogies.

**CL 8002. Basic Research Seminar in Comparative Literature II.** (3 cr. ; Student Option; Every Spring)
Key texts, positions, problematic in field of comparative critical theory. Special attention to historical precursors, influential contemporary debates, disciplinary genealogies.

CL 8333. FTE: Master's. ( ; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

CL 8362. Modernity and Its Others. ( ; 4 cr. ; Student Option; Periodic Fall & Spring) Dialectical interrogation of Western and non-Western theories of modernity. Reckoning with differences and variations in its history, providing an account of the normative category of modernity (designated as European), and alternative articulations around the globe.

CL 8444. FTE: Doctoral. ( ; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CL 8666. Doctoral Pre-Thesis Credits. ( ; 1-6 cr. ; Max 12 cr.) ; No Grade Associated; Every Fall, Spring & Summer) Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CL 8777. Thesis Credits: Master's. ( ; 1-18 cr. ; Max 50 cr.) ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

CL 8888. Thesis Credit: Doctoral. ( ; 1-24 cr. ; Max 100 cr.) ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

CL 8901. Intro to the Profession: Critical Methods of Research, Pedagogy, and Creative Work in the Humanities. ( ; 3 cr. ; Student Option; Every Spring) Prepares graduate majors for teaching. Issues of pedagogy. Preparing syllabi for specific courses that graduate instructors teach. Required for students planning to teach in Department of Cultural Studies and Comparative Literature. prereq: Grad comp lit major

CL 8902. Methodologies Colloquium. ( ; 1 cr. ; Max 2 cr.) ; S-N only; Every Fall & Spring) Presentations by CL/CSDS faculty. Methods in relation to field as a whole. Library component. Meetings with research librarians. prereq: CL grad major or instr consent

CL 8910. Advanced Topics in Comparative Literature. ( ; 3 cr. ; Max 24 cr.) ; Student Option; Every Fall & Spring) Practical applications of specific methodologies and theories to a determined area. Topics vary by instructor and semester.

CL 8920. Advanced Topics in Comparative Literature. ( ; 3 cr. ; Max 15 cr.) ; Student Option; Periodic Fall & Spring) Practical applications of specific methodologies and theories to a determined area. Topics vary by instructor and semester.

CL 8992. Directed Reading in Comparative Literature. ( ; 1-4 cr. ; Max 12 cr.) ; Student Option; Every Fall & Spring) tbd prereq: instr consent

CL 8994. Directed Research in Comparative Literature. ( ; 1-4 cr. ; Max 48 cr.) ; Student Option; Every Fall & Spring) Directed research. prereq: instr consent

Computer Engineering (CMPE)

CMPE 8333. FTE: Master's. ( ; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

CMPE 8777. Thesis Credits: Master's. ( ; 1-18 cr. ; Max 50 cr.) ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only

Computer Science (CSCI)


CSCI 1103. Introduction to Computer Programming in Java. ( ; 4 cr. ; Student Option; Every Fall) Fundamental programming concepts/software development using Java language. Problem solving skills. Algorithm development techniques. Use of abstractions/modularity. Data structures/abstract data types. Substantial programming projects. Weekly lab.

CSCI 1113. Introduction to C/C++ Programming for Scientists and Engineers. ( 4 cr. ; Student Option; Every Fall, Spring & Summer) Programming for scientists/engineers. C/C++ programming constructs, object-oriented programming, software development, fundamental numerical techniques. Exercises/examples from various scientific fields. prereq: Math 1271 or Math 1371 or Math 1571H or instr consent

CSCI 1133. Introduction to Computing and Programming Concepts. ( ; 4 cr. ; Student Option; Every Fall, Spring & Summer) Fundamental programming concepts using Python language. Problem solving skills, recursion, object-oriented programming.

Algorithm development techniques. Use of abstractions/modularity. Data structures/abstract data types. Develop programs to solve real-world problems. prereq: concurrent registration is required (or allowed) in MATH 1271 or concurrent registration is required (or allowed) in MATH 1371 or concurrent registration is required (or allowed) in MATH 1571H or instr consent

CSCI 113H. Honors Introduction to Computing and Programming Concepts. ( ; 4 cr. ; A-F only; Every Fall) Programming concepts using Python language. Real world problem solving, recursion, object-oriented programming. Algorithm development techniques. Abstractions/modularity. Optional honors topics: programming robots, programming paradigms, artificial intelligence. prereq: concurrent registration is required (or allowed) in MATH 1271 or concurrent registration is required (or allowed) in MATH 1371 or concurrent registration is required (or allowed) in MATH 1571H, CSci majors, pre-majors in CSE/CLA, honors student

CSCI 1905. Survey of Applied Computer Science Using Computer Games. ( ; 3 cr. ; Max 6 cr.) ; Student Option; Periodic Fall) An overview of applied areas of computer science such as artificial intelligence, computer graphics, robotics, and user interfaces. Concepts from these fields are demonstrated by using a commercial computer game development environment to create interactive applications. High school algebra, but no programming experience, is required.

CSCI 1913. Introduction to Algorithms, Data Structures, and Program Development. ( ; 4 cr. ; Student Option; Every Fall, Spring & Summer) Advanced object oriented programming to implement abstract data types (stacks, queues, linked lists, hash tables, binary trees) using Java language. Searching/sorting algorithms. Basic algorithmic analysis. Scripting languages using Python language. Substantial programming projects. Weekly lab. prereq: (EE major and EE 1301) or (CmpE major and EE 1301) or 1103 or 1113 or instr consent

CSCI 1933. Introduction to Algorithms and Data Structures. ( ; 4 cr. ; Student Option; Every Fall, Spring & Summer) Advanced object oriented programming to implement abstract data types (stacks, queues, linked lists, hash tables, binary trees) using Java language. Inheritance. Searching/sorting algorithms. Basic algorithmic analysis. Use of software development tools. Weekly lab. prereq: 1133 or instr consent

CSCI 1933H. Honors Introduction to Algorithms and Data Structures. ( ; 4 cr. ; A-F only; Every Spring) Advanced object oriented programming to implement abstract data types (stacks, queues, linked lists, hash tables, binary trees) using Java language. Inheritance. Searching/sorting algorithms. Basic algorithmic analysis. Use of software development tools. Weekly lab. Optional honors topics: Advanced Java topics, GUI programming, CSE research examples.
CSCI 2021. Machine Architecture and Organization. (4 cr.; Student Option; Every Fall & Spring)
Introduction to hardware/software components of computer system. Data representation, boolean algebra, machine-level programs, instruction set architecture, processor organization, memory hierarchy, virtual memory, compiling, linking. Programming in C. prereq: 1913 or 1933 or instr consent

CSCI 2033. Elementary Computational Linear Algebra. (4 cr.; Student Option; Every Fall & Spring)
Matrices/linear transformations, basic theory. Linear vector spaces. Inner product spaces. Systems of linear equations, Eigenvalues, singular values. Algorithms/computational matrix methods using MATLAB. Use of matrix methods to solve variety of computer science problems. prereq: [MATH 1271 or MATH 1371]. [1113 or 1133 or knowledge of programming concepts]

CSCI 2041. Advanced Programming Principles. (4 cr.; Student Option; Every Fall & Spring)
Principles/techniques for creating correct, robust, modular programs. Computing with symbolic data, recursion, iteration, functional programming, impact of evaluation strategies, parallelism. Organizing data/computations around types. Search-based programming, concurrency, modularity. prereq: [1913 or 1933], 2011

CSCI 2999. Special Exam. (4 cr.; Student Option; )

CSCI 3003. Introduction to Computing in Biology. (3 cr.; Student Option; Every Spring)
This course builds computational skills needed to carry out basic data analysis tasks common in modern biology. Students will learn computing concepts (algorithm development, data structures, complexity analysis) along with practical programming skills in Python and R. No previous programming knowledge assumed. Prereq: introductory biology course.

CSCI 3081W. Program Design and Development. (Wil; 4 cr.; Student Option; Every Fall & Spring)
Principles of programming design/analysis. Concepts in software development. Uses C/C++ language to illustrate key ideas in program design/development, data structures, debugging, files, I/O, state machines, testing, coding standards. prereq: [2021, 2041]; CS upper div, CS grad, or dept. permission

CSCI 3921W. Social, Legal, and Ethical Issues in Computing. (CIV,WI; 3 cr.; Student Option; Every Fall)
Impact of computers on society. Computer science perspective of ethical, legal, social, philosophical, political, and economic aspects of computing. prereq: At least soph or instr consent

CSCI 3970. Industrial Student Co-op Assignment. (2 cr. [max 4 cr.]; S-N or Audit; Every Fall & Spring)
Industrial work assignment in a co-op program involving advanced computer technology. Reviewed by a faculty member. Grade based on final written report. prereq: CS, in co-op program, instr consent

CSCI 4011. Formal Languages and Automata Theory. (4 cr.; Student Option; Every Fall & Spring)
Logical/mathematical foundations of computer science. Formal languages, their correspondence to machine models. Lexical analysis, string matching, parsing. Decidability, undecidability, limits of computability. Computational complexity. prereq: 2041 or instr consent

CSCI 4041. Algorithms and Data Structures. (4 cr.; Student Option; Every Fall & Spring)
Rigorous analysis of algorithms/implementation. Algorithm analysis, sorting algorithms, binary trees, heaps, priority queues, heapsort, balanced binary search trees, AVL trees, hash tables and hashing, graphs, graph traversal, single source shortest path, minimum cost spanning trees. prereq: [(1913 or 1933) and 2011] or instr consent; cannot be taken for grad CSci cr

CSCI 4041H. Algorithms and Data Structures. (4 cr.; A-F only; Every Fall)
Rigorous analysis of algorithms/implementation. Algorithm analysis, sorting algorithms, binary trees, heaps, priority queues, heapsort, balanced binary search trees, AVL trees, hash tables/hashing, graphs, graph traversal, single source shortest path, minimum cost spanning trees, prereq: [(1913 or 1933) and 2011], honors student) or instr consent. Cannot be taken for grad CSci cr

CSCI 4061. Introduction to Operating Systems. (4 cr.; Student Option; Every Fall & Spring)
Processes/threads, process coordination, interprocess communication, asynchronous events, memory management/file systems. Systems programming projects using operating system interfaces and program development tools. prereq: 2021 or EE 2361; CS upper div, CS minor, CompE upper div., EE upper div., EE grad, ITI upper div., Univ. honors student, or dept. permission; no cr for grad in CSci

CSCI 4131. Internet Programming. (3 cr.; Student Option; Every Fall & Spring)

CSCI 4203. Computer Architecture. (4 cr.; Student Option; Every Fall & Spring)
Introduction to computer architecture. Aspects of computer systems, such as pipelining, memory hierarchy, and input/output systems. Performance metrics. Examines each component of a complicated computer system. prereq: 2021 or instr consent

CSCI 4211. Introduction to Computer Networks. (3 cr.; Student Option; Every Fall & Spring)
Concepts, principles, protocols, and applications of computer networks. Layered network architectures, data link protocols, local area networks, routing, transport, network programming interfaces, networked applications. Examples from Ethernet, Token Ring, TCP/IP, HTTP, WWW. prereq: 4061 or instr consent; basic knowledge of [computer architecture, operating systems] recommended, cannot be taken for grad CSci cr

CSCI 4511W. Introduction to Artificial Intelligence. (WI; 4 cr.; Student Option; Every Spring)

CSCI 4611. Programming Interactive Computer Graphics and Games. (3 cr.; Student Option; Every Fall & Spring)
Tools/techniques for programming games/interactive computer graphics. Event loops, rendering/animation, polygonal models, texture, physical simulation. Modern graphics toolkits. History/future of computer game technology. Social impact of interactive computer graphics. prereq: 2021 or instr consent

CSCI 4707. Practice of Database Systems. (3 cr.; Student Option; Every Fall & Spring)
Concepts, conceptual data models, case studies, common data manipulation languages, logical data models, database design, facilities for database security/integrity, applications. prereq: 4041 or instr consent

CSCI 4921. History of Computing. (HIS,TS; 3 cr.; Student Option; Fall Even Year)
Developments in last 150 years; evolution of hardware and software; growth of computer and semiconductor industries and their relation to other businesses; changing relationships
resulting from new data-gathering and analysis techniques; automation; social and ethical issues.

CSCI 4950. Senior Software Project. (3 cr.; max 6 cr.; A-F only; Every Fall & Spring)
Student teams develop a software system, distribute system to users, and extend/maintain it in response to their needs. Software engineering techniques. Software development, team participation, leadership.
prereq: Upper div CSci, instr consent

CSCI 4970W. Advanced Project Laboratory. (WI; 3 cr.; max 9 cr.; Student Option; Every Fall & Spring)
Formulate and solve open-ended project: design, implement, interface, document, test. Team work strongly encouraged. Arranged with CSci faculty.
prereq: Upper div CSci, 4061, instr consent; cannot be taken for grad cr

CSCI 4994H. Honors Thesis. (; 1-3 cr.; max 6 cr.; A-F only; Every Fall, Spring & Summer)
Research work for an honors thesis arranged with a CS faculty member who is the adviser or coadviser.
prereq: Honors student, instr consent

CSCI 5103. Operating Systems. (; 3 cr.; Student Option; Every Fall)
Conceptual foundation of operating system designs and implementations. Relationships between operating system structures and machine architectures. UNIX implementation mechanisms as examples.
prereq: 4061 or instr consent

CSCI 5105. Introduction to Distributed Systems. (; 3 cr.; Student Option; Periodic Spring)
Distributed system design and implementation. Distributed communication and synchronization, data replication and consistency, distributed file systems, fault tolerance, and distributed scheduling.
prereq: [5103 or equiv] or instr consent

CSCI 5106. Programming Languages. (; 3 cr.; Student Option; Every Fall)
Design and implementation of high-level languages. Course has two parts: (1) language design principles, concepts, constructs; (2) language paradigms, applications. Note: course does not teach how to program in specific languages.
prereq: 4011 or instr consent

CSCI 5115. User Interface Design, Implementation and Evaluation. (; 3 cr.; Student Option; Every Fall)
Theory, design, programming, and evaluation of interactive application interfaces. Human capabilities and limitations, interface design and engineering, prototyping and interface construction, interface evaluation, and topics such as data visualization and World Wide Web. Course is built around a group project.
prereq: 4041 or instr consent

CSCI 5117. Developing the Interactive Web. (; 3 cr.; Student Option; Spring Even Year)
Hands-on design experience using modern web development tools. Students work in teams to develop software programs using each of four toolkits. Analyze developments in forum posts and classroom discussions.
prereq: 4131 or 5131 or instr consent; upper div or grad in CSci recommended

CSCI 5123. Recommender Systems. (3 cr.; Student Option; Fall Odd Year)
An overview of recommender systems, including content-based and collaborative algorithms for recommendation, programming of recommender systems, and evaluation and metrics for recommender systems.
prereq: Java programming and 2033 and 3081, or instructor consent

CSCI 5125. Collaborative and Social Computing. (; 3 cr.; Student Option; Spring Even Year)
Introduction to computer-supported cooperative work, social computing. Technology, research methods, theory, case studies of group computing systems. Readings, hands-on experience.
prereq: 5115 or instr consent

CSCI 5127W. Embodied Computing: Design & Prototyping. (WI; 3 cr.; Student Option; Fall Even Year)
Principles of human-centered design applied to real-world challenges. A semester-long team project involving (1) investigating human needs, (2) charting the solution space through ideation and visual exploration, and (3) rapidly prototyping and iterating ubiquitous computing solutions. Collaborative writing describing your process and findings.
prereq: CSci 4041, upper division or graduate student, or instructor permission; CSci 5115 or equivalent recommended.

CSCI 5143. Real-Time and Embedded Systems. (; 3 cr.; A-F only; Periodic Spring)
Real-time systems that require timely response by computer to external stimulus. Embedded systems in which computer is part of machine. Increasing importance of these systems in commercial products. How to control robots and video game consoles.
Lecture, informal lab. prereq: [4061 or instr consent], experience with C language

CSCI 5161. Introduction to Compilers. (3 cr.; Student Option; Every Spring)
Techniques for translating modern programming languages to intermediate forms or machine-executable instructions/their organization into compiler. lexical analysis, syntax analysis, semantic analysis, data flow analysis, code generation. Compiler project for prototypical language.
prereq: [2021, 5106] or instr consent

CSCI 5204. Advanced Computer Architecture. (; 3 cr.; Student Option; Every Fall)
Instruction set architecture, processor microarchitecture, memory, I/O systems. Interactions between computer software and hardware. Methodologies of computer design.
prereq: 4203 or EE 4363

CSCI 5211. Data Communications and Computer Networks. (; 3 cr.; Student Option; Every Fall)
Concepts, principles, protocols, and applications of computer networks. Layered network architectures, data link protocols, local area networks, network layer/routing protocols, transport, congestion/flow control, emerging high-speed networks, network programming interfaces, networked applications. Case studies using Ethernet, Token Ring, FDDI, TCP/IP, ATM, Email, HTTP, and WWW.
prereq: [4061 or instr consent], basic knowledge of [computer architecture, operating systems, probability], grad student

CSCI 5221. Foundations of Advanced Networking. (; 3 cr.; Student Option; Spring Even Year)
prereq: 4211 or 5211 or equiv intro course in computer networks recommended

CSCI 5321. Wireless and Sensor Networks. (; 3 cr.; Student Option; Spring Odd Year)
Enabling technologies, including hardware, embedded operating systems, programming environment, communication, networking, and middleware services. Hands-on experience in programming tiny communication devices.
prereq: 4211 or 5211 or instr consent

CSCI 5327. Introduction to Computer Security. (; 3 cr.; Student Option; Every Fall)
Concepts of computer, network, and information security. Risk analysis, authentication, access control, security evaluation, audit trails, cryptography, network/database/application security, viruses, firewalls.
prereq: 4061 or equiv or instr consent

CSCI 5302. Analysis of Numerical Algorithms. (; 3 cr.; Student Option; Every Spring)
Additional topics in numerical analysis. Interpolation, approximation, extrapolation, numerical integration/differentiation, numerical solutions of ordinary differential equations. Introduction to optimization techniques.
prereq: 2031 or 2033 or instr consent

CSCI 5304. Computational Aspects of Matrix Theory. (; 3 cr.; Student Option; Every Fall)
prereq: 2031 or 2033 or instr consent

CSCI 5403. Computational Complexity. (3 cr.; Student Option; Periodic Fall & Spring)
Computational models, complexity measures in each model, and related complexity classes.
prereq: 4041 or instr consent

CSCI 5421. Advanced Algorithms and Data Structures. (; 3 cr.; Student Option; Every Fall & Spring)
Fundamental paradigms of algorithm and data structure design. Divide-and-conquer, dynamic programming, greedy method, graph algorithms, amortization, priority queues and variants, search structures, disjoint-
set structures. Theoretical underpinnings. Examples from various problem domains. prereq: 4041 or instr consent

CSCI 5451. Introduction to Parallel Computing: Architectures, Algorithms, and Programming. (3 cr.; Student Option; Every Spring) Parallel architectures design, embeddings, routing. Examples of parallel computers. Fundamental communication operations. Performance metrics. Parallel algorithms for sorting, Matrix problems, graph problems, dynamic load balancing, types of parallelisms. Parallel programming paradigms. Message passing programming in MPI. Shared-address space programming in openMP or threads. prereq: 4041 or instr consent

CSCI 5461. Functional Genomics, Systems Biology, and Bioinformatics. (3 cr.; Student Option; Every Spring) Computational methods for analyzing, integrating, and deriving predictions from genomic/proteomic data. Analyzing gene expression, proteomic data, and protein-protein interaction networks. Protein/gene function prediction. Integrating diverse data, visualizing genomic datasets. prereq: 3003 or 4041 or instr consent

CSCI 5465. Introduction to Computing for Biologists. (3 cr.; Student Option; Fall Odd Year) This course is designed for graduate students in biology or other related sciences that wish to learn fundamental computing skills that will enable them to develop their own computational approaches for meaningful interpretation of scientific data. Students will complete programming assignments in Python and R. No previous programming knowledge assumed. Prereq: Introductory biology course; non-CSE students only.

CSCI 5471. Modern Cryptography. (3 cr.; Student Option; Periodic Fall & Spring) Introduction to cryptography. Theoretical foundations, practical applications. Threats, attacks, and countermeasures, including cryptosystems and cryptographic protocols. Secure systems/networks. History of cryptography, encryption (conventional, public key), digital signatures, hash functions, message authentication codes, identification, authentication, applications. prereq: [2011, 4041, [familiarity with number theory or finite fields]] or instr consent


CSCI 5511. Artificial Intelligence I. (3 cr.; Student Option; Every Fall) Introduction to AI. Problem solving, search, inference techniques. Logic/theorem proving. Knowledge representation, rules, frames, semantic networks. Planning/scheduling, Lisp programming language. prereq: [2041 or instr consent], grad student

CSCI 5512. Artificial Intelligence II. (3 cr.; Student Option; Every Spring) Uncertainty in artificial intelligence. Probability as a model of uncertainty, methods for reasoning/learning under uncertainty, utility theory, decision-theoretic methods. prereq: [STAT 3021, 4041] or instr consent

CSCI 5521. Introduction to Machine Learning. (2 cr.; Student Option; Periodic Fall) Problems of pattern recognition, feature selection, measurement techniques. Statistical decision theory, nonstatistical techniques. Automatic feature selection/data clustering. Syntactic pattern recognition. Mathematical pattern recognition/artificial intelligence. prereq: [2031 or 2033], STAT 3021) or instr consent

CSCI 5523. Introduction to Data Mining. (3 cr.; Student Option; Periodic Fall & Spring) Data pre-processing techniques, data types, similarity measures, data visualization/exploration. Predictive models (e.g., decision trees, SVM, Bayes, K-nearest neighbors, bagging, boosting). Model evaluation techniques. Clustering (hierarchical, partitional, density-based), association analysis, anomaly detection. Case studies from areas such as earth science, the Web, network intrusion, and genomics. Hands-on projects. prereq: 4041 or equiv or instr consent

CSCI 5525. Machine Learning. (3 cr.; Student Option; Fall Even Year) Models of learning. Supervised algorithms such as perceptrons, logistic regression, and large margin methods (SVMs, boosting). Hypothesis evaluation. Learning theory. Online algorithms such as winnow and weighted majority. Unsupervised algorithms, dimensionality reduction, spectral methods. Graphical models. prereq: Grad student or instr consent

CSCI 5551. Introduction to Intelligent Robotic Systems. (3 cr.; Student Option; Periodic Fall) Transformations, kinematics/inverse kinematics, dynamics, control. Sensing (robot vision, force control, tactile sensing), applications of sensor-based robot control, robot programming, mobile robotics, microrobotics. prereq: 2031 or 2033 or instr consent


CSCI 5561. Computer Vision. (3 cr.; Student Option; Every Fall) Issues in perspective transformations, edge detection, image filtering, image segmentation, and feature tracking. Complex problems in shape recovery, stereo, active vision, autonomous navigation, shadows, and physics-based vision. Applications. prereq: 5511 or instr consent

CSCI 5567. Fundamentals of Computer Graphics I. (3 cr.; Student Option; Every Fall) Fundamental algorithms in computer graphics. Emphasizes programming projects in C/C++. Scan conversion, hidden surface removal, geometrical transformations, projection, illumination/shading, parametric cubic curves, texture mapping, antialiasing, ray tracing. Developing graphics software, graphics research. prereq: concurrent registration is required (or allowed) in 2033, concurrent registration is required (or allowed) in 3081


CSCI 5569. Visualization. (3 cr.; Student Option; Fall Even Year) Fundamental theory/practice in data visualization. Programming applications. Perceptual issues in effective data representation, multivariate visualization, information visualization, vector field/volume visualization. prereq: [1913, 4041] or equiv or instr consent

CSCI 5611. Animation & Planning in Games. (3 cr.; Student Option; Fall Odd Year) Theory behind algorithms used to bring virtual worlds to life. Computer animation topics. Real-time, interactive techniques used in modern games. Physically-based animation, motion planning, character animation, simulation in virtual worlds. prereq: 4041 or 4611 or instr consent

CSCI 5619. Virtual Reality and 3D Interaction. (3 cr.; Student Option; Spring Odd Year) Introduction to software, technology/applications in virtual/augmented reality, 3D user interaction. Overview of current research. Hands-on projects. prereq: 4611 or 5607 or 5115 or equiv or instr consent

CSCI 5707. Principles of Database Systems. (3 cr.; Student Option; Every Fall) Concepts, database architecture, alternative conceptual data models, foundations of data manipulation/analysis, logical data models, database designs, models of database security/integrity, current trends. prereq: [4041 or instr consent], grad student

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
CSCI 5708. Architecture and Implementation of Database Management Systems. (3 cr.; Student Option; Every Spring) Techniques in commercial/research-oriented database systems. Catalogs, Physical storage techniques, Query processing/optimization, Transaction management. Mechanisms for concurrency control, disaster recovery, distribution, security, integrity, extended data types, triggers, and rules. prereq: 4707 or 5707 or instr consent

CSCI 5715. From GPS and Virtual Globes to Spatial Computing. (3 cr.; Student Option; Spring Even Year) Mathematical concepts, geo-information, representations, algorithms, data-structures/ access methods, analysis, architectures, interfaces, reasoning, time. prereq: Familiarity with Java, C++, or Python

CSCI 5801. Software Engineering I. (3 cr.; Student Option; Every Fall) Advanced introduction to software engineering. Software life cycle, development models, software requirements analysis, software design, coding, maintenance. prereq: 2041 or instr consent

CSCI 5802. Software Engineering II. (3 cr.; Student Option; Periodic Spring) Introduction to software testing, software maturity models, cost specification models, bug estimation, software reliability models, software complexity, quality control, and experience report. Student groups specify, design, implement, and test partial software systems. Application of general software development methods and principles from 5801. prereq: 5801 or instr consent

CSCI 5890. Special Topics in Computer Science. (1-3 cr. [max 27 cr.]; Student Option; Periodic Fall & Spring) Lectures and informal discussions on current topics in computer science. prereq: instr consent; may be repeated for cr

CSCI 5991. Independent Study. (1-3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Independent study arranged with CS faculty member. prereq: instr consent; may be repeated for cr

CSCI 5994. Directed Research. (1-3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Directed research arranged with faculty member. prereq: instr consent; may be repeated for cr

CSCI 5996. Curricular Practical Training. (1 cr. [max 3 cr.]; S-N or Audit; Every Fall, Spring & Summer) Industrial work assignment involving advanced computer technology. Reviewed by faculty member. Grade based on final report covering work assignment. prereq: [CSci or CompE] major, instr consent

CSCI 8001. Introduction to Research in Computer Science I. (1 cr.; A-F only; Every Fall) First of two-part sequence course. Students must take both parts to complete course and receive grade. Conducting literature review. Identifying research questions. Writing a research proposal. Research areas in CS. Practical research skills. Research ethics. Resources. prereq: 1st yr CS PhD student

CSCI 8002. Introduction to Research in Computer Science II. (2 cr.; A-F only; Every Spring) Second of two-part sequence course. Students must take both parts to complete course and receive grade. Conducting literature review. Identifying research questions. Writing a research proposal. Research areas in CS. Practical research skills. Research ethics. Resources. prereq: 8001, 1st yr CS PhD student

CSCI 8101. Advanced Operating Systems. (3 cr.; Student Option; Periodic Fall) Successful research systems and existing theory of systems design. Goal is not merely to catalog systems or learn mathematics, but to develop a sense of elegance of design that leads to successful systems. prereq: 5103 or instr consent

CSCI 8102. Foundations of Distributed Computing. (3 cr.; Student Option; Periodic Spring) Fundamental principles underlying design of distributed and multiprocessor operating systems. Foundations of distributed computing systems; shared multiprocessor systems. prereq: 8101 or instr consent

CSCI 8115. Human-Computer Interaction and User Interface Technology. (3 cr.; Student Option; Periodic Fall & Spring) Current research issues in human-computer interaction, user interface toolkits and frameworks, and related areas. Research techniques, model-based development, gesture-based interfaces, constraint-based programming, event processing models, innovative systems. prereq: 5115 or instr consent

CSCI 8117. Understanding the Social Web. (3 cr.; Student Option; Periodic Fall & Spring) Research on the social web. Read, present, and discuss papers, do homework using social web research techniques such as data analysis and simulation. Semester research project. prereq: CS grad or instr consent

CSCI 8161. Advanced Compiler Techniques. (3 cr.; Student Option; Periodic Fall & Spring) Techniques for unprocessors and parallel computers. Fundamental program analysis instruments such as data flow analysis and data dependence analysis. Variety of code generation and transformation techniques. prereq: 4061 or instr consent


CSCI 8211. Advanced Computer Networks and Their Applications. (3 cr.; Student Option; Periodic Fall & Spring) Current research issues in traffic and resource management, quality-of-service provisioning, for integrated services networks (such as next-generation Internet and ATM networks) and multimedia networking. prereq: 5211 or instr consent

CSCI 8271. Security and Privacy in Computing. (3 cr.; A-F or Audit; Periodic Fall) Recent security/privacy issues in computer systems/networks. Threats, attacks, countermeasures. Security research, authentication, network security, wireless security, computer system security, anonymous system, pseudonym, access control, intrusion detection system, cryptographic protocols. How to pursue research in security and design secure systems. prereq: [5211, 5103] or instr consent; 5471 or EE 5248 or Math 5248 or equiv recommended

CSCI 8314. Sparse Matrix Computations. (3 cr.; Student Option; Periodic Spring) Sparsity and sparse matrices. Data structures for sparse matrices. Direct methods for sparse linear systems. Reordering techniques to reduce fill-in such as minimal degree ordering and nested dissection ordering. Iterative methods. Preconditioning algorithms. Algorithms for sparse eigenvalue problems and sparse least-squares. prereq: 5304 or numerical linear algebra course or instr consent

CSCI 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

CSCI 8363. Numerical Linear Algebra in Data Exploration. (3 cr.; Student Option; Periodic Spring) Computational methods in linear algebra, matrix decompositions for linear equations, least squares, eigenvalue problems, singular value decomposition, conditioning, stability in method for machine learning, large data collections. Principal directions, unsupervised clustering, latent semantic indexing, linear least squares fit. Markov chain models on hyperlink structure. prereq: 5304 or instr consent

CSCI 8442. Computational Geometry and Applications. (3 cr.; Student Option; Periodic Spring) Designing efficient algorithms and data structures for geometric problems. Models of computation, convex hulls, geometric duality, multidimensional search, Voronoi diagrams and Delaunay triangulations, linear programming in fixed dimensions, lower bound techniques. Applications, advanced topics. prereq: 5421 or instr consent

CSCI 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CSCI 8551. Intelligent Agents. (3 cr.; Student Option; Periodic Fall) Theories of intelligent agents. Agent architectures; knowledge representation,
communication, cooperation, and negotiation among multiple agents; planning and learning; issues in designing agents with a physical body; dealing with sensors and actuators; world modeling. prereq: 5511 or instr consent

CSCI 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CSCI 8701. Overview of Database Research. (; 3 cr.; Student Option; Periodic Fall & Spring) Research papers from journals and conferences on current topics in databases, such as database research methodologies, relational implementation techniques, active databases, storage systems, benchmarking, distributed and parallel databases, new data models, prototype systems, data mining, and future directions. prereq: 5708 or instr consent

CSCI 8715. Spatial Data Science Research. (; 3 cr.; Student Option; Periodic Fall & Spring) Motivation, models of spatial information, querying spatial data, processing strategies for spatial queries, multi-dimensional storage/access methods, spatial graph datasets, spatial data mining, trends (e.g., spatio-temporal databases, mobile objects, raster databases), research literature, how to pursue research. prereq: 4707 or 5707 or 5715 or GIS 5571 or GIS 5573

CSCI 8725. Databases for Bioinformatics. (; 3 cr.; Student Option; Periodic Spring) DBMS support for biological databases, data models. Searching integrated public domain databases. Queries/analyses, DBMS extensions, emerging applications. prereq: 4707 or 5707 or instr consent

CSCI 8735. Advanced Database Systems. (; 3 cr.; A-F or Audit; Periodic Fall) Database systems for emerging applications, nontraditional query processors, multi-dimensional data indexing. Current research trends. prereq: 4707 or 5707 or 5708

CSCI 8760. Plan B Project. (; 3 cr.; S-N or Audit; Every Fall & Spring) Project arranged between student and faculty. prereq: CSci MS student, inst consent

CSCI 8777. Thesis Credits: Master’s. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

CSCI 8970. Computer Science Colloquium. (; 1 cr.; S-N or Audit; Every Fall & Spring) Recent developments in computer science and related disciplines. Students must attend 13 of the 15 lectures.

CSCI 8980. Special Advanced Topics in Computer Science. (; 1-3 cr. [max 27 cr.]; Student Option; Every Fall & Spring) Lectures and informal discussions. prereq: instr consent

CSCI 8991. Independent Study. (; 1-3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Independent study with professor. prereq: instr consent

CSCI 8994. Directed Research in Computer Science. (; 1-3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Directed research with professor. prereq: instr consent

Conservation Sciences (CONS)

CONS 8001. Conservation Biology Seminar. (; 1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring) Topics vary. prereq: inst consent

CONS 8004. Economic and Social Aspects of Conservation Biology. (; 3 cr.; Student Option; Every Spring) Economic/social aspects of conservation biology. Ecological economics, human dimension of conservation biology, values of conserving species/ecosystems. prereq: CBio student or inst consent

CONS 8093. Directed Study Experience. (; 1-5 cr. [max 6 cr.]; S-N or Audit; Periodic Fall) Directed Study Experience prereq: inst consent

CONS 8095. Contemporary Problems in Conservation Biology. (; 1 cr.; S-N or Audit; Every Fall & Spring) Comprehensive review of conservation biology issue. Written exam. prereq: 8004, FW 8452, inst consent

CONS 8103. Research in Support of Resource Management: a Dialog With Land Managers. (; 2 cr.; S-N only; Fall Odd Year) Effective communication between researchers and natural resource managers. Organized around research needs of land managers. Students select topics of interest from these needs and, as small teams, prepare short research proposals to address each topic.

CONS 8201. How to Excel in Graduate School. (; 2 cr. [max 8 cr.]; S-N only; Every Fall) Overview of history/philosophy of science as framework for writing thesis or dissertation. How to conduct research. Time management.

CONS 8333. FTE: Master’s. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

CSCI 8801. Advanced Software Engineering. (; 3 cr.; Student Option; Periodic Fall & Spring) Software reusability, internet/intranet programming, software reengineering, and software safety. prereq: 5801 or inst consent

CSCI 8888. Thesis Credit: Doctoral. (; 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CONS 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

CSCI 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CONS 8777. Thesis Credits: Master’s. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

CONS 8888. Thesis Credit: Doctoral. (; 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral thesis credit. prereq: Max 18 cr per semester or summer; 24 cr required; prior to passing written and oral prelims, must have: 1 yr coursework in program; approval on a degree program; 1-2 pg research proposal (approved by adviser) to DGS assst

Construction Management (CMGT)

CMGT 2019. AutoCAD for Construction Managers. (; 2 cr.; Student Option; Every Fall & Spring) Most current version of AutoCAD software skills and construction concepts. 2-D techniques and business applications of computer-aided drafting (CAD) at job entry level. prereq: 30 sem cr

CMGT 3001W. Introduction to Construction. (WI; 3 cr.; Student Option; Every Fall, Spring & Summer) A wide range of construction-related topics and an overview of the industry itself are presented: type and size of projects, where the industry has come from and where it appears to be heading, and roles and responsibilities of participants. Through assignments and projects, the course defines project and construction sequences, materials and building systems, and project scheduling and delivery methods. Students will conduct research into construction materials, sustainability, and self-selected topics. As a writing intensive course focused on developing skills crucial to professionals, it requires the production and revision of a variety of construction documents, including drawings and specifications.

CMGT 3011. Construction Plan Reading. (; 2 cr.; Student Option; Every Fall, Spring & Summer) Intro to construction plan reading and construction documents (using architectural, civil, mechanical, electrical drawings and project manual). Read, understand, and interpret commercial construction plans and...
COURSES LISTED IN THIS CATALOG ARE CURRENT AS OF 2018-08-23. FOR UP-TO-DATE INFORMATION, VISIT WWW.CATALOGS.UMN.EDU.

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CMGT 3024W. Facility Programming and Design. (WI; 2 cr.; A-F or Audit; Every Fall) Facility Programming and Design moves through the process of defining a building-related need, evaluating the existing facility, exploring design solutions, and presenting a business case for the final project. This course is constructed from the viewpoint of the facility manager, and each step of the instruction and each assignment builds to the final project and presentation. It is a requirement for Construction Management degree and certificate students. It can also be used as an elective for undergraduate or graduate students pursuing degrees in architecture, civil engineering, facility management, interior design, housing studies, and other related majors. There are no formal prerequisites, but it is recommended that students have completed at least one of the following: 1. CMgt 3011 (Construction Plan Reading) or CMgt 3001/3001W (Introduction to Construction) taken before or simultaneously with this course; 2. completion of a first or second year architecture or interior design studio; 3. relevant prior experience in the facility management industry; 4. approval of the instructor.

CMGT 4000. The Construction Industry through Time and Tomorrow. (2 cr.; A-F or Audit; Every Fall) This course centers on the construction industry in all its facets. The intention is to ensure that students taking it are provided with an in-depth understanding of how the industry evolved from early times to the present day and where the industry may be heading in the future. Equipped with this knowledge, graduates will be in a better position to understand their role in whichever sector of the industry they choose to build their careers and to contribute to positive change and improvement in how the industry serves its clients. It should be emphasized that this course is neither a history of architectural or engineering design, nor of construction technology, but concentrates rather on industry structure, organization, and the way it delivers its products.

CMGT 4001. Innovative Contracting. (1 cr.; A-F or Audit; Fall Odd Year) The triple constraint of time/cost/quality has often been challenged by traditional design/bid/build delivery methods. The private sector has had a unique advantage in its ability to negotiate contracts in the absence of firm bidding rules, including the extensive use of design/build delivery methods, while the public sector has been required by statute to bid to the lowest responsible bidder using design/bid/build. In an attempt to find the right balance that respects the competitive public bidding process while taking advantage of alternative project delivery strategies, the public sector has used enabling legislation to aggressively find new ways to contract project delivery, improve quality, speed of delivery, and cost management while reducing risk. This course will explore the methods of innovative contracting used by MnDOT and their underlying strategies, techniques, metrics, and outcomes, using a case study approach.

CMGT 4003. Managing in the BIM Environment. (1 cr.; A-F or Audit; Periodic Fall & Spring) For 5,000 years we have used hand drawings to communicate ideas and methodologies, from Egyptian hieroglyphs to computer technology. Building Information Modeling (BIM) computer models act as simulators, analyzing architectural programs, materials, energy usage, constructability, construction sequencing, and more, down to tens of micrometers. For example, metal units can be fabricated directly from 3D models; material quantities can be extracted from modeled objects and tied to cost early in the design process; coordinated models can be visualized by project teams, clarifying scope and providing a vehicle for communication. Although this survey course is not a technical training in BIM, it will help you understand how BIM might shape your future as a construction manager and will guide you in applying techniques to manage the BIM process within your projects. Prerequisites: None. However, if you have no prior experience with construction, we recommend CMGT 3001 - Intro to Construction and CMGT 4021 - Construction Planning and Scheduling for knowledge of industry project delivery.

CMGT 4011. Construction Documents and Contracts. (3 cr.; Student Option; Every Fall & Spring) Definition, interpretation, and utilization of drawings. Specifications, agreements, bidding forms, general conditions. Bonds, contracts, subcontracts, and related documents. Appropriate provisions for minority business participation, such as tax exempt status and wage rates. Prereq: 3001, 45 sem cr.

CMGT 4021. Construction Planning and Scheduling. (3 cr.; Student Option; Every Fall & Spring) Project planning, scheduling, and control. Consideration/understanding alternatives. Industry techniques. Introduction to critical path method. Using commercial software on personal computers. Updating/analyzing project schedules. Prereq: 3001, 3011, 45 sem cr.


CMGT 4041W. Specifications and Technical Writing for Construction Professionals. (WI; 3 cr.; Student Option; Every Spring) Develop/enhance appropriate oral/written communication necessary for use in the construction process from planning phase through contract closeout. Develop construction-specific practical applications to facilitate the process and avoid common pitfalls. Prereq: 4011 or concurrent registration is required (or allowed) in 4011.

CMGT 4051. Construction Materials for Managers. (3 cr.; Student Option; Every Fall & Spring) Concepts of physical properties. Behavior mechanisms for construction materials such as concrete, aggregate, steel, and wood. Standard specifications for material properties. Lab techniques for evaluation of each material. Prereq: 3001, [AEM 2011 or BP 3001 or BP 3101], 45 sem cr.


CMGT 4081. Managing Erosion and Sediment Control on Construction Sites. (1 cr.; A-F or Audit; Every Summer) Best management practices relating to supervision or direction of construction site operations. Grading, culvert replacement, bridge construction, incorporating permit requirements, sample specifications, Storm Water Pollution Prevention Plan (SWPPP). Management practices to reduce or control erosion/sedimentation. Prereq: 3011 or related experience.

CMGT 4193. Directed Study. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Independent project. Topic arranged with supervised by construction management faculty. Prereq: Admitted to CMgt major or minor or certificate.

CMGT 4196. Construction Management Internship. (1-4 cr. [max 12 cr.]; S-N only; Every Fall, Spring & Summer) Hands-on work experiences in a construction company, applying coursework in the workplace, contributing knowledge of best practices, and participating in career development exercises. Prereq: [(CMgt) major or minor or certificate student], [jr or sr], dept consent.

CMGT 4201. Construction Accounting. (2 cr.; A-F or Audit; Every Fall) Unique characteristics and dissimilarities crucial for all parties involved to understand/manage the construction process. Unique
aspects of construction financial accounting, managerial accounting, tax planning, and auditing. prereq: 3001, Acct 2050, ABUs 4101

CMGT 4215. Facility Quality Assessment and Commissioning. (3 cr.; A-F or Audit; Every Spring) How to assess condition/quality of building site, exterior/interior of facility, and building equipment. Evaluating effectiveness/efficiency of facility operations/maintenance program. What to look for during building audits. How to write professional assessment reports. How to make useful recommendations for improvements. Value/purpose of building commissioning/re-commissioning. prereq: 3001, [4213 or concurrent registration is required (or allowed) in 4213], 4542, 4562

CMGT 4301. Introduction to Environmental Health & Safety. (3 cr.; A-F or Audit; Every Fall) While OSHA (Occupational Safety and Health Administration) remains the governmental regulatory agency, the responsibility for occupational safety and health of employees has evolved into an integral part of a variety of industries, including construction, health care, oil and gas extraction, and many more. The course provides a comprehensive understanding of environmental health and safety standards and their application to the management of workplace injury prevention and health promotion. prereq: 45 credits

CMGT 4302. Environmental Health Principles. (3 cr.; A-F or Audit; Every Fall) The construction industry has one of the highest morbidity and mortality rates among professions, and there is also an economic implication. Companies can reduce the risk of injuries, diseases, and death due to environmental hazards by implementing an appropriate health and safety plan. Plans must be continually reviewed to ensure they are current with new products, scientific evidence, legal parameters, and cultural changes. This course will review requirements and provide direction in controlling regulations related to environmental and occupational health, chemical and biological safety, hazardous materials, and other health hazards. prereqs: 45 credits completed. Some knowledge of construction management principles is strongly recommended.

CMGT 4422. Advanced Construction Cost Estimating. (2 cr.; Student Option; Every Spring) Advanced estimating concepts, including procurement, productivity, and value engineering. Working in teams, students develop and deliver a competitive bid for a real project and examine strategies to meet the owner’s budget and expectations through value engineering approaches. prereq: CMGT 4022 or instr consent

CMGT 4471. Sustainability for Construction Managers. (2 cr.; A-F or Audit; Every Spring) Building industry’s impact on the environment; sustainable building initiatives; environmental principles and practices in pre-con, construction, close-out and operations; impact on construction manager role, procurement methods, contracts, estimating and scheduling, and team structure; green adoption issues; current technologies; future trends.

CMGT 4542. Building Energy Systems. (3 cr.; A-F or Audit; Every Spring) Functions of building mechanical systems, their integration with other building components. Residential/commercial HVAC systems, alternative energy sources, energy efficiency, structural implications of mechanical systems, indoor air quality, environmental strategies. Case studies. prereq: [3001, jr or sr] or instr consent

CMGT 4544. Materials and Structures I. (4 cr.; A-F or Audit; Every Fall) First part of the two-semester statics/materials/structures sequence. Introduces basic statics as it relates to structural analysis, including a fundamental understanding of forces, loads, shears, and moments applied to structural elements. These principles will be applied through the development of beam diagrams using load path analysis. Provides an introduction to building structural systems and their design and construction process, and covers building loads and the methods of analyzing and designing structural elements such as beams and columns. Discusses the path of loads applied to a building and the structural materials?specifically, wood and steel?that are commonly used to support these loads in building construction. Finally, the course provides an overview of the tools and techniques used by the structural engineer in the course of building design, as well as basic procedures for choosing materials and member sizes for use in a building system.

CMGT 4545. Materials and Structures II. (4 cr.; A-F or Audit; Every Spring) Building on the engineering, materials, and structural concepts of Materials and Structures I, this course explores concrete as a material (components, manufacture, installation, and mix design), and in terms of its structural uses. Soils and aggregates (origin, analysis, and classification) and earthwork/compaction concepts are also surveyed. Laboratory testing of these materials is included. These two broad topics are then combined with masonry concepts to discuss foundations, retaining walls, slabs, and footings. Finally, lateral systems within a structure are discussed. An overall curriculum project (which will refer back to MS & I) will examine a real-world structural system, including load bearing, engineering, materials, and construction aspects. prereq: CMgt 4544

CMGT 4550. Topics in Construction Management. (1-2 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Seminar. Timely issues/themes in construction management.

CMGT 4562. Building Envelope Design and Construction. (2 cr.; A-F or Audit; Every Fall) Science behind design of a weather-tight building envelope. Construction principles for foundations, exterior walls, windows, opening, roofs. Consequences of poor design/construction. Component review of building envelope (shell) elements. Testing/quality control strategies. Construction issues/ envelope sequencing. prereq: None, but 4542 or 4572 or professional experience recommended

CMGT 4572. Structural Frames and Building Design/Construction. (3 cr.; A-F or Audit; Every Fall & Spring) Basic contemporary structural systems in masonry, steel, and wood framing systems. Forms/performance of systems. prereq: 3001, [AEM 2011 or BP 3001 or BP 3101]

CMGT 4861. Construction Management Capstone. (3 cr.; A-F or Audit; Every Spring) Using a case study approach, explores concepts of project management, decision theory, and leadership needed to solve critical, complex, and even routine problems within construction businesses and their projects. Students will be required to think critically and creatively about the possible solutions and be able to effectively articulate those solutions. It will apply all prior construction management-related coursework into a comprehensive construction and facility project management capstone intended to demonstrate mastery of the construction and facility management body of knowledge prior to graduation. prereqs: CMGT 4011, 4013, 4021, 4022, and 4031 (which may be taken concurrently WITH instructor permission), and CMGT 4041 and 4201 (which may be taken concurrently WITHOUT instructor permission).

Continuing Dental Education (CDED)

CDED 6101. Postgraduate Contemporary Esthetic Dentistry I: Level I--Lecture/Laboratory Series. (5 cr.; S-N or Audit; Every Fall, Spring & Summer) Dental materials, occlusion, dental photography, smile design, anterior ceramic restorations, posterior ceramic restorations. Color, bleaching, and endoesthetics. Anterior composite restorations. Posterior composite restorations, fiber-reinforced composite bridges, in-office indirect restorations, partial/full denture esthetics, implant esthetics, perio esthetics, practice management for contemporary esthetic dentistry. Lectures, discussion, lab applications.

CDED 6202. Postgraduate Contemporary Esthetic Dentistry: Level II--Patient Series. (5 cr.; S-N or Audit; Every Fall, Spring & Summer) Dental photography, anterior/posterior composite restorations, indirect anterior restorations, indirect posterior restorations. Lectures, case presentations. Clinical experience with multi-unit, complex restorative problems. prereq: 6101

CDED 7301. Postgraduate Contemporary Esthetic Dentistry: Level III--Occlusion and Function. (1-1.5 cr.; S-N or Audit;) How to provide occlusal stability through functional/anatomical harmony. Centric...

CDED 7302. Postgraduate Contemporary Esthetic Dentistry: Level III—Orthodontic and Periodontal Esthetics. (1-1.5 cr.; S-N or Audit; ) How periodontal/orthodontic therapies may be used to enhance aesthetic outcome of restorative cases. How to use cephalometric analysis for evaluating facial esthetics. When to use limited orthodontic treatment before restorative treatment. How to eliminate uneven gingival contours, lengthen crowns, recontour interdental papilla, and optimize periodontal esthetics around dental implants. Lectures, workshop with removable appliances. Surgical demonstrations, discussions of cases from practice.

CDED 7303. Postgraduate Contemporary Esthetic Dentistry: Level III—Dental Implants. (2 cr.; S-N or Audit; ) How to use dental implants as part of restorative treatment plan. Patient selection/treatment planning, surgical phases of implant placement, restorative phases of implant placement, perioesthetics related to dental implants. Lectures, lab, clinical demonstrations, discussion of cases from practice.


CDED 7306. Postgraduate Contemporary Esthetic Dentistry: Level III—Diagnostic Box. (1 cr.; S-N or Audit; ) Advanced techniques for photographic, cosmetic, and occlusal analysis. How to customize gender, age, and personality into case design. Emphasizes effective case presentation and staff involvement. Lecture, lab/clinical experience with diagnostic records, cosmetic previews.

CDED 7307. Postgraduate Contemporary Esthetic Dentistry: Level III—Technology in Restorative Dentistry. (1-1 cr.; S-N or Audit; ) How to incorporate new technologies into practice. Composite curing technology, digital radiography, high tech software programs CAD/CAM technology digital cameras, diagnost, intraoral cameras, other new high tech equipment, CEREC, digital radiography, digital cameras, diagnost, high tech software systems. Small group interaction with faculty.

CDED 7401. Postgraduate Contemporary Esthetic Dentistry: Level III—Research Design. (1 cr.; S-N or Audit; ) Analyzing research findings, writing a research proposal. How to critique dental literature, evaluate claims made by dental manufacturers. Methods of research design, data collection/interpretation. Methods to pose a research question, prepare a research plan, and apply analytical skills to everyday practice.

CDED 7402. Postgraduate Contemporary Esthetic Dentistry: Level III—Independent Research Paper. (3-5 cr.; S-N or Audit; Periodic Fall & Spring) Independent research paper under supervision of faculty mentor. Selected topic must pose a research question, follow established research protocol, and advance knowledge in the field of contemporary restorative/esthetic dentistry. prereq: 7401

Coptic (COPT)

COPT 5001. Elementary Coptic. (3 cr.; Student Option; ) Introduction to Coptic grammar and vocabulary, chiefly in the Sahidic dialect.

COPT 5002. Elementary Coptic. (3 cr.; Student Option; Periodic Fall) Reading a variety of Coptic literature, such as Gnostic, martyrological, or monastic texts. prereq: 5001 or equiv

Ctr for Spirituality/Healing (CSPH)

CSPH 1000. Topics in Whole Life Wellbeing. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Special topics offerings in Integrative Health/Wellbeing. Contact department for semester offerings.

CSPH 1001. Principles of Holistic Health and Healing. (2 cr.; Student Option; Every Fall & Spring) Principles/measures of holistic health that promote health and well being. Theory, how holistic health is incorporated into health care delivery system. Application/integration of holistic health into daily personal life.

CSPH 1101. Self, Society, and Environment: An Integral Systems Approach to Personal Wellbeing and Engagement. (3 cr.; Student Option; Every Fall & Spring) Complexity theory approach to internal/external systems that influence lives/health. Interrelated workings of mind, psyche, and body. Means of bringing these into dynamic balance. Environmental/social systems.

CSPH 3000. Topics in Integrative Health. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Special offerings in Integrative Health. Contact department for semester offerings.

CSPH 3001. Introduction to Integrative Healing. (3 cr.; Student Option; Every Fall & Spring) Current US health care system/US cultural views of health/wellness. Various complementary/alternative medical systems/practices that might be integrated into current way of thinking about health/wellness/treatment of illness/disease. prereq: 60 credits or instr consent

CSPH 3101. Creating Ecosystems of Well-Being. (2 cr.; Student Option; Every Fall & Spring) Information, practices, and tools that enable individuals and communities to build capacity for well-being. Factors and ecosystems that contribute to health, happiness, and well-being. Students develop a personal plan for health and well-being and one for a community.

CSPH 3201. Introduction to Mindfulness-Based Stress Reduction. (2 cr.; Student Option; Every Spring) Techniques by which stress endemic in a fast-paced competitive culture can be reduced or worked with constructively. Students practice/apply techniques of mindfulness. Recent medical-scientific literature on physiological/psychological elements in the stress response.


CSPH 4311. Foundations of Hatha Yoga: Alignment & Movement Principles. (3 cr.; Student Option; Every Fall & Summer) Anatomical considerations/understanding critical to executing safe/effective Hatha Yoga instruction. Overview of human gross anatomy/bodily systems essential to Hatha Yoga. First in sequence of three courses in University of Minnesota Yoga Teachers Education & Training Sequence. Students who complete sequence may be qualified to register with Yoga Alliance as 200 hour Registered Yoga Teacher. prereq: [Prerequisite PsTL 1135 Essentials of Human Anatomy and Physiology or equivalent], instr consent (prerequisite course may be taken concurrently)
CSPH 4312. Hatha Yoga Philosophy, Lifestyle, & Ethics. (3 cr.; Student Option; Every Fall, Spring & Summer) History, tradition, philosophy of Hatha Yoga with emphasis on ethical practice of Hatha Yoga. Study of classical/modern text. Foundational concepts of how to use knowledge to facilitate strong Yoga Asana, Pranayama, meditation practice. Second course in sequence of three (3) courses in University of Minnesota Yoga Teachers’ Education & Training Sequence. prereq: 4311.

CSPH 4313. Hatha Yoga Teaching Principles & Methodology. (2 cr.; Student Option; Every Fall, Spring & Summer) Communication/sequencing principles necessary for teaching effective, safe Hatha Yoga classes. Use knowledge/skills gained during prerequisite two Hatha Yoga courses. Practice skills through participation in Service Learning. Third course in sequence of three (3) courses in University of Minnesota Yoga Teachers’ Education & Training Sequence. prereq: 4311, 4312.

CSPH 5000. Explorations in Integrative Therapies and Healing Practices. (1-4 cr.; [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Research and practice on therapies, delivery of complementary therapies and, regulatory issues. prereq: Jr or sr grad student or instr consent.

CSPH 5101. Introduction to Integrative Healing Practices. (3 cr.; Student Option; Every Fall, Spring & Summer) Cultural contexts of healing traditions. Integrative therapies presented by practitioners, including traditional Chinese medicine, meditation, mind-body healing, spiritual practices, energy healing, naturopathy, herbalism, movement therapies, homeopathy, manual therapies, nutrition. prereq: Jr or sr grad student or instructor consent.

CSPH 5102. Art of Healing: Self as Healer. (1 cr.; Student Option; Every Fall & Spring) Introduction to individual transformational journey as part of health science education. Students become aware of their responsibility/resources to facilitate development of the self. Research data, experience of self that is part psychoneuroimmunology, mind-body-spirit approaches. Lecture, scientific literature, meditation, imagery, drawing, group interaction. prereq: Jr or sr grad student or instr consent.

CSPH 5111. Ways of Thinking about Health. (2 cr.; S-N or Audit; Every Fall) Cultural contexts explored through field-trip immersion experiences. Aspects of different health care systems. Indigenous North American, Vedic, traditional Chinese, biomedicine. Writing assignment. prereq: Jr, Sr, or grad student standing, instr consent.

CSPH 5115. Cultural Awareness, Knowledge and Health. (3 cr.; Student Option; Every Spring) How knowledge can become resource for individual, family, community health. Interactive glimpse of wisdom of cultural communities. Develop capacity to see culture within professional education/practice. Cultural constructs underpinning medical system, role of culture in interaction between practitioner/patient. Process of reconnection to cultural heritage in healing. prereq: Jr or sr grad student or instr consent.

CSPH 5118. Whole Person, Whole Community: The Reciprocity of Wellbeing. (3 cr.; Student Option No Audit; Every Fall & Spring) This course explores the symbiotic and reciprocal relationship between individual and community health and wellbeing, as well as the many factors/forces which influence that relationship. Drawing upon recent studies in the area of reciprocal/symbiotic effects between individual wellbeing and community wellbeing, this course will include the following core topics: definitions of community and related dimensions of wellbeing, importance of Individual/Community reciprocity (Social Justice, Equity, Safety, and Trust), historical trauma and healing, and individual action and personal empowerment in community transformation. Utilizing elements of the Center for Spirituality & Healing’s Wellbeing model and modes of contemplative practice, this course will ultimately assist learners through phases of individual reflection and mindfulness for the purpose of creating more open and reciprocal relationships with entities they describe as their communities. An extension of recent studies in the area of the reciprocal (or rippling) effect between individual wellbeing and community wellbeing this course will guide individuals in identifying the various communities in which they live or participate, the roles they “play” within those communities and why/how this knowledge can help prepare them for action and leadership. Main themes of the course will include: - Mindfulness, Reflection and Healing: Historical Trauma and Marginalization. - Roles and Reciprocity: Justice, Equity, Security and Trust between individuals and their communities. - Transformation: Individual Action/Leadership as Bridge between Personal and Community Wellbeing.

CSPH 5121. Whole Systems Healing: Health and the Environment. (2 cr.; Student Option; Every Fall & Spring) Selected interfaces between human health and the environment. Using complexity theory as a theoretical framework, students use phenomenological methodologies to analyze and describe the interrelated dynamics of human and natural systems. Case studies. Develop strategies to optimize the healthy functioning of human/environmental systems. prereq: Jr or sr grad student.

CSPH 5201. Spirituality and Resilience. (2 cr.; Student Option; Every Spring & Summer) Links between resilience and spirituality. Applications of resilience/health realization model to students’ personal/professional lives. Review of literature, theory, and research. prereq: Jr or sr grad student or instr consent.

CSPH 5211. Peacemaking and Spirituality: A Journey Toward Healing and Strength. (2-3 cr.; Student Option; Every Fall & Summer) Influence of spirituality upon process of resolving conflict and making peace in intense interpersonal/intrapersonal conflicts in multiple health care and social work settings, including in families, between patients/clients and nurses/social workers, within communities, among friends, between co-workers, or within ourselves. prereq: Jr or sr grad student or instr consent.

CSPH 5212. Peacebuilding Through Mindfulness: Transformative Dialogue in the Global Community. (3 cr.; Student Option; Every Spring & Summer) Contemplative/mindfulness practice. Tapping into reservoir of strength, compassion, and wisdom that fosters expressions of unconditional love, reconciliation, and forgiveness. Shifting from ego centered cognitive analysis/assessment to heart centered presence and deep listening grounded in humility/compassion. Native American circle process, including use of talking piece. prereq: Jr or sr grad student or instr consent.

CSPH 5215. Forgiveness and Healing: A Journey Toward Wholeness. (3 cr.; Student Option; Every Spring & Summer) Impact of forgiveness on process of inter-intra-personal healing. Forgiveness/healing in health care and social work settings from multiple spiritual/secular traditions. prereq: Jr or sr grad student.

CSPH 5226. Advanced Meditation: Body, Mind, and Universe. (1 cr.; Student Option; Periodic Fall) Meditation as a physical, emotional, intellectual, and spiritual inquiry. Students examine a variety of texts and develop ability to enter a state of calm, meditative awareness. prereq: Jr or sr grad student or instr consent.

CSPH 5311. Introduction to Traditional Chinese Medicine. (2 cr.; A-F or Audit; Every Spring & Summer) Philosophical roots of Shamanism, Confucianism, Taoism, and Buddhism. Influence of these philosophies on Chinese medicine. Evolution of concepts of the tao, Yin-Yang, microcosm, macrocosm. Development of herbal medicine, Tui Na, Qi Gong, acupuncture, moxibustion. Traditional Chinese medicine etiology of disease, physiology, diagnosis, therapy, disease prevention, ethics, psychology, cosmology. prereq: Jr or sr grad student or instr consent.

CSPH 5313. Acupressure. (1 cr.; Student Option; Every Fall & Summer)

CSPH 5315. Traditional Tibetan Medicine: Ethics, Spirituality, and Healing. (2 cr.; Student Option: Periodic Fall) Ethics, spirituality, and healing from perspective of traditional Tibetan medicine. Believe that illness results from imbalance and that treating illness requires correcting underlying imbalance. How to apply these principles, integrate them into clinical practice, and consult with a traditional Tibetan doctor. prereq: Jr or sr or grad student or instr consent

CSPH 5317. Yoga: Ethics, Spirituality, and Healing. (2 cr.; Student Option: Every Summer) Students test claim that systematic yoga practice leads to optimal health. Yoga’s philosophy, scientific evidence, practical application. Students propose research-based programs for integrating yoga into personal/professional life.

CSPH 5318. Tibetan Medicine, Ayurveda, and Yoga in India. (4 cr.; Student Option No Audit; Every Fall & Summer) Students study with expert practitioners in India. Using critical thinking, philosophical knowledge, cultural practices, scientific evidence, and research-based programs to integrate these traditions into personal/professional life. prereq: [5315, 5317] or instr consent

CSPH 5319. Yoga and Ayurveda in India. (4 cr.; Student Option No Audit; Every Spring) Yoga and Ayurveda are interrelated, ancient, holistic Indian traditions that integrate ethics, spirituality, and healing. While studying with expert practitioners at the University of Minnesota and in India, students will examine the claim that the systematic practice of these traditions promotes healing and optimal health. prereq: CSPH 4311 (and instructor approval), CSPH 5317 or CSPH 5318 or instructor consent.

CSPH 5331. Foundations of Shamanism and Shamanic Healing. (2 cr.; S-N or Audit; Periodic Fall) 3-day retreat intensive. Shamanic philosophies, ritual etiquette, Core beliefs common to all shamanic healing practices. Cross-cultural healing beliefs/practices, unique psychology for understanding them, their use with contemporary healing practices and for personal growth. prereq: Jr or sr or grad student or instr consent

CSPH 5332. Global Healing Traditions: Amazonian Plant Spirit Medicine. (2 cr.; S-N or Audit; Periodic Fall) Non-biomedical traditional healing paradigms as practiced in other parts of the world. Focuses on indigenous healing practices in Peru as directed by a local shaman. prereq: [5331, [grad student or jr or sr in health science or practicing health professional]] or instr consent

CSPH 5341. Overview of Indigenous Hawaiian Healing. (2 cr.; Student Option; Every Fall) Traditional Hawaiian healing. ho’iomilomi (massage), lā‘au lāpatau (herbal medicine) and ho’oponopono (conflict resolution). Hawaiian epistemology, traditions, and cultural values compared with western. The science of traditional ecological knowledge for healing and self-reliance.


CSPH 5407. Science of Self-healing. (3 cr.; Student Option; Every Fall & Summer) Widely-used botanical medicines from traditional cultures. Ethnopharmacology's past, current, and potential contributions to human knowledge. Concrete examples. prereq: Jr or sr or grad student or instr consent

CSPH 5408. Plants in Human Affairs. (4 cr.; Student Option; Periodic Fall) Twelve-day, intensive course. Introduction to ethnobotany/ethnopharmacology. Lectures, field trips, presentations by local experts. prereq: Jr or sr or grad student or instr consent

CSPH 5451. Botanical Medicines in Integrative Healthcare. (3 cr.; Student Option; Every Fall) Widely-used botanical medicines from biomedical perspective. Alternative therapeutic systems presented according to bodily systems/processes. Evidence for therapeutic use. Botanical characteristics, traditional uses, chemical properties, dosage, hazards/safety issues, quality control. prereq: Jr or sr or grad student or instr consent

CSPH 5502. Aromatherapy Fundamentals. (1 cr.; Student Option; Every Spring & Summer) For health professional students/practicing health professionals. Essential oil therapy and current aromatherapy practices in clinical settings. Key safety/toxicity issues. Critically evaluate scientific/medical evidence about the therapeutic qualities of six essential oils in common use by the public and in clinical settings. prereq: Jr or sr or grad student

CSPH 5503. Aromatherapy Fundamentals. (2 cr.; Student Option No Audit; Every Summer)
CSPH 5533. Introduction to Energy Healing. (2 cr.; Student Option; Every Fall)
Healing techniques that use energetic systems in body to enhance body’s ability to heal. Therapeutic touch, healing touch, Reiki, acupuncture, reflexology, magnets, homeopathy, other modalities. Scientific theories on mechanisms of energetic medicine and ways to measure energy. Students interact with practitioners of energy healing. prereq: Jr or sr or grad student or instr consent

CSPH 5535. Reiki Healing. (1 cr.; S-N only; Every Fall, Spring & Summer)
History, principles, precepts, and practical application of Reiki energy healing. Alternative energy healing modalities, current research findings. Activation of the Reiki energy, hand positions to perform a treatment. Students provide Reiki treatments, discuss findings. prereq: Jr or sr or grad student or instr consent

CSPH 5536. Advanced Reiki Healing: Level II. (1 cr.; S-N only; Every Spring)
Principles/application of Reiki energy healing. Four levels of healing. Emphasizes healing at spiritual level. Activation of Reiki energy. Symbols that allow for energy transfer through space/time. Using second level Reiki energy for both distance healing and standard Reiki treatment. Students provide Reiki treatments, discuss findings. Current literature, research findings. prereq: 5535, instr consent

CSPH 5541. Emotional Healing and Happiness: Eastern and Western Approaches to Transforming the Mind. (2 cr.; Student Option; Every Fall)
Experiential training in the cultivation of happiness, emotional health, and healing for multi-disciplinary professions. Ancient/contemporary, eastern/western approaches. How to increase positive emotions and mind states. Meditation, integrative approaches. Case examples. prereq: Sr or grad student or instr consent

CSPH 5555. Introduction to Body and Movement-based Therapies. (2 cr.; Student Option; Periodic Fall)
Theories/approaches of selected somatic therapies, including dance, movement, and body-based therapies. Historic/theoretical perspectives on use of movement, dance, and somatic re-patterning. Demonstrations of techniques. Application of techniques to specific populations/settings. prereq: Jr or sr or grad student or instr consent

CSPH 5561. Overview of the Creative Arts in Health and Healing. (2 cr.; Student Option; Every Summer)
How creative arts therapies are integrated into health care. Art therapy, poetry therapy, dance/movement therapy, music therapy. Guided experiential exercises, discussions, readings, individual learning interventions, lectures. prereq: Jr or sr or grad student

CSPH 5561. Music, Health and Healing. (2 cr.; Student Option; Every Fall & Summer)
Music therapy, music medicine, music psychotherapy. Techniques/interventions. Hypotheses/rationale related to interventions. Related research. prereq: Jr or sr or grad student or instr consent

CSPH 5605. Movement and Music for Well-being and Healing. (2 cr.; Student Option; Every Fall)

CSPH 5631. Healing Imagery I. (2 cr.; Student Option; Every Spring)
How imagery and imagery interventions are implemented for healing and to promote health/well-being. Experience/create imagery interventions. Instructional strategies include experiential, discussions, readings, lecture, and individual learning interventions. prereq: Jr or sr or grad student

CSPH 5641. Animals in Health Care: The Healing Dimensions of Human/Animal Relationships. (3 cr.; Student Option; Every Summer)
Central elements of animal assisted therapy in multiple health care settings. History, principles, and evidence-based guidelines. Community-based interventions, in-class demonstrations, field trips. prereq: Jr or sr or grad student

CSPH 5642. Nature Heals: An Introduction to Nature-based Therapeutics. (3 cr.; Student Option; Every Fall, Spring & Summer)
This course will cover the basic theories and approaches of Nature-Based Therapeutics including restorative environments, therapeutic horticulture, animal assisted interactions, therapeutic landscapes, forest bathing, green care farming, facilitated green exercise, wilderness therapy and ecopsychology. The course includes: 1) historic and theoretical perspectives 2) research into specific techniques 3) application of techniques to specific population and setting

CSPH 5643. Horse as Teacher: Intro to Nature-based Therapeutics Equine-Assisted Activities & Therapies (EAAT). (3 cr.; Student Option; Every Fall)
This course is designed to introduce students to the field of Equine-Assisted Activities and Therapies (EAAT) and to the range of therapeutic and learning opportunities found within equine interactions. Five domains of practice in EAAT are covered and include physical, social, cognitive, psychological and spiritual contexts. The course presents historical and theoretical concepts which helped develop various types of EAATs, and how the growth of EAAT nationally and internationally has continued to mold the profession. Students will learn to describe safety guidelines, best practices as they are currently known, and precautions and contraindications in EAAT sessions. During a three-day face-to-face class, students will engage in hands-on learning with horses and apply course concepts and topics during this intensive. Students will evaluate peer-reviewed literature in EAAT research to identify the strengths and weaknesses of such published material. Students will synthesize reading, lecture and experiential learning to develop an EAAT plan for an assigned target group population. prereq: Jr or sr or grad or instr consent

CSPH 5701. Fundamentals of Health Coaching I. (4 cr.; A-F only; Every Fall)

CSPH 5702. Fundamentals of Health Coaching II. (4 cr.; A-F or Audit; Every Spring)
Basic tenets of health coaching model. Tools for self development, deep listening, and effective communication. Core building blocks for optimal health from a holistic perspective. Identify/benchmarking stages/patterns of change, interfacing with interdisciplinary health care providers, locating resources to assist clients in decision making, and educating clients on self-care practices. prereq: CSPH 5701; admitted to Integrative Health and Wellbeing Coaching MA program; or, Integrative Therapies and Healing Practices Certificate-Health Coaching track; or, instr consent.

CSPH 5703. Advanced Health Coaching Practicum. (3 cr.; A-F only; Every Fall)

CSPH 5704. Business of Health Coaching. (2 cr.; A-F only; Every Fall)

CSPH 5705. Health Coaching Professional Internship. (2 cr.; S-N only; Every Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

120 hours of health coaching practice. Students work with individual clients in acute/ longitudinal encounters, provide wellness teaching, design career plan. Prerequisite CSPH 5701, 5702, 5703; admitted to Integrative Health and Wellbeing Coaching MA; or, Integrative Therapies and Healing Practices Certificate-Health Coaching track [CSPH 5101, 5704 recommended]

CSPH 5706. Lifestyle Medicine. (2 cr.; Student Option; Every Fall & Summer) This course provides a foundation in the theory and clinical application of lifestyle medicine. Lifestyle medicine aims to address the behavioral and lifestyle bases of common illnesses through health promoting activities and reducing harmful behaviors. In this course, we will explore optimal nutrition, lifestyle, physical activity, and attitude. We will examine the emerging evidence base of lifestyle medicine and how it relates to health promotion and disease prevention. Participants will be introduced to common laboratory and imaging findings, and how they relate to optimal health. Prereq: basic course in Biology or Human Physiology.

CSPH 5707. Coaching People with Clinical Conditions. (2 cr.; Student Option; Every Spring & Summer) This course provides the student with a basic awareness and expanded perception of prevalent clinical conditions, and supports the development of empathy. It equips the student with best practice coaching skills to use with a client managing one or more clinical conditions. And it supports the development of professional communication skills. Prereq: CSPH 5701, 5702 and 5706; practicing health professional admitted to one of the following programs: Integrative Health and Wellbeing Coaching Master's or Integrative Therapies and Healing Practices Certificate-Health Coaching track, or instructor consent.

CSPH 5708. Mind-Body Science and the Art of Transformation. (1 cr.; Student Option; Every Fall, Spring & Summer) Explore how utilizing transformative practices changes in our physical brain, thoughts, beliefs, bodies, emotions and paradigms and create sustainable shifts towards optimal health, wellness and living. This course will include knowledge and discoveries from multiple disciplines including but are not limited to psychologists, scientists, quantum physicist, philosophers, healers, educators. The mind-body research has accelerated dramatically in the past couple decades and will provide students with an opportunity to discover new ways of understanding our human brains and bodies. This in turn provides new insight and innovation into human behavior and sustainable transformative change.

CSPH 5709. Health and Wellbeing Group Coaching. (2 cr.; Student Option No Audit; Every Fall) The Group Coaching course expands the competencies of the Health Coach from the one-to-one coaching process to a group format. Theories and tools of group coaching will be applied to facilitating a group coaching process in the community. Course progress will include: Foundations of Group Coaching; Developing Group Coaching Skills; Application of Group Coaching Skills to a Community Organization; Expanding Theory and Application of Group Coaching. Prereq admission to Integrative Health & Wellbeing MA or graduate of Certificate in Integrative Therapies and Healing Practices-Health Coaching program or instructor approval; CSPH 5701,5702,5706; recommended CSPH 5707; or instructor approval.

CSPH 5711. Optimal Healing Environments. (3 cr.; Student Option; Every Fall) Development/implementation of optimal healing environments. Evidence base supporting structural, architectural, human, and care processes. Emphasizes identifying models of optimal healing environments and leadership strategies that support diffusion of innovation. Prereq: Jr or sr or grad student or instr consent.

CSPH 5712. Supervised Health Coaching Skills Advancement. (1-2 cr. [max 6 cr.]; S-N only; Every Fall, Spring & Summer) Prereq admitted to Integrative Health and Wellbeing Coaching Master of Arts, Integrative Therapies and Healing Practices Certificate-Health Coaching Track; CSPH 5701, CSPH 5702; or instructor consent. This course provides Health Coaching students the opportunity to advance coaching skills/ strategies through individual client practice under the supervision of a health coach. The student health coach will engage in recorded in-person and/ or telephone coaching sessions, and receive live feedback from the instructor. The student will assess their own integration of coaching skills through completion of self-skills assessment (level appropriate) that includes self-reflection. A final skills assessment (level appropriate) will be completed utilizing the standardized tool developed for the University of Minnesota Health Coaching program (developed in alignment with guidelines the International Consortium for Health and Wellness Coaching).

CSPH 5713. Health Coaching for Health Professionals. (2 cr.; A-F only: Every Fall) Prereq enrolled in Doctor of Nursing Practice-Integrative Health and Healing track or other health professional program; or instr consent. This course explores the basic tenets of the four pillars of health coaching model: self-awareness, mindful presence, authentic communication, and safe/sacred space. Students will learn to identify/benchmark stages/patients of change and to respectfully collaborate with interdisciplinary health care providers and facilitate clients ability to achieve sustainable lifestyle changes. Consistent, nonjudgmental application of a holistic perspective of health and wellbeing in patient encounters will be discussed and demonstrated. Students will have the opportunity to observe and to practice applying tools and practices from motivational interviewing, emotional intelligence, appreciative inquiry and non-violent communication. Students will identify the basic elements of an effective coach/client interchange in order to apply basic, effective coaching techniques. Students will be able to differentiate between health coaching, nurse education, case/disease management, and therapy. The course will discuss the importance of ongoing personal development in one's professional practice so that students may apply tools for self-reflection and personal growth in their own lives and work settings.

CSPH 5805. Wellbeing the Workplace. (3 cr.; Student Option No Audit; Every Fall & Spring) Work and experiences in the workplace have a profound impact on many dimensions of individual and collective wellbeing, including a sense of purpose and meaning, financial and emotional security, quality of relationships and community, physical and emotional health, and the local and global environments. In this course, students will learn multi-disciplinary perspectives on key challenges in creating workplaces that contribute to greater wellbeing. Students will also reflect on their own personal experiences with wellbeing in their current and past work environments and examine strategies for enhancing wellbeing based on interdisciplinary theory and research. Specific topics include the importance of purpose and meaning at work, challenges in achieving work-life integration, the impact of technology on work expectations, and organizational change. This course is based on a whole-life, integrative model of wellbeing and draws from research and theory across the social, behavior, and health sciences.

CSPH 5806. Wellbeing and Resiliency for Health Professionals. (1 cr.; Student Option; Every Fall, Spring & Summer) This course will teach health professional students and health professionals self-care strategies that will improve their individual wellbeing and reduce the stress and burnout often experienced in these professions. Improving individual wellbeing will also contribute to greater wellbeing in the teams and systems in which these professionals work.

CSPH 5807. Mindfulness in the Workplace: Pause, Practice, Perform. (2 cr.; Student Option; Every Fall & Spring) An experiential course designed to teach core mindfulness skills while also exploring specific applications to the workplace setting. Explores key mindfulness traits and how they relate to essential workplace skills, such as resilience, task execution, critical analysis, intra/interpersonal growth, and leadership. The course will explore existing workplace programs and how corporate culture can be a barrier or a catalyst for adoption of mindfulness principles. From the perspective of the workplace and academic literature, students will gain an understanding of how to practically apply evidence-based techniques to help them succeed on the job.

CSPH 5905. Food Matters: Cook Like Your Life Depends On It. (1 cr.; Student Option; Every Fall & Spring) This course examines the role of food as it bears on the current acute care approach
to health and healing, the predominance of chronic disease and the important role that lifestyle (physical activity, stress, sleep, diet) has on all aspects of well being. For healthcare students and future practitioners, this course will support the development of personal food and cooking skills. This will allow them to serve as models to patients, as well as provide tools, resources and applications to support and guide patients in addressing their own diet and cooking challenges, specifically as they pertain to improving their health outcomes. Provides an in-depth exploration of dietary trends, their risks and benefits in relation to current health concerns such as diabetes, obesity, heart disease, etc. Also examines the impact of the Standard American Diet (BAD?) on these public and personal health problems linked to diet and lifestyle. Analyzes the components of a food system including how production, distribution and consumption of food are interrelated.

**CSPH 6000. Integrative Therapies and Healing Practices Topics.** (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Topics-based exploration/research on integrative therapies/healing practices. prereq: Grad student or instr consent

**CSPH 7001. The Healer's Art.** (1 cr.; S-N only; Every Spring)
Hidden crisis in medicine. Growing loss of meaning/commitment experienced by physicians nationwide under stresses of today’s healthcare system. How to stress-proof students to meet challenges of practice. prereq: Medical student

**CSPH 8100. Special Topics in Complementary Therapy and Healing Practices.** (1-6 cr. [max 12 cr.]; Student Option; Periodic Fall, Spring & Summer)
Critiquing research on complementary therapies (e.g., design, outcome measures). Synthesizing research findings for a therapy. Hypothesizing future directions for research on complementary therapies.

**CSPH 8101. Critiquing and Synthesizing Complementary and Alternative Healing Practices (CAHP) Research.** (2 cr.; Student Option; Every Fall & Spring)
Seminar. Students evaluate peer-reviewed literature in complementary/alternative healing practices (CAHP) research. Identifying strengths/weaknesses of published research, synthesizing findings from multiple studies. prereq: Grad student

**CSPH 8191. Independent Study in Integrative Therapies and Healing Practices.** (1-6 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Individual study with faculty guidance. Students write proposal, including outcome objectives/work plan. Faculty member directs work, evaluates project. prereq: instr consent

**CSPH 8701. Integrative Health and Wellbeing Coaching MA Capstone Project.** (2 cr.; S-N only; Every Fall & Spring)
Culminating course for the master of arts in integrative health and wellbeing coaching program. Students use coaching data collected during the Advanced Health Coaching practicum, Health Coaching Professional internship, or Group Health Coaching course to write and orally present a research-informed concept analysis and retrospective narrative case report. prereq: Integrative Health and Wellbeing Coaching MA student, CSPH 5701, 5702, 5703, 5704, 5706, 5707, 5709.

**Cultural Stdy/Comparative Lit (CSCL)**

**CSCL 1001. Introduction to Cultural Studies: Rhetoric, Power, Desire.** (AH,DSJ; 3 cr.; Student Option; Every Fall & Spring)
Ways of reading texts, artistic forms, everyday practices that define ongoing conflicts over meaning, value, truth. Examples from visual arts, music, film, literature, myth, ritual, built environment.

**CSCL 1101. Literature.** (LITR; 4 cr.; Student Option; Every Fall & Spring)
Introduction to literature across time, national boundaries. Basic genres, including poetry, novel, drama, historical/philosophical writing. Key questions: What is literature? What forms does it take? Why does literature matter?

**CSCL 1201W. Cinema.** (AH,WI; 4 cr.; Student Option; Every Fall & Spring)
Introduction to the critical study of the visual in modernity, presented through sustained analysis of the cinema and cinematic codes. Emphasizes on formal film analysis and major film movements and conventions in the international history of cinema. Students develop a vocabulary for formal visual analysis and explore major theories of the cinema. "Students will not receive credit for CSCL 1201W if they have already taken SCMC 1201W, ARTH 1921W, CSCL 1921W, CSCL 1201 or SCMC 1201";

**CSCL 1202W. Media: Word, Image, Sound.** (AH, WI, TS; 4 cr.; Student Option; Every Fall & Spring)
Introduction to the critical and theoretical study of media and technology from Aristotle to the modern world. The first half of the course emphasizes theoretical readings in dialogue with historical apparatuses (printing press, photography, radio, cinema, television) and various expressive objects (the bible, early film, ethnographic sound recordings). The second half turns to the modern culture industry since World War II, and introduces students to the critical study of mass culture, the concept of ideology, and of the relationship between corporate power and media conglomerates.

**CSCL 1301W. Reading Culture: Theory and Practice.** (AH, WI; 3 cr.; Student Option; Every Fall & Spring)
Culture and cultural conflict. Reading cultural theory/texts such as film, literature, music, fashion, commercial art, and built environment.

**CSCL 1401W. Reading Literature: Theory and Practice.** (LITR; 3 cr.; Student Option; Every Fall & Spring)
How can we read/understand different ways that literature is meaningful? Emphasizes practice in reading a broad spectrum of world literature, literary theory.

**CSCL 1501W. Reading History: Theory and Practice.** (HIS,WI; 3 cr.; Student Option; Every Fall & Spring)
What is history? How can we understand its meanings/uses? Emphasizes practice in reading cultural texts from various historical perspectives.

**CSCL 3005. Seminar in Critical Thought.** (3 cr.; A-F only; Every Fall)
Exploration of concepts and problems foundational to the practice of critique. Focus on paradigmatic concerns and shifts underpinning humanistic inquiry, from the past to the present, such as representation, narrative, ideology, subjectivity, power and violence, and transformation. Groundwork for understanding the European critical tradition and key challenges from non-European sources.

**CSCL 3110. Basic Concepts of Literary Study.** (3 cr.; Student Option; Every Fall & Spring)
Concepts used when carrying out work of reading/interpretation. How analysis works: aspects of distinction between text, context, other concepts. How to understand/justify literary interpretation. Course does not engage in the reading of literature.

**CSCL 3111W. Close Reading.** (LITR,WI; 3 cr.; Student Option; Every Fall & Spring)
History/theory of "close reading" (i.e., the most intense encounter between reader and text) exemplified through critical texts. Students perform close readings of various texts.

**CSCL 3120. Poetry as Cultural Critique.** (3 cr.; Student Option; Periodic Spring)
Examines the status of "poetry" in several cultures of the Americas bringing together techniques of close reading and broad cultural inquiry.

**CSCL 3122. Reading Literary Movements.** (LITR; 3 cr.; Student Option; Every Fall & Spring)
Literary movements that emerge when group of writers puts forth new definition of literature. Literary movements created by scholars after the fact. Focuses on one or two related movements (e.g., surrealism, dadaism).

**CSCL 3123. Jewish Writers and Rebels in German, Austrian, and American Culture.** (3 cr.; Student Option; Periodic Fall)
Literary/cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English. prereq: No knowledge of German required; Extra work in German must be done in order to count this course toward a German minor or a German, Scandinavian, Dutch major.

**CSCL 3130W. Colonial and Postcolonial Literatures and Theory: 1700 to the Present.** (GP,WL,LITR; 3 cr.; Student Option; Fall Odd, Spring Even Year)
Readings in colonial/postcolonial literatures/ theory from at least two world regions: Africa, the Americas, the Arab world, Asia, Europe, and the Pacific. Cultural/psychological dynamics and political economy of world under empire, decolonization, pre- vs. post-coloniality, globalization.

CSCL 3175. Comedy: Text and Theory. (AH; 3 cr.; Student Option; Every Fall & Spring) Comedy as a discursive/political practice. Jokes, stand-up routines, plays, films, satire, and social ritual. Philosophical, literary, psychological, anthropological, feminist, and postmodern theory.

CSCL 3210. Cinema and Ideology. (AH; 4 cr.; Student Option; Every Fall & Spring) The cinema as a social institution with emphasis on the complex relations it maintains with the ideological practices that define both the form and the content of its products. Specific films used to study how mass culture contributes to the process of shaping beliefs and identities of citizens.

CSCL 3211. Oppositional Cinemas. (GP; 4 cr.; Student Option; Every Fall, Spring & Summer) The ways diverse national cinemas engage the international hegemony of Hollywood cinema. The cinematic struggle against cultural imperialism and the role of race, class, and gender in the domain of international cultural politics.

CSCL 3212W. Documentary Cinema: History and Politics. (WI; 4 cr.; Student Option; Periodic Fall & Spring) Documentary cinema from its emergence in 1920s to present. Complex power relations between filmmakers and their subjects. Political appropriations of the genre.

CSCL 3220W. Screen Cultures. (AH,WI,TS; 3 cr.; Student Option; Every Spring) Study of the ways that technologies of film, television, and computing have shaped the twentieth and twenty-first centuries, especially our forms of cultural expression and identity. These topics are approached from both critical and historical perspectives in order to explore the complex relationship between media technologies and audiences.

CSCL 3221. On Television. (CIV; 3 cr.; Student Option; Every Fall & Spring) Key debates in the history, theory, and criticism of television. Focuses on critical/creative "readings" of television's past/present forms. TV's influence on film, music, and digital media.

CSCL 3250. Music as Discourse. (AH; 3 cr.; Student Option; Every Fall & Spring) Close examination of widely varying musical forms and styles, "classical" and "popular," in relation to human subjectivity and configurations of culture, ideology, and power.

CSCL 3281. European Intellectual History: The Early Modern Period, Antiquity to 1750. (3 cr.; Student Option; Periodic Fall) First of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings from original sources.

CSCL 3282. European Intellectual History: The Modern Period, 1750-Present. (3 cr.; Student Option; Spring Even Year) Second of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings from original sources.

CSCL 3310W. The Rhetoric of Everyday Life. (CIV, WI; 3 cr.; Student Option; Every Fall & Spring) How discourse reproduces consciousness and persuades us to accept that consciousness and the power supporting it. Literary language, advertising, electronic media; film, visual and musical arts, built environment, and performance. Techniques for analyzing language, material culture, and performance. (previously 3173W)

CSCL 3311W. Theories of Culture. (AH, WI; 3 cr.; Student Option; Every Fall & Spring) Examination of three prevalent theoretical perspectives on culture -- philosophical, anthropological, and aesthetic -- as they converge in the work of writers who have contributed to our contemporary conception of cultural diversity.

CSCL 3322. Visions of Nature: The Natural World and Political Thought. (ENV; 3 cr.; Student Option; Every Fall & Spring) Scientific and cultural theory concerning the organization of nature, human nature, and their significance for development of ethics, religion, political/economic philosophy, civics, and environmentalism in Western/other civilizations.

CSCL 3323. Science and Culture. (AH; 3 cr.; Student Option; Every Spring) Science and technology engaged through historical and cultural manifestations from film, literature, and YouTube to scientific and philosophical essays. Relations among humanities, science, economics, politics, philosophy and history. Psychiatry and drugs, food and agriculture, sexuality, religion and science, climate change.

CSCL 3334. Monsters, Robots, Cyborgs. (LITR; 3 cr.; Student Option; Every Fall & Spring) Historical/critical reading of figures (e.g., uncanny double, monstrous aberration, technological hybrid) in mythology, literature, and film, from classical epic to sci-fi, cyberpunk, and Web. (previously 3461)

CSCL 3335. Aliens. (DSJ; 3 cr.; Student Option; Every Fall & Spring) Do interactions with people from other countries affect fears, anxieties, and desires about beings from other worlds? In whose interests are "aliens" used? Novels, radio broadcasts, and films considered from perspectives of sociology, philosophy, psychology, literary criticism, and history.

CSCL 3350W. Sexuality and Culture. (DSJ, WI; 3 cr.; Student Option; Periodic Fall & Spring) Historical/critical study of forms of modern sexuality (heterosexuality, homosexuality, romance, erotic domination, lynching). How discourses constitute/regulate sexuality. Scientific, political, and cultural documents, fiction, personal narratives, films, advertisements.

CSCL 3351W. The Body and the Politics of Representation. (HIS, WI; 3 cr.; Student Option; Every Fall & Spring) Western representation of the human body, 1500 to present. Body's appearance as a site and sight for production of social and cultural difference (race, ethnicity, class, gender). Visual arts, literature, music, medical treatises, courtesy literature, erotica. (previously 3458W)

CSCL 3352W. Queer Aesthetics & Queer Critique. (DSJ, WI, LITR; 3 cr.; Student Option; Periodic Fall & Spring) Is there such a thing as global queer aesthetic? If so, how do various modes of representation and expression (novels, poetry, and sophisticated uses of language across film, television and video, digital media, pop music and punk) elaborate and enact queerness in particular material ways while also helping to create a larger, intermedial queer culture?

CSCL 3353. Contemporary Sub-Saharan African Popular Art Forms. (3 cr.; A-F only; Every Fall) This course explores contemporary sub-Saharan African popular cinema, popular music, community theatre, street arts, bus slogans, comic books, graphic art, social media, fashion, sports, and other forms of popular communication as signifiers of larger social, political, and economic processes. It examines popular cultural forms as constantly evolving expressions of social, political, and personal identities in an ever globalized and interconnected world. As sites where the tensions, frictions, collisions and notably, the productive creativities of the local and the global are circulated, negotiated, and contested, African popular cultures provide insights into a unique and increasingly crucial facet of contemporary African artistic practice as critical intervention. Indeed, in their function as channels of communication generated within local cultures as reactions to transnational phenomena and dynamics, African popular forms offer timely perspectives on questions of cultural resurgence, global power relations and their underpinning national, ethnic and gender implications. Through our discussion of art and gender, for instance, we will examine the ways in which art in Africa was/is used to empower women.

CSCL 3405. Marx for Today. (AH, DSJ; 3 cr.; Student Option; Every Spring) This course provides students with an introduction to Marxist theory, with particular attention to its relevance for the contemporary world. The course will focus on Marx's writings themselves as well as a range of applications and case studies as they relate to gender, race, ethnicity, and social inequality. Among the many topics to be considered include topics like modes of production, labor, profit and surplus value, slavery and race, gender
and domestic labor, finance capital and crisis, and environmental sustainability. Students will be required to take two exams, in addition to completing a final paper. It is a discussion-based course, and active participation, close reading, and analytical writing will be expected.

CSCL 3412W. Psychoanalysis and Literature Part I: The Essential Freud. (WI; 3 cr.; Student Option: Every Fall) Theoretical writings of Sigmund Freud; basic concepts of psychoanalytic criticism; dream and interpretation; genre of the case study; Freud's ideas concerning the constitution of ethnicity, culture, identity, and gender; fantasy vs. reality; psychoanalysis of the author/character/culture.


CSCL 3910. Topics in Cultural Studies and Comparative Literature. (3 cr. [max 24 cr.]; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

CSCL 3910H. Topics in Cultural Studies and Comparative Literature: Honors. (3 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Topics specified in Class Schedule.

CSCL 3993. Directed Study. (1-3 cr.; Student Option; Every Fall) Guided individual reading or study. Prereq-instr consent, dept consent, college consent.

CSCL 4993. Directed Study. (1-3 cr. [max 6 cr.]; A-F or Audit; Every Fall, Spring & Summer) Guided individual study.

CSCL 5281. European Intellectual History: The Early Modern Period, Antiquity to 1750. (3 cr.; Student Option; Periodic Fall) First of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings from original sources.

CSCL 5282. European Intellectual History: The Modern Period, 1750-Present. (3 cr.; A-F or Audit; Periodic Spring) Second of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings are from original sources.

CSCL 5302. Aesthetics and the Valuation of Art. (3 cr.; Student Option; Periodic Fall & Spring) Society, ideology, and aesthetic value considered in light of recent critical theories of visual art, music, and literature. Meditations of place, social class, gender and ideology on aesthetic judgment in post-Renaissance Western culture.

CSCL 5305. Vision and Visuality: An Intellectual History. (3 cr.; A-F only; Periodic Fall & Spring) Central role of vision/visuality in modernity. Modern age as scopic regime. Ways that ideas/ideologies of perception have shaped aesthetic experience within social existence.

CSCL 5331. Discourse of the Novel. (3 cr.; Student Option; Periodic Fall & Spring) Comparative study of the novel, 18th century to present. Its relations to ordinary language practices, emergent reading publics, technologies of cultural dissemination, problems of subjectivity, and its role in articulating international cultural relations.

CSCL 5401. Origins of Cultural Studies. (3 cr.; Student Option; Periodic Fall & Spring) Intellectual map of the creation of cultural studies as a unique approach to studying social meanings. Key figures and concepts, including nineteenth- and early twentieth-century precursors.

CSCL 5411. Avant-Garde Cinema. (4 cr.; A-F or Audit; Every Fall) History/theory of avant-garde cinema, from classical period to post-WWII; prereq: 1921 or ARTH 1921W or equiv.

CSCL 5555. Introduction to Semiotics. (3 cr.; Student Option; Periodic Spring) Problems of the nature of the sign; sign function; sign production; signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Application of semiotics to various signifying practices (literature, cinema, daily life).

CSCL 5566. Film Music: Theory, History, Practice. (4 cr.; A-F only; Periodic Fall & Spring) Role of music in American/European film from early 20th century silent cinema to near present. Narrative features, shorts, documentary, horror, thriller, science fiction, comedy, cartoon. Film music as social/cultural practice and as part of political economy within culture industry.

CSCL 5583. Marx, Freud, Nietzsche: Intellectual Foundations. (3 cr.; Student Option; Periodic Fall & Spring) Three thinkers who defined modernity: Marx, Freud, and Nietzsche. Central tenets of their thought/terms associated with their theories. Their careers portrayed against the background of their times; their place in intellectual history.

CSCL 5901. Topics in Cultural Studies and Comparative Literature. (3-4 cr. [max 32 cr.]; Student Option; Every Fall, Spring & Summer) Topics specified in Class Schedule.

CSCL 5944H. Honors Thesis. (3 cr.; A-F only; Every Fall & Spring) Honors thesis. prereq: Candidate for honors in CSCL; consent of CSCL honors adviser

CSCL 5993. Directed Study. (1-3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq-instr consent, dept consent, college consent.

Curriculum and Instruction (CI)

CI 822. Introductory Algebra (Computer). (0 cr.; Student Option; Every Fall, Spring & Summer) Students learn via multimedia software. Instructor helps students individually during class. Real numbers, expressions, equations, inequalities, rectangular graphs, systems, word problems, exponents, polynomials, factoring, prereq: [4 cr equiv], General Math Placement Test.

CI 832. Algebra Review. (0 cr.; Student Option; Every Fall, Spring & Summer) Students learn via multimedia software. Instructor helps students individually during class. Topics include rational expressions, absolute value, roots, radicals, quadratic, exponential, and logarithmic functions, complex numbers. prereq: 4 cr equiv or grade of at least C in [0713 or 0717 or 0721 or 0722 or 0822] or General Math Placement Test.

CI 1001. Introduction to the Elementary School. (3 cr.; A-F or Audit; Every Fall & Spring) Three modules focus on important aspects of contemporary urban elementary school teaching: the principal's role, the teacher's role, and the students. Central to each module are school-based visits, observations, and interviews.

CI 1032. Creating Identities: Learning In and Through the Arts. (AH; 4 cr.; Student Option; Every Fall & Spring) Students create and analyze art in order to experience how creative expressions reveal aspects of our personal and social identities. Through multiple mediums, students explore how artists are influenced by cultural elements (environments, religion, nationality, socioeconomic status, etc.) and how artists shape perceptions of culture and identity.

CI 1121. Educational Movements Past and Present: Multicultural Perspectives. (DSJ,HIS; 4 cr.; Student Option; Every Fall & Spring) Students will explore diverse historical perspectives regarding educational movements in the U.S. since the Civil War. Through challenging questions and problems in educational history, students will develop critical frameworks necessary for interpreting America's educational past and how it is tied to culture, politics, privilege, and power.

CI 1124. Global Stories of Education: Literature for Young Adults. (GP,LITR; 3 cr.; Student Option; Every Fall & Summer) Using young adult novels, short stories, nonfiction, and poems by immigrants, indigenous, minority, and refugee authors, students explore learning experiences of youth. Through immersion in the global lives and identities of characters who cross geographic and cultural borders, students consider what stories teach and how young people learn.
CI 1150. Special Topics History. (GP,HIS; 4 cr.; Student Option; Every Fall & Spring) History topics in education.


CI 1563. Physics by Inquiry. (PHYS; 4 cr.; Student Option; Every Fall & Spring) Laboratory-based introductory class where students learn by experimenting and model building and testing. Topics include electric circuits, light and color, and observational astronomy. Emphases include the nature of science and science learning, effective strategies for team-based learning, and logical reasoning skills.

CI 1806. College Algebra through Modeling. (MATH; 3 cr.; Student Option; Every Fall, Spring & Summer) Math modeling, including linear, polynomial, rational, exponential, logarithmic functions, counting/probability. Excel or calculators used to develop equations/graphs from theoretical/real interdisciplinary data. Projects enable students to use models to examine trends, make predictions. Prereq: Three yrs high school math or grade of at least C+ in PsTL 0731 or PsTL 0732 or CI 0832 or placement test score or instr consent

CI 1826. Social Justice Calculus. (MATH; 3 cr.; Student Option; Every Fall & Spring) This class is an introduction to differential calculus: instantaneous rates of change, derivative graphs and formulas, multivariate scenarios, partial derivatives and integration. Applications focus on analyzing change in social science scenarios such as gentrification and racial disparities in housing using authentic Minnesota data. Prerequisites: four years high school math OR grade of at least B+ in PsTL 0731 or PsTL 0732 or CI 0832 or placement test score OR instructor consent.

CI 1871. Computer Literacy and Problem Solving. (4 cr.; Student Option; Every Fall, Spring & Summer) Competencies in computer applications used in the social sciences and business to solve problems. Using advanced word processing techniques to create complex documents, electronic spreadsheets to analyze data and present it graphically, database management programs to store, organize, and query data, and presentation software to communicate ideas.

CI 1942. Social Media & the Changing Nature of Interaction. (TS; 3 cr.; A-F only; Every Fall) This seminar is designed to educate learners about the current impact of social media, particularly those most often used today, and those which could potentially arise with future developments and innovations. A humanistic perspective will provide the lens by which we will examine universal utility and explore strategies and measures we can take as individuals and community members to leverage their potential for forming connections and interacting as global citizens.

CI 2110. Topics in Education. (1-6 cr. [max 12 cr.]; Student Option; Periodic Fall, Spring & Summer) Topics related specifically to Education. Topics, location, credits, and duration may be highly flexible.

CI 2311W. Introduction to Technology and Ethics in Society. (CIV,VI; 3 cr.; Student Option; Every Fall, Spring & Summer) Values and ethical issues related to technology use in education, workplace, and family/community life.

CI 2312. Sex, Drugs, and the Internet: Educational Perspectives. (3 cr.; A-F only; Every Fall, Spring & Summer) Immersive exploration/critique of advantages/disadvantages associated with society's pervasive use of the Internet. Dangers and strategies to combat them. The Internet's potential for teaching/learning.

CI 3001. Engaged Arts Learning in Elementary Classrooms. (2 cr.; A-F or Audit; Periodic Fall & Spring) Introduction to pictorial expression, design, and the function of art in the social environment.

CI 3101. Issues in Urban Education. (3 cr.; Student Option; Every Fall & Spring) Issues in urban education examines and critiques contemporary and historical discourse on urban education through texts, social media, case studies, and service-learning in schools. Through examination of socio-cultural and socio-political contexts of urban education, this course considers the role of teachers, curriculum, and community in urban schooling.

CI 3211. Introduction to Elementary Teaching. (3 cr.; A-F only; Every Fall & Spring) Classroom management, instructional planning, working with families in elementary classroom. Assigned readings, lectures, classroom activities, assignments. Prereq: [Elementary ed or early childhood ed foundations major], concurrent practicum experience.

CI 3212. Practicum: Elementary Teaching. (2 cr.; S-N only; Every Fall & Spring) Field-based practicum. Students apply learning from their University Elementary School setting, connecting theory, research, and practice. Prereq: concurrent registration is required (or allowed) in 5111. [elementary education foundations or early childhood foundations major]

CI 3283. Practicum: Special Education K-6. (2 cr.; S-N only; Every Fall & Spring) Field-based practicum. Students apply learning from their university course in elementary school setting, linking theory, research, and practice. Prereq: concurrent registration is required (or allowed) in EDPSY 5613. Concurrent registration is required (or allowed) in EDPSY 5616, elementary education: foundations major.

CI 3342. Social Media & Connected Learning. (3 cr.; A-F only; Every Fall & Spring) This course investigates current and potential future impacts of social media using connected learning (ILO) and participatory culture (Jenkins) as a theoretical lens to understand the ways in which it can be used for education. Connected learning focuses on learning "pathways" that move across formal and informal settings to transform the very nature of learning - what it means, how it occurs, and where it takes place. In addition to gaining a philosophical understanding of participatory practices in spaces of connected learning, students will develop conceptual and practical expertise in using social media applications and social networking platforms for learning, creative expression, forming connections, and interacting as global citizens. The overarching aim of this course is to help students become critical consumers and ethical producers of new media in various forms for learning purposes. A balanced analysis and critique of both the affordances and the challenges associated with social media use as a tool for learning will be an essential component of the course and will frame each social media application and network that is explored and authentically integrated into the course. An examination of social media practices and influences will include their use in both formal education as well as informal learning contexts.

CI 3401W. Diversity in Children's Literature. (WI; 3 cr.; A-F or Audit; Every Fall & Spring) Classic/contemporary books for children in all genres, created by authors/illustrators. Research in transactional theory. Cultural authenticity. Reading, discussion, group activities, interactive lectures, projects.

CI 3421W. Writing on Education: Pivotal Experiences of Teaching and Learning. (WI; 4 cr. [max 8 cr.]; Student Option; Every Fall & Spring) Reflection and narrative play important roles in developing deep understanding of teaching and learning. In this course students will read and write texts about critical moments of education, and through this work develop reflective, analytic, and writing skills that will enable them to become more thoughtful and effective citizens in the world of education. Whether students hope to become teachers, youth workers, community organizers, curriculum designers or administrators in educational settings, this course invites students to consider how writers represent experiences of teaching and learning and how these reflective narratives can inform our own work and worlds. Students will explore the ways that writers of creative nonfiction use language to examine pivotal experiences of teaching and learning in diverse contexts, and add their own voices to this rich body of work by producing their own texts. Through study of writing, students will develop familiarity with writing choices and practice employing these techniques and processes in their own writing.
Students will read personal essays written by writers in the US who reflect on their own experiences and interrogate how aspects of their identities (including race, ethnicity, gender, family history and language) inform pivotal experiences of teaching and learning. Students will compose texts that explore their own experiences within a constellation of formal and informal educational settings and the questions raised and arguments made through these representations. We will use a workshop-based format that supports transformational learning, helping writers see themselves and their worlds in new ways.

Course reading will introduce a range of issues raised by experiences in and outside of the classroom.

CI 3610. Linguistics for Teachers. (SOCS; 3 cr.; A-F only; Every Fall & Spring)
For pre-K-6 pre-service teachers. Introduction to linguistics, linguistic terminology and how to apply methods of linguistic analysis to English, focusing on educational settings and classroom instruction.

CI 3611W. Basics in Teaching English as a Second Language. (WI; 4 cr.; Student Option No Audit; Every Fall & Spring)
Writing intensive course that combines service learning internship with classroom lectures, discussions, group work, experiential activities. In this course, service learning requires students to act as teachers and professional leaders with students for 30 hours a semester. Prepares students for teaching ESL to adults in community programs. Prereq: Have studied another language.

CI 3612. Introduction to Pronunciation and Grammar for ESL Teachers. (4 cr.; Student Option No Audit; Every Fall & Spring)
Introduces English language analysis with key concepts/theories in English pronunciation system/grammar. Issues within each/explore way ESL textbooks/instructors can advance ESL learners' language proficiency in these areas. Prereq: An Introduction to Linguistics course, e.g., CI 3610 or LING 3001.

CI 3613. Intercultural Communication and English Language Teaching. (3 cr.; Student Option No Audit; Every Fall & Spring)
Foundations of international/cross-cultural communication. Increased understanding of personal preferences/experiences in learning languages/using them in international communication. How these skills vary across individuals/contexts.

CI 3901. Exploring the Teaching Profession I. (2 cr.; A-F only; Every Fall)
Introduction to K-12 teaching as a profession. Culture of teaching, roles of teachers, student learning, multicultural/diverse students/contexts, societal influences. Volunteer experiences in Twin Cities. Prereq: DirecTrack to Teaching Program or department consent

CI 3902. Exploring the Teaching Profession II. (2 cr.; A-F only; Every Spring)
Diversity in schools, strategies for increasing cultural competence. Parents, communities, professional development. Students reflect on themselves as future teachers and complete 50 hours in educational settings. Prereq: CI 3901, admission to DirecTrack to Teaching or department consent

CI 4121. Culture Power and Education. (3 cr.; A-F only; Every Fall & Spring)
Manifestations of culture/power in education. How culture is mediating factor in educational achievement of students of color. Relationship between home/community, school cultures. Theories/research that show importance of integrating students' interests, knowledge, experience for increasing student engagement/achievement.

CI 4122. Social Class Education and Pedagogy. (3 cr.; A-F only; Every Fall & Spring)
Social, psychological, economic, political aspects of social class/poverty. Implications for education as social institution/classroom pedagogy. Social class in U.S., working-class literature for adults/children, labor histories, economic systems.

CI 4311W. Technology and Ethics in Society. (CIV; VI; 3 cr.; Student Option; Every Fall, Spring & Summer)
Critique of values and ethical issues related to technology use in education, the workplace, and family and community life.

CI 4312. Sex, Drugs, and the Internet: Educational Perspectives. (3 cr.; A-F only; Every Fall, Spring & Summer)
Immersive exploration/critique of advantages/risks associated with society's pervasive use of the Internet. Dangers and strategies to combat them. The Internet's potential for teaching/learning.

CI 4602. English Learners and Academic Language. (1 cr.; A-F only; Every Spring)
The course prepares teacher candidates to work effectively with English Learners (ELs) and other linguistically diverse students in their subject areas of music and agricultural education and to develop their students' academic language proficiency as needed for school success.

CI 5008. Theory and Practice of Arts Teaching. (1-2 cr.; max 3 cr.; A-F or Audit; Every Fall & Spring)
Designed for students pursuing visual or performing arts education licensure, the course explores: 1) Arts concepts, skills, and processes appropriate for elementary school; 2) methods of teaching arts for social justice; and 3) an overview of children's production of and responses to visual and performing arts.

CI 5049. Digital Media & Technology Integration: Arts Education Theory & Practice. (3 cr.; A-F or Audit; Every Summer)
This course explores issues in the visual and performing arts regarding the current and potential use of technology and digital media in P-12 arts classrooms. Through readings, discussions, artistic production, academic writing, and collaboration, you will understand the use and integration of technology in P-12 arts classrooms as pedagogical tools; the function of scaffolding students' use of digital media as part of 21st century arts teaching and learning; various technological supports for student learning and artistic production; specific digital media theories, pedagogies, and content knowledge; the use of technology in designing, sharing, and conducting lessons; issues concerning the assessment and exhibition of student works; and practical issues of using technology for teaching in and through the arts.

CI 5050. Issues in Art Education. (1 cr.; max 8 cr.; Student Option; Every Fall & Summer)
Issues/trends, current practices, recent research.

CI 5065. Improving Arts Programs in the Schools. (3 cr.; A-F or Audit; Every Fall)
This course provides students with an exploration of issues in visual and performing arts instruction, including teaching methods and evaluation, philosophical frameworks of pedagogy, and institutional issues concerning arts programs in middle and high schools; social and cultural structures of schooling, practical issues, and teaching arts.

CI 5069. Curriculum Innovations in Arts Education. (3 cr.; A-F or Audit; Every Fall)
The Social, Historical and Cultural Foundations of Arts Education. (3 cr.; A-F or Audit; Periodic Fall)
The Social, Historical and Cultural Foundations of Arts Education will examine the arts in public education since the 1800s.

CI 5078. Application of Aesthetic Theory in Education. (2 cr.; A-F or Audit; Every Spring & Summer)
The course explores: 1) contemporary theories of arts? Psychological and philosophical foundations? An overview of children's production of and responses to visual and performing arts.

CI 5096. Arts Education Practicum. (1-6 cr.; A-F or Audit; Every Fall)
In this course, students complete practicum observations in designated K-12 visual art or performing art, special education, and kindergarten classrooms.

CI 5097. Student Teaching in Arts Education. (8 cr.; S-N or Audit; Every Spring & Summer)
Teacher candidates spend 16 weeks student teaching in visual art, dance, or theatre. Eight weeks occur in an elementary setting and eight weeks occur in a secondary setting including, but not limited to, middle school.

CI 5105. Increasing Access and Success in Undergraduate Classrooms. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Fundamentals and best practices for promoting student access, persistence, and retention within classroom. Focuses on traditionally under-represented/served populations.

CI 5106. Multicultural Teaching and Learning in Diverse College Contexts. (3 cr.; A-F only; Every Fall)
Theory/pedagogy for culturally responsive teaching from perspectives of teachers/learners in postsecondary settings. Critical multicultural education, universal instructional design, integrated multicultural instructional design.

CI 5111. Introduction to Elementary School Teaching. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Curriculum organization, instruction, management, assessment, professional decision making. Foundations of ed major or elem ed initial lic

CI 5166. Action Research in Educational Settings. (3 cr.; A-F or Audit; Every Spring)
Action research as method of improving teaching/learning in educational settings. Experience doing research in classrooms. Relative strengths/challenges of different approaches to classroom research. Ethical issues.

CI 5121. Culture Power and Education. (3 cr.; A-F only; Every Fall & Spring)
In this course we will explore the manifestations of culture and power in education. We will examine the ways in which culture is a mediating factor in the educational achievement of underrepresented students. We will explicate the relationship between home/community and school cultures; and illuminate the detrimental impact of subtractive schooling practices. We then explore the theories and research that have shown the importance of integrating students' interests, knowledges, and experiences-cultures for increasing student engagement and achievement. Our examination of culturally relevant pedagogy we will move beyond an understanding of "culture" within education as the "celebration" of ethnic food, songs and customs. Instead, we shift toward a more complex understanding of "culture" that takes into account the influences of ethnic culture, youth culture, and popular culture.

CI 5122. Social Class, Education and Pedagogy. (3 cr.; A-F only; Every Fall & Spring)
This course will immerse students in social, psychological, economic, and political aspects of social class and poverty, and the implications for education as a social institution and classroom pedagogy. Students will engage in inquiries around social class in the U.S.; working-class literature for adults and children; labor histories; and economic systems and will learn to design social class-sensitive teaching practices guided by five principles for social class-sensitive change.

CI 5136. History of the American Curriculum. (3 cr.; Student Option;)
Survey of formation of public school subjects and curriculum theory in United States. Social, political, and economic implications of curriculum theory.

CI 5137. Multicultural Gender-Fair Curriculum. (3 cr.; A-F or Audit; Periodic Fall & Spring)

CI 5145. Critical Pedagogy. (3 cr.; A-F or Audit; Every Spring)
Examination of critical pedagogy; critique of power relations regarding race, culture, class, gender, and age in various educational settings; consideration of improved practice in education for children, youth, and adults.

CI 5150. Curriculum Topics. (3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer)
Special topics, current trends in curriculum. Subject integration, curriculum contexts, development, implementation, evaluation.

CI 5155. Contemporary Approaches to Curriculum: Instruction and Assessment. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Current research/issues that cross disciplinary boundaries in curriculum development, instructional practices, and assessment methods. Interrelations among curriculum, instruction, and assessment within framework of constructivist learning theory. Individual classroom practices/theories. prereq: Grad students only

CI 5156. Popular Culture, Teaching, and Learning. (3 cr.; A-F only; Every Fall) Approaches to the study of popular culture and education. Intersection between everyday life and broader historical contexts. Sporting events, toys, clothing, shopping malls, vampire mania, music festivals, video, and comics are the kinds of popular forms of culture we will engage as we develop teaching/learning strategies. prereq: Grad student or sr in a program that teaches as a component of the discipline

CI 5163. Child and Adolescent Development for Teaching and Learning I. (1 cr.; A-F only; Every Fall & Summer)
Attending to constant transitions/development in which children and adolescents negotiate their road to adulthood. How to foster learning/positive development. prereq: Enrolled in teacher initial licensure program

CI 5164. Child and Adolescent Development for Teaching and Learning II. (2 cr.; A-F only; Every Fall & Spring)
Transitions/development in which children/adolescents negotiate road to adulthood. How to foster learning/positive development. prereq: Enrolled in teacher initial licensure program

CI 5177. Practical Research. (1-3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Preparation for identifying a research and development topic, reviewing the existing knowledge on the topic, planning and carrying out a project, further investigating the topic, and writing a report on the project. prereq: CI MEd student, or CI or EdPA Teacher Leadership MEd student

CI 5186. School-Related Projects. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Research or evaluation project related to teaching, curriculum, or other aspect of schooling. Approved and supervised by faculty advisor. prereq: MEd student

CI 5187. Practicum: Improvement of Teaching in Elementary or PreKindergarten Schools. (2-3 cr.; S-N or Audit; Every Fall, Spring & Summer)
Elementary school classroom teaching project designed to improve specific teaching skills. Approved and directed by adviser. prereq: Students in early childhood educ M Ed, or elem educ M Ed, or teaching M Ed

CI 5190. Directed Individual Study in Curriculum and Instruction. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

CI 5211. Elementary Education Content and Pedagogy I. (4 cr.; A-F only; Every Fall, Spring & Summer)
Teacher Candidates will complete eight modules on elementary content/pedagogy instruction across disciplines. Introduce various concepts/practices that will be spiraled in each subject area.

CI 5212. Elementary Education Content and Pedagogy II. (3 cr.; A-F only; Every Fall, Spring & Summer)
Teacher Candidates will complete five modules on elementary content/pedagogy instruction across disciplines. Builds on various concepts/practices from introductory course. Introduces content that will be spiraled in each subject area.

CI 5213. Elementary Education Content and Pedagogy III. (3 cr.; A-F only; Every Fall, Spring & Summer)
Teacher Candidates will complete six modules on elementary content/pedagogy instruction across disciplines. Builds on various concepts/practices from two previous introductory courses. Introduces content that will be spiraled in each subject area.

CI 5214. Elementary Education Content and Pedagogy IV. (3 cr.; A-F only; Every Fall, Spring & Summer)
Teacher Candidates will complete five modules on elementary content/pedagogy instruction across disciplines. Builds on various concepts/practices from previous three courses. Introduces content that will be spiraled in each subject area.

CI 5215. Elementary Education Content and Pedagogy V. (2 cr.; A-F only; Every Fall, Spring & Summer)
Teacher Candidates will complete five modules on elementary content/pedagogy instruction across disciplines. Builds on various concepts/practices from introductory courses. Introduces content in each subject area. Serves as conclusion to elementary ed content/pedagogy courses.

CI 5254. Kindergarten Methods. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Purpose of kindergarten, its place in elementary program. Curriculum appropriate for needs of age group, including children with special needs. Assessment procedures, role of classroom teacher, prereq: Foundations of Education/Elementary Education or M.Ed./ILP Elementary Education

CI 5283. Practicum: Applying Instructional Methods in the Elementary Classroom. (3 cr. [max 6 cr.]; S-N only; Every Fall & Spring) Field-based practicum in elementary school setting. In-class discussions about application of classroom learning to school setting. prereq: M.Ed./Elementary education initial licensure student, enrolled in elementary education methods course

CI 5285. Clinical Experience in Elementary School Teaching. (12 cr. [max 24 cr.]; S-N only; Every Fall, Spring & Summer) Students spend full days in elementary classroom, gradually assuming responsibility for teaching, and prepare portfolio based on criteria given. One seminar per week. prereq: M.Ed./Elementary education initial licensure student

CI 5286. Student Teaching Seminar: Elementary Education. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Weekly seminar supplementing student teaching experience. Class discussions, sharing of artifacts from the classroom, reflections, and readings. prereq: M.Ed./Elementary education initial licensure only

CI 5287. Capstone Project: Improvement of Teaching in Elementary and Pre-Kindergarten Schools. (3 cr.; A-F only; Every Fall, Spring & Summer) Elementary school classroom teaching project to improve specific teaching skills. Approved/directed by adviser. prereq: M.Ed./Elementary education initial licensure student

CI 5300. Teaching Introductory Computer Concepts and Skills. (1-3 cr.; A-F or Audit; Every Spring) Pedagogical strategies for teaching keyboarding and word processing.

CI 5301. Foundations of Computer Applications for Business and Education. (3 cr.; A-F only; Every Fall, Spring & Summer) Instructional uses of computers/representative business, education, marketing applications. Word processing, databases, spreadsheets, graphic design. Expectations are for demonstrations of skills on apps/understanding of concepts that go beyond basic.

CI 5304. Data Management for Online Integration. (3 cr.; Student Option; Every Spring) Using database software to organize, manage, and display online data, to create content management systems, and to integrate into existing websites.

CI 5305. Integrated Computer Applications in Business and Marketing Education. (3 cr.; Student Option; Every Fall & Spring) Case-based authentic business computing problems requiring integration of two or more application packages. Pedagogical issues of learning/teaching advanced computer applications.

CI 5307. Technology for Teaching and Learning. (1.5 cr.; A-F or Audit; Every Fall, Spring & Summer) Diverse educational technology in K-12 classrooms. Effective use of technology. Computer technologies used to stimulate personal productivity/communication and to enhance teaching/learning processes. prereq: [MED/initial licensure or CLA music ed major or preteaching major or inst consent], basic computer skills

CI 5321. Foundations of Distance Education. (3 cr.; A-F or Audit; Every Summer) History, philosophies, technologies, and best practices related to distance learning environments. Distance education theories. Issues in distance education.

CI 5323. Online Learning Communities. (3 cr.; A-F or Audit; Every Spring) Students design/research an online learning environment that promotes community. What community is, how it fosters learning in educational learning environments. Theories of distance learning instruction. Community models, technological tools to develop online communities.

CI 5325. Designing and Developing Online Distance Learning. (3 cr.; A-F or Audit; Every Fall) Students research, use, and evaluate technologies for distance learning and design their own learning environments. prereq: 5351 or 5362 recommended

CI 5327. Designing Online Adventure Learning. (3 cr.; A-F or Audit; Every Spring) Bring adventure to your online learning environments: learn to design, develop, and deliver an online program that provides opportunities to explore real-world issues through authentic learning experiences in a collaborative online space. You'll engage learners virtually and in real-time. For more info go to http://www.chasingseals.com then sign up and start exploring.

CI 5331. Introduction to Learning Technologies. (3 cr.; A-F or Audit; Every Fall & Summer) Topics related to needs of in-service teachers. Topics, location, credits. Duration flexible.

CI 5331. Introduction to Learning Technologies. (3 cr.; A-F or Audit; Every Fall) An exciting look at the field of learning technologies (LT), examining the numerous opportunities this area of study brings to individuals who decide to pursue a LT degree. Students engage in numerous real-world projects as they come to understand both the past and future of technology in education, business, and society as a whole.


CI 5351. Technology Tools for Educators. (3 cr.; A-F or Audit; Every Fall) Develop skills in using technology applications to support teaching and learning. Internet applications, presentation software, Web 2.0 technologies, and Web site development.

CI 5361. Teaching and Learning with the Internet. (2-3 cr.; Student Option; Every Spring) Implications/challenges in using Internet-based technologies in classroom. Pedagogical models.

CI 5362. Foundations of Interactive Design for Web-based Learning. (3 cr.; A-F or Audit; Every Fall) Processes of designing/developing interactive learning media and online applications from ground up. Focuses on usability/aesthetics in online learning.

CI 5363. New Media and Interaction Design for Online and Mobile Learning. (3 cr.; A-F or Audit; Every Fall) New media design from perspective of instructional designer. Designing with Adobe Flash environment. Context of authentic design problems. Consideration of raster/vector imaging, web video optimization, usability analysis.

CI 5365. Contemporary Software Development Issues and Tools. (3 cr.; A-F or Audit; Every Summer) Software used in multimedia design/development. Uses of the software, intricacies of interface, relevant programming principles. Introduction to developing multimedia applications. prereq: Familiar with standard computer/Internet operations.

CI 5367. Interactive Multimedia Instruction. (3 cr.; A-F or Audit; Every Spring) Principles of effective computer-based design; tools in multimedia development; contemporary issues and skills used in the design, development, and implementation of interactive multimedia instruction. Use multimedia development tools, create a multimedia portfolio, and investigate the issues surrounding their effective use. prereq: Knowledge of principles and procedures of CBI design and one multimedia authoring system

CI 5371. Learning Analytics: Theory and Practice. (3 cr.; Student Option; Every Fall) Learning analytics as a nascent field is broadly defined as the “measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs.” This course aims to provide a general, non-technical survey of learning analytics, as well as its application in various educational contexts. In particular, we will discuss foundations of learning analytics, survey pertinent education theories, discuss new forms of assessment, explore popular data mining techniques, review learning analytical tools and case studies, and de- sign analytics for our own
CI 5390. Learning Technologies Field Experiences. (2 cr.; S-N only; Every Fall & Spring) Field-based experience for students enrolled in computers, keyboarding, and related technology applications methods classes. Apply learning from University courses to the K-12 school setting. In-class discussions about the application of classroom learning to the school setting. prereq: Students in teachers of computers/keyboarding/related technology applications additional licensure program

CI 5402. Introduction to Special Collections. (3 cr.; A-F or Audit; Periodic Fall) Uses Children's Literature Research Collection as research material. Study of manuscripts, original art, and letters. prereq: Children's lit course

CI 5403. Writing For and By Children. (3 cr.; A-F only; Every Fall) Aspects of writing/illustrating children's literature or children's own writing. May feature authors/illustrators of children's books.

CI 5404. Multicultural Literature for Children and Adolescents. (3 cr.; A-F or Audit; Spring Odd Year) Course explores multicultural literature for children and adolescents as a site where difference can be emphasized and appreciated rather than downplayed and muted. We study award-winning works of fiction and arrive at a definition of multicultural literature for the modern classroom.

CI 5405. Middle School Language Arts Methods. (2 cr.; A-F only; Fall Odd Year) Introduction to the unique needs of middle school students in the language arts classroom. Language arts content and pedagogical skills. Adolescent development/psychology. Field placement in a middle school language arts classroom. prereq: Elem ed licensure student

CI 5410. Special Topics in the Teaching of Literacy. (1-3 cr. [max 9 cr.]; Student Option; Every Fall & Summer) Topics related specifically to the needs of in-service teachers. Topics, location, credits, and duration will be highly flexible.

CI 5413. Foundations of Reading. (3 cr.; A-F or Audit; Periodic Spring) Reading processes, development of readers. Assessment and tutoring of individual children in reading and other literacy practices. prereq: CI 3610 and concurrent registration with CI 5414

CI 5414. Practicum: Working With Developing Readers. (2 cr.; S-N only; Every Fall & Spring) Field-based practicum. Students apply learning from their University course to working with developing readers. Instructor provides specific assignment. prereq: CI 3610 and concurrent registration with CI 5413 required; elementary education foundations major

CI 5417. Elementary Literacy Instruction for ESL Students. (3 cr.; A-F or Audit; Fall Odd Year) Teaching reading/writing in elementary grades to students from diverse languages. Second-language literacy development. Phonemic awareness, phonics, fluency, vocabulary, comprehension. Ways to connect students' background knowledge to literacy curriculum. prereq: Bachelor's degree completed

CI 5419. The American Middle School. (3 cr.; Student Option; Every Fall & Summer) Focus on the uniqueness of the early adolescent and appropriate learning situations. For educators working with middle-level students.

CI 5422. Teaching Writing in Schools. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theory/practice of teaching writing in schools. How race, gender, and social class impact teaching/learning.

CI 5425. Reading Instruction in the Elementary Grades. (3 cr.; A-F or Audit; Every Fall & Spring) Curricular/methodological issues in teaching of reading. Reading/orthographic processes, strategy instruction for word recognition/comprehension, authentic assessment strategies, and teaching diverse students. prereq: [Elementary or early childhood] licensure student

CI 5426. Language Arts Instruction in the Elementary Grades. (3 cr.; A-F or Audit; Every Fall & Spring) Curricular/methodological issues of language arts. Oral language development, response to literature, writing processes, authentic assessment strategies. Teaching diverse students. prereq: Elementary or early childhood licensure student

CI 5431. Introduction to Instructional Leadership in K-12 Reading. (3 cr.; A-F or Audit; Every Summer) K-12 curriculum in reading. Major theories/research that motivate curriculum. Major instructional principles, alignments needed, resources available. prereq: Minnesota license valid for classroom teaching in pre-kindergarten. prerequisite: [adult basic education or grades kindergarten through 6 or 1 through 6 or 5 through 8 or 9 through 12 or kindergarten through 12]

CI 5432. Instructional Leadership in Reading in Kindergarten and the Elementary Grades. (3 cr.; A-F or Audit; Every Fall) Research-based reading instruction for elementary grades. How to help other teachers improve practice. Characteristics of effective schools within context of improving students. prereq: CI 5431

CI 5433. Instructional Leadership in Reading for the Middle and Secondary Grades. (3 cr.; A-F or Audit; Every Spring)

CI 5463. Minnesota Writing Project Annual Invitational Summer Institute. (3 cr.; A-F only; Every Summer) Workshop. Participants reflect on their own literacy processes, participate in a writing group, discuss current reading texts, and demonstrate best practices in classroom. prereq: Licensed teacher or administrator or [space available, faculty letter of recommendation]

CI 5464. The Politics of Literacy and Race in Schools. (3 cr.; A-F or Audit; Every Fall) Literacy and race in schools examined, especially how power plays out, and what are the possibilities for creating radical democratic forms of life. Conceptions of language, literacy, whiteness, and racial identities are explored. Topics include educators? talk and silence about race, Ebonics, and youth?s racial identities in global times.

CI 5465. Writing and Social Justice: A Minnesota Writing Project Open Institute. (3 cr.; Student Option; Every Summer) This course focuses on practices within literacy instruction as related to the current educational landscape and a theme of social justice. In this course, participants will focus on three areas: writing, teaching, and learning. Participants will reflect on their own writing processes as they write, share, and participate in a community of writers. Writing groups will meet several times during the course. Participants will also consider the theory and practice of writing instruction that helps students achieve their potential as writers and change agents. In addition, participants will investigate a literacy issue relevant to the course theme, social justice, and will present it as a research project or lesson. This course is offered for practicing teachers at all levels and across disciplines.

CI 5471. Clinical Experience in Teaching Secondary English. (3 cr.; A-F only; Every Fall) Initial licensure candidates in English Education will observe the teaching and learning experience in a school and classroom context; implement approaches, assessments, and philosophies learned about in corresponding methods courses; reflect upon the complexities of classroom life in a seminar format; and co-plan and co-teach a five-day unit. prereq: Must register same semester as CI 5441 and CI 5451.

CI 5472. Teaching Critical Media Analysis in Schools. (3 cr.; A-F or Audit; Every Fall & Spring) "Critical" media literacy means that we focus on, among other things, analyzing the intersection between media and issues of identity -- like gender, race, class and sexuality. We also focus on how to teach critical media analysis to students and others.

CI 5474. New Literacies Frameworks and Instruction: Digital Texts and Digital Reading. (3 cr.; A-F only; Every Fall) Read digital texts against backdrop of traditional print-based notions of reading, literacy, school curricula/instruction. Assists education professionals in making school/ district-wide decisions based on sound research on digital reading/new literacies.


CI 5483. Critical Literacy, Storytelling, and Creative Drama. (3 cr.; Student Option; Every Summer) This course examines how storytelling and creative drama can be used as tools to help develop students? critical literacy and to assist them in becoming more fluent readers and writers. Storytelling is a unique blend of performance, literature, and folklore. It engages personal and cultural identities and promotes creative thinking. Critical literacy is the ability to analyze the presentation of information and identify how it influences listeners and readers. Writing, performing, and analyzing narratives are, therefore, powerful means for developing critical literacy. In other words, critical literacy is the focus; theater and storytelling are the vehicles. Key topics to be covered include: 1) A historical background on fairy and folk tales, legends, tables, myths, and the different oral traditions; 2) Tools for developing a critical view of diverse tales; 3) Practical instruction on how to use storytelling and story genres in the classroom to develop critical literacy; 4) Assessing storytelling work in the classroom. Students will meet in the first week at the University to learn tools of the Neighborhood Bridges program and in the second week practice and observe each other?s teaching with local school classrooms. In the past we have worked with 4th graders and 6th graders, though we will also discuss how course content applies to high school students.

CI 5484. Improving Secondary English Language Arts Instruction: Seminar for Early Career Teachers Part I. (1.5 cr.; A-F only; Every Fall) This online course is designed for MEd students in Curriculum and Instruction who have recently earned the Communication Arts and Literature (English Language Arts) teaching license. The purpose of this course sequence is to improve teacher effectiveness through ongoing feedback from the instructor and other participants. The course will provide support through small group discussions and peer and instructor response. Key topics to be covered include: 1) frameworks for understanding teacher growth in ELA contexts; 2) developing an ELA classroom ecology; and 3) supporting and assessing student learning in the ELA Common Core Standards. This 1.5-credit course was designed in a sequence with CI 5485: Improving Secondary English Language Arts Instruction: Seminar for Early Career Teachers Part II, which is also 1.5 credits and offered in the following spring. prereq: Recently received Communication Arts and Literature (i.e., English Language Arts) teaching license.

CI 5485. Improving Secondary English Language Arts Instruction in the First Three Years: Part II. (1.5 cr.; A-F only; Every Spring) This course is designed for MEd students in Curriculum and Instruction who have recently earned the Communication Arts and Literature (English Language Arts) teaching license. The purpose of this course sequence is for secondary English Language Arts (ELA) teachers in their first three years to examine their practice in a collaborative community and to improve teacher effectiveness through ongoing feedback from the instructor and other participants. The course will provide support through small group discussions and peer and instructor response. This 1.5-credit course was designed in a sequence with CI 5484: Improving English Language Arts Instruction in the First Three Years: Part I, which is also 1.5 credits and taken in the previous fall. This second course in the sequence will focus on teacher-driven professional inquiry that participants began developing during the fall course. prereq: Successful completion of CI 5484.

CI 5493. Minnesota Writing Project Directed Studies. (1-3 cr.; A-F only; Every Summer) Directed study for teachers involved in MWP. Capstone course for those enrolled in the Certificate in Teaching Writing and Critical Literacy. Teachers investigate current theory and practice of literacy instruction. Ongoing cohort for those enrolled in the Certificate. prereq: Teaching license, [CI 5463 or enrolled in the Certificate for Teaching Writing and Critical Literacy] or instructor permission.

CI 5496. Directed Experiences in Teaching English. (4-8 cr.; S-N or Audit; Every Fall & Spring) Student teaching/c clinical experience for English Education (Comm Arts & Lit) initial licensure and middle level endorsement students. Credits vary depending on length of field experience and should be determined with your academic adviser. prereq: MED/initial licensure students in English ed only

CI 5502. Science Instruction in the Elementary Grades. (3 cr.; A-F or Audit; Every Fall & Spring) Methods/materials for teaching science/health at elementary school level. prereq: Early Childhood or Elementary Education ILP
CI 5511. Introduction to Secondary Science: Laboratory-based Instruction. (4 cr.; A-F only; Every Fall, Spring & Summer) Inquiry about teaching/learning, observing/analyzing instruction, reflecting on own/each other's science teaching. How to use various instructional techniques/methods.

CI 5512. Secondary Science Methods: Understanding the Nature of Science. (3 cr.; A-F only; Every Fall, Spring & Summer) Inquiry about teaching/learning, observing/analyzing instruction, reflecting on own/each other's science teaching. How to use various instructional techniques/reflect upon teaching. Develops understanding of equitable science teaching practices/safe student-centered classroom culture.

CI 5513. Secondary Science Methods: Equity in Science Teaching. (3 cr.; A-F only; Every Fall, Spring & Summer) Inquiry about teaching/learning, observing/analyzing instruction, reflecting on science teaching. How to use various instructional techniques, reflect upon professional growth using evidence from teaching. Identify goals/instruction plans for professional practice.

CI 5514. Secondary Science Methods: The Science Learning Environment. (2 cr.; A-F only; Every Fall, Spring & Summer) Inquiry about teaching/learning, observing/analyzing instruction, reflecting on science teaching. How to use various instructional techniques, reflect upon professional growth using evidence from teaching. Identify goals/instruction plans for professional practice.

CI 5515. Secondary Science Methods: Developing Adaptive Expertise. (3 cr.; A-F only; Every Fall, Spring & Summer) Lab-based science teaching in secondary school setting. Research-based teaching strategies are modeled that address national/state-level standards. How to use various inquiry-based instructional techniques/methods.

CI 5531. Secondary Science Methods II. (3 cr.; A-F or Audit; Every Fall) Methods of planning/teaching science to middle school students. Prereq: Initial licensure student in science ed and CI 5530 Secondary Science Methods I

CI 5532. Secondary Science Methods III. (3 cr.; A-F or Audit; Every Spring) Methods of planning/teaching science for secondary school students. Prereq: Admission to initial licensure program in science and CI 5531 Secondary Science Methods II

CI 5533. Current Developments in Science Teaching. (3 cr.; A-F or Audit; Every Summer) Using curriculum standards to design science courses. Prereq: Med, initial licensure, grad student, or instr consent

CI 5534. Studies in Science Education. (3 cr.; A-F or Audit; Every Fall) Improvement of science teaching through the application of research findings. Prereq: Med., init lic, or instr consent

CI 5535. Foundations of Science Education. (3 cr.; A-F or Audit; Every Spring) Analysis of present science teaching practices in light of historical and philosophical foundations of science education. Prereq: Med., grad student, or instr consent

CI 5536. Equity, Policy, and Assessment in Science Education. (3 cr.; A-F only; Every Fall) Nature of equity, diversity, and policy matters that influence schools/teachers involved in science teaching and scientific literacy. Classroom presentations, discussions, readings in current research, prereq: Med, or grad student, or instr consent

CI 5537. Principles of Environmental Education. (3 cr.; A-F or Audit; Every Fall) Critical review of Environmental Education, its history, theories, curricula, teaching methods, and assessment practices. Development of an exemplary unit plan for teaching environmental studies. Prereq: Undergrad in NRES or Med. or grad student in education or instr consent

CI 5538. Action Research in Science Education. (3 cr.; A-F only; Every Spring) This course is designed to accomplish several main goals for those enrolled: (1) articulate their own understanding of what it means for there to be equity in science education and how their personal interpretation aligns with existing frameworks for viewing equity; (2) become familiar with interactions between equity and educational policies, including standardized testing, school organization, and teaching preparation in Minnesota; (3) design and conduct an investigation around a classroom dilemma pertaining to an issue of equity.

CI 5540. Special Topics: Science Education. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Detailed examination and practice of the teaching of one area of science (e.g. geology, health, physical science) or one method of instruction (e.g. laboratories, demonstrations, Internet, simulations).

CI 5541. Teaching History and Nature of Science. (3 cr.; A-F or Audit; Every Fall) Understanding nature of science (NOS). Integrate/reflect on NOS in secondary science classroom. Historical cases/integrating NOS with science content/scientific inquiry. Prereq: Med ILP or professional studies student in science education or instr consent

CI 5551. Reflecting on Science Classroom Practices I. (1.5 cr.; A-F only; Every Fall) Students reflect on their instruction and student learning during first years of teaching. Monthly meetings, observations, online discussion.

CI 5552. Reflecting on Science Classroom Practices II. (1.5 cr.; A-F only; Every Spring) Students reflect on their instruction and student learning during first years of teaching. Monthly meetings, observations, online discussion.

CI 5556. CARLA Summer Institute Seminar. (1-4 cr. [max 16 cr.]; Student Option No Audit; Every Summer) The Center for Advanced Research on Language Acquisition (CARLA) offers a series of intensive summer institutes to provide timely professional development for foreign language and ESL educators throughout the country. The special topics offered under CI 5506 are designed to provide language teachers with the latest research-based information and best practices skill development as the field of language instruction evolves. Each institute is highly interactive and includes discussion, theory-building, hands-on activities, and plenty of networking opportunities with colleagues from around the world.


CI 5612. ESL Methods for Multilingual Development. (3 cr.; A-F only; Every Fall, Spring & Summer) Introduction to methods of developing reading, writing, speaking, listening skills among English learners in K-12. Reflect on beliefs/ideas, cultivate orientation towards reflective teaching/life-long learning.

CI 5613. Testing and Assessment for English Learners. (3 cr.; A-F only; Every Fall, Spring & Summer) Develop awareness/familiarity with policies, procedures, practices in use in attempting to determine academic readiness of students learning English as secondary language in American public schools.

CI 5614. Curriculum and Materials Development for English Learners. (3 cr.; A-F only; Every Fall, Spring & Summer) Explore role ESL teachers play in curriculum/materials development. Historical overview of
CI 5615. Academic English for English Learners: Planning, Assessment, Instruction. (2 cr.; A-F only; Every Fall, Spring & Summer) Prepar...to respond to learners' language development in the classroom. Participants begin with a brief review of theories of second language acquisition, and then work together to reflect on videos of learner language as it is produced by different kinds of learners. Institute participants work with instructors to identify specific features in these learners' language. Participants then apply those insights to their own classrooms by learning how to set up engaging, puzzle-solving activities that stimulate growth in learner language. Finally, participants learn how to design pre- and post-course measures that demonstrate the impact of their innovations in instruction on the growth of specific features and dimensions of learner language in their own classrooms.

CI 5631. Second Language Curriculum Development and Assessment. (1.5 cr. ; Student Option No Audit; Every Fall & Summer) Instruction/assessment of ESL and World Languages in the modalities of speaking, listening, reading, and writing. Backwards design, proficiency-oriented approach, use of content-based instruction. Planning for the integration of instruction and assessment. prereq: 5646, 5649 [or other course on the grammar of a language]

CI 5632. Literacy and Language Development in Second Language Classrooms. (3 cr.; A-F or Audit; Every Fall) Processes/instructional approaches in developing second language proficiency in the modalities of reading, writing, speaking, and listening and communicative modes (interpretive, presentational, interpersonal); development of literacy in a second language; planning L2 literacy instruction based on research on L1 and L2 literacy development; integration of instruction/assessment in language teaching. prereq: SLC initial licensure only

CI 5634. Content-Based Instruction in Second Language Settings. (3 cr.; A-F or Audit; Every Spring) Building on foundation from other courses in the sequence. Instruction/assessment of ESL and World Languages at the secondary level. Prepares students to connect language teaching with other content areas, analyze/address the academic language needs of English learners, and advocate for second language programs and students. prereq: SLC initial licensure only

CI 5653. Culture and Diversity in Second Language Classrooms. (3 cr.; Student Option; Every Spring) Teaching culture as content and including students' home cultures in the curriculum and diverse student needs. Needs of students of various educational, social, and cultural backgrounds/ways to develop academic success through instruction in learning strategies and other approaches to differentiation. prereq: Initial licensure program only

CI 5656. Developing Learners' Sociocultural Competence. (2 cr.; Student Option No Audit; Every Summer) Overview of how to incorporate a pragmatics component into second/foreign language curriculum to enhance learners' sociocultural competence. Includes approaches to teaching/evaluating pragmatics.

CI 5657. Creativity in the Second Language Classroom. (2 cr.; Student Option; Every Summer) This institute will examine the connection between multilingualism and creativity, and explore strategies to increase engagement in the classroom. This institute is designed for foreign language, ESL, and immersion teachers who want to promote creativity in their classroom while simultaneously improving learner's target language proficiency.
within the context of World Languages and ESL with a focus on their own teaching practices and student learning. Participants engage in online discussions, read, reflect, and create professional growth plans.

CI 5637. Problems of Practice in Second Language Education: Seminar for Early Career Language Teachers Part 2. (1.5 cr. ; A-F only; Spring Even Year) In this course, recently licensed practicing teachers continue to develop their skills as reflective practitioners within the context of World Languages and ESL with a focus on their own teaching practices and student learning. Participants engage in online discussions, read, reflect, and implement and report on professional growth plans. Prerequisite: Completion of CI 5636 or instructor consent.

CI 5641. Language, Culture, and Education. (3 cr. ; A-F or Audit; Periodic Spring & Summer) Applies current sociolinguistic and discourse theory/research to study of relationships between language and culture in educational settings: language curriculum and instruction; classroom language use; borders between school and home/community language use; and educational policies on literacy/second-language instruction.

CI 5642. Assessing English Learners. (3 cr. ; A-F or Audit; Spring Odd Year) Current practices concerning language and academic content assessment of English learners (ELs) at the school site, state, and national level; factors affecting academic learning needs of ELs/where assessment fits into that picture.

CI 5645. Teaching English Learners in the Elementary Classroom. (3 cr. ; A-F only; Every Fall, Spring & Summer) Benefits/challenges of working with English learners (ELs). Linguistically/culturally diverse students. Instructional practices/strategies for teaching ELs in elementary classrooms. Language learning/bilingualism: Cultural differences. prerequisite: Early Childhood or Elementary Education ILP

CI 5646. English Grammar for ESL Teachers. (3 cr. ; Student Option; Every Fall) English syntax from pedagogical perspective. Grammatical structures that challenge ESL learners. Analyzing learner errors. Issues/activities related to teaching grammar in ESL contexts. prerequisite: LING 5001 or instr consent

CI 5648. Advanced Practices in Teaching Academic Language. (3 cr. ; A-F only; Every Spring) Prepares K-12 teachers for student development of academic language proficiency. Read/discuss current research. Implement innovative teaching practices. prerequisite: Grad student, instr consent

CI 5649. Language Analysis for ESL Teaching in Higher Ed. (4 cr. ; Student Option No Audit; Every Spring) Overview of complex aspects of English grammar not covered in 5646. Academic uses of passives, indirect objects, conditionals, relative clauses, complementation, reported speech, deixis/reference, articles, prepositions, phrasal verbs, pragmatics. prerequisite: 5646

CI 5651. Foundations of Second Languages and Cultures Education. (3 cr. ; A-F or Audit; Every Fall) Historical overview of second language teaching/learning in U.S. introduction to second language acquisition. Second language instructional concepts across elementary, secondary/university options for foreign language, bilingual education, immersion language programs, and English as a second language programs. Theoretical frameworks for language instruction are tied to practice.

CI 5653. Methods in Teaching English as a Second Language (ESL) in Higher Education. (3 cr. ; Student Option No Audit; Every Fall & Spring) Theory/practice teaching academic English as second or foreign language in contexts of higher education. History of field/varied methods in language teaching. Current best practices in teaching academic English pronunciation, listening, speaking, reading, writing skills. prerequisite: An intro to linguistics course

CI 5654. Practice in Language Teaching: ESL and World Languages. (1-6 cr. ; S-N only; Every Spring) Practical, hands-on training in teaching of English as Second Language. Applying theoretical/descriptive material studied in prior course work. Discuss readings/research articles on SLA, applying theoretical/practical principles to specific critical classroom incidents.

CI 5656. Teaching Literacy in Second Language Classrooms. (3 cr. ; Student Option No Audit; Every Fall) Reading comprehension/composing processes in a second language; relationship between first and second literacy development; relationship between reading and writing; relationship of culture to reading comprehension and writing; politics of literacy; assessment of second language literacy; using technology to enhance literacy instruction.

CI 5657. Teaching Speaking and Listening in Second Language Classrooms. (3 cr. ; A-F or Audit; Spring Even Year) Theories/methods in teaching language as communication in oral/aural modes; planning student interaction; classroom organization for oral language learning/acquisition; using technology to enhance interaction; assessment of listening comprehension and oral communication.

CI 5658. Foreign Language Testing and Assessment. (3 cr. ; A-F or Audit; Spring Odd Year) For world language/EFL teachers. Aligning foreign language classroom instruction/assessment; language testing/assessment; classroom-based and large-scale proficiency testing/assessment; assessing proficiency in speaking, listening, reading, writing and communicative modes (interpretive, presentational, interpersonal); creation of formative/summative assessments; critique of contemporary assessment instruments.

CI 5660. Special Topics in the Teaching of Second Languages and Cultures. (1-4 cr. [max 12 cr.]; Student Option; Every Spring & Summer) Topics related specifically to the needs of the in-service teacher. Topics, location, credits, and duration are flexible.

CI 5662. Second Language Curriculum Design. (3 cr. ; A-F or Audit; Every Spring) Historical overview of curriculum development in second language education; contexts that influence curriculum development; models for curriculum development in second language settings; politics of curricular reform; national/state standards and implications for curriculum development; effects of technology on second language curriculum.

CI 5670. Foundations of Dual Language and Immersion Education. (3 cr. ; Student Option; Every Fall) Research foundations and program principles for dual language/immersion. Second language acquisition; critical features of program design/implementation; benefits/challenges of dual language/immersion; program assessment; advocacy. Theory/research for dual language/immersion tied to practical application. prerequisite: Enrollment in certificate program in dual language/immersion educ or instr consent

CI 5671. Curriculum Development and Assessment in Dual Language/Immersion Classrooms. (3 cr. ; Student Option; Fall Odd Year) Content-based language instruction and curriculum development for dual language, bilingual, and immersion contexts; balancing content/language goals/objectives in curriculum and instruction; integration of language, literacy content, and culture in curriculum; standards-based instruction; backwards design; assessment that aligns with content-based curriculum and instruction. prerequisite: instr consent

CI 5672. Language-Focused Instructional Practices and Strategies for Dual Language/Immersion Classrooms. (3 cr. ; Student Option; Every Spring) Counterbalancing content with integrated focus on language and literacy development for dual language, bilingual, and immersion classrooms. Materials development; proactive/reactive instructional techniques; noticing and awareness-raising strategies; structuring student language production; differentiating for content, ability, and language. prerequisite: instr consent

CI 5673. Immersion 101: An Introduction to Immersion Teaching. (2 cr. ; Student Option No Audit; Every Summer) Research-based introduction to issues for teachers, administrators, and district personnel in K-12 immersion education. One-way (foreign language), two-way (bilingual), and indigenous programs. Principles/practices that inform
language-attentive curriculum development/instruction.

CI 5676. Biliteracy Development in Dual Language/Immersion Classrooms. (3 cr.; Student Option; Spring Odd Year) This course aims to provide dual language, bilingual and language immersion educators with an understanding of the complex phenomena of literacy and biliteracy and with a range of instructional strategies for fostering literacy and biliteracy development in dual language/immersion classrooms.

CI 5693. Directed Study in Second Language Education. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Individual or group work on curricular, instructional, or assessment problems. prerequisites: instr consent

CI 5696. Practicum: Teaching World Languages and Cultures in Elementary Schools. (2-6 cr.; Student Option; Every Fall, Spring & Summer) Teaching and learning experiences in Second Languages and Cultures at the elementary-school level. Requires students to work in a public school setting. prerequisite: 5619, advisor approval; credits cannot be counted on a graduate degree program for endorsement candidates

CI 5697. Practicum: ESL in the Elementary School. (2-6 cr.; Student Option; Every Fall, Spring & Summer) Teaching/learning experiences in an English as a Second Language setting at elementary school level. Requires students to work in a public school setting. prerequisite: Adviser approval

CI 5698. Student Teaching in Second Languages and Cultures. (2-6 cr. [max 14 cr.]; Student Option; Every Fall, Spring & Summer) Student teaching in Second Languages and Cultures at the secondary level for teachers already licensed in another field. Requires students to work in a public school setting. prerequisite: Adviser approval; credits cannot be counted on a graduate degree program

CI 5699. Clinical Experiences in Second Languages. (3-12 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Teaching and learning experiences in elementary and secondary second language instructional settings. Includes a seminar held concurrently to support the student teaching experience. prerequisite: SLC initial licensure program only

CI 5702. Social Studies Instruction in the Elementary Grades. (3 cr.; A-F only; Every Fall & Spring) Content/organization of elementary social studies programs. Programs of understanding. Improving learning situation. prerequisite: Early Childhood or Elementary Education ILP

CI 5741. Introduction to Social Studies Education. (3 cr.; A-F only; Every Summer) Broad issues and themes related to social studies education, including societal context, rationale, and scope and sequence. Analysis and evaluation of selected teaching strategies, methods, and resources.

CI 5742. Advanced Methods of Teaching the Social Studies. (3 cr.; A-F only; Every Fall) Focus on developing a repertoire of instructional methods that support authentic pedagogy and assessment. Enhancing reading comprehension and writing skills in the social studies. prerequisite: Secondary social studies initial licensure student

CI 5743. The Social Sciences and the Social Studies. (3 cr.; A-F only; Every Fall) Development of instructional strategies and contexts for exploring the social sciences as disciplines at the secondary level; central concepts and generalizations; tools of inquiry; competing structures and theories; and the relative impact of multicultural and gender-fair perspectives on the nature of history and the social sciences. prerequisite: Secondary social studies initial licensure student

CI 5744. Seminar: Reflecting on Professional Development in Social Studies Education. (3 cr.; A-F only; Every Spring) Reflecting on teaching experience, examining social/cultural context of teaching/learning, developing a professional identity. Refining teaching and teacher research skills. prerequisite: Secondary social studies initial licensure student

CI 5745. Engaging Youth With Social Studies Texts. (3 cr.; A-F only; Every Spring) Ways to engage students (grades 5-12) in social studies (textbooks, literature, speeches, editorials, political cartoons, tables, graphs, maps, film.). Developing middle/high school students’ disciplinary literacy.

CI 5746. Global and Multicultural Education in the Secondary Classroom. (3 cr.; A-F only; Every Spring) Issues, classroom practices, and controversies surrounding global/multicultural perspective-taking in social studies education. Strategies for helping secondary social studies students develop global/multicultural worldviews.

CI 5747. Global and Environmental Education: Content and Practice. (3 cr.; A-F or Audit; Every Spring) Preparers educators for leadership responsibilities in the area of global environmental education. Focus on the knowledge and process skills necessary to carry out a leadership role in the curriculum.

CI 5762. Developing Civic Discourse in the Social Studies. (3 cr.; A-F or Audit; Periodic Spring & Summer) Philosophies, strategies, and research on developing civic discourse in secondary social studies classroom. Selecting issues. Democratic classroom climate. Relating to social/cultural contexts.

CI 5782. Clinical Experiences in Teaching Social Studies. (1-8 cr. [max 16 cr.]; S-N or Audit; Every Fall & Spring) Student teaching experiences for students preparing to become secondary social studies teachers. Teacher candidates work closely with social studies teachers in grades 5-12 to plan and implement engaging and meaningful learning experiences for middle and high school students. prerequisite: MEd/initial licensure student

CI 5811. Introduction to Teaching Secondary Mathematics. (4 cr.; A-F only; Every Fall, Spring & Summer) Introduction to teaching mathematics. Fundamental mathematical ideas/different ways children think about these ideas.

CI 5812. Teaching Algebra. (3 cr.; A-F only; Every Fall, Spring & Summer) Uses algebra as vehicle to discuss student learning trajectories, ways to measure students understanding, make instructional decisions to help students grow.

CI 5813. Teaching Geometry. (3 cr.; A-F only; Every Fall, Spring & Summer) Geometry/measurement ideas as vehicle to model ways to engage/manage students in more effective ways.

CI 5814. Teaching and Learning Mathematics. (3 cr.; A-F only; Every Fall, Spring & Summer) Topics require more sophisticated understanding of teaching based on first year experience/reflect deeper on teaching.

CI 5815. Leadership in Mathematics Education. (2 cr.; A-F only; Every Fall, Spring & Summer) Preparing to give back to profession as you grow in role as teacher leader.

CI 5822. Mathematics Instruction in the Elementary Grades. (3 cr.; A-F or Audit; Every Fall & Spring) Principles of learning mathematics in elementary grades. Objectives, content, philosophy, instructional materials, methods of instruction/evaluation. prerequisite: Early Childhood or Elementary Education ILP

CI 5980. Clinical Experiences for K-12 Teaching. (1-4 cr.; A-F only; Every Fall, Spring & Summer) Practical teaching/learning experiences in school setting. Includes co-teaching during student teaching and coaching/assessment by a university supervisor.

CI 5981. Introduction to Equity-Based Pedagogy. (1 cr.; A-F only; Every Fall, Spring & Summer) Introduces aspects of inequities in U.S. society/school. Examines how social class/poverty permeated education as social institution/classroom pedagogy. Covers five principles for social class-sensitive change/intersections between social class/other markers of difference.

CI 5982. Enacting Equity-Based Pedagogy. (2 cr.; A-F only; Every Fall, Spring & Summer) Extended study of inequities. Examines working-class literature for adults/children. Labor histories, economic systems, hierarchies of class, race, gender, sexuality, language in schools/communities.

CI 5983. Equity-Based Pedagogy/Advocacy. (1 cr.; A-F only; Every Fall, Spring & Summer)
Extends study of inequities in society. Five principles for social class-sensitive change. Intersections between social class/other markers of difference such as race, gender, sexuality, language.

CI 5984. Planning Design and Management. (1 cr.; A-F only; Every Fall, Spring & Summer) Foundational understanding of being teacher, developing culturally responsive classroom, designing learning experiences. Conceptualization of teacher nationally/locally, language in classroom. Foundational concepts/tools used when facilitating learning.

CI 5985. Academic Language and English Learners in the Content Areas. (1 cr.; A-F only; Every Fall, Spring & Summer) Prepares teacher candidates to work effectively with English learners/other linguistically diverse students across all content areas. Develop students’ academic language proficiency as needed for school success.

CI 5986. Foundations of Special Education. (1 cr.; A-F only; Every Fall, Spring & Summer) Skills to promote learning/success for all students, including those at risk for school failure/with special needs. Introduces research/ issues emphasizing collaborative problem solving approach that facilitates effective family-professional partnerships/educational programming for individuals with disabilities.

CI 5987. Child and Adolescent Development for Teaching, Learning, and Assessment. (1 cr.; A-F only; Every Fall, Spring & Summer) Cognitive, social, emotional development of childhood/adolescence. Ecological influences in development. Theories of learning/cognition, cognitive/social development, motivation, individual/group differences, testing/assessment, teaching methodologies, pragmatic issues.

CI 5988. Clinical Experience: Improvement of Teaching. (2 cr.; A-F only; Every Fall, Spring & Summer) Capstone project. Link theory/practice, integrate coursework with experiences in classroom.

CI 5993. Directed Study in Family, Youth, and Community. (1-3 cr. [max 9 cr.]; A-F only; Every Fall, Spring & Summer) Self-directed study in areas not covered by regular courses. Specific program of study is jointly determined by student and advising faculty member. prereq: instr consent

CI 8075. Seminar: Art Education. (2 cr.; A-F or Audit; Periodic Fall & Spring) Reports, evaluation of problems, and review of recent literature. prereq: Educ grad student or instr consent

CI 8079. Research in Art Education. (3 cr.; A-F or Audit; Periodic Fall) Current research agenda. Helps students identify research questions and choose appropriate methodologies. prereq: Educ grad student or instr consent

CI 8085. Narrative Inquiry in Education. (3 cr.; Student Option; Spring Even Year) Through readings and activities focused on published studies and articles, students explore theory/application of two narrative research forms, narrative analysis—in which stories of informants are collected and analyzed, and narrative construction—in which researchers compose qualitative data collected in research settings into the form of stories.

CI 8089. Problems: Art Education. (1-12 cr.; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance; may include advanced studio practice and educational issues requiring a research methodology. prereq: Grad art educ major or instr consent

CI 8111. Representations of Knowledge in Curriculum and Culture. (1-3 cr.; Student Option; Periodic Fall) Overview of research and theory on sociology of knowledge and education. Conceptions of knowledge in curriculum; connections between cultural conditions and curriculum design and implementation; influence of national political agendas, popular culture, mass media, and textbooks on curriculum in diverse educational settings. prereq: Grad student or instr consent

CI 8115. Curriculum and Achievement Outcomes in a Diverse Society. (3 cr.; A-F or Audit; Periodic Fall) Analysis of American public school experiences for students of African-American, Hispanic, Asian, and American Indian background; social, political, regional, and educational variables that influence student outcomes; perspectives concerning ethnic student achievement; factors influencing school achievement, and prospects for change. prereq: Doctoral student

CI 8121. Curriculum Change: Perspectives, Processes, and Participants. (3 cr.; Student Option; Periodic Fall) Examination of curriculum within educational organizations; educational organization as mediator and transmitter of societal/cultural perspectives; implications of organizational context for curriculum change, change processes, and change participants. prereq: CI grad student or instr consent

CI 8127. Curriculum Theory and Research: Alternative Paradigms and Research Methods. (3 cr.; Student Option; Periodic Fall) Traditions of inquiry, exemplary studies, and associated research methods; survey and assessment of topics and methods as applied to curriculum questions; and relationships between theory and research. prereq: CI grad student or instr consent

CI 8131. Curriculum and Instruction Core: Critical Examination of Curriculum in Context. (3 cr.; A-F or Audit; Periodic Fall & Spring) Central concepts, ideas, and debates in professional field of curriculum. Curriculum in general education. prereq: CI PhD or MA student or instr consent

CI 8132. Curriculum and Instruction Core: Teaching Theory and Research. (3 cr.; A-F or Audit; Every Fall & Spring) Overview of research on teaching: historical perspective, modern research/findings, implications for practice/research. prereq: CI PhD or MA student or instr consent

CI 8133. Research Methods in Curriculum and Instruction. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Survey of educational research methods, comparison of underlying assumptions/procedures. prereq: CI PhD or MA student or instr consent

CI 8134. Foundations of Research in Curriculum and Instruction I. (3 cr.; A-F or Audit; Every Spring) This Foundations of Research course is the first of a two-course sequence required for PhD students in Curriculum and Instruction. The course is designed to ground students in qualitative and quantitative paradigms and epistemology and prepare students for specialized methodology courses that focus on specific research approaches in education.

CI 8135. Foundations of Research in Curriculum and Instruction II. (3 cr.; A-F or Audit; Every Spring) This Foundations of Research course is the second of a two-course sequence required for PhD students in Curriculum and Instruction. The course is designed to ground students in qualitative and quantitative paradigms and epistemology and prepare students for specialized methodology courses that focus on specific research approaches in education.

CI 8145. Using Mixed Methods in Educational Research. (3 cr.; A-F or Audit; Every Fall & Spring) Conceptual issues surrounding design/use of mixed methods in addressing problems/research questions in education. Critique of select mixed design exemplars published in respected research publications/practical application of analyses of data using mixed inquiry methods. prereq: 8133, 8148, OLPD 8812 or equiv. [CI PhD student or instr consent], additional quantitative/qualitative methodology courses recommended

CI 8146. Critical Ethnography in Education. (3 cr.; A-F or Audit; Spring Odd Year) Theoretical/methodological foundations. Possibilities and problems for understanding inequality/disparities in education. Research design, data collection, analysis, writing. prereq: MA or PhD student or Inst consent

CI 8147. Critical Discourse Analysis in Educational Research. (3 cr.; A-F or Audit; Fall Odd Year) Students apply CDA methods to analysis of written, visual, and spoken texts in social settings such as schools, families, and communities. prereq: [MA or PhD] student

CI 8148. Conducting Qualitative Studies in Educational Contexts. (3 cr.; Student Option; Every Spring) Qualitative research methods. Ethnography, sociolinguistics, symbolic interactionism. Observation. prereq: CI 8133 and [CI or OLPD PhD student]
CI 8149. Qualitative Research: Coding, Analysis, Interpretation, and Writing. (3 cr.; A-F or Audit; Periodic Fall)
How to code/analyze field notes. Individual/group interviews, multimedia using NUDIST NVivo software. Students interpret analyzed material and complete an article length document that includes a review of related research/methodology. prereq: [8133, 8148, grad student, completion of a qualitative research study] or instr consent

CI 8150. Research Topics in Curriculum & Instruction. (3 cr.; max 9 cr.; A-F only; Periodic Spring & Summer)
Special topics, current research trends in curriculum and instruction. Research review, subject integration, curriculum contexts, development, implementation, data collection, analysis, evaluation.

CI 8151. Paradigms and Practices in Teacher Preparation. (3 cr.; A-F or Audit; Fall Even Year)

CI 8152. Teacher Learning and Professional Development. (3 cr.; A-F or Audit; Fall Odd Year)
Theoretical/empirical work on teacher learning, professional communities, teacher inquiry, perspectives on outcomes of professional development, and policy recommendations for supporting teacher learning. Research methodologies. prereq: Grad student

CI 8153. Research Approaches to Classroom Discourse. (3 cr.; A-F or Audit; Fall Even Year)
This course introduces students to major traditions in analysis of classroom discourse, anthropological linguistics, conversational analysis, sociocultural, critical discourse and multimodal discourse analysis and their use in conjunction with other qualitative approaches to classroom research. Analysis of genre, gesture, and verbal performance are also addressed.

CI 8154. Culturally Relevant Pedagogy. (3 cr.; A-F or Audit; Fall Even Year)
Research on relationship between home and school cultures. Education of students of color. Culture, including experiences/practices of students' homes. Cultural approaches for improving teaching, transforming society.

CI 8155. Immigrant Families and U.S. Schools. (3 cr.; A-F or Audit; Fall Odd Year)

CI 8156. Asian American Education. (3 cr.; A-F or Audit; Spring Even Year)

CI 8159. Culture and Teaching Colloquium. (3 cr. [max 6 cr.]; A-F or Audit; Every Fall)
Doctoral seminar. Interdisciplinary perspectives on theme central to cultural study of teaching. Theme varies year to year.

CI 8161. Research Experience I: Study Design and Planning. (3 cr.; Student Option No Audit; Every Fall)
Students identify research topic, conduct literature review, refine research questions, design study, obtain IRB approval as needed, and begin data collection. Readings, seminar discussions, peer critique of work, prereq: [8134, 8135, 6-12 cr. of research methodology, CI PhD student] or instr consent

CI 8162. Research Experience II: Data Analysis and Manuscript Preparation. (3 cr.; Student Option No Audit; Every Spring)
Students complete data collection/analysis, prepare research manuscript. Seminar discussions, critical examination of their own and peers' work. prereq: CI 8161

CI 8165. Queer and Feminist Theories: Collective Memory Research Methods. (3 cr.; A-F only; Spring Even Year)
Seminar for advanced graduate students to work with queer and feminist theories in what is broadly constructed as educational research. We consider post-modern theoretical work that recognizes the "rational" being and the mind/body dichotomy as constructions which reproduce existing structures. Collective memory writing is explored as a research method.

CI 8166. Seminar in Teaching in Colleges of Education. (3 cr.; Student Option; Periodic Fall)
Goals, instructional strategies, evaluation procedures, and professional considerations. prereq: CI PhD student or instr consent

CI 8195. Problems: Improvement of Instruction. (1-6 cr.; Student Option; Every Fall & Summer)
Independent research in curriculum and instruction. prereq: instr consent

CI 8196. Practicum in Teaching in Colleges of Education. (1-3 cr.; S-N only; Periodic Fall & Spring)
Practicum experience for graduate students to learn how to teach a college level course through a supervised, mentored experience. Supervised teaching occurs in an education course at the University or other institution.

CI 8197. Problems: Curriculum Studies. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall)
Directs students to completing Plan B paper for M.A. degree. prereq: MA student

CI 8198. Problems: Teacher Education. (1-6 cr. [max 12 cr.]; Student Option; Every Spring)
Independent research. prereq: instr consent

CI 8201. Critical Theories of Growth and Change in Elementary Education. (3 cr.; Student Option; Every Fall & Spring)
This course provides students with the opportunity to 1) trace, historically, how growth and change has been theorized in elementary schooling with particular focus on how the role of the teacher and the curriculum have been constructed; 2) analyze a "contingent, recursive" conception of growth and change called for by socio-cultural theorist, Nancy Lesko, and further developed by scholars of elementary education; and 3) re-imagine conceptions of growth and change in elementary schooling using other theoretical perspectives (e.g., feminist, culturally relevant, queer, social class-sensitive).

CI 8202. Elementary Education Colloquium. (3 cr.; Student Option; Fall Even, Spring Odd Year)
In this course, students will consider how elementary education has been and continues to be imagined as a scholarly field of study, with particular focus on how the field is seen as a fluid intellectual space in which scholars study broad philosophical, political, and social ideas, issues, and concerns as they take concrete (lived) shape in the schooling, cultures, and pedagogies of elementary schooling.

CI 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Master's student, adviser approval, DGS approval

CI 8350. Special Topics in Learning Technologies. (2-3 cr. [max 6 cr.]; Student Option; Periodic Fall)
Topics in learning technologies. Topics and credits are flexible.

CI 8361. Advanced Courseware and Design: Issues. (3 cr.; A-F or Audit; )
Examination and critique of existing research. Students identify a research topic, write a literature review, plan a study, and present a research proposal.

CI 8371. Applied Social Network Analysis in Education. (3 cr.; Student Option; Spring & Summer Odd Year)
This course examines the application of Social Network Analysis in various educational settings. As a methodology, Social Network Analysis (SNA) is concerned with social affiliations and interactions in social structures of all kinds. SNA has garnered significant interests in educational research and has been applied to investigating a myriad of educational phenomena such as student friendship, school choice, and classroom discourse. This course is organized into four major components including: (1) foundations of social network perspectives in education; (2) techniques for collecting social network data in educational settings; (3) techniques for analyzing and visualizing social networks; and (4) practical guidelines on conducting SNA research in educational contexts, with considerations to education theories, ethics, and real-world implications.

CI 8391. Learning Technologies Seminar. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
This seminar course offers an advanced exploration and critique of contemporary research in the field of learning technologies;
Individual research. prereq: instr consent

CI 8511. Seminar: Research in Science Education. (1-2 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Students and faculty present research projects for comment and critique. Special topics may also be considered. prereq: CI grad student or instr consent

CI 8541. History and Philosophy of Engineering and Engineering Education. (3 cr. : A-F only; Every Fall) History and philosophy of engineering/ engineering education. Critical reflection/ analysis of philosophical, epistemological, historical arguments. prereq: PhD or MA student or instr consent

CI 8542. Modeling and Model-Based Reasoning in STEM Education. (3 cr. : A-F or Audit; Every Fall & Spring) Models/modeling perspectives for engineering, mathematics, and science education. Theorists/researchers that shaped STEM model-based reasoning. Discussions, individual/group presentations, small-group activities. prereq: STEM Education PhD or MA student or instr consent

CI 8570. Advanced Topics in Science Education. (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Examination/critique of current research topics, methods, and issues. prereq: instr consent

CI 8571. Equity, Policy, and Social Justice in Science Education. (3 cr. : Student Option No Audit; Every Fall) Interactions of issues of diversity, equity, policy, and social justice as related to science education. Diverse perspectives on purposes/ scope of science education. Consequences for diversity, equity, access, social justice, empowerment, and educational policy. prereq: Science ed or STEM grad student or instr consent

CI 8572. Learning Theory and Classical Research in STEM Education. (3 cr. : A-F only; Fall Odd, Spring Even Year) STEM education research. Theorists/classical research. Mathematics, science, engineering education. prereq: Grad math educ major

CI 8573. Nature of Inquiry in STEM Education. (3 cr. : A-F only; Every Fall & Spring) STEM Education. Mathematics, science, engineering. Teaching/ learning/teacher education through cognitive, affective, and metacognitive. teaching standards, current research, current cognitive theories of learning. prereq: MA or PhD student or instr consent

CI 8574. History and Philosophy of Science in Education. (3 cr. : A-F only; Fall Odd Year) This course introduces students to STEM education the historical and philosophical theories, ideas, principles, and events in science and how they inform science education at the K-12 level. Students learn contributions of philosophers in understanding what science and how history of science and scientific events have influenced the growth of science. Nature of Science, historical contributions of women in science, and sociological nature of science inform larger discussions that take place in this class.

CI 8594. Conducting Research in Science Education. (3 cr. : Student Option; Periodic Fall) Application of research methodology to a specific science education issue. prereq: sci educ research course

CI 8595. Problems: Science Education. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Independent research. prereq: CI grad student or instr consent

CI 8645. Indigenous Language Revitalization and Activist Research Methods. (3 cr. : A-F only; Fall Even Year) This course is a hands-on look at activist research methods situated in the context of Indigenous Language Revitalization. That is, what happens when a community problem is the organizing force in research? Students will be expected to both engage in language learning, research, designing a research project, and connecting this to critical thinking as applied to culture, language and indigenous language revitalization.

CI 8650. Seminar: Special Topics in Second Languages and Cultures Research. (1-3 cr. [max 6 cr.]; Student Option; Periodic Fall & Summer) Research topics vary. prereq: CI grad student or instr consent

CI 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

CI 8671. Sociolinguistic Research Approaches to Education. (3 cr. [max 6 cr.]; A-F only; Spring Odd Year) This course provides students with an overview of current research approaches, theories, and methods in linguistic anthropology and interactional sociolinguistics with a focus on educational contexts and linguistic diversity. Course activities include reviewing and critiquing current research and theory in the field and working on small projects.

CI 8689. Language and Education Policy. (3 cr. [max 6 cr.]; A-F or Audit; Every Spring) Students will gain a solid understanding of language policy theory, language policy research methods, and key empirical findings. They will acquire skills to critically analyze and evaluate language policy, and gain experience and academic practice in doing so.

CI 8691. Readings in Second Languages and Cultures Education. (1-3 cr. ; Student Option; Every Fall & Spring) Independent reading. prereq: instr consent
CI 8695. Problems: Second Languages and Cultures Education. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Independent research. prereq: instructor consent

CI 8741. History and Theory of Social Studies Education. (3 cr. [max 6 cr.]; A-F or Audit; Every Spring) History/theory of social studies education in United States. Organization, subject matter, methods of instruction.

CI 8742. Seminar: Research in Social Studies Education. (3 cr.; A-F or Audit; Every Spring) Critical review and analysis of seminal research studies; criteria for appraising research findings; educational implications. prereq: CI grad student or instructor consent

CI 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD

CI 8795. Problems: Social Studies Education. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Independent research. prereq: CI grad student or instructor consent

CI 8796. Research Internship in Social Studies Education. (1-6 cr.; A-F or Audit; Every Fall, Spring & Summer) Internship with social studies education faculty member; experience in collecting and analyzing data; drafting and presenting reports; writing for publication. prereq: CI grad student

CI 8888. Thesis Credits: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credits: Doctoral prereq: Max 18 cr per semester or summer; 24 cr required

CI 8900. Family, Youth, and Community Colloquium. (1-4 cr.; S-N only; Periodic Fall & Spring) Theories, philosophies, practices, pedagogies, epistemologies, and public policies not dealt with in regular courses. Content varies by offering. prereq: [MA or PhD] student

CI 8913. Interpretive Research. (3 cr.; A-F only; Every Fall) Hermeneutic, ethnmethodological, and phenomenological research methodologies. Ethics, evaluation, and usefulness of interpretive research. Practice in conducting interpretive research.

CI 8914. Critical Science Research. (3 cr.; A-F only; Every Spring) Origins, influences, characteristics, and central concepts. Distinction between critical science and other action research. Requisite skills/ knowledge for conducting critical science research, using that knowledge in a project.

CI 8994. Directed Research in Family, Youth, and Community. (1-6 cr.; A-F only; Every Fall, Spring & Summer) TBD prereq: Family, Youth, and Community student doing Plan B research

Dakota (DAKO)

DAKO 1121. Beginning Dakota I. (5 cr.; Student Option; Every Fall) Listening, speaking, reading, writing. Oral drills, in-class participation focused on questions/answers.

DAKO 1122. Beginning Dakota II. (5 cr.; Student Option; Every Spring) Further development of language acquisition skills. Oral drills, in-class participation focused on questions/answers. prereq: 1121

DAKO 3123. Intermediate Dakota I. (5 cr.; Student Option; Every Fall) Listening, speaking, reading, writing. Oral drills, in-class participation focused on questions/answers. prereq: 1121, 1122, 3123

DAKO 3124. Intermediate Dakota II. (5 cr.; Student Option; Every Spring) Listening, speaking, reading, writing. Oral drills, in-class participation focused on questions/answers. prereq: 1121, 1122, 3123

DAKO 3125. Introduction to Dakota Linguistics. (3 cr.; Student Option; Every Fall) Structure of Dakota, including phonology, morphology, syntax, and semantics. prereq: 3124

DAKO 3127. Dakota Language for Teachers. (3 cr.; A-F only; Every Fall) Dakota language for teachers. Methods of teaching Dakota language in the classroom. prereq: 1121

DAKO 4121. Beginning Dakota I. (3 cr.; Student Option; Every Fall) Language acquisitions skills, oral drills. In-class participation focuses on questions/answers. prereq: [1122, 1004] in another language or passing score on LPE or grad student

DAKO 4122. Beginning Dakota II. (3 cr.; Student Option; Every Spring) Further development of language acquisition skills. Oral drills, in-class participation focused on questions and answers. prereq: [1121, 1004] in another language or passing score on LPE or grad student

DAKO 4123. Intermediate Dakota I. (3 cr.; Student Option; Every Fall) Listening, speaking, reading, writing. Oral drills. In-class participation focuses on questions/answers. prereq: 1121, 3123, 5126

DAKO 4124. Intermediate Dakota II. (3 cr.; Student Option; Every Spring) Listening, speaking, reading, writing. Oral drills. In-class participation focuses on questions/answers. prereq: 1121, 1122, 3123

DAKO 5126. Advanced Dakota Language I. (3 cr. [max 12 cr.]; A-F or Audit; Every Fall) Focuses on immersion method.

DAKO 5129. Advanced Dakota Language II. (3 cr. [max 12 cr.]; A-F or Audit; Every Spring) Focuses on immersion method.

DAKO 5226. Dakota Mastery I. (3 cr. [max 6 cr.]; Student Option; Every Fall) This content-based Dakota language class will focus on Dakota culture and history. Students will learn through both oral and written texts. Both traditional and contemporary stories will be discussed and utilized to give students a better view of Dakota ontology and epistemology. The effects of colonization and the need for decolonization will be also be discussed through the lens of Dakota stories and culture.

Dance (DNCE)

DNCE 1001. Modern/Contemporary Dance Technique 1. (1 cr.; Student Option; Every Fall & Spring) First course in ten-section sequence of modern dance technique. Introductory modern dance technique training. Dance form varies according to instructor.

DNCE 1002. Modern/Contemporary Dance Technique 2. (1 cr.; Student Option; Every Spring) Second course in ten-section sequence of modern dance technique. Introductory modern dance technique training. Dance form varies according to assigned instructor. prereq: 1001 or audition or instructor consent

DNCE 1010. Modern/Contemporary Dance Technique 3. (1-2 cr. [max 4 cr.]; Student Option; Every Fall) Third course in ten-section sequence of modern dance technique. Beginning modern dance technique training. Dance form varies by instructor. prereq: dept consent, audition

DNCE 1020. Modern/Contemporary Dance Technique 4. (1-2 cr. [max 4 cr.]; Student Option; Every Spring) Fourth course in ten-section sequence of modern dance technique. Beginning modern dance technique training. Dance form varies by instructor. prereq: 1010, dept consent, audition

DNCE 1030. Athletic Movement for Dance. (1 cr. [max 3 cr.]; Student Option; Periodic Fall & Spring) This course explores athletic movement and its applications to dance training. Athletes and dancers are the focus of this course. Class work will emphasize: agility, dexterity, hand-eye coordination, 360 degree body motion, strong alignment/skeletal understanding in motion, holistic strength training and stamina.

DNCE 1040. Modern Dance Partnering Technique. (1 cr. [max 2 cr.]; A-F only; Every Spring) Technical demands, approaches, and skills needed for partnering in modern dance. prereq: Dance major or instructor consent

DNCE 1101. Ballet Technique 1. (1 cr.; Student Option; Every Fall & Summer) Principles, basic technique, and vocabulary of ballet; barre, center, and allegro.

DNCE 1102. Ballet Technique 2. (1 cr.; Student Option; Every Spring) Second of two-semester sequence of fundamental Classical Ballet Technique. Principles of Classical Ballet technique. Each principle introduced separately/in progression. Barre/center work with emphasis on simplicity, repetition, creativity. prereq: 1101, or audition, or instructor consent
DNCE 1100. Ballet Technique 3. (2 cr. [max 4 cr.]; Student Option; Every Fall)  
First of two-semester sequence of beginning ballet technique. Level 3 in eight-level sequence of ballet technique. Practical application of ballet principles. Barre work needed for center work. Center work will consist of adagio, basic turns, petit, grand allegro. prereq: dept consent, audition

DNCE 1120. Ballet Technique 4. (2 cr. [max 4 cr.]; Student Option; Every Spring)  
Second of two-semester sequence in beginning ballet. Practical application of ballet principles. Barre/center work. Ever-changing combinations/steps learned in previous level. prereq: 1110, dept consent, audition

DNCE 1201. Jazz Technique 1. (1 cr.; Student Option; Every Fall & Summer)  
First of six-semester sequence of jazz dance. Fundamental jazz vocabulary/movement. Basic understanding of proper body placement, clear articulation, basic mechanics of jazz movement, rhythmic footwork. Improvisation will be introduced. Overview of history of jazz music/dance styles.

DNCE 1202. Jazz Technique 2. (1 cr.; Student Option; Every Spring)  
Second of six-semester sequence in jazz dance. Fundamental jazz vocabulary/movement. Clear articulation of movement, use of space, weight, dynamics, focus, style, musicality. Improvisation. Overview of history of jazz music/dance styles. prereq: 1201 or instr consent

DNCE 1210. Jazz Technique 3. (1 cr. [max 2 cr.]; Student Option; Every Fall)  
Third of six-semester sequence of jazz dance. Vocabulary. Technical skills using variety of jazz dance styles while increasing flexibility, groundedness, strength. Increase understanding of musicality, dynamics, style, improvisation. prereq: dept consent, audition

DNCE 1220. Jazz Technique 4. (1 cr. [max 2 cr.]; Student Option; Every Spring)  
Fourth of six-semester sequence of jazz dance. Expand vocabulary/develop skills, technique, style. Increase flexibility, strength. Use of space, clear articulation of movement, rhythmic footwork, grounding movement, dynamics, musicality. prereq: 1210, dept consent, audition

DNCE 1301. Tap Technique 1. (1 cr.; Student Option; Every Fall & Summer)  
Learning fundamental terms, basic rhythm structures, stock steps, and standard time steps.

DNCE 1302. Tap Technique 2. (1 cr.; Student Option; Every Spring)  
Fundamental terms, basic rhythms and syncopation, stock steps, and standard time steps; clarity of sound and rhythm. prereq: 1301 or instr consent

DNCE 1313. African Based Movement. (1 cr.; Student Option; Every Fall & Spring)  
Varied movement of African diaspora, primarily but not limited to West African region and continent of Africa. Traditional movement. Movement inspired by Africa, the Caribbean, and African diaspora at large. In-class movement participation, one movement midterm, one two-page paper.

DNCE 1315. Flamenco. (1 cr.; Student Option; Every Fall, Spring & Summer)  
Basic Spanish Flamenco dance technique with focus on rhythm, footwork, body style. Choreography incorporating techniques learned. Live flamenco guitar accompanies classes.

DNCE 1323. Swing Dance. (1 cr.; Student Option; Every Fall & Spring)  
Traditional swing dances popular in the United States from 1930s through early 1960s. Each week new movements/figures are taught and previous dances reviewed. Students are expected to change partners.

DNCE 1327. Argentine Tango. (1 cr.; Student Option; Every Fall)  
Basic rhythms emphasizing posture, axis, walking, lead/follow techniques, footwork patterns. Students listen to music to identify rhythm, communicate.

DNCE 1331. Yoga. (1 cr.; Student Option; Every Fall, Spring & Summer)  

DNCE 1332. Yoga for Dancers. (1 cr.; Student Option; Periodic Fall & Spring)  
Physical experience and related aesthetic topics. Historical aspects. Philosophical ideas of yoga. Improving body mechanics through alignment, flexibility, and strength. Developing mental focus/control. Reinforcing positive body language.

DNCE 1335. Tai Chi Ch’uan. (1 cr.; Student Option; Every Spring & Summer)  

DNCE 1343. Urban & Street Dance Forms 1: Introduction. (1 cr.; Student Option No Audit; Periodic Fall)  
We study the origins of Hip Hop dance and how it has evolved to the current incarnations of the form. There is also a focus on Hip Hop culture as a whole and we have many discussions about issues of identity, relation to power, appropriation, and youth culture. The specific forms of movement in this course are toprocking, rocking, breakdancing (breaking), New Jack Swing, and house dance. Some questions to focus on: What is Hip Hop dance? Where does it originate? Who created Hip Hop artistic expressions? What voices/bodies are heard/seen or not heard/not seen in the films assigned?

DNCE 1344. Urban & Street Dance Forms 2: Advanced Foundation and Histories. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)  
In this second course in the dance program’s 4-semester Urban and Street Dance sequence, students further investigate the technical foundations and histories of rocking, breaking, funk styles, krump, house, and specific techniques that mix these forms together. These further explorations focus on more advanced techniques, aesthetic approaches, and complex issues within these forms. Students are assigned readings and writing assignments that critically examine each issue. Students will participate in an informal showing at the end of the semester. Prerequisite: completion of DNCE 1343 or audition.

DNCE 1345. Alexander Technique for Movement Artists. (2 cr.; Student Option No Audit; Every Spring)  
Increased kinesthetic awareness of habitual movement patterns in order to improve dance/movement technique and prevent related injuries.

DNCE 1349. Contact Improvisation. (1 cr.; Student Option; Every Fall, Spring & Summer)  
Safe, clear introduction to principles of contact improvisation. Rolling point of contact, supporting/being supported, falling/recovering, connecting with center as source/support for movement. Classes include warm-up.

DNCE 1351. African Diasporic Movement 1. (1 cr.; Student Option No Audit; Every Fall)  
First of six-course sequence. Introduction to traditional West African dance technique as a foundational base to begin learning technique, body placement, movement, space, time, energy, isolations, patterns, etiquette, community building, group work and presentation.

DNCE 1352. African Diasporic Movement 2. (1 cr.; Student Option No Audit; Every Spring)  
Second of six-course sequence. Builds on level 1 by further developing in complexity technique movement, poly-rhythm, levels, undulation, combinations, dynamics. Relationship between dance/drum, energy expressing. prereq: 1351 recommended

DNCE 1353. African Diasporic Movement 3. (1 cr.; Student Option No Audit; Every Fall)  
Third of six-course sequence. Afro-Brazilian dance, including jumps, turns, floor work, and rhythmicity to develop flexibility, strength, and vocabulary in polycentric movement, moving toward body-sound harmony, illuminating dynamics of coordination, relaxation, breathing, undulation.

DNCE 1354. African Diasporic Movement 4. (1 cr.; Student Option No Audit; Every Spring)  
Fourth of six-course sequence. Builds on level 3 by exploring movement from mythologies of Afro-Brazilian belief systems ori/?? and Candombi/??. How corporeal knowledge and technique fluency through the course sequence support different dance techniques. prereq: 1353 or audition or instr consent

DNCE 1401. Introduction to Dance. (AH; 3 cr.; Student Option No Audit; Every Fall & Spring)  
What is dance? How does movement create meaning? Dance as action and framework for analysis of moving bodies. Movement politics of race, class, gender, sexuality, and...
DNCE 1500. Topics in Dance. (2-3 cr. [max 10 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Topics specified in Class Schedule.

DNCE 1601. Dance Improvisation. (1 cr.; A-F or Audit; Every Fall)
Individual ways of moving linked to fundamental elements of dance: time, space, and energy. Metered time, musical phrasing. Movement speed, shape, and quality. Creative process, individual movement vocabulary, structural devices in dance. prereq: Concurrent registration in a modern dance technique course, dept consent

DNCE 1626. Music for Dance. (AH; 3 cr.; Student Option; Every Fall)
Cultural gravity of the Western perspective. Ways global regions express natural laws of acoustics through music while considering historical, political, and ethical issues around the relationship between music and dance. Workshops, practice, and exercises. prereq: dept consent

DNCE 1914. Latinx Moves: The Politics of Salsa, Race, and Migration. (3 cr.; Student Option No Audit; Periodic Fall & Spring)
Jennifer Aniston’s character performs salsa in Along Came Polly and hopeful contestants dance it on So You Think You Can Dance, so how can salsa be a political act? This course considers the politics of salsa dancing. We will look closely at race and migration as we write, read, and dance salsa. Class time is evenly devoted to studio and seminar settings because reading about the politics of salsa can inform our dance practice, and dancing salsa can inform how we understand what we read. In the studio students will engage in movement activities that critically examine salsa through dance making and dance technique (such as partnering, rhythm, displacement, turns, awareness of other bodies, and improvisation). We will relate practices of salsa in the studio to the critical discussion of readings and movies in the seminar room. We will develop skills that will help us to closely analyze dancing bodies and the social meanings of salsa practices. Come prepared to read, write, dance, and discuss course topics. No dance experience necessary.

DNCE 3010. Modern/Contemporary Dance Technique 5. (2 cr. [max 4 cr.]; Student Option; Every Fall)
Fifth course in ten-section sequence of modern dance technique. Application of principles of space, time, energy. Alignment, power from pelvic center, rotation/turnout, muscular tonality, joint articulation, clarity of intent, stretch, strength, stamina. prereq: 3010, dept consent, audition

DNCE 3110. Ballet Technique 5. (2 cr. [max 4 cr.]; Student Option; Every Fall)
Stretch, strength, balance, musicality. Longer phrases in adagio/allegro work. More complex elevations in petit allegro. Practical work conducted in context of study of technical development of ballet. prereq: dept consent, audition

DNCE 3120. Ballet Technique 6. (2 cr. [max 4 cr.]; Student Option; Every Spring)

DNCE 3220. Jazz Technique 5. (1 cr. [max 2 cr.]; Student Option; Every Fall)
Continuation of jazz technique. Rhythm structures, longer phrases, greater physical speed, attack/control. prereq: dept consent, audition

DNCE 3300. Tap Technique 3. (1 cr. [max 2 cr.]; Student Option; Every Fall & Summer)
Tap techniques and creative development through improvisational studies. prereq: 1302 or instr consent

DNCE 3301. Tap Technique 4. (1 cr.; Student Option; Every Spring)
Tap techniques and rhythm structures. prereq: 3301 or instr consent

DNCE 3311. Contemporary Indian Dance 1. (1 cr.; Student Option No Audit; Periodic Fall)
First in two-course sequence. Odissi classical Indian dance, martial movement Chhau, iyengar yoga. Students deconstruct, extend and interweave these to create contemporary South Asian form. Footwork, hip flexion, torso movement, breath, rhythmic complexity. prereq: instr consent

DNCE 3312. Contemporary Indian Dance 2. (1 cr.; Student Option No Audit; Periodic Spring)
Second in two-course sequence. Odissi classical Indian dance, martial movement Chhau, iyengar yoga. Students deconstruct, extend and interweave these to create contemporary South Asian form. Footwork, hip flexion, torso movement, breath, rhythmic complexity. prereq: 3311 or instr consent

DNCE 3334. Introduction to Dance/Movement Therapy. (2 cr.; Student Option; Every Fall & Spring)
Historical/theoretical perspectives on use of movement/dance in relationship to psychology/healing. D/MT pioneers/techniques. Applications of D/MT with various populations/settings. Experiential course. prereq: dept consent

DNCE 3337. Body Mind Centering. (2 cr.; Student Option; Every Fall, Spring & Summer)
Improvisational movement explorations, hands-on re-patterning work. Direct experience of the way mind (desire, attention, intention) is expressed through various body systems. Students use imagery, touch, and anatomical information to access a range of inner sensations and movement experiences. Emphasizes each individual’s unique experience of the body.

DNCE 3341. African Urban & Street Dance Forms 3: Emerging Scholar. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring)
This is the third course in the Dance Program’s 4-semester Urban and Street Dance sequence. It focuses on intermediate/advanced techniques in rocking, breaking, funk styles, krump, house, and specific techniques that mix these forms together. These further explorations focus on more advanced techniques, aesthetics, and complex issues within forms practiced by instructors. Students are assigned readings, videos, and writing assignments to think critically about each issue. There is an informal showing at the end of the semester. prereq: Completion of DNCE 2341 or audition.

DNCE 3342. Urban & Street Dance Forms 4: Scholar. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring)
This is the final course in the Dance Program’s 4-semester Urban and Street Styles sequence. It focuses on advanced techniques in rocking, breaking, funk styles, krump, house, and specific techniques that mix these forms together. These further explorations focus on advanced techniques, aesthetics, and complex issues within forms practiced by instructors. Students are assigned readings, videos, and writing assignments to think critically about each issue. There is an informal showing at the end of the semester. Prerequisite: Completion of DNCE 3341 or audition.

DNCE 3351. African Diasporic Movement 5. (1 cr. [max 2 cr.]; Student Option No Audit; Every Fall)
Rigorous practice. West African techniques. Cardiovascular endurance of students will improve as a result. Live drummers, students can expect to learn drum parts to enhance the understanding of the rhythms. prereq: 1354 or audition or instr consent

DNCE 3352. African Diasporic Movement 6. (1 cr. [max 2 cr.]; Student Option No Audit; Every Spring)
Dances performed by dance companies of Guinea through the use of more complex and deep rhythms such as Yamama, Doundounba, Baho and Tiribah. Rigorous practice. West African techniques. Live drummers. prereq: DNCE 3351 African Diasporic Movement 5 or audition or instructor consent

DNCE 3401W. Dance History 1. (GP, WI; 3 cr.; Student Option; Every Fall)
Historiography of dance, 20th century through present. Reconstruction/incorporation of dance practice in context of globalization. Artistic choices as influenced by complex history of performing arts and terrain of body/politics.
DNCE 3402W. Dance History 2. (WI; 3 cr.; Student Option; Every Spring) History/theory of dance in varied forms/aspects. From development of ballet through 20th century modern dance. Second half of year-long survey. prereq: 3401W

DNCE 3411. Dance and Popular Culture: Choreographing Race, Class, and Gender. (DDJ; 3 cr.; Student Option; Every Spring) How race, class, and gender become aestheticized and are put into motion as popular culture. Choreographic analysis of moving bodies. How “popular” affects understanding of culture. Exoticism, binary structures of stereotypes, identity, hegemony.

DNCE 3433. Articulate Body. (3 cr.; Student Option; Every Spring) Lectures and movement sessions in biodynamic considerations for optimal dance performance and metabolistic demands of dance. prereq: Dance major, dept consent

DNCE 3434. Nutrition and Body Maintenance for Movement Artists. (2 cr.; Student Option No Audit; Every Spring) Students learn and research ways to improve nutrition and remain injury-free throughout career and beyond. Discuss nutrition principles and apply to unique challenges, needs, interests of movement artists. Examine anatomy of movement to develop constructive injury prevention and management strategies. Stress reduction.

DNCE 3487W. Dance and Citizenship: Land, Migration, and Diaspora. (WI; 3 cr.; Student Option; Every Fall) Dance/performance as practiced/transformed by minority groups in the United States. Migration as a global phenomenon, particularly pertaining to land disputes, labor distribution, political asylum, refugee, and dislocation.

DNCE 3495. Dance and Global Tourism. (GP; 3 cr.; Student Option No Audit; Every Fall) Political economy of the dancing body and its role in the representation of nation-states through global tourism. Dance and its relationship to belonging, nationalism, and the politics of art and tradition. Prereq: Jr or sr

DNCE 3500. Topics in Dance. (1-3 cr. [max 6 cr.]; A-F or Audit; Every Fall, Spring & Summer) Topics specified in Class Schedule.

DNCE 3601. Dance Composition 1. (3 cr.; Student Option; Periodic Spring) Movement, vocabulary in relation to theme, space, time, energy, and body parts; solo, duet, and trio forms. prereq: 1020, 1601, concurrent regis in a modern dance technique course, dept consent

DNCE 3602. Dance Composition 2. (3 cr.; Student Option; Every Fall) Movement, vocabulary in relation to theme, space, time, energy, and body parts. Solo, duet, and trio forms. prereq: 3601, dept consent, concurrent regis in a modern dance technique course

DNCE 3621. Dance Production I. (2 cr.; A-F or Audit; Every Fall) Technical/administrative aspects of dance production. Lighting, costumes, sound, marketing, stage management, fundraising, publicity. Emphasizes practical project management and personal management skills. Prereq: Dance major, dept consent

DNCE 3622. Dance Production II. (2 cr.; A-F or Audit; Every Spring) Continuation of 3621. Students produce the spring Student Dance Concert. prereq: 3621, dance major, dept consent

DNCE 3700. Performance. (1 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Creation or reconstruction of a dance theatre work under the direction of a guest artist or faculty member. Work is performed at the end of the rehearsal period. Prereq: Concurrent enrollment in a technique course, audition, dept consent

DNCE 3701. Summer Dance Intensive. (1-3 cr. [max 6 cr.]; Student Option No Audit; Every Summer) Real-world experience with a professional dance company. Students participate in daily technique and repertory classes culminating in an informal performance. Artists are arranged year-by-year.

DNCE 3901. Career Readiness in Dance. (3 cr.; Student Option; Every Spring) Strategies fundamental to a dancer’s survival. Injury prevention/care. Development of healthy dietary and muscular/skeletal habits. Career tracks. Prereq: Dance major, dept consent

DNCE 4443. Theorizing Dancing Bodies. (3 cr.; Student Option; Every Fall) Major developments in Western philosophic thought on dance and dance theory, from its beginnings to present. Prereq: 3402W or instr consent

DNCE 4601. Dance Composition 3. (3 cr.; Student Option; Periodic Spring) Continuation of movement vocabulary through improvisation, analysis of form and structure, experimentation with tone and performance persona. Effects of lights/costumes/text/props/music; development of larger ensemble works. prereq: 3602, concurrent regis in a modern dance technique course, dept consent

DNCE 4602. Dance Composition 4. (3 cr.; Student Option; Every Fall) Continuation of 4601. Movement vocabulary through improvisation, analysis of form and structure, experimentation with performance persona, and the effects of technical elements. Development of larger ensemble works. Prereq: 4601, concurrent registration is required (or allowed) in modern dance technique course, dept consent

DNCE 4901. Capstone Seminar for Dance. (1-2 cr.; S-N or Audit; Every Fall) Development of senior project, alone or in groups, under guidance of faculty members. Prereq: Sr. [Dnce or Th major]

DNCE 5010. Modern/Contemporary Dance Technique 7. (2 cr. [max 4 cr.]; Student Option; Every Fall) Continuation of 5010. Musicality, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet. Prereq: 5110, dept consent, audition

DNCE 5020. Modern/Contemporary Dance Technique 8. (2 cr. [max 4 cr.]; Student Option; Every Spring) Continuation of 5020. Performance range/style. Students study with various guest artists. Prereq: 5020, dept consent, audition

DNCE 5030. Modern/Contemporary Dance Technique 9. (2 cr. [max 6 cr.]; A-F or Audit; Every Fall) Ninth course in ten-section sequence of modern dance technique. It focuses on pre-professional technique training for students prepared for that level of technical achievement and readying themselves for a potential career as contemporary dance professionals. All Dance Program Modern Dance Technique courses examine the practical application and understanding of principles of space, time, and energy focusing on alignment, weight, momentum, power for the body’s core, joint and skeletal articulation, clarity of focus and intent, flexibility, strength, stamina and energy flow and lines through the use of breath appropriate to the technical level of the course. The course also explores a range of performance strategies that students may encounter for future performance experiences within the dance program and beyond.

DNCE 5040. Modern/Contemporary Dance Technique 10. (2 cr. [max 6 cr.]; Student Option; Every Spring) Tenth course in ten-section sequence of modern dance technique. It focuses on pre-professional technique training for students prepared for that level of technical achievement and readying themselves for a potential career as contemporary dance professionals. All dance program modern dance technique courses examine the practical application and understanding of principles of space, time, and energy focusing on alignment, weight, momentum, power for the body’s core, joint and skeletal articulation, clarity of focus and intent, flexibility, strength, stamina and energy flow and lines through the use of breath appropriate to the technical level of the course. The course also explores a range of performance strategies that students may encounter for future performance experiences within the dance program and beyond.

DNCE 5110. Ballet Technique 7. (1 cr. [max 2 cr.]; Student Option; Every Fall) Continuation of ballet technique. Musicality, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet. Prereq: dept consent, audition

DNCE 5120. Ballet Technique 8. (1 cr. [max 2 cr.]; Student Option; Every Spring) Continuation of 5110. Musicality, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet. Prereq: 5110, dept consent, audition

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
DNCE 5334. Introduction to Dance/Movement Therapy. (2 cr. ; Student Option; Every Spring) Historical/theoretical perspectives on use of movement/dance in relationship to psychology/healing. D/MT pioneers/techniques. Applications of D/MT with various populations/settings. Experiential course. prereq: dept consent

DNCE 5443. Theorizing Dancing Bodies. (; 3 cr. ; Student Option; Every Fall) Major developments in Western philosophic thought on dance and dance theory, from its beginnings to present. prereq: instr consent

DNCE 5454. (Re)Writing the Dancing Body. (; 3 cr. ; Student Option; Every Spring) Modes of writing found in dance studies. Oral histories, historical documentation, performance reviews, performance ethnographies, scholarly essays. Discussion/critique of existent modes of writing. Writing/rewriting practice. prereq: Grad student

DNCE 5493. Choreographing Social Justice: Staging "Equitable" Choreographies. (; 3 cr. ; A-F only; Every Spring) Possibilities and implications of artistic work. Metaphoric bodily practices and intersections of performance and social justice practices. Theories and histories of intersections within communities of color across global North and South. Group project. prereq: 4443 recommended

DNCE 5495. Dance and Global Tourism. (; 3 cr. ; Student Option No Audit; Every Fall) Politics of dance/performance for tourism industry. Ways in which dancing body produces ideas of nation-state. How this reflects stereotypes of female identity in global context. prereq: Grad student

DNCE 5500. Topics in Dance. (; 1-3 cr. [max 30 cr.]; Student Option; Periodic Fall, Spring & Summer) Topics specified in Class Schedule.

DNCE 5601. Dance Composition 5. (; 1-2 cr. ; Student Option; Every Spring) Final part of six-semester sequence in dance composition. Exploration of movement through independently scheduled rehearsals. Choreographic concepts. Tools in dance creation, development/refinement of movement, structure of group choreography. prereq: 4601, 4602, dept consent

DNCE 5700. Performance. (; 1 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Technique, improvisation, choreography, music, design, and technical production as they relate to dance performance. prereq: concurrent registration is required (or allowed) in technique course, dept consent

DNCE 5858. Dance Pedagogy. (; 3-4 cr. ; Student Option; Every Fall) Teaching dance provides the foundational pedagogy and methods for artful and responsible teaching and learning in dance. Students will examine key dance education theories and quality teaching practices, and then apply the theories by developing and teaching dance lessons. The course introduces tools that assist in the planning, teaching, assessing, and sharing of dance experiences with children, adolescent, and adult learners in a variety of settings. Specific learning opportunities include: readings, investigation and discussion of dance pedagogy; the creation of lesson plans; teaching labs (in-class and off-site supervised practice teaching); and clinical observations where students can observe the theory in practice.

DNCE 5993. Directed Studies. (1-4 cr. [max 10 cr.]; Student Option; Every Fall & Spring) Guided individual study. Prereq-instr consent, dept consent, college consent.

Data Science (DSCI)

DSCI 5994. Directed Research. (1-3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Directed Research

DSCI 8760. Data Science M.S. Plan B Project. (3 cr. [max 6 cr.]; S-N only; Every Fall, Spring & Summer) Project arranged between student and faculty.

DSCI 8970. Data Science M.S. Colloquium. (1 cr. ; S-N or Audit; Every Fall) Recent developments in Data Science and related disciplines. Students must attend 13 of the 15 lectures.

DSCI 8991. Independent Study. (1-3 cr. [max 6 cr.]; Student Option; Every Fall) Independent study with professor. prereq: instr consent

Denmark's Int'l Study Program (DIS)

DIS 1001. Beginning Danish I. (; 3-5 cr. ; A-F or Audit; Every Fall, Spring & Summer) Speaking/understanding skills for everyday situations, using family or collegium as point of departure. Reading, writing, grammar.

DIS 1002. Beginning Danish II. (; 3-5 cr. ; A-F or Audit; Every Fall, Spring & Summer) Speaking/understanding skills for everyday situations. Using family or collegium as point of departure. Reading, writing, grammar.

DIS 1003. Intermediate Danish I. (; 3-5 cr. ; A-F or Audit; Every Fall, Spring & Summer) First semester of second-year Danish, using increasingly difficult texts and written assignments.

DIS 1004. Intermediate Danish II. (; 3-5 cr. ; A-F or Audit; Every Fall, Spring & Summer) Continues intermediate Danish I at more advanced level.

DIS 3120. Hans Christian Andersen. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Life/works of Andersen. Analysis of selected texts. Andersen as writer in European romantic tradition.

DIS 3211. European Art of the 20th Century: From Expressionism to Postwar Art. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Major artistic concepts, 1900-1950. Expressionism, cubism, abstract art, surrealism.

DIS 3212. European Art: From Impressionism to Abstract Art. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Emphasizes post-World War II film history of France, Italy, Germany, Great Britain, the Soviet Union, and Scandinavia. Basic facts methods of film comprehension, film analysis, and general film history.

DIS 3214. Contemporary European Film: the Individual and Society. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Representative themes in contemporary European film concerning attitudes in social, political, and artistic issues in France, Germany, Great Britain, Italy, Sweden, and other countries.

DIS 3230. History of European Film. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Main facets of European film from Renaissance to present, its development in social/artistic context. Visits to Royal Danish Ballet.

DIS 3320. Dickens and Andersen: Romanticism, Realism, and Modernism. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Comparative reading of Dickens and Andersen. Touches on European literary romanticism, realism, and modernism.

DIS 3321. Nationalism and Minorities in Europe. (; 3 cr. ; A-F or Audit; Every Fall, Spring & Summer) Introduction to major figures in Scandinavian literature since 1870. "Modern breakthrough." Literature as vehicle raising social/human problems and as expression of Scandinavian character and world view.
Problems of European security. Emphasizes issues resulting from end of Cold War. Search for new European security order. Emergence of security threats such as nationalism and minority issues.

**DIS 3334. Russia under Putin.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Past/current developments. Attempts to look into future: How will Russia develop politically, economically, and militarily?

**DIS 3341. The Jews in Europe from the Middle Ages to the Present.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) History, culture, and beliefs of the Jewish populations in Eastern and Western Europe, mostly from 18th century to present.

**DIS 3342. The Impact of Epidemic Disease upon European History.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) How epidemic disease has been a powerful factor in shaping attitudes, belief systems, institutions, and policies (e.g., public health).

**DIS 3343. Environmental History of Europe.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) European history, Ice Age-present, from ecological perspective. Theories of environment as determining factor in historical development.

**DIS 3344. 20th Century European History.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Main periods/trends in European history, from end of 19th century to present. Interplay of political, social, and ideological developments.

**DIS 3421. Kierkegaard: Philosophy and the Meaning of Life.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Kierkegaard’s view on relationship of personal existence to art, society, philosophy, and religion.

**DIS 3422. Making of the Modern Self.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Introduction to Kant, Hegel, Nietzsche, Heidegger, and others. Trying to find meaning in a world that no longer offers one answer to the question, “What is a human being?”

**DIS 3423. Biomedical Ethics.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) What are ethical criteria for evaluating biotechnology? How far do we want to legislate “life”? How can such legislation be enforced?

**DIS 3431. Danish Politics and Society.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Analyzes politics, economics, and society of contemporary Denmark.

**DIS 3433. The European Union.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) European unification, from its inception in early 1990s to its ongoing development today.

**DIS 3441. Brain Functioning and the Experience of Self.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Relationship between biological, psychological, and social factors that contribute to human functioning and the individual’s experience of self-in-the-world.

**DIS 3442. Developmental Psychopathology.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Risk, resilience, and psychopathology in children’s development. Bridges gap between developmental psychology and abnormal psychology.

**DIS 3451. Nordic Mythology.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Myths, cults, and traditions of pre-Christian Nordic peoples as expressed in contemporary literature, eye-witness reports, and art. Emphasizes Viking period. All readings in modern English translations.

**DIS 3511. Criminal Justice in Scandinavia.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Ideology of crime control and criminal justice administration in Scandinavia, with a North American point of reference. Emphasizes Scandinavia’s liberal criminal policy and fairly modest crime rate.

**DIS 3620. Architecture Foundations Studio.** (6 cr.; A-F or Audit; Every Fall, Spring & Summer) Elements of architectural design: principles of structure, process of design, composition of form, functional resolution, language of architectural graphics, presentation of projects in drawings/models.

**DIS 3621. Architectural Design Studio.** (6 cr.; A-F or Audit; Every Fall, Spring & Summer) Combines small-group/individual research, programming, and design in relation to Danish regional conditions. Field visits (e.g., buildings, housing areas, construction sites).

**DIS 3622. Architectural Interior Design Studio.** (6 cr.; A-F or Audit; Every Fall, Spring & Summer) Builds on Architectural Design Studio I, with increasing independence in programming/evaluating projects.

**DIS 3623. 20th Century Danish Architecture.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Danish architecture in historical, political, and social/architectural context. Relation of Danish architecture to Scandinavian/international architecture.

**DIS 3624. Contemporary European Architectural Theories.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Complexities of contemporary architecture. Comprehensive foundation for students’ own work.


**DIS 3626. Visual Journal.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Seminar. Students develop Journal as tool for analyzing (e.g., architectural solutions, urban spaces). Skill-building in observation, and in recordings of physical environment and individual objects.

**DIS 3627. Urban Design Journal.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Experiencing, analyzing, and recording urban landscape, its fabric, spatial elements, and individual components, through a journal.

**DIS 3628. Scandinavian Design and Architecture.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Overview of Scandinavian design/architecture. Historical/current conditions of architecture, urban design, and planning from architectural, social, and political points of view.

**DIS 3630. Furniture Design Studio and Workshop.** (6 cr.; A-F or Audit; Every Fall, Spring & Summer) Process of furniture making. Students develop/refine a concept, produce working drawings, and build a wood or steel model.

**DIS 3631. Furniture Design in Scandinavia.** (3-6 cr.; A-F or Audit; Every Fall, Spring & Summer) Introduction to furniture design in Scandinavia. Focuses on Denmark. Current/historical conditions of furniture. Design theories/methodologies.

**DIS 3641. Digital Design in Scandinavia.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Aspects of history, theory, and practice of Scandinavian design. Philosophical, economic, and political trends that affect practice of design in a global perspective.

**DIS 3730. International Finance in a European Context.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Exchange rate determination, inflation rates, interest rates. Managing exchange-rate risk. Financial/investment decisions made by multinational companies. Issues related to European Economic and Monetary Union.

**DIS 3740. European Business Environment: the EU.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) European Union in terms of basic business-related functions, institutions, policies, issues, and implications for international business operations/competitiveness. Required study tours.

**DIS 3742. Environmental Business Strategy.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) “Green management” experience. Action of advanced European companies in face of international environmental regulation, EU opportunities/instruments for industry, and management theory.

**DIS 3760. Global Business Strategy: European Approaches.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Strategic response of European business managers to recent international economic developments.

**DIS 3761. Human Resource Management in Europe.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
DIS 3820. European Business Environment: the EU. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
European Union in terms of basic business-related functions, institutions, policies, issues, and implications for international business operations and competitiveness. Includes required study tours.

DIS 3821. Marine Biological Research Project. (6 cr.; A-F or Audit; Every Fall, Spring & Summer)
Research project with practical field components. Students use scientific libraries of various research institutions, engage in discussions/seminars with leading Danish/German scientists, and conduct experiments on research ship and at marine biological laboratory.

DIS 3822. Ecology and Human Impact in the North and Baltic Seas. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Ecosystems of North/Baltic Seas. How natural/human activities threaten their integrity. Given in Copenhagen area, with study tour in northern/western Denmark.

DIS 3823. Biology of Marine Mammals. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)

DIS 3824. Ecotoxicology: Principles and Practice. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Introduction to fate/effects of toxic chemicals in ecological systems.

DIS 3825. Intensive Ecotoxicology Laboratory: Introduction to International Tests and Assays. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Hands-on experience of standard ecotoxicological test methods used internationally.

DIS 3826. Biophysical Basis of Ecophysiology. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Introduction to biophysics and biophysical chemistry as basis for biologist's understanding of physiological processes.

DIS 3827. Element and Energy Cycling in Ecosystems. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Major element cycles/processes that regulate flow/transformation of elements/energy in ecosystems.

DIS 3828. Intensive Field Course: Carbon Cycling in Danish Forest and Fjord Ecosystems. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Students use/evaluate classic ecological techniques for measuring carbon flow/transformations in terrestrial/aquatic ecosystems on coast of Denmark.

DIS 3830. Marine Biology of European Coastal Waters. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Marine biology of Baltic/North Seas. Coastal waters, interactions between organisms and their environment, methods to investigate biological systems. Students conduct simple experiments during field trips in Denmark.

DIS 3901. Religion in Crisis. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3902. New Members of the European Union. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3903. International Marketing and Branding Field Project. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3904. Economic Theories of Globalization. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3905. The Context of Danish History. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3906. Children in a Multicultural Context: Practicum. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3907. Children in Multicultural Context: Theory. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3908. Migrants, Minorities, and Multiculturalism. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3909. American Popular Culture. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3910. Health Care in Scandinavia. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3911. Human Health and Disease. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3912. Muslims in the West. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3913. Sociology of European Families. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3914. International Law in a European Perspective. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3915. Independent Study. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3917. Masterpieces of Russian Literature. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3918. Communication Across Cultures in Europe. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3919. Decision Making in the European Union. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3920. Sustainable by Design. (3 cr.; A-F only; Every Fall, Spring & Summer)

DIS 3921. European Urban Design Theories. (3 cr.; A-F only; Every Fall, Spring & Summer)

Dental Hygiene (DH)

DH 2111. Dental Anatomy, Embryology & Histology. (3 cr.; A-F only; Every Fall)
Structural microscopic anatomy of oral hard/soft tissues. All deciduous/permanent teeth, including tooth form, function, and relationship to oral health. Tooth development, calcification, eruption, and exfoliation patterns. Ideal static occlusion, dental terminology, tooth annotation systems. Learning activity includes identification/annotation of teeth, dental histology, embroylogy, and anatomy.

DH 2121. The Dental Hygiene Care Process Clinical Application I. (5 cr.; A-F or Audit; Every Fall)
Dental hygiene care process. Assessment principles related to medical and oral health status, dental hygiene clinical procedures, and development of instrumentation skills. prereq: DH student

DH 2132. Head and Neck Anatomy. (2 cr.; A-F or Audit; Every Fall)
The anatomical structures of head and neck as they relate to the practice of dental hygiene and dental therapy.

DH 2212. Communication for Oral Health Providers. (2 cr.; A-F only; Every Spring)
The study of effective communication strategies within healthcare settings with emphasis on the oral health provider-patient relationship. Application of health literacy concepts and behavior change theory as components of evidence-based decision making in a variety of practice settings.

DH 2215. Oral Histology and Embryology. (3 cr.; A-F or Audit; Every Spring)
Development of orofacial region. Structural microscopic anatomy of oral hard/soft tissues applicable for rendering clinical treatment. prereq: DH student

DH 2211W. Periodontology. (WI; 3 cr.; A-F only; Every Spring)
This course introduces periodontal diseases; etiology, assessment, and treatment options. It includes clinical experience in debridement, root planing with ultrasonic and hand instruments. (3 credits) prereq: DH student

DH 2222. Dental Hygiene Care Process Clinical Application II. (4 cr.; A-F or Audit; Every Spring)
In this class you will begin to apply your knowledge of the various preventive products, patient education, assessment data and medical histories to clinical practice. You will develop application skills in fluoride treatments and pit and fissure sealants as well as the evaluation of products used in the treatment of dental caries and periodontal diseases. This class will also give you an introduction to the School of Dentistry’s clinical systems, various medical and emergency conditions affecting patient care and preventive strategies for oral diseases.

DH 2225. Microbiology, Immunology, and Oral Health. (3 cr.; A-F only; Every Fall)
Encounters with microorganisms are part of everyday life for humans, both as pathogenic and non-pathogenic entities. During this microbiology course students will learn characteristics of microbial life for bacteria, viruses, parasites, and fungi. An emphasis will be placed on microorganisms that are commonly found in the oral cavity. An introduction to the human immune system and its function in regulating infections will be presented. Students will gain an understanding of both commensal microbiota and pathogenic microorganisms, and how their impact on human health. Additionally, students will begin to convey scientific data and research results to non-scientists as a basis for discussing disease prevention, infection management, and treatment plans in a clinical setting. prereq: dental hygiene student

DH 2231. Cariology and Applied Nutrition in Dental Hygiene Care. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) The study of dental caries etiology, pathology and prevention, and the applied principles of diet and nutrition to dental hygiene patient care with skills in dental dietary counseling. Course content also includes a comprehensive review of CAMBRA. Cariology and Applied Nutrition in Dental Hygiene Care is designed to provide the beginner level dental hygiene student with a knowledge base in cariology and nutrition as it applies to the oral cavity. The implementation of this knowledge is Dental Dietary Counseling with a dental hygiene patient. DH 2231 relies on the communication skills developed in DH 2212.

DH 3121. Local Anesthesia and Pain Management. (2 cr.; A-F only; Every Summer) Concepts in the administration of local anesthesia, nitrous oxide-oxygen sedation, and other methods of pain management. Anatomy, physiology, pharmacology, patient assessment, indications and contraindications, selection of agents, injection techniques, complications, emergency management, and legal/ethical considerations. Lecture, lab, clinical. Clinical sessions include actual experience in administering local anesthesia and other methods of pain management. The administration of local anesthesia will be taught to clinical competency. The didactic component of nitrous oxide-oxygen sedation will be completed in this course with clinical experiences occurring in the Faculty Practice Clinic and in subsequent clinical rotations leading to clinical competency in this method of pain management.

DH 3123. The Dental Hygiene Care Process Clinical Application III. (4 cr.; A-F only; Every Summer) Dental hygiene planning for caries prevention and control, non-surgical periodontal therapy and tobacco cessation. Case presentation, ergonomic and clinical experience in dental hygiene patient care. prereq: DH student

DH 3125. General and Oral Pathology. (2 cr.; A-F or Audit; Every Fall, Spring & Summer) This course covers topics in pathology related to dentistry and the oral cavity. Oral benign/malignant tumors, infectious, inflammatory, and immunologically mediated lesions/diseases are covered.

DH 3126. Oral and Maxillofacial Radiology Clinic I. (0 cr.; A-F or Audit; Every Fall & Summer) Radiographic Technique. Exposing radiographs on skulls, interpretation, panoramic/extrarodial technique, quality assurance procedures. prereq: DH student

DH 3133. Pharmacology. (2 cr.; A-F or Audit; Every Summer) Principles of pharmacology, physical/chemical properties of drugs, modes of administration, therapeutic/adverse effects, drug actions/interactions. prereq: DH student

DH 3134. Pediatric Dentistry. (1 cr.; A-F or Audit; Every Summer) Knowledge, skills, and attitudes required for providing dental hygiene care for pediatric patients. prereq: DH student

DH 3151. Oral and Maxillofacial Radiology. (2 cr.; A-F or Audit; Every Spring) General principles of radiology, radiation physics, dosimetry, biology, radiation protection, regulations, recent concepts of imaging, and radiographic anatomy. prereq: DH student

DH 3191. Independent Study. (0 cr.; A-F only; Every Fall & Spring) Clinical experience in dental hygiene care. prereq: DH student

DH 3211. Biomaterials and Principles of Restorative Techniques I. (4 cr. [max 8 cr.]; A-F only; Every Summer) This course is for dental hygiene students to learn theory and/or hands on practice of dental restorative materials. Students will practice the manipulation and placement of various dental materials in permanent and primary typodont prepared teeth, and they will also learn and practice the selection process and placement of stainless steel crowns on primary typodont teeth. prereq: DH student

DH 3224W. Dental Hygiene Care Process: Clinical Application IV. (WI; 6 cr.; A-F only; Every Fall) Clinical experience in dental hygiene care. prereq: DH student

DH 3227. Oral and Maxillofacial Radiology Clinic II. (2 cr.; A-F or Audit; Every Fall) Exposing patient radiographs, interpretation, panoramic/extrarodial technique, and quality assurance procedures. prereq: DH student

DH 3228. Ethics and Jurisprudence for the Dental Hygienist. (1 cr.; A-F only; Every Fall) Ethical decision making, jurisprudence. prereq: Dental hygiene student


DH 3328. Ethics and Jurisprudence for the Dental Hygienist. (1 cr.; A-F only; Every Fall) Ethical decision making, jurisprudence. prereq: Dental hygiene student

DH 4105. Dental Professional Development. (1 cr.; A-F only; Every Spring) Dental Hygiene Course Description Skills to effective practice management and strategic decision-making, promoting mutual trust and respect in all interpersonal interactions, with an emphasis on the roles of a collaborative dental team. Dental Therapy Course Description Interprofessional course. Organizational, managerial, and financial systems that affect successful dental practice.

DH 4125W. Dental Hygiene Care Process: Clinical Application V. (DSJ; 6 cr.; A-F only; Every Spring) Social justice of health/oral health care in U.S. How race/class/gender impact resources? Dental hygiene treatment in diverse patient population.

DH 4135W. Research Methods in Dental Hygiene. (WI; 3 cr.; A-F only; Every Spring) Develop skills in the scientific method and critiquing scientific literature. Emphasis is on place evidence-based decision-making, types of research and research design, problem identification and hypothesis development, analyzing individual components of journal articles in relation to research principles, and writing the literature review. Fulfills writing intensive requirement. prereq: DH

DH 4136. Periodontology I Lecture. (1 cr.; A-F or Audit; Every Spring) This course will provide information regarding the surgical phase of periodontal therapy, including select topics in implantology. The course also emphasizes the evaluation of periodontal treatment, periodontal maintenance care, and the relationship between periodontics and other disciplines in dentistry. Use of pharmacological agents, periodontal medicine, clinical research and integrating periodontics into the general practice also are covered.

DH 4139. Dental Public Health and Academic Service Learning II. (2 cr.; A-F only; Every Spring) Academic service learning in various community healthcare settings. The student will apply information from Dental Public Health & Service Learning I and II to assess, plan, implement, and evaluate a dental public health program designed to meet the oral health needs of a priority population.

DH 4191. Independent Study. (0-6 cr.; A-F only; Every Fall, Spring & Summer)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Clinical instruction in oral radiography. 
Intraoral/extraoral radiographic procedures, evaluations. prereq: Must be in dental therapy masters program

DT 5320. Comprehensive Care Clinic. (1-5 cr. [max 10 cr.]; S-N only; Every Spring) Assessment, treatment, and management of patients. Concepts/principles of evidence-based dentistry as applied to clinical practice.

DT 5321. Treatment Planning for the Dental Therapist. (1 cr.; S-N only; Every Fall, Spring & Summer) Formal lecture presentations regarding fundamentals of assessment/treatment planning of dental cases. Prepare student to understand University of Minnesota School of Dentistry protocol in development of optimal, alternative, emergency treatment plans.

DT 5360. Outreach Experiences I. (1 cr.; S-N only; Every Fall) Students work in clinics outside of U of M with underserved patients.

DT 5361. Outreach Experiences II. (2 cr.; S-N only; Every Fall, Spring & Summer) Experiences that reinforce principles of delivering dental health care/services to patients, including underserved patient populations, in contemporary off-site clinical settings.


DT 5429. Introduction to Psychomotor Skill Development. (1 cr.; S-N only; Every Fall) Virtual reality based training for psychomotor skills required in prosthodontic/operative courses. Eye-hand/mirror skills, ergonomics used while preparing teeth for restoration. Prereq-In dental therapy program.

DT 5430. Oral Anatomy. (2 cr.; A-F only; Every Fall) Morphological characteristics of human dentition, associated contiguous structures. Foundational knowledge applied to situations encountered in general dental clinical practice. prereq: Accepted into dental therapy masters program

DT 5431. Oral Anatomy Laboratory. (3 cr.; A-F only; Every Fall) Manual dexterity skills, anatomy of human dentition. prereq: Accepted into masters in dental therapy program

DT 5432. Operative Dentistry I. (1 cr. [max 2 cr.]; A-F only; Every Fall, Spring & Summer) How to treat dental caries. Therapeutic treatment of underlying pathology. Surgical treatment of early caries lesion.

DT 5433. Operative Dentistry I Pre-Clinic Laboratory. (2 cr.; A-F only; Every Fall, Spring & Summer) How to treat dental caries. Therapeutic treatment of underlying pathology. Surgical treatment of early caries lesion. Hands-on projects working with models simulating teeth and surrounding structures. prereq: 2nd yr masters in dental therapy student

DT 5434. Operative Dentistry II Lecture. (1 cr.; A-F only; Every Fall, Spring & Summer) How to surgically manage more advanced caries lesions. Transition from pre-clinic lab to clinic setting. prereq: Enrolled in master's in dental therapy program

DT 5435. Operative Dentistry II for the Dental Therapist, Lab. (1 cr.; A-F only; Every Fall, Spring & Summer) More advanced caries lesions: diagnosis, structural preparation, decay removal and restoration.

DT 5443. Operative Clinic III. (4 cr.; A-F only; Every Fall, Spring & Summer) How to place restorations. Students place single-tooth restorations on patients.

DT 5460. Essentials of Clinical Care I For the Dental Therapist. (10 cr. [max 12 cr.]; S-N only; Every Fall) Students provide comprehensive care under direction of clinical faculty. May include periodontics, operative, pediatric care, and health promotion. Limited care may be given on rotations to oral surgery clinics.

DT 5471. Prosthodontic Topics for Dental Therapy. (1 cr.; A-F only; Every Summer) Lectures, lab projects of selected prosthodontic techniques to enable the dental therapist to provide/cement quality pre-fabricated metal or resin provisional crowns and other prosthodontic procedures in the scope of DT practice.

DT 5960. Essentials of Clinical Care II for the Dental Therapist. (5-10 cr. [max 20 cr.]; S-N only; Every Summer) Students provide comprehensive care under direction of clinical faculty. May include periodontics, operative, pediatric care, and health promotion. Limited care may be given on rotations to oral surgery clinics.

DT 6164. Principles of Exodontia and Minor Oral Surgery for the ADT student. (1 cr.; [max 2 cr.]; A-F only; Every Fall, Spring & Summer) This course develops knowledge and skill in the advanced dental therapy (ADT) student in exodontia and minor oral surgery.

DT 6321. Treatment Planning. (2 cr.; A-F only; Every Fall) Fundamentals of assessment/dental treatment planning using University of Minnesota School of Dentistry protocol in developing optimal, alternative, emergency treatment plans. Case-based treatment planning/small group seminars utilized.

DT 6340. Advanced Dental Therapy Prep Clinic. (10 cr.; A-F only; Every Fall) Preparation for licensed dental therapists to be eligible for advanced dental therapy certification. Topics range from essential basic sciences to specific clinical procedures. prereq: Must be a licensed dental therapist who was originally trained at the University of Minnesota, School of Dentistry.

DT 6341. Advanced Dental Therapy Prep Lecture. (2 cr.; A-F only; Every Fall) Preparation for licensed dental therapists to become eligible for advanced dental therapy certification. Topics range from essential basic sciences to specific clinical procedures. prereq: Must be a licensed dental therapist who was originally trained at the University of Minnesota, School of Dentistry.

DENT 6113. Oral Radiology Clinic III. (2 cr.; A-F or Audit; Every Fall, Spring & Summer) This course consists of radiographing dental school patients, radiographic interpretations, panoramic and extraoral technique seminars and quality assurance procedures.

DENT 6225. Advanced Oral and Maxillofacial Surgery Elective. (1-5 cr.; S-N or Audit; Every Fall) Diagnosis/treatment of dentoalveolar pathology. 25-125 contact hours.

DENT 6230. Oral and Maxillofacial Surgery Externship Elective. (0 cr.; S-N or Audit; Periodic Fall & Spring) Students gain additional surgical experiences and determine if career in oral/maxillofacial surgery is desirable. prereq: Interview with externship dir, letter stating student registered in good standing at ADA-accredited dental school; experience in dentoalveolar surgery procedures preferred

DENT 6231. Hospital Dentistry Clinic Rotation. (0 cr.; S-N or Audit; Every Fall) Managing hospitalized patients, operating room protocols, patient admission and discharge, and ambulatory patients.

DENT 6232. Hospital Dentistry Clinic Rotation. (1 cr.; S-N or Audit; Every Fall & Spring) Managing hospitalized patients, operating room protocol, admission/discharge of patients, ambulatory patients.

DENT 6319. Surgical and Clinical Oral and Maxillofacial Pathology. (1-10 cr.; S-N or Audit; Periodic Fall & Spring) This elective involves spending time with Division of Oral and Maxillofacial Pathology faculty while they diagnose surgical pathology cases and see clinical oral pathology referral patients.

DENT 6470. Health Ecology Elective. (1-10 cr.; Student Option; Every Fall & Spring) Highly motivated students earn academic credit for activities in special-interest areas.

DENT 6480. Advanced General Dentistry Elective. (1-10 cr.; Student Option; Every Fall, Spring & Summer) Block rotations of 2 to 10 weeks in selected special clinics and programs such as prisons, regional treatment centers, and migrant worker health care programs.

DENT 6490. Health Ecology: Independent Study. (1-10 cr.; Student Option; Every Fall & Spring) Arranged with any Health Ecology faculty member.

DENT 6591. Pediatric Dentistry Independent Study. (2 cr.; Student Option; )
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**DENT 8090. Evidence-based Clinical Pediatric Dentistry.** (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Selected pediatric dentistry topics. In-depth literature review, seminar discussion.

**DENT 8091. Interdisciplinary Care of the Cleft Palate Patient.** (1 cr.; S-N or Audit; Every Summer)
Comprehensive surgical, dental, and speech and hearing evaluation and management of patients with cleft lip and palate.

**DENT 8100. Topics in Advanced Periodontology: Literature Review.** (2 cr.; Student Option; Every Fall, Spring & Summer)
State-of-the-art information on a variety of topics concerning risk factors and therapeutic modalities for periodontal disease.

**DENT 8101. Dental Implantology: A Multidisciplinary Approach.** (2 cr.; Student Option; Every Fall & Summer)
Dental implant therapy from perspective of several dental disciplines.

**DENT 8120. Advanced Principles and Techniques of Orofacial Pain Disorders.** (2 cr. [max 3 cr.]; A-F or Audit; Every Spring)
Interdisciplinary study of theory, principles, epidemiology, mechanisms associated with TMJ/craniofacial pain disorders. Basis for scientific understanding of diagnostic/management strategies. prereq: Participation in TMJ orofacial pain advanced education program

**DENT 8121. Current Literature in TMD and Orofacial Pain.** (1 cr.; A-F or Audit; Every Fall, Spring & Summer)
Review of current literature/how it relates to past literature. Topics on pain, philosophies of management.

**DENT 8123. Advanced Topics in Orofacial Pain.** (2 cr.; A-F or Audit; Every Spring)
Review of cutting edge research and clinical findings regarding etiology and treatment of acute and chronic orofacial pain conditions and related disorders. prereq: Grad student in dentistry or other health sciences grad student or inst consent

**DENT 8200. Dental Clinic for Oncology Fellows.** (13 cr.; S-N only; Every Fall, Spring & Summer)
Train oral/maxillofacial surgeons in principals/practice of head/neck oncology. Treatment of benign/malignant disease including salivary gland tumors. Training will emphasize multidisciplinary care of head/neck oncology patient.

**DENT 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

**DENT 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

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**Dermatology (DERM)**

**DERM 7182. Dermatology Preceptorship.** (4 cr.; H-N only; Every Fall, Spring & Summer)
This elective is useful to the student planning a career in a primary care specialty or dermatology.

**DERM 7183. Advanced Dermatology.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Students will gain further experience in all aspects of dermatology. This course is appropriate for medical students interested in pursuing a career in Dermatology.

**DERM 7185. Research in Dermatology.** (8 cr. [max 16 cr.]; H-N only; Every Fall, Spring & Summer)
An introduction to research in dermatology. The student pursues a research project through clinical or laboratory research. The specific project is individually formulated by the student and faculty. As time permits during this course, the student is invited to attend research and teaching conferences conducted by the Department of Dermatology.

**DERM 7910. Dermatology Medical Residency.** (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Dermatology medical residency.

**DERM 7920. Medicine/Dermatology Medical Residency.** (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Medicine/dermatology medical residency.

**DERM 7930. Dermatology Medical Fellowship.** (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Dermatology medical fellowship.

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**Design (DES)**

**DES 1000. D@MN: Design@Minnesota.** (AH; 3 cr.; A-F only; Every Spring)
Applications of design thinking/design process. Understanding design as consumers, customers, possible future clients.

**DES 1001. Introducing the College of Design.** (1 cr.; A-F only; Every Fall & Spring)
DES 1001 is a 1 cr. topics course. This course provides a set of experiences that help to explain the concepts of design through the lenses of different fields of design, both traditional and emerging, within the College of Design. Students from various design disciplines will engage in design experiences that teach them how designers from different fields identify, define and solve problems. They will be introduced to the resources offered to designers in the College of Design through hands-on experiences. Students will reflect upon their experiences by participating in a series of reflection pieces, and completing a culminating project that will be shared with class members and invited stakeholders. Through this engagement, students will learn about each other and their motivations for being in the College of Design, as well as gain an understanding of the breadth of the college and its resources as they begin their design education.

**DES 1002. Improvisation for Design.** (3 cr.; A-F only; Every Spring)
This course explores how the art of improvisation can build collaboration, communication, and creativity skills. In this class we will focus on how improvisation is applied to fields of design, however these skills may be applicable to other disciplines. Through both readings and an interactive curriculum of improv exercises, students will learn specific tools to facilitate idea generation, collaborative team processes, idea selection, sketching and critique.

**DES 1101V. Honors: Introduction to Design Thinking.** (AH; 4 cr.; A-F only; Every Fall)
Theories/processes that underpin design thinking. Interactions between humans and their natural, social, and designed environments where purposeful design helps determine quality of interaction. Design professions. prereq: Honors student

**DES 1101W. Introduction to Design Thinking.** (AH; 4 cr.; A-F only; Every Fall & Spring)
Theories/processes that underpin design thinking. Interactions between humans and their natural, social, and designed environments where purposeful design helps determine quality of interaction. Design professions.

**DES 1111. Creative Problem Solving.** (3 cr.; A-F only; Every Fall)
Development of creative capability applicable to all fields of study. Problem solving techniques. Theory of creativity/innovation.

**DES 1111H. Honors: Creative Problem Solving.** (3 cr.; A-F only; Every Fall)
Development of creative capability applicable to all fields of study. Problem solving techniques. Theory of creativity/innovation. prereq: Honors

**DES 1170. Topics in Design.** (1 cr. [max 4 cr.]; A-F or Audit; Periodic Fall & Spring)
In-depth investigation of specific topic, announced in advance.

**DES 1401. Beyond the Suburbs: Living and Working in Rural America.** (2 cr. [max 3 cr.]; A-F only; Periodic Fall)
Beyond the suburbs lies rural America. Whether you grew up in the country or in the city, you probably have some ideas about
rural places. Maybe you think of small rural towns as ideal places to grow up and grow old, quiet places that are safe from crime, without traffic and pollution, or maybe you think of rural places as backward, boring, and bleak. In this class, we’ll explore various myths and realities of life beyond the suburbs. We’ll discover what is unique about rural places. We will examine who lives in rural America and how they make a living. We’ll explore the concept of rural design and learn more about housing issues facing rural communities. We will discuss how “rural” varies across the country. From cowboys to downhillskiers, from tourists to farmers and ranchers, the rural America is wildly varied and fascinating. Join us and discover more about life and livelihoods beyond the suburbs.

**DES 1405W. Building Vision.** (WI; 3 cr.; A-F only; Every Fall)
The desire to succeed and do well can sometimes circumvent one’s willingness to embrace challenge in order to safely achieve an outcome (not fail). This freshman seminar aims to break down barriers and fears while developing processes toward new ways of seeing. It builds and expands connections to a larger world of ideas and disciplines. Through weekly exercises in visual story-telling, participants will sharpen their ability to see (the real world as well as the imagined). Projects are constructed to challenge perceived personal limitations in ideation and process and to build a way of communicating in a visual manner. This seminar is for individuals interested in expanding personal ways of seeing, thinking, and doing, individuals interested in developing a personal process in the evolution of ideas. It includes lectures, student-led discussions, demonstrations, classroom activities, field trips, and homework. Various media will be used to build a visual journal and to build skills in articulation. While drawing will be a component, students need not be skilled, just willing. A writing component will help students gain skills in understanding connections between right brain and left brain functions. They will find relationships between self-expression via the written word and self-expression through visual work. Many who do visual work, become tongue-tied at explaining the deeper concepts behind their work. This course will build a long lasting confidence by building skills in visual and verbal expression.

**DES 1407. Fashion and Feminism: Dressing for Change.** (2 cr.; A-F only; Periodic Fall)
This class explores the sometimes problematic relationship between fashion and feminism. Literature from First Wave Feminism revealed visceral tensions between fashion and the perceived value of women in society. Fashionable dress was considered constrictive, submissive, and indicative of women’s diminished roles in both private and public realms. Second Wave Feminism, which took place approximately between 1963 and 1975, did not often address fashion directly. However, there were dramatic changes in beauty ideals during that time. Second Wave Feminism integrated into mainstream culture, with high profile authors such as Simone de Beauvoir, Frances Beal, Betty Friedan, and Gloria Steinem. This class focuses on formative feminist texts of Second Wave Feminism and explores how they began to shape mainstream fashion in the middle to late twentieth century. Clothing objects from the Goldstein Museum of Design's permanent collection will be used to study social mores and norms associated with women's changing roles in society. Contemporary movements will also be addressed, exploring the complex relationship between femininity and feminism.

**DES 2101. Design and Visual Presentation.** (2 cr.; A-F only; Every Fall & Spring)
Introduction to visual design. Development of visual design skills. Visual presentation methods. Lectures, design exercises, discussion.

**DES 3131. User Experience in Design.** (4 cr.; A-F only; Every Fall)
Introduction to theories/principles of human interaction with designed objects. Focuses on affect/emotional quality of designs. Objects, interfaces, environments. Digitally mediated experiences.

**DES 3132. Service Design Studio.** (3 cr.; A-F or Audit; Every Fall)
Systems-based approach towards service design. Course emphasis placed on the articulation of a service through concept mapping, blueprints, and user touch points.

**DES 3141. Technology, Design, and Society.** (TS; 3 cr.; A-F only; Every Spring)
Explore/evaluate impact of technology/design on humans, societies. How design innovation shapes cultures. How people use technology to shape design, adoption, use of designed products/environments through consumerism/ethical values.

**DES 3151. Italian Design Studio: Blending Tradition and Innovation.** (GP; 3 cr.; A-F only; Every Summer)
Italian Design Studio meets general Core course requirements in the following ways: 
- **ENHANCING A LIBERAL EDUCATION:** Students in this course exercise design as a mode of thinking and practice in an interdisciplinary design work. The study abroad studio course is submitted to the Council on Liberal Education for approval for a Global Perspectives Theme. 
- **Designing the material world?whether apparel, graphic, landscape architecture, architecture or interior design?invites a fusion of art and science.** As a mode of inquiry, students in this course pursue design thinking as a rigorous and analytical process with a role for intuition and creativity. Designed objects and places express cultural aspirations and makes our experiences with the physical world poetic. In this way, de is allied with other arts and humanities disciplines. Yet, all designed things are beholden to a host of constraints or forces that lie beyond the control of the designer. Architecture, for example, must accommodate human behavior and needs, must shelter in a particular climate, and must respond to the laws of materials and gravity.

**DES 3160. Topics in Design.** (1-4 cr.; [max 24 cr.]; A-F only; Every Fall, Spring & Summer)
Topics in Design.

**DES 3170. Topics in Design.** (1-4 cr.; [max 32 cr.]; A-F or Audit; Every Fall, Spring & Summer)
In-depth investigation of specific topic.
DES 3196. Field Study: National or International. (1-10 cr.; A-F or Audit; Every Fall, Spring & Summer) Faculty-directed field study in national or international setting.

DES 3201. Career and Internship Preparation for Design. (1 cr.; A-F only; Every Fall & Spring) Research career opportunities and organizations related to industry. Set career goals based on skills and interests. Identify job search skills to secure internships, implement transition from college to employment. prereq: Pre-graphic design or graphic design or pre-interior design or interior design or pre-apparel design or apparel design or environmental design or architecture or pre-product design or product design

DES 3250. Topics in Design. (1-4 cr.; A-F only; Periodic Summer) Topics in Design


DES 3311. Travels in Typography. (3 cr.; A-F only; Every Fall & Spring) Using collection in James Ford Bell Library, students study rare book/map collections and undertake hands-on exercises on history of type, including developments in typsetting, calligraphy, and letterpress printing.

DES 3321. Furniture Design: Exploration. (3 cr.; A-F only; Every Fall) Furniture design as discipline, not as method. Material. Objects that mediate our environment. History, design criteria, technology, craft. Group case study, research presentation, individual making/presenting of concept-prototype.

DES 3322. Furniture Design, Practice. (4 cr.; A-F only; Every Spring) The hardest things about the creative act is learning how to start something before you know what it is. The simplest objects are always more formally complex than the mind can accurately imagine. This course teaches design thinking through furniture construction using a fast, loose & ad-hoc "children-club-fort-building" method of discovering & visualizing while making. Direct-construction design is tangibly satisfying and will provide powerful context for all other scales of creative, design and planning methods. Your results will not be conventionally good-looking, but you will make real & functioning cultural things. All exercises will be dependent on connecting to ideas beyond commonly recognized boundaries of the furniture. Think "Chair-ness, not Chair."

You will be taught basic welding and wood joinery to provide fast & viable structural frames, "surfacing" methods in wood, foam and fabric composites, and an introduction to mold making and material casting. You do not need to be good at making, but you must be game to try. Craft is important so far as basic structural usability is attained. Ideas will always trump material "correctness."

DES 3331. Street Life Urban Design Seminar. (3 cr.; A-F only; Every Spring) The street as part of network of urban systems/fragments: sidewalks, private interiors, curbs, terraces, boulevards, parking lots, bus stops, public institutions, urban architectures, utility lines, storm/sewer systems, groundwater, communication systems, gardens, and lighting. Readings in urban studies, geography, design, economics and art history. Students review case studies, envision possible transformations of streets/street life.


DES 3351. Phenomenon of Everyday Design. (3 cr.; A-F only; Every Spring) Examines the growing fascination with design in everyday life. From Target to IKEA, from TIME magazine to the New York Times Sunday supplement, interest in the designer and designed object are permeating popular culture. Implications of this phenomenon in the present and historical precedents for the "design in everyday life" concept.

DES 4160. Topics in Design. (1-4 cr.; max 24 cr.; A-F only; Every Fall, Spring & Summer) In-depth investigation of single specific topic announced in advance.

DES 4165. Design and Globalization. (DSJ; 3 cr.; A-F or Aud; Every Fall) The course explores how culture, identity, and difference are defined and produced and the role that design plays in the production of difference, inequality, and marginalization. prereq: Jr or Sr

DES 4193. Directed Study in Design. (1-6 cr.; max 36 cr.; A-F only; Every Fall, Spring & Summer) Directed Study in Design prereq: dept consent

DES 5160. Topics in Design. (1-4 cr.; max 24 cr.; A-F only; Every Fall, Spring & Summer) Topics in design

DES 5165. Design and Globalization. (3 cr.; A-F or Audit; Every Fall) The course explores how culture, identity, and difference are defined and produced and the role that design plays in the production of difference, inequality, and marginalization. prereq: Grad student

DES 5168. Evidence-Based Design. (3 cr.; A-F or Audit; Every Fall) Origins of evidence-based design/possible benefits and detractors. Students learn various components as a process/ explore methods of integrating process via application to a design project in their area of expertise. Process, impact, influences, and anticipated outcomes are documented/analyzed as compared to a typical design process approach. prereq: CDes grad student or instr consent

DES 5170. Topics in Design. (3 cr.; max 24 cr.; A-F or Audit; Periodic Fall) In-depth investigation of single specific topic, announced in advance.

DES 5185. Human Factors in Design. (3 cr.; A-F or Audit; Periodic Fall) Theories/methods that influence the assessment of physical, social, and psychological human factors. Development of user needs with application to designed products that interact with human body. prereq: Grad student or sr or instr consent

DES 5188. Anthropometrics, Sizing & Fit. (4 cr.; A-F only; Periodic Fall & Spring) Comprehensive attention to ergonomics and anthropometric variance across populations is crucial to the advancement of wearable products and apparel. This course will examine the relationship between body size, body shape, product design, sizing systems, and fit. Students will examine existing sizing systems and develop new sizing systems using anthropometric data, body scan technology, and OptiTex 3D patternmaking software. A special focus will be given to examining innovative tools that encourage the merging of anthropometrics and design throughout the design process. This class is suitable for students across a variety of disciplines.

DES 5193. Directed Study in Design. (1-6 cr.; max 36 cr.; A-F only; Every Fall, Spring & Summer) Directed Study in Design prereq: dept consent

DES 5196. Field Study: National/International. (1-10 cr.; A-F or Audit; Every Fall, Spring & Summer) Faculty-directed field study in a national or international setting.

DES 8102. Quantitative Research Methods. (3 cr.; A-F only; Fall Even Year) Quantitative research methods for issues related to human, their behaviors, and everyday living in the designed environment.

DES 8103. Qualitative and Mixed Methods Research. (3 cr.; A-F or Audit; Fall Odd Year) A scientific approach to qualitative research. Methods/strategies combined to explore complex research questions.


DES 8114. Design Studio. (3 cr. A-F or Audit; Fall Even Year) Advanced problem analysis, design solution. prereq: Design grad student or instr consent

DES 8115. Grant Writing. (3 cr. A-F or Audit; Fall Even Year) Interdisciplinary course.

DES 8151. Product Development: Theory and Practice. (3 cr. A-F; Spring Odd Year) Product development theories/methods as applied in many design fields. Emphasizes retail setting. Seminar format discussion, case studies, observation/critique of hands-on industry product development project.

DES 8164. Innovation Theory and Analysis. (3 cr. A-F or Audit; Spring Odd Year) Theories and factors that influence adoption and diffusion of designed products. Methodologies used in analysis of diffusion process.

DES 8166. Material Culture and Design. (3 cr. A-F or Audit; Periodic Spring) Research approaches to material culture study using artifacts from Goldstein Museum of Design. prereq: [DHA or DES] grad student or instr consent.

DES 8167. Aesthetics of Design. (3 cr. A-F or Audit; Periodic Spring) How we perceive, analyze, value, and evaluate design outcomes/results.

DES 8170. Topics in Design. (1.5 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) In-depth investigation of topic announced in advance.

DES 8181. Research Ethics. (1 cr. S-N or Audit; Every Spring) From researchers, code of conduct. prereq: Grad DSSC minor or instr consent.

DES 8181. Research Ethics. (1 cr. S-N or Audit; Every Spring) In-depth investigation of topic announced in advance.

DES 8333. FTE: Master’s. (1 cr. No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent.

DES 8444. FTE: Doctoral. (1 cr. No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent.

DES 8666. Doctoral Pre-Thesis Credits. (1.5 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

DES 8777. Thesis Credits: Master’s. (1 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

DES 8888. Thesis Credit: Doctoral. (1.1-3 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

### Develpmnt Std and Soc Change (DSSC)

DSSC 8111. Approaches to Knowledge and Truth: Ways of Knowing in Development Studies and Social Change. (3 cr. [S-N or Audit; Every Fall]) Approaches practiced by physical, biological, social science, and humanities scholars.

DSSC 8112. Scholarship and Public Responsibility. (1.5 cr. [max 2 cr.]; S-N only; Every Spring) Seminar. Concerns/themes relevant to public engagement in academic work.

DSSC 8211. Doctoral Research Workshop in Development Studies and Social Change. (3 cr. [S-N or Audit; Every Fall]) Interdisciplinary workshop to assist doctoral students in writing successful research and grant proposals to support their dissertation research on themes related to global social change.

DSSC 8310. Topics in Development Studies and Social Change. (1.5 cr. [max 9 cr.]; S-N only; Every Fall & Spring) Seven-week seminar. Topical issues in development and social change.

### Doctor of Dental Surgery (DDS)

DDS 6111. Periodontology I Lecture. (1.5 cr. A-F only; Every Summer) Periodontal anatomy, physiology/etiology of periodontal diseases. Clinical, histopathological, and pathogenesis of gingivitis and periodontitis. Role of genetics, tobacco use, and systemic disorders.

DDS 6112. Periodontology II: Technique. (2 cr. A-F or Audit; Every Fall) Presurgical procedures in periodontology. Clinical skills to examine, diagnose, prevent, and treat periodontal diseases. Prereq: In DDS program.


DDS 6121. Periodontology Clinic. (2 cr. A-F or Audit; Every Spring) Nonsurgical and surgical treatment of periodontal diseases, evaluation of periodontal therapy, implementation of maintenance programs.

DDS 6122. Periodontology Clinic DDS3. (2 cr. A-F only; Every Spring) Nonsurgical and surgical treatment of periodontal diseases, evaluation of periodontal therapy, implementation of maintenance programs.

DDS 6124. Periodontology Clinic D4. (2 cr. A-F only; Every Spring) This course is designed to enable the dental student to gain expertise, knowledge and confidence in the clinical skills needed to examine, diagnose and treat the periodontal patient. Students are expected to complete 3-4 competencies and a Patient Case presentation.

DDS 6130. Introduction to Clinical Dentistry. (2.2 cr. [max 20 cr.]; S-N only; Every Summer) Methods/procedures consistent with preclinical teaching in traditional predoctoral program. prereq: Enrolled in PASS.

DDS 6131. Pediatric Dentistry Pre-Clinic. (1.7 cr. A-F or Audit; Every Spring & Summer) Physical, emotional, dental, and language development. Diagnosis, prevention, and management of oral diseases in children.

DDS 6141. Pediatric Dentistry Clinic. (3.6 cr. A-F only; Every Fall, Spring & Summer) Preventive/clinical topics/techniques. Diagnosis, treatment planning, and clinical treatment of pediatric patients. Prereq: 3rd yr DDS student.

DDS 6151. Pain and Anxiety Control. (1.2 cr. A-F or Audit; Every Spring & Summer) Didactic/post-clinical aspects of pain/anxiety control as pertains to dentistry. Emphasizes use of local anesthetics, conscious sedation (nitrous oxide inhalation). Acute/chronic pain mechanisms, neuropathic pain, issues pertaining to narcotic/other drug abuse.

DDS 6152. Oral and Maxillofacial Surgery I. (1.1 cr. A-F only; Every Fall) Introduction to concepts of oral/maxillofacial surgery. Emphasizes fundamental skills of oral surgery that apply to practice of general dentistry.
DDS 6153. Oral and Maxillofacial Surgery II. (1.2 cr.; A-F only; Every Spring) Fundamental clinical/diagnostic skills that apply to practice of general dentistry. Surgical procedures, complications, facial fractures, congenital abnormalities. Prereq-Oral Surgery I.

DDS 6161. Oral & Maxillofacial Surgery Clinic Rotation. (2.5 cr.; S-N or Audit; Every Spring) Oral Surgery Clinic experience.

DDS 6171. Orthodontics I. (2.7 cr.; A-F only; Every Fall) Supervision, guidance, and correction of growing or mature dentofacial structures. Growth/development of craniofacial structures. Diagnostic methods. biology of tooth movement and biomechanics. Clinical diagnosis, treatment planning.

DDS 6172. Orthodontics II. (1.5 cr.; A-F only; Every Spring) Lectures examine clinical management of specific orthodontic problems; and principles and procedures in preventative, interceptive, and corrective orthodontics examined through case analysis and treatment planning. Lab covers practical applications of developing occlusion analysis; and fundamentals of orthodontic appliances.

DDS 6181. Orthodontic Clinic Rotation. (1 cr.; S-N or Audit; Every Fall & Spring) Diagnosis, treatment timing, and treatment objectives; skills required to perform orthodontic procedures.

DDS 6211. Introduction to Oral Biology. (0.6 cr.; S-N only; Every Spring) Biology of the mouth. Broad overview of current information on the following topics: plaque microbiology, bone growth and remodeling, oral diseases, bad breath, and amalgam fillings. Prereq-1st yr DDS or DT student.


DDS 6214. General Histology. (3.7 cr.; A-F or Audit; Every Fall) Structure/function of cells, tissues, and organs. Prereq-Accepted into DDS program.


DDS 6231. Physical Evaluation I. (2.9 cr.; A-F only; Every Spring) Concepts of diagnosis and patient evaluation for exam of patients in various adult clinical programs in School of Dentistry. Prereq-1st yr DDS or DT student.

DDS 6232. Physical Evaluation II. (2.2 cr.; A-F or Audit; Every Fall) Lecture and case-based series designed to review physical evaluation of common medical-systemic problems of patient management and care based on principles of medical management, thorough evaluation, and recognition of the medically compromised patient. Includes acute management of medical emergencies in dental practice.


DDS 6234. Radiographic Interpretation. (2 cr.; A-F only; Every Fall) Dental record keeping. Documentation/analysis of medical/clinical findings. Patient's rights, informed consent. Radiographic interpretation of deviations from normal. Prereq-In DDS program.

DDS 6235. Oral Radiology Preclinical Lab I. (0.9 cr.; S-N only; Every Fall) Preclinical demonstration-participation phases in radiographic technique, using mounted human skulls. Prereq-In DDS program.


DDS 6243. Oral Radiology Clinic. (0.5 cr.; S-N only; Every Fall & Spring) Radiographing dental school patients, radiographic interpretations, panoramic/extraoral technique seminars, quality assurance procedures. Prereq-3rd yr DDS student.

DDS 6244. Oral Radiology Clinic II. (0.5 cr.; S-N only; Every Spring) This course consists of radiographing dental school patients, radiographic interpretations, panoramic and extraoral technique seminars and quality assurance procedures.

DDS 6251. Oral Histology and Embryology and Medical Genetics. (2.6 cr.; A-F only; Every Spring) Embryologic development and histologic structure of tissues in the head, face, and mouth with emphasis on clinical correlations, principles of medical genetics, complex traits of the orofacial region, and genetic contributions to oral diseases.

DDS 6252. Oral and Maxillofacial Pathology. (3.1 cr.; A-F or Audit; Every Fall & Spring) Recognizing, diagnosing, and managing diseases with maxillofacial, oral, or dental manifestations. Deductive approaches to identifying associated diseases.

DDS 6253. Pathology for Dental Students. (5 cr.; A-F only; Every Fall) Pathologic principles necessary for understanding oral pathology. Diseases that manifest in or around oral cavity/systemic diseases impacting health of patients.

DDS 6271. TMD & Orofacial Pain. (1 cr.; A-F or Audit; Every Fall & Summer) Evaluation and differential diagnosis of temporomandibular and orofacial pain disorders. Rehabilitation treatment strategies for the most common TM disorders, including splints, physical therapy, behavioral therapy, and medications.

DDS 6310. Introduction to Dental Clinics. (1 cr.; S-N only; Every Fall) This course is designed to expose the first year doctor of dental surgery students to clinical activities early in their dental training. It will allow students to become oriented to the clinics, dispensary personnel, clinic supplies and patient communication. Students will be trained in infection control and the care of standard dental equipment and instruments. It will also provide modeling of appropriate professional demeanor, attire and interactions with other dentists, student operators and patients. Each student will be assigned to 10 - 3 hours assisitng sessions.

DDS 6312. Comprehensive Care Clinic I. (1 cr. [max 3 cr.]; S-N only; Every Fall, Spring & Summer) Application of clinical knowledge, skills, and the principles of care to the comprehensive assessment, diagnosis, treatment planning, treatment, and management of patients.

DDS 6313. Comprehensive Care Clinic II. (1 cr. [max 3 cr.]; S-N only; Every Fall, Spring & Summer) Patient management skills. Diagnosis, treatment planning, delivery of comprehensive care, efficient use of clinic time. Prereq-6050.

DDS 6314. Treatment Planning and Introduction to Patient Care. (4.1 cr.; S-N or Audit; Every Spring & Summer) Management of dental patients. Process/development of comprehensive treatment plans. Treatment planning in private-practice setting.

DDS 6315. Clinical Geriatric Dentistry Rotation. (0 cr.; S-N only; Every Fall) The purpose of this rotation is to complement and reinforce information provided in didactic course DDS 6338 Geriatrics and Special Needs Patient Care to enable upper level
students time to interact with older adults with complex dental, medical and psycho-social concerns during routine dental appointments.

DSS 6322. Treatment Planning Clinic II. (1 cr.; A-F or Audit; Every Spring) Devises initial plan from established database; make case presentation; develop final treatment plan, informed consent and appointment plan; and make financial arrangements. Prereq: Patient Management II Resource Workbook

DSS 6325. Dental Professional Development I. (1 cr.; S-N only; Every Fall & Spring) First of a series that prepares the student in professionalism and practice management. Uses self-assessment and strategic planning to lead students to identify personal and professional aspirations. Four sequential levels of learning creating progressively higher levels of competence using a blended-learning format including online education, simulations and self-directed learning.

DSS 6326. Dental Professional Development II. (1 cr.; S-N only; Every Summer) Focuses on Career Planning, Personal Strategic Planning, Personal Finance and Debt Management. Students apply principles and tools learned to their future professional practice and career.

DSS 6327. Dental Professional Development III. (2 cr.; S-N only; Every Spring) This course focuses on preparing the student in professionalism, critical thinking, problem solving and practice management. It uses a blended-learning format that includes online education, simulations and self-directed learning. It lays the groundwork for students to develop day-to-day leadership skills needed to operate a successful dental practice.

DSS 6328. Dental Professional Development IV. (1 cr.; S-N only; Every Summer) Fourth and final course sequence in Dental Professional Development. Focuses on completing business plans and refining personal and professional strategic plans applying skills learned in the previous three courses.


DSS 6334. Professional Problem Solving. (0.8 cr.; S-N only; Every Spring) Forum for discussion of clinical dental cases in context of ethics/professionalism. Five workshops based on ADA principles of ethics and code of professional conduct. Prereq-DDS 3rd yr.

DSS 6335. Professional Problem Solving. (0.3 cr.; S-N only; Every Fall) Forum for discussion of clinical dental cases in context of ethics/professionalism. Given over fall/spring semester of 4th year. Three workshops on dental cases/ethics.

DSS 6336. Dental Practice Management. (2 cr.; S-N only; Every Spring) Skills in planning, organizing, leading, and controlling the clinical, business, and human aspects of dental practice.

DSS 6337. Current Legal Issues for the New Dentist. (2.1 cr.; S-N only; Every Fall) Legal issues: regulation of the profession, associationships, purchasing a dental practice, starting a practice, dental risk management, contract law considerations. Prereq-In DDS Program.

DSS 6338. Special Issues in Oral Health Care: Geriatric, Hospital, and Special Needs Patient Dentistry. (1.7 cr.; A-F only; Every Summer) Delivering optimal oral health care to older adults and patients with special needs. Clinical management of patients with social, psychological, physiological, and dental characteristics. Dentistry in hospital setting. Prereq: 4th yr DDS program student.

DSS 6339. Emergency Preparedness. (0.8 cr.; S-N only; Every Spring) Emergency preparedness for the dental office with emphasis on teamwork skills. Online module, lectures, and participation in simulated realistic disaster scenarios with interprofessional teams. Prereq: Must be enrolled in a School of Dentistry program.

DSS 6340. Medical Emergencies and Patient Safety in the Dental Clinical Environment. (0.5 cr.; S-N only; Every Spring) Hands-on/ didactic training in recognizing/managing medical emergencies. Patient safety/reduction of risks for accidental patient injury in dental clinical environment.

DSS 6360. Introduction to Outreach Experiences. (0 cr.; S-N only; Every Spring) Provide dental care to underserved populations in various clinical settings throughout Minnesota.

DSS 6361. Outreach Experiences I. (2 cr.; S-N only; Every Fall, Spring & Summer) Dental care/involvement in community health promotion/service events to under-served populations throughout Minnesota.

DSS 6362. Outreach Experiences II. (2 cr.; S-N only; Every Fall) Provide dental care/involvement in community health promotion/service events to underserved populations in various clinical settings throughout Minnesota. Prereq: Doctor of Dental Surgery Program.

DSS 6363. Outreach Experiences III. (2 cr.; S-N only; Every Spring) Dental care/involvement in community health promotion/service events to under-served populations throughout Minnesota.

DSS 6411. Applied Dental Biomaterials. (2 cr.; A-F only; Every Spring) Prosthodontics, operative dentistry. Students apply scientific principles to selection/utilization of biomaterials, and evaluate a recent research publication. Prereq-In DDS program.

DSS 6431. Oral Anatomy I. (2 cr. [max 4 cr.]; A-F or Audit; Every Fall) Morphological characteristics of human dentition and associated contiguous structures. Foundational knowledge applied to situations in general clinical practice. Lectures, lab. Prereq: 1st yr DDS student.


DSS 6433. Introduction to Psychomotor Skill Development I & II. (0.7 cr. [max 1.4 cr.]; S-N only; Every Fall & Summer) Virtual-reality-based training for psychomotor skills. Mirror skills, proper ergonomics. Preparation of intra-coronal activity. Prereq: 1st yr DDS student.

DSS 6434. Operative Dentistry I. (1.7 cr.; A-F only; Every Fall & Summer) Restoration of small caries lesions, cervical abrasion lesions, and attrition defects. Practical aspects of caries risk assessment, lesion identification, and comprehensive caries management. Emphasizes indications for surgical intervention, principles of restoration design, and rationale for various design features. Prereq: Dental Anatomy, Biomaterials.

DSS 6435. Operative Dentistry I Laboratory. (2.3 cr.; A-F or Audit; Every Fall & Summer) Restoration of small caries lesions, cervical abrasion lesions, and attrition defects in clinical simulation setting. Emphasizes design/ executing retentive/resistant restorations, conserving tooth structure, and operating in clinically relevant orientations. Self-evaluation techniques, discriminatory skills. Prereq: Dental Anatomy, Biomaterials.

DSS 6436. Operative Dentistry II. (2.1 cr.; A-F only; Every Fall) Diagnosis, treatment planning, and treatment of moderate to severe phase of dental caries. Use of dental amalgam, cast gold, composite resin, and cast porcelain. Aesthetic modification to teeth. Prereq: In DDS program.

DSS 6437. Operative Dentistry II Lab. (2.9 cr.; A-F only; Every Fall) Exercises in treatment of moderate to severe phase of dental caries utilizing dental amalgam, cast gold, composite resin, and cast porcelain. Aesthetic modifications to teeth. Prereq: In DDS program.


DSS 6439. Operative Dentistry IV. (1.4 cr.; A-F only; Every Fall)
Contemporary aspects of operative Dentistry. Students, working in groups, answer clinical questions. Evidence-based approach. Prereq: 3rd yr DDS student.

**DDS 6411. Operative Dentistry Clinic I.** (4 cr.; A-F only; Every Fall & Spring) Students, under direction of instructor, place single tooth restorations on patients, perform dental exams, and prepare treatment plans for patients with consultation from Operative Dentistry Division faculty. Prereq: Operative Dentistry I, II, III, Operative Dentistry I and II Lab.

**DDS 6412. Operative Dentistry Clinic II.** (7.5 cr.; A-F only; Every Spring) Clinical application of operative dentistry diagnosis, treatment planning, clinical judgment, and technical skills. Prereq: Operative Dentistry I, II, III, Operative Dentistry I and II Lab.

**DDS 6411. Introduction to Endodontics Lecture and Laboratory.** (3.7 cr.; A-F or Audit; Every Summer) Study of morphology, physiology, and pathology of the human dental pulp and periradicular tissues.

**DDS 6461. Endodontic Clinic D3.** (2 cr.; S-N only; Every Fall & Spring) Clinical practice for endodontics.

**DDS 6462. Endodontic Clinic.** (2 cr.; A-F or Audit; Every Spring) Clinical practice for endodontics.

**DDS 6471. Preclinical Prosthodontics Single Crown Restoration Lecture II.** (1.5 cr. [max 3 cr.]; A-F or Audit; Every Spring & Summer) Provides fundamental knowledge/procedural skills necessary for managing simulated patient cases that require full crown restoration.

**DDS 6472. Preclinical Prosthodontics Single Crown Restoration Technique Laboratory II.** (3.3 cr. [max 6.6 cr.]; A-F or Audit; Every Spring & Summer) Lab techniques, fundamentals of tooth preparation.

**DDS 6473. Preclinical Prosthodontics Technique Lecture III.** (1.5 cr.; A-F or Audit; Every Fall & Summer) Fixed, removable, occlusion topics.

**DDS 6474. Preclinical Prosthodontics Technique Laboratory III.** (2.1 cr.; A-F or Audit; Every Fall & Summer) Fixed, removable, occlusion topics.

**DDS 6475. Preclinical Prosthodontics Techniques Lecture IV.** (1.8 cr.; A-F only; Every Fall) Theory/practice in complete denture construction. Diagnosis, treatment planning/sequencing for edentulous patient. Instruments, terminology, principles, technical/clinical procedures. Prereq: DDS program.

**DDS 6476. Preclinical Prosthodontics Technique Laboratory IV, Complete Dentures.** (2.3 cr.; A-F only; Every Fall) Technical/clinical laboratory procedures used for fabrication/replacement of teeth with complete dentures. Prereq: DDS program.

**DDS 6477. Preclinical Prosthodontics Technique Lecture V, Removable Partial Dentures.** (2.5 cr.; A-F only; Every Spring) Principles/philosophies of removable partial denture prosthodontics. Design/fabrication of removable prosthesis to replace teeth for partially edentulous patient. Lecture format, plus an interactive seminar.

**DDS 6478. Preclinical Prosthodontics Technique Laboratory V, Partial Dentures.** (2.2 cr.; A-F only; Every Spring & Summer) Technical/clinical laboratory procedures used for fabrication/replacement of teeth with partial dentures.

**DDS 6479. Clinical Occlusion.** (1 cr. [max 2 cr.]; A-F or Audit; Every Spring) Clinical variation in occlusion encountered in a typical clinical setting. Guidelines to manage this variation, prereq: Enrolled in dentistry program.

**DDS 6481. Fixed Prosthodontics Clinic II.** (1 cr., [max 2 cr.]; S-N only; Every Fall & Summer) Diagnosis, design, construction of fixed prosthodontic cases.

**DDS 6482. Removable Prosthodontics Clinic II.** (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Clinical practice in partial and complete removable denture prosthodontics for DDS third-year students.

**DDS 6483. Fixed Prosthodontics Clinic IV.** (7.5 cr.; A-F only; Every Spring) Diagnosis, design, construction of fixed prosthodontic cases.

**DDS 6484. Removable Prosthodontics Clinic IV.** (4 cr.; A-F only; Every Spring) Clinic practice in complete/partial removable denture prosthodontics.

**DDS 6485. Preclinical Removable Prosthodontics Lectures for PASS.** (2.5 cr.; A-F only; Every Spring) Principles and philosophies of removable partial denture prosthodontics. Design and fabrication of removable prosthesis to replace teeth for partially edentulous patient. Lecture and interactive seminar.

**DDS 6486. Removable Prosthodontics Laboratory PASS.** (2.2 cr.; A-F only; Every Spring) Technical/clinical laboratory procedures used for fabrication/replacement of teeth with partial dentures.

**DDS 6487. Fixed Prosthodontics for PASS (Program for Advanced Standing Students).** (3 cr.; A-F only; Every Summer) Pre-clinical didactic and laboratory course designed to provide students with the knowledge and procedural skills necessary for managing simulated patient cases requiring partial crown restoration.

**DDS 6491. Preclinical Prosthodontics Technique Lecture VI.** (1.9 cr.; A-F only; Every Summer) Implanting fixed/removable protocols. Principles of restoring damaged teeth. Prereq: 5910 through 5911.

**DDS 6492. Preclinical Prosthodontics Techniques Laboratory VI.** (1 cr.; A-F only; Every Summer) Implanting fixed/removable protocols. Principles of restoring damaged teeth. Prereq: 5901 through 5910.

**DDS 6493. Prosthodontics I.** (1.1 cr. [max 2.2 cr.]; A-F only; Every Spring) Links preclinical/clinical areas. Treatment planning for abutments, retainers, and pontics. Design principles for porcelain fused to metal restorations, pontic designs, occlusion. Prereq: Fundamentals of prosthodontics shape/color, aesthetics of anterior prosthodontics.

**DDS 6494. Global and Integrated Competency Assessment Course.** (1 cr.; S-N only; Every Spring) Global/integrated assessment of didactic/clinical competency for 4th year DDS students. Results of assessment shall be used to establish/maintain standards/competency of University of Minnesota, School of Dentistry.

**DDS 6495. Oral & Maxillofacial Surgery Honors Elective Course.** (1 cr.; S-N only; Every Fall, Spring & Summer) This course provides Doctor of Dental Surgery students the opportunity to participate in a week-long externship experience in the Oral & Maxillofacial clinic at the University of MN, School of Dentistry. Students will be shadowing the OMS Residents as they care for patients. This includes evaluation and management of a surgical patient, pre- & post-operative care, and treatment planning.

**DDS 6496. Predoctoral Prosthodontic Honors Course.** (1 cr.; S-N only; Every Fall & Spring) Clinical, laboratory, and seminar based course for senior dental honors students. Theory and practice in complete denture construction and implant restoration.

**DDS 6511. Foundations of Interprofessionalism, Communication, and Collaboration.** (1 cr.; S-N only; Every Fall) First of three phases of Center for Interprofessional Education's health curriculum. Online work, face-to-face sessions. Professional identity, integrity. Relationships between professionals and those they serve. Social networking, tools for self/peer assessment.

**DDS 6570. Mission of Mercy Volunteer Elective Experience.** (0 cr.; S-N only; Every Fall) Short term volunteer experience to learn public health aspects of oral health. Must be approved by School of Dentistry. Must have faculty supervision.

**DDS 6571. Special Smiles Volunteer Elective Experience.** (0 cr.; S-N only; Every Summer) Short term volunteer experience with Special Smiles event. Public health initiatives of oral health. Must be approved by School of Dentistry. Must have faculty supervision.

**DDS 6572. Team Smiles Volunteer Elective Experience.** (0 cr.; S-N only; Every Summer)
Short term volunteer experience for Team Smiles event. Students experience public health initiative in oral health. Must be approved by School of Dentistry, have faculty supervision.

DDS 6588. Common Hope: Short-term Clinical Experience in Guatemala Elective. (0 cr.; S-N only; Every Spring) Students spend up to two weeks working with Common Hope in Guatemala providing oral health care in cities of Antiqua & San Rafael. Clinical care given under direct supervision of School of Dentistry faculty licensed dentist.

DDS 6601. Phillips Neighborhood Elective Volunteer Experience. (0 cr.; No Grade Associated; Every Fall, Spring & Summer) Opportunity to observe/assist in provision of health care services to populations diverse in age, ethnicity, social environment. Experience unique clinical settings.

DDS 6602. Harbor Lights Elective Volunteer Experience. (0 cr.; No Grade Associated; Every Fall & Spring) Short term volunteer experience to learn about particular aspect of oral health. Must be approved by School of Dentistry/have faculty supervision. prereq: Must be in DDS program

DDS 6603. Elective Regional Volunteer Experience. (0 cr.; S-N only; Every Fall, Spring & Summer) Short term volunteer experience to learn particular aspect of oral health. Must be approved by School of Dentistry. Must have faculty supervision.

DDS 6604. Elective Regional Volunteer Experience. (0 cr.; S-N only; Every Fall, Spring & Summer) Short term volunteer experience to learn particular aspect of oral health. Must be approved by School of Dentistry. Must have faculty supervision.

DDS 6605. Advanced Practice Management Elective. (0-2 cr.; S-N only; Every Spring) Fundamentals of business management related to maintaining dental practice. Components include economics, planning practice philosophy, operational decisions, financial decisions, financial analysis, business taxation, evaluation.

DDS 6606. Rural Dentistry Scholars Elective. (0-1 cr.; S-N only; Every Fall, Spring & Summer) The Rural Dentistry Scholars Elective course (RDSP) is for second and third year DDS students and Dental Therapy students selected to participate in the MN Collaborative Rural Oral Health Project (MN-CROHP) to address the rural dental workforce issues. Students spend 3.5 weeks in a rural dental practice in selected counties in MN under the mentorship of a rural dentist. During the same period, they participate in community activities for oral health promotion and disease prevention instruction during community events and in K-12 schools and network with other health care providers in the community. Through a grant, students receive stipend and receive reimbursement for housing and travel costs.

DDS 6607. Interprofessional Leadership and Facilitation Elective. (1 cr.; S-N only; Every Fall) Instruction on Kotter’s 8-Step Process for leading change. Attend facilitator training associated with AHC course Foundations of Interprofessional Communication/Collaboration. Facilitate six small group sessions of first year students within AHC. prereq: Four-year DDS student

DDS 6608. Elective Externship I. (1-5 cr.; S-N only; Every Fall, Spring & Summer) Short-term externship to become familiar with a particular aspect of oral health or participate in international exchange program.

DDS 6609. Elective Externship II. (1-5 cr.; max 10 cr.; S-N only; Every Fall, Spring & Summer) Short-term externship to become familiar with a particular aspect of oral health or participate in international exchange program.

DDS 6610. Elective Externship III. (1-5 cr.; S-N only; Every Fall, Spring & Summer) Short-term externship to become familiar with a particular aspect of oral health or participate in international exchange program.

DDS 6611. Study Abroad Externship. (1-10 cr. [max 25 cr.]; S-N only; Every Fall, Spring & Summer) Short-term externship to become familiar with a particular aspect of oral health or participate in international exchange program.

DDS 6612. Union Gospel Mission Volunteer Outreach Opportunity. (0 cr.; S-N only; Every Fall, Spring & Summer) Volunteer at Union Gospel Mission in St. Paul, Minnesota under guidance of School of Dentistry faculty.

DDS 6613. Endodontic Topics for the General Dentist. (0 cr.; S-N only; Every Fall & Spring) Presentations on scientific/biologic basis for root canal therapy.

DDS 6614. Predoctoral Periodontal Honors. (2 cr.; A-F only; Every Spring) Surgical periodontics. Lab exercises, gingivectomy, modified widow flap, apically positioned flap with osseous recontouring, free gingival graft procedures. Surgically placed dental implants in aplastic madible. Students assist senior perio residents in surgery, perform surgery on their own patient.

DDS 6615. Oral and Maxillofacial Pathology Independent Study. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring) Independent projects in oral and maxillofacial pathology designed by student and faculty. This elective covers primarily retrospective surgical pathology studies although active laboratory research may be possible.

DDS 6616. Advanced Simulation Clinic Elective I. (0.5 cr.; S-N only; Every Fall, Spring & Summer) Operative dental procedures. Psycho-motor skills for performing basic operative preparations according to specifications of DentSim software. Prereq-DDS program.

DDS 6617. Advanced Simulation Clinic Elective II. (0.5 cr.; S-N only; Every Fall, Spring & Summer) Additional operative dental procedures. Psycho-motor skills for performing basic operative preparations according to specifications of DentSim software. Prereq-DDS program.

DDS 6619. Moderate Sedation Techniques. (0 cr.; S-N only; Every Fall) Planning/administration of moderate sedation via parenteral access (intravenous).

DDS 6621. Introduction to CAD/CAM Restorations. (2 cr.; S-N only; Every Fall, Spring & Summer) CAD/CAM in restorative dentistry. Emphasizes clinical aspects. Students deliver CAD/CAM restorations to patients.

DDS 6622. EBD: Advanced Dental Materials for Esthetic & Digital Applications. (1 cr.; S-N only; Every Fall, Spring & Summer) Advanced evidence-based aesthetic restorative materials/digital clinical modalities. Rationale of prescribing different esthetic/adhesive/digital treatment modalities. Selection of various dental materials based on scientific rationale. prereq: DDS program

DDS 6623. Oral Disease Clinic Elective. (0 cr.; S-N only; Every Fall, Spring & Summer) Students experience clinical oral pathology diseases not normally seen during dental clinic rotations. Students observe operator protocol, management, and referrals.

DDS 6624. Disaster 101 Elective. (1 cr.; S-N only; Every Fall & Spring) Disaster preparedness. Timeliness/quality of response. Students participate in simulated disaster scenarios in interprofessional teams. Prereq-In DDS program.

DDS 6625. Pediatric Dentistry Honors Elective. (0.5 cr.; A-F only; Every Fall, Spring & Summer) Didactic discussionsclinical sessions with pediatric patients requiring advanced dental treatment and/or advanced behavioral management skills.

DDS 6626. Orofacial Pain Clinic Elective. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Two days of observation in the Orofacial Pain Clinic while residents and faculty evaluate and manage patients with orofacial pain conditions. Students will gain working knowledge of patient interviewing skills, musculoskeletal exam of the head and jaw, jaw range of motion and function. They will also gain knowledge of how to prescribe and deliver dental appliances.

DDS 6630. Dental Research Training. (2-6 cr.; S-N or Audit; Every Summer) Research project, written report.

DDS 6631. DDS/PhD Research Elective I. (2 cr. [max 6 cr.]; S-N only; Every Fall, Spring & Summer) Integrate research education with dental education. Attend labs one-half day per week, MNCrest seminar monthly, and oral biology student seminar weekly. Additional research time/credits may be permitted with approval of
associate dean for academic affairs. Prereq-Students must be part of the MinnCRest program.

**DDS 6632. DDS/PhD Research Elective II.** (2 cr. [max 6 cr.]; S-N only; Every Fall, Spring & Summer)
Integrate research education with dental education. Attend lab one-half day per week, MinnCRest seminar monthly, and oral biology student seminar weekly. Additional research time/credits may be permitted with approval of associate dean for academic affairs. Prereq-Students must be part of the MinnCRest Program.

**DSS 6640. Curricular Practical Training Elective.** (1 cr. [max 4 cr.]; S-N only; Every Fall, Spring & Summer)
This course is an elective internship or employment to gain practical work experience, advance professional skills and explore career interests.

**DSS 6900. Dental Clinic.** (1-15 cr.; S-N or Audit; Every Fall, Spring & Summer)
Elective clinical course for students and adult special students who want additional clinical training in comprehensive dental care.

**DSS 6901. Essentials of Clinical Care DDS2.** (0 cr.; S-N only; Every Fall, Spring & Summer)
This course will introduce sophomore doctor of dental surgery students to the clinical care of patients. Students will assist in care provision in multiple care environments under the direction and supervision of experienced clinical faculty. This course will encompass clinical training over two semesters and a final grade is given at the end of the last semester. This course will also allow students to volunteer to assist at the Union Gospel Mission Dental Clinic in St. Paul. prereq: Must be enrolled in the Doctor of Dental Surgery Program.

**DSS 6911. Essentials of Clinical Care: D3.** (0-18 cr. [max 72 cr.]; S-N only; Every Fall, Spring & Summer)
Students provide comprehensive care under direction of clinical faculty. May include periodontics, operative, prosthodontics/ endodontics, and health promotion. Limited care may be given on rotations to oral surgery/ endodontics clinics. Prereq-DDS 3rd yr.

**DSS 6918. Evidence Based Dentistry.** (1-2 cr.; A-F only; Every Fall & Spring)
Background knowledge and skills to integrate the best research evidence with clinical expertise and patient preferences in making clinical decisions. Principles of evidence-based dentistry are discussed as well as their clinical application. Prereq-Must be in DDS program.

**DSS 6921. Essentials of Clinical Care: D4.** (0-18 cr. [max 54 cr.]; S-N only; Every Fall, Spring & Summer)
Students provide comprehensive care under direction of clinical faculty. May include periodontics, operative, prosthodontics/ endodontics, and health promotion. Limited care may be given on rotations to oral surgery and endodontics clinics. Prereq-DDS 4th yr.

**DSS 6931. Dental Clinic.** (1-15 cr.; S-N only; Every Fall, Spring & Summer)
Elective clinical course. Clinical training in comprehensive dental care.

**DSS 7103. Biochemistry & Cell Biology for Dental Students.** (4 cr. [max 8 cr.]; A-F only; Every Fall)
This course covers four main classes of biomolecules (nucleic acids, proteins, carbohydrates, and lipids) and how they interact at the cellular and organismal levels. Dental students will learn about the building blocks that comprise these biomolecules and how they are produced and degraded as part of normal cellular growth processes. These basic biochemical concepts will then be transferred to cellular processes including enzyme kinetics, roles of salivary enzymes in health and disease, metabolic pathways, and regulation of cellular processes such as cell cycle progression and the blood-clotting cascade. Upon completion of the course, students will be able to explain the role of these biomolecules in health and disease, with an emphasis on oral health, as well as being capable of diagnosing diseases based on biochemical characterization of patient samples.

### Dutch (DTCCH)

**DTCCH 1001. Beginning Dutch.** (1 cr.; Student Option; Every Fall & Spring)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

**DTCCH 1002. Beginning Dutch.** (1 cr.; Student Option; Every Fall & Spring)
Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and Dutch culture. prereq: 1001

**DTCCH 1003. Intermediate Dutch.** (2 cr.; Student Option; Every Fall)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments. prereq: 1002

**DTCCH 1004. Intermediate Dutch.** (2 cr.; Student Option; Every Spring)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. prereq: 1003

**DTCCH 1911. Anne Frank: her Life and Legacy.** (3 cr.; Student Option; Periodic Spring)
To understand Anne Frank’s symbolic status as a holocaust victim and object of identification for many young people in the world, one must know the context of her ethnic heritage, the uniqueness of her hiding situation, and the critical acclaim of her journal and its adaptations. This seminar examines the iconic text against the backdrop of the Netherlands under a civil administration during the Nazi occupation. From the perspective of the history of Jewish life in the Netherlands, the rise of antisemitism and the German exploitation of the Dutch bureaucracy for the purpose of persecution and deportation, Anne Frank will emerge as a particular case of victimization, one of many, and not as the universal example with sainthood status that she has become over time. To look at her from this perspective, however, will by no means undermine or devalue the legacy of her optimism and humanism for our world of today.

**DTCCH 3011W. Conversation and Composition.** (WI; 3 cr.; Student Option; Every Fall)
Practice/refinement of spoken/written Dutch. Composition, vocabulary. Reading, viewing, and discussion of Dutch/Flemish media reports. Grammar review, critical corrective grammatical skills. prereq: 1004 or 4004 or instr consent

**DTCCH 3012. Conversation and Composition.** (3 cr.; Student Option; Periodic Spring)
Practice and refinement of spoken and written Dutch. Compositional skills, vocabulary. Reading, viewing, and discussion of Dutch and Flemish media reports. Grammar review. Development of critical corrective grammatical skills. prereq: 3011 or 4011

**DTCCH 3610. Dutch Literature in Translation.** (3 cr. [max 9 cr.]; Student Option; Periodic Spring)
In-depth study of authors or topics from various periods in Dutch literature. All primary/secondary literature is read in English translation.

**DTCCH 3993. Directed Studies.** (1-5 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Guided reading in or study of Dutch literature, culture, or advanced language skills. Prereq-instr consent, dept consent, college consent.

**DTCCH 4001. Beginning Dutch for Graduate Research.** (5 cr.; Student Option; Every Fall & Summer)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.). Meets concurrently with 1001.

**DTCCH 4002. Beginning Dutch for Graduate Research.** (5 cr.; Student Option; Every Spring & Summer)
Continues the presentation of all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.). Meets concurrently with 1002.

**DTCCH 4003. Intermediate Dutch for Graduate Research.** (5 cr.; Student Option; Every Fall)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments. Meets concurrently with 1003.
DTCH 4004. Intermediate Dutch for Graduate Research. (1.5 cr.; Student Option; Every Spring)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. Meets concurrently with 1004.

DTCH 4011. Conversation and Composition for Graduate Research. (3 cr.; Student Option; Every Fall)
Practice/refinement of spoken/written Dutch. Composition, vocabulary. Reading, viewing, and discussion of Dutch/Flemish media reports. Grammar review, critical corrective grammatical skills. Meets with 3011W.

DTCH 4012. Conversation and Composition for Graduate Research. (3 cr.; Student Option; Periodic Spring)
Practice/refinement of spoken/written Dutch. Compositional skills, vocabulary. Reading, viewing, and discussion of Dutch/Flemish media reports. Grammar review. Development of critical corrective grammatical skills. Meets with 3012. Prereq; 3011 or 4011

DTCH 5993. Directed Studies. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. Prereq-instr consent, dept consent, college consent.

Early Modern Studies (EMS)

EMS 5500. Topics in Early Modern Studies. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Selected topics in early modern studies from various disciplinary perspectives/world regions. Prereq; Grad student

EMS 8100. Workshop in Early Modern Studies. (1-3 cr.; S-N only; Every Fall & Spring)
Lectures and workshops offered by various centers, departments, institutes, and libraries across disciplines on Twin Cities campus. Online reports and discussion. Prereq; instr consent

EMS 8250. Seminar in Early Modern Studies. (3 cr. [max 6 cr.]; Student Option; Every Fall)
Current research and debates in early modern studies. Theoretical approaches to major questions shaping seminar's subject matter.

EMS 8500. Topics in Early Modern Studies. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Selected topics in early modern studies from various disciplinary perspectives and world regions. Prereq; Grad student

EMS 8993. Directed Study. (1-6 cr.; A-F or Audit; Every Fall, Spring & Summer)
Students work on tutorial basis. Guided individual reading or study. Prereq; Grad student

Earth Sciences (ESCI)

ESCI 1001. Earth and Its Environments. (ENV,PHYS; 4 cr.; Student Option; Every Fall, Spring & Summer)

ESCI 1003. Dinosaurs and Our World. (BIOL,ENV; 4 cr.; Student Option; Every Spring)
Dinosaur evolution, ecology, and extinction. Evolution of modern ecosystems from the Mesozoic Era to the Anthropocene (and dinosaurs roles in that evolution). Human interactions with our environment and our roles as historic agents. Structure and function of biological forms, interpreting past life, and the social history of scientific inquiry.

ESCI 1005. Geology and Cinema. (ENV,PHYS; 4 cr.; Student Option; Every Fall)
Physical processes shaping the Earth. Materials it comprises, its nearly five billion year history as told spectacularly, but often wrongly, by Hollywood movies.

ESCI 1006. Oceanography. (ENV,PHYS; 4 cr.; Student Option; Every Fall)
How various processes in the ocean interact. Marine biology, waves, tides, chemical oceanography, marine geology, and human interaction with the sea. Labs include study of live marine invertebrates, manipulation of oceanographic data, and discussion using videos showing unique aspects of ocean research.

ESCI 1007. From Microbes to Mammoths: History of Life on Earth. (BIOL; 4 cr.; Student Option; Every Fall)
Scientific evidence from biology, paleontology, and geology for origin/evolution of life over 4.5 billion years of Earth's history. Biochemical basis of life, biogeochemical cycles, natural selection, origin of species, genetics, phylogeny reconstruction, timescales for evolution.

ESCI 1012. Natural Hazards and Disasters. (TS; 3 cr.; Student Option; Every Spring)
Geological processes that give rise to natural hazards and the emerging technologies that allow societies to mitigate their effects.

ESCI 1081. Conspiracies, Fraud, and Deception in Earth History. (1 cr.; Student Option; Every Spring)
Famous cases of geological deception from three centuries are presented in the intellectual context of their time and demonstrate the prevailing power of scientific reasoning.

ESCI 1101. Introduction to Geology. (ENV; 3 cr.; Student Option; Every Fall, Spring & Summer)
Physical processes that shape the Earth: volcanoes, earthquakes, plate tectonics, glaciers, rivers. Current environmental issues and global change. Lecture.

ESCI 1105. Geology and Cinema. (ENV; 3 cr.; Student Option; Every Spring)
Physical processes shaping the Earth, materials it comprises, its nearly five billion year history as told spectacularly, but often wrongly, by Hollywood movies.

ESCI 1106. Oceanography. (ENV; 3 cr.; Student Option; Every Fall)
How various processes in the ocean interact. Marine biology, waves, tides, chemical oceanography, marine geology, human interaction with sea.

ESCI 1201. Into Earth Sciences Lab. (1 cr.; Student Option No Audit; Every Fall, Spring & Summer)
ESCI 1201 is simply the same suite of laboratory explorations that comprise the lab component of ESCI 1001. ESCI 1201's only purpose is to allow students who have previously taken ESCI 1101 (the lecture-only equivalent of ESCI 1001) to combine ESCI 1101 and ESCI 1201 to complete the standard ESCI 1001 class in order to satisfy LE requirements as a Physical Science (students who completed ESCI 1101 have already fulfilled the requirements for the Environment theme). ESCI 1201 is only available to students who have previously taken ESCI 1101, it cannot be taken as a stand-alone course. Please refer to ESCI 1001 for an equivalent description of the combined ESCI 1101/1201 program.

ESCI 1902. Geology of Minnesota. (ENV; 3 cr.; Student Option; Every Fall)
This course addresses important societal questions, such as "Where does my drinking water come from? Do I really need to buy bottled water? What should my stand be regarding major water-related environmental issues in Minnesota?" In this course, we will explore the world around us, and apply what we learn to better contribute to the solutions we will need as a society to deal with impacts on water quality and quantity due to factors such as agriculture, flood control, groundwater pumping, hydroelectric power, integrity of surface water features, interbasin transfers, invasive biota, mining, and shipping. In doing so, we will explore ways for everyone to better take responsibility for their role in optimizing public health, maximizing economic benefits, maintaining biodiversity, and protecting the integrity of surface water features on our landscape. Emphasis will be placed on how our choices and solutions will in the long term affect our principal drinking water source--the groundwater that is hosted in ancient rocks in the north and in the deep subsurface, younger limestone and sandstone in the south, and the sediments of the most recent Ice Age from which our soils have formed. A full-day field trip planned for a Saturday in September will examine how societal choices affect our use of and protection of water resources in our rivers and lakes, and a second full-day trip on a Saturday in October will address the same issues in relation to our largest source of drinking water--our wells. Those unable to attend a field trip may instead prepare a paper.

ESCI 1904. Astrobiology: The Science of the Search for Life on Other Planets. (3 cr.; Student Option No Audit; Every Fall)
Astrobiology brings together concepts from many different scientific fields, including
geology, chemistry, biology, astronomy, and planetary science, to help answer one of the most enduring questions humankind has asked while looking up at the stars: Are we alone in the Universe? From a foundation of what we know about life today and what we have learned about past life preserved in the rock record on Earth, we are looking for signs of life on habitable worlds within our solar system (including Mars, Europa, Ganymede, and Enceladus). Further, with an ever-increasing catalog of worlds detected around stars outside of our solar system, we are studying how to look for life on worlds beyond our solar system. This course will address questions that are fundamental to astrobiology, including: What is life? What are the physical and chemical requisites for life as we know it? Were these requisites present on other worlds in the past, or are they present today? How do we look for signs of past or present life on other worlds? To help address these questions, students will learn the basic principles of astronomy (star formation, planetary accretion), geology (planetary composition, geologic time, plate tectonics, preservation of biosignatures), chemistry (elements and reactions essential to life, chemical signatures life produces), and biology (metabolism, chemotrophy, phototrophy, biological innovation). Students will complete this course with a deeper understanding of: (1) how our solar system and planet formed; (2) how life developed and evolved; (3) planetary geology and geologic time; (4) the strategies for life in extreme environments; (5) the conditions necessary for a habitable world; (6) past, present, and future missions looking for life on other worlds; and (7) the place of our planet in the universe.

ESCI 2201. Solid Earth Dynamics. (4 cr.; A-F or Audit; Every Fall) Dynamics of solid Earth, particularly tectonic system. Seismology, internal structure of Earth. Earth's gravity, magnetic fields. Paleomagnetism, global plate tectonics, tectonic systems. Field trip. prereq: concurrent registration is required (or allowed) in PHYS 1301 or instr consent


ESCI 2203. Earth Surface Dynamics. (4 cr.; A-F or Audit; Every Spring) Earth's surface processes, drivers, and implications. Interactions between atmosphere, lithosphere, hydrosphere, and biosphere.

ESCI 2301. Mineralogy. (3 cr.; Student Option; Every Fall) Crystallography, crystal chemistry, physics. Physical/chemical properties, crystal structures, chemical equilibria of major mineral groups. Lab includes crystallographic, polarizing microscopy, X-ray powder diffraction exercises, hand-specimen mineral identification. prereq: [concurrent registration is required (or allowed) in CHEM 1061, concurrent registration is required (or allowed) in CHEM 1065, concurrent registration is required (or allowed) in MATH 1271] or instr consent

ESCI 2302. Petrology. (3 cr.; Student Option; Every Spring) Magmatic and metamorphic processes, with an emphasis on plate tectonic interpretation of rock sequences. prereq: 2301 or instr consent

ESCI 3002. Climate Change and Human History. (ENV; 3 cr.; A-F or Audit; Spring Every Year) Causes of long/short-term climate change. Frequency/magnitude of past climate changes; their geologic records. Relationship of past climate changes to development of agrarian societies and to shifts in power among kingdoms/city-states. Emphasizes last 10,000 years.

ESCI 3004. Water and Society. (ENV; 3 cr.; Student Option; Periodic Fall) For non-science majors. Study of (1) the role of humans as agents influencing the composition (quality) of water resources through domestic, agricultural, industrial, and other land-use practices; (2) the role of water in various ecosystem services which may be at odds with the anthropocentric view of water as a resource; (3) how population increase and climate change, coupled with human actions, is affecting the quality and quantity of available water, leading to lack of access to clean water and decent sanitation, and to severe water shortages (e.g., for irrigation) in some areas, especially in developing nations and politically unstable regions; and (4) how the availability of water shapes a society's view of water as a resource and its view of the non-human demands for water (which is not uniform across the globe).

ESCI 3005. Earth Resources. (3 cr.; Student Option; Fall Odd Year) Geologic aspects of energy/material resources. Resource size/life-times. Environmental consequences of resource use. Issues of international/public ethics associated with resource production, distribution, and use.


ESCI 3093. Problems in Earth Sciences: Junior. (1-4 cr.; max 6 cr.; Student Option; Every Fall & Spring) Problems in earth sciences studied independently under the direction of a faculty member. prereq: instr consent

ESCI 3190. Curricular Practical Training. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Work assignments involving advanced earth science training. Reviewed by the Director of Undergraduate Studies.
ESCI 4204. Geomagnetism and Paleomagnetism. (3 cr.; Student Option; Periodic Fall)
Present geomagnetic field at the Earth's surface, secular variation, geomagnetic field reversals. Physical and chemical basis of paleomagnetism: origin of natural remanent magnetization, mineralogy of magnetic minerals, magnetic polarity stratigraphy, apparent polar wander, and environmental magnetism. prereq: 2201, Phys 1302, Math 1272 or instr consent

ESCI 4211. Solid Earth Geophysics I. (3 cr.; A-F or Audit; Every Fall)
Basic elasticity, basic seismology, and physical structure of the Earth's crust and deep interior. prereq: 2201, Phys 1302

ESCI 4212. Solid Earth Geophysics II. (3 cr.; A-F or Audit; Every Spring)
Dynamics of the solid Earth, mostly mantle and core; seismic tomography, geothermal measurements, gravity, time-dependent deformation of the Earth, computer modeling. prereq: 2201, Phys 1302

ESCI 4401. Aqueous Environmental Geochemistry. (3 cr.; Student Option; Periodic Spring)

ESCI 4402. Biogeochemical Cycles in the Ocean. (3 cr.; Student Option; Fall Even Year)
Marine biogeochemistry and chemical oceanography. Processes controlling chemical composition of oceans past/present. Cycles of major/minor constituents, including carbon, nitrogen, phosphorus, silicon, and oxygen and their isotopes. Role of these cycles in climate system. prereq: [CHEM 1021, CHEM 1022] or instr consent

ESCI 4501. Structural Geology. (3 cr.; Student Option; Every Fall)
Fundamental concepts related to deformation of Earth's crust. Processes associated with deformation, faulting, folding, fabric development. Lab/recitation include solving problems, conducting physical/numerical experiments. Field trips. prereq: 2201, 2302

ESCI 4502. Tectonic Styles. (3 cr.; Student Option; Periodic Fall)
Origin and nature of major types of tectonic disturbances affecting the crust and lithosphere, including analysis of the form and development of individual structural components and relationship to plate tectonics. Changes over geologic time in the nature of orogenic processes. prereq: 4501 or instr consent

ESCI 4503. Neotectonics. (3 cr.; Student Option; Periodic Fall)
Integration of diverse elements of geology, geodesy, and geophysics to examine recent and active tectonics of the Earth's lithosphere; extensional, compressional and wrench tectonic regimes with case studies around the world; modern global plate motions, geodetic techniques, seismic anisotropy, climatically driven tectonics. prereq: 4501 or instr consent

ESCI 4602. Sedimentology and Stratigraphy. (3 cr.; Student Option; Every Spring)
Interpretation of origin of sedimentary rocks through application of basic physical/chemical principles. Modern depositional environments, petrographic microscopy, basin dynamics, stratigraphy. prereq: [2203, 2301] or instr consent

ESCI 4701. Geomorphology. (4 cr.; Student Option; Fall Even Year)
Origin, development, and continuing evolution of landforms in various environments. Environmental implications. Weathering, slope and shore processes, fluvial erosion and deposition, and region processes, glacial processes. This course includes lecture and laboratory components, including field trips. prereq: ESCI 2201, 2203 and 3202; MATH 1272; and PHYS 1301; or instructor consent

ESCI 4702. General Hydrogeology. (4 cr.; Student Option; Every Spring)
Theory of groundwater geology, hydrologic cycle, watershed hydrology. Darcy's law, governing equations of groundwater motion, flow net analysis, analog models, groundwater resource evaluation/development. Applied analysis of steady and transient equations of groundwater motion and chemical transport. Chemistry of natural waters. prereq: [concurrent registration is required (or allowed) in CHEM 1062, concurrent registration is required (or allowed) in CHEM 1066, MATH 1271, PHYS 1201] or instr consent

ESCI 4703. Glacial Geology. (4 cr.; Student Option; Fall Odd Year)
Formation and characteristics of modern glaciers; eolian and erosional features of Pleistocene glaciers; history of quaternary environmental changes in glaciated and nonglaciated areas. Field trips and labs. prereq: 1001 or instr consent

ESCI 4801. Geomicrobiology. (3 cr.; Student Option; Every Spring)
Geosphere/biosphere interactions over temporal/spatial scales. Global biogeochemical cycling, microbe-metal interactions, microbial paleobiology, environmental geomicrobiology, life detection, habitability of planets. prereq: One semester college level biology

ESCI 4971W. Field Hydrogeology. (4 cr.; Student Option; Every Summer)
Aquifer, vadose zone, and surface water hydrology field techniques. Shallow soil

ESCI 5093. Directed Studies in Earth Sciences. (1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring)

Independent, directed study in earth sciences arranged by student/faculty member.

ESCI 5102. Climate Change and Human History. (3 cr.; Student Option; Spring Even Year)

Causes of long-/short-term climate change. Frequency/magnitude of past climate changes, their geologic records. Relationship of past climate changes to development of agrarian societies and to shifts in power among kingdoms/city-states. Emphasizes last 10,000 years. prereq: 1001 or equiv or instr consent

ESCI 5201. Time-Series Analysis of Geological Phenomena. (3 cr.; A-F or Audit; Periodic Fall)

Time-series analysis of linear and nonlinear geologic and geophysical phenomena. Examples drawn from ice age cycles, earthquakes, climatic fluctuations, volcanic eruptions, atmospheric phenomena, thermal convection and other time-dependent natural phenomena. Modern concepts of nonlinear dynamics and complexity theory applied to geological phenomena. prereq: Math 2263 or instr consent

ESCI 5203. Mineral and Rock Physics. (3 cr.; Student Option; Periodic Spring)

Physical properties of minerals and rocks as related to the composition and dynamics of the Earth's crust, mantle, and core. prereq: 2201, Phys 1302

ESCI 5204. Geostatistics and Inverse Theory. (3 cr.; Student Option; Fall Odd Year)


ESCI 5205. Fluid Mechanics in Earth and Environmental Sciences. (3 cr.; Student Option; Fall Even Year)


ESCI 5302. Isotope Geology. (3 cr.; A-F or Audit; Every Fall)

Theory and uses of radioactive, radiogenic, and stable isotopes in geology. Radiactive dating, geothermometry, and tracer techniques in geologic processes. prereq: 3303W or instr consent

ESCI 5351. Geochemical Modeling of Aquifer Systems. (3 cr.; Student Option; Spring Odd Year)

Using mass transfer reaction path models to assess chemical evolution of natural fluids, hydrothermal alteration processes, and formation of hydrothermal ore deposits. prereq: 4401

ESCI 5353. Electron Microprobe Theory and Practice. (3 cr.; Student Option; Periodic Fall)

Characterizing solid materials with electron beam instrumentation, including reduction of X-ray data to chemical compositions. prereq: One yr chem, one yr physics or instr consent

ESCI 5402. Science and Politics of Global Warming. (3 cr.; Student Option; Every Spring)


ESCI 5502. Advanced Structural Geology. (3 cr.; Student Option; Periodic Fall)

Analysis of structures and fabric of deformed rocks. Determination of states of stress and strain in rocks and of evolution of these with time. Deformation mechanisms. Extensive reading in journal literature. Field trips. prereq: 4501 or instr consent

ESCI 5503. Advanced Petrology. (3 cr.; Student Option; Fall Odd Year)

Quantitative approach to modern igneous/metamorphic petrology. Emphasizes thermodynamics of minerals/melts and with applications to phase diagrams, thermobarometry, melting relationships, and energetics of petrologic mass transfer. prereq: 2302, CHEM 1061, CHEM 1065, [MATH 1372 or MATH 1272 or MATH 1572]

ESCI 5504W. Neotectonics. (WI; 3 cr.; Student Option; Fall Even Year)

Integration of multidisciplinary elements of geology, geodesy, geodynamics, seismotectonics, tectonophysics to examine recent/active tectonics of Earth's lithosphere. Extensive, compressional, wrench-tectonic regimes with global case studies incorporating mantle to surface processes. prereq: [2201, 4501] or instr consent

ESCI 5601W. Advanced Sedimentology. (WI; 4 cr.; Student Option; Fall Odd Year)

Principles/processes of sedimentary geology. Interactions among lithosphere, biosphere, atmosphere, hydrosphere. Detrital/carbonate facies of modern/ancient systems, coastal processes, geobiology, tectonics, paleoclimate, structural diagenesis, paleosols, volcanic sedimentation. prereq: 4602 or instr consent

ESCI 5705. Limnogeology and Paleoenvironment. (3 cr.; Student Option; Periodic Fall)

Within-lake, hydrogeologic, and landscape (geological/biological) processes that lead to formation of various proxy records of paleoenvironment. Systems approach to physical, geochemical, biogeochemical, and biotic proxies. Basic principles, case studies. Emphasizes how proxy records relate to paleoclimate. prereq: instr consent

ESCI 5805. Standards and Practices for Professional Geoscientists. (3 cr.; Student Option; Every Spring)

This course is meant to provide students with a clear understanding of the standards and practices regularly used by Geoscience professionals in industry and agency. The course builds on the foundational knowledge offered through the core curriculum of the Earth Sciences undergraduate major, and fills a critical gap in showing how this knowledge is translated into common standards and practices, regulations, funding mechanisms, and even professional expectations within a variety of geoscience disciplines. In short, this course aims to smooth a student's transition from University to an entry-level position from which they can build a successful and sustainable career. This course is targeted for both upper level undergraduates and graduate students. Aspects of the course include: - Detailed discussion of regional stratigraphy, bedrock and glacial geology and how they relate to various industrial applications and environmental issues. - Examination of state and federal environmental regulations, as well as the phases of environmental impact statements. - Survey of fundamental investigation techniques (GeoProbe drilling, hollow-stem auger drilling, well installation, analytical testing? soil, groundwater, air). - Introduction to environmental clean-up grants and their management. - Assessment of topics covered in the National Association of State Boards of Geology (ASBOG) Fundamentals of Geology (FG) exam. This exam is a required step on the way to becoming a registered geologist. The exam is offered in mid-March, and the expectation is that students participating in the class will take it. - Coordination and completion of the 40 hour HAZWOPER training through UMN. - Invited lectures from select representatives of various subfields and professional organizations (groundwater & contaminant hydrogeology, mining & geophysical exploration, environmental engineering, petroleum) to give students a jumpstart in their professional networking.

ESCI 5971. Field Hydrogeology. (2 cr.; Student Option; Every Summer)

Aquifer, vadose zone, and surface water hydrology field techniques. Shallow soil boring and sampling. Well installation. Single/multiple well aquifer testing. Ground water sampling for chemical analysis. Weather data collection, hydrogeologic mapping, water balance calculation. prereq: instr consent

ESCI 5980. Seminar: Current Topics in Earth Sciences. (1-4 cr. [max 12 cr.]; S-N or Audit; Periodic Fall & Spring)

Topics in earth sciences investigated in a seminar format.

ESCI 8001. Introductory Graduate Seminar. (2 cr.; S-N or Audit; Every Fall)

Graduate level survey of important research, concepts, and methods in the earth sciences;
familiarization with program faculty/facilities and basics of science writing and proposal craft. prereq: Grad student status in earth sci

ESCI 8203. Environmental Geophysics. (3 cr.; Student Option; Every Fall)
Seismic exploration (reflection/refraction). Potential techniques (gravity/magnetics), electrical techniques of geophysical exploration. prereq: Phys 1301 or equivalent

ESCI 8204. Geomagnetism and Paleomagnetism. (3 cr.; Student Option; Spring Even Year)
Present geomagnetic field at Earth’s surface, secular variation, geomagnetic field reversals. Physical/chemical basis of paleomagnetism. Origin of natural remanent magnetization, mineralogy of magnetic minerals, magnetic polarity stratigraphy, apparent polar wander, environmental magnetism. prereq: 2201, Phys 1302, [Math 1272 or instr consent]

ESCI 8243. Principles of Rock Magnetism. (3 cr.; Student Option; Periodic Fall)
Remanent magnetizations, their classification and origins. Fundamentals of fine particle magnetism; magnetic minerals; separation of multicomponent magnetizations; effects of chemical change on magnetization; magnetic proxies of climatic and environmental change; biomagnetism. prereq: 4204 or instr consent

ESCI 8333. FTE: Master’s. (1-3 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Master’s student, adviser and DGS consent

ESCI 8353. Phase Equilibrium in Mineral Systems. (3 cr.; Student Option; Periodic Fall)
Principles of homogeneous and heterogeneous equilibria and their application to problems in petrology. Emphasis on derivations from first principles and formulation of algebraic and graphical methods essential to multicomponent systems. prereq: 4301, Chem 3501, Math 2243

ESCI 8354. Igneous Petrology. (3 cr.; Student Option; Periodic Fall)
Igneous rocks and processes, emphasizing geochemistry of melts and minerals. Content varies with instructor and student interest. prereq: 4301 or instr consent

ESCI 8355. Metamorphic Petrology. (3 cr.; Student Option; Periodic Fall)
Metamorphic processes; relation of theory and observation to current problems. Relation of fundamental concepts and techniques to progressive development of mineral assemblages. Term paper required. prereq: 8353

ESCI 8401. Aqueous Environmental Geochemistry. (3 cr.; Student Option; Periodic Spring)
General principles of solution chemistry applied to geochemistry. Solution-mineral equilibria. Redox processes in natural waters. Geochemistry of hydrothermal fluids. Environmental geochemistry. prereq: Chem 5501 or instr consent

ESCI 8402. Biogeochemical Cycles in the Ocean. (3 cr.; Student Option; Fall Even Year)
Marine biogeochemistry/chemical oceanography. Processes controlling chemical composition of oceans past/present. Cycles of major/minor constituents, including carbon, nitrogen, phosphorus, silicon, oxygen/their isotopes. Role of cycles in climate system. prereq: [Chem 1021, Chem 1022] or instr consent

ESCI 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(no description) prereq: Doctoral student, adviser and DGS consent

ESCI 8501. Structural Geology. (4 cr.; Student Option; Every Fall)
Fundamental concepts related to deformation of Earth’s crust. Problem solving with deformation, faulting, folding, fabric development. Lab/recitation include solving problems, conducting physical/numerical experiments. Term Paper. Field trips. prereq: 2301 or instr consent

ESCI 8502. Tectonic Styles. (3 cr.; Student Option; Spring Odd Year)
Origin/nature of major types of tectonic disturbances affecting crust/lithosphere, including analysis of form/development of individual structural components/relationship to plate tectonics. Changes over geologic time in nature of orogenic processes. prereq: 4501 or 8501 or instr consent

ESCI 8511. Mechanics of Sediment Transport. (3 cr.; A-F or Audit; Spring Even Year)

ESCI 8601. Introduction to Stream Restoration. (3 cr.; A-F or Audit; Every Fall)
Background material essential for participating in a stream restoration project. How to assimilate geologic, hydrologic, and ecological data at the watershed and reach scales to plan a restoration project and evaluate/critique existing stream restoration projects. prereq: Grad student in CE or ESCI or EEB or WRS or Chem 2301 or instr consent

ESCI 8602. Stream Restoration Practice. (2 cr.; S-N only; Every Summer)
Field experience, group design project. Students provide a stream restoration context for each other’s elective coursework, complete critical assessments of stream restoration projects, and design a stream restoration site. prereq: 8601 or CE 8601

ESCI 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; Max 12 cr.) No Grade Associated; Every Fall, Spring & Summer
Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ESCI 8712. Transport Phenomena and Analytical Geohydrology. (3-4 cr.; Student Option; Every Fall)
Microscopic flow parameters, momentum, mass and energy transport through porous media. Geologic factors in aquifer performance, equations for groundwater flow, and analysis of pump tests. prereq: 5701 or CE 3502 or instr consent

ESCI 8718. Numerical Methods in Hydrogeology. (4 cr.; A-F or Audit; Periodic Fall)
Introduction to finite difference and finite element methods in hydrogeology. Students develop one- and two-dimensional models of diffusion and advection-dispersion equations. prereq: 5701, CSci 1107 or instr consent

ESCI 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]) No Grade Associated; Every Fall, Spring & Summer
(no description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ESCI 8801. Geomicrobiology. (3 cr.; Student Option; Every Spring)
Geosphere/biosphere interactions over temporal/spatial scales. Global biogeochemical cycling, microbe-metal interactions, microbial paleobiology, environmental geomicrobiology, life detection, habitability of planets. prereq: One semester college level biology

ESCI 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]) No Grade Associated; Every Fall, Spring & Summer
(no description) prereq: Max 18 cr per semester or summer; 24 cr required

ESCI 8890. Seminar: Current Topics in Earth Sciences. (1-4 cr. [max 32 cr.]) Student Option; Periodic Fall & Spring
Seminar course. Individual topics will be determined and added per semester. prereq: instr consent

ESCI 8890. Seminar: Current Topics in Earth Sciences. (1-4 cr. [max 30 cr.]) S-N or Audit; Every Fall & Spring
Selected seminar topics. prereq: instr consent

ESCI 8894. Research in Earth Sciences. (1-4 cr. [max 30 cr.]) Student Option; Every Fall, Spring & Summer
Independent research under faculty supervision. prereq: instr consent

East Asian Studies (EAS)

EAS 3461. Introduction to East Asia I: The Imperial Age. (3-4 cr.; Student Option; Every Fall & Spring)
Comparative survey of early history of China, Japan, Korea, and Vietnam; early Chinese thought; diffusion of Confucianism, Buddhism, and other values throughout East Asia; political and social history of region to 1600.

EAS 3462. From Subjects to Citizens: The History of East Asia From 1500 to the Present. (GP,HIS; 3-4 cr.; Student Option; Every Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>EAS 3462H</td>
<td>Honors: From Subjects to Citizens: The History of East Asia from 1500 to the Present. (GP,HIS; 3-4 cr.; A-F only; Every Spring)</td>
<td>How Asian states, societies, economies, and cultures linked with one another and with European powers. How period's historical effects still resonate. Covers India, China, Japan, Korea, and Indochina.</td>
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<tr>
<td>EAS 3468</td>
<td>Social Change in Modern China. (: 3 cr.; Student Option; Every Fall)</td>
<td>Principles of ecology from populations to ecosystems. Applications to human populations, disease, exotic organisms, habitat fragmentation, biodiversity and global dynamics of the earth. prereq: [Math 1142, 1241, 1271 or equivalent]</td>
</tr>
<tr>
<td>EAS 3469</td>
<td>Evolution. (3 cr.; Student Option; Every Fall &amp; Spring)</td>
<td>Principles of population growth/interactions, communities and ecosystem function applied to ecological issues. Regulation of populations, dynamics/impacts of disease, invasions by exotic organisms, biodiversity, global change. Lab. Scientific writing. Quantitative skill development (mathematical models, data analysis, statistics and some coding in R). prereq: [One semester college biology or instr consent], [Math 1142 or MATH 1271 or Math 1272 or Math 1241 or Math 1242 or MATH 1281 or Math 1282 or equiv]</td>
</tr>
<tr>
<td>EAS 3479</td>
<td>History of Chinese Cities and Urban Life. (; 3-4 cr.; A-F or Audit; Periodic Fall &amp; Spring)</td>
<td>Introduction to traditional Chinese cities, modern transformation. Ideal city plan in Confucian classics compared with physical layout of major cities. Models about Chinese cities, influence of models on our understanding of Chinese history/society.</td>
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<tr>
<td>EEB 3001</td>
<td>Ecology and Society. (ENV; 3 cr.; A-F or Audit; Every Fall, Spring &amp; Summer)</td>
<td>Basic concepts in ecology. Organization, development, function of ecosystem. Population growth/regulation. Human effect on ecosystems. prereq: [Or or sr] recommended; biological sciences students may not apply cr toward major</td>
</tr>
<tr>
<td>EEB 3002</td>
<td>Sex, Evolution, and Behavior: Examining Human Evolutionary Biology. (; 4 cr.; A-F or Audit; Every Spring)</td>
<td>Methods/theories to understand humans in evolutionary framework. What can be known only/primarily from evolutionary perspective. How evolutionary biology of humans might lead to better evolutionary theory. How physiology, development, behavior, and ecology coordinate/coevolve in humans.</td>
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<tr>
<td>EEB 3007</td>
<td>Ecology. (3 cr.; Student Option; Every Fall)</td>
<td>Principles of ecology from populations to ecosystems. Applications to human populations, disease, exotic organisms, habitat fragmentation, biodiversity and global dynamics of the earth. prereq: [Math 1142, 1241, 1271 or equivalent]</td>
</tr>
<tr>
<td>EEB 3403</td>
<td>Science, Protection, and Management of Aquatic Environments. (; 3 cr.; Student Option; Every Spring)</td>
<td>Fundamentals of aquatic ecology. Case study approach to water problems faced by society (e.g., eutrophication, climate change, invasive species, acid rain, wetland protection, biodiversity preservation). Science used to diagnose/remediate or remove problems. prereq: One semester college biology or instr consent, Math 1142 or MATH 1271 or Math 1272 or Math 1241 or Math 1242 or MATH 1281 or Math 1282 or equiv</td>
</tr>
<tr>
<td>EEB 3500</td>
<td>Special Topics in Ecology, Evolution and Behavior. (. 1-3 cr. [max 4 cr.]; S-N only; Every Fall &amp; Spring)</td>
<td>Special Topics in Ecology, Evolution and Behavior.</td>
</tr>
<tr>
<td>EEB 3534</td>
<td>Biodiversity Science: The origins, maintenance, consequences, detection &amp; assessment of biodiversity. (ENV; 3 cr.; A-F only; Every Fall)</td>
<td>Biodiversity science is a rapidly expanding field of enquiry with increasing digital resources and global monitoring capabilities precisely at the moment in history that scientists recognize as the Sixth Extinction. In other words, we are currently facing a biodiversity crisis with threats to the Earth's biota not seen since the dinosaurs perished 65 million years ago. “Biodiversity” was coined by W.G. Rosen and E.O Wilson in the 1980s to describe the variation in all of life on Earth. The term is now widely used in both the scientific and popular literature and is at the center of scientific enquiry, conservation efforts, large-scale collaborative pursuits of technological advances to allow monitoring from space, and global assessments that interface with international policy. Biodiversity requires integration across multiple disciplines from evolution, to ecology, remote sensing, conservation biology, economics and the social sciences, including the environmental policy. Biodiversity science is thus inherently interdisciplinary. As a consequence, rarely does a single course provide students the opportunity to focus on this critical topic from multiple perspectives and dimensions. This new course seeks to provide students intensive study of biodiversity from six perspectives: 1) the origins of biodiversity, including the processes of speciation and extinction over macroevolutionary timescales and those involved in generating biological variation at microevolutionary scales; 2) the ecological problem of species coexistence, given the nature of competitive interactions and biological filters with a focus on the interactions of individual species and major threats to biodiversity; 3) the consequences of biodiversity and biodiversity loss for ecosystem functions, focusing on ecosystem services; 4) the services or benefits to humans attributed to biodiversity, including cultural benefits of biodiversity; here we discuss both practical and ethical arguments for sustaining biodiversity; 5) methods of detecting biodiversity including classic field biodiversity observations and taxonomic collections and emerging remote sensing methods that harness hyperspectral data and satellite imagery; and 6) scientific assessments of biodiversity that communicate the science of biodiversity to policymakers, particularly the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). The IPBES involves scientists from around the world and integrates indigenous and local knowledge (ILK). The United Nations and governments around the globe are sponsoring the IPBES, building on earlier assessments such as a prominent one in the UK. Several guest lecturers from across the University will participate in discussions and aid in development of computer labs (including Sharon Jansa (CBS), Keith Barker (CBS), Joe Knight (CFANS), and others). prereq: One semester college biology or instr consent, Math 1142 or MATH 1271 or Math 1272 or Math 1241 or Math 1242 or MATH 1281 or Math 1282 or equiv</td>
</tr>
<tr>
<td>EEB 3507</td>
<td>Ecology. (4 cr.; A-F or Audit; Every Summer)</td>
<td>Population growth/interactions. Ecosystem function applied to ecological issues. Regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, biodiversity.</td>
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</table>

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Lab, field work. prereq: [One semester college biology], [MATH 1142 or MATH 1271 or MATH 1281 or equiv]

EEB 3811. Introduction to Animal Behavior. (4 cr.; A-F or Audit; Every Summer)
Biological study of animal behavior. Mechanism development, function, evolution. Emphasizes evolution of adaptive behavior, social behavior in natural environment. Lab, field work. prereq: 1002 or 1009 or 2003 or equiv or instr consent

EEB 4068. Plant Physiological Ecology. (3 cr.; Student Option No Audit; Spring Even Year)
Plant function, its plasticity/diversity in an ecological context. Impact of environmental stresses on major physiological processes of plants, including photosynthesis, respiration, water uptake/transport, and nutrient uptake/assimilation. Lab, field trip to Cedar Creek.

EEB 4129. Mammalogy. (4 cr.; A-F or Audit; Every Fall)
Evolutionary and biogeographic history of mammals. Recognize, identify, and study natural history of mammals at the ordinal level, North American mammals at familial level, and mammals north of Mexico at generic level. Minnesota mammals at specific level. Includes lab. prereq: Biol 1001 or Biol 2012

EEB 4134. Introduction to Ornithology. (4 cr.; Student Option; Every Spring)
Structure, evolution, classification, distribution, migration, ecology, habitats, identification of birds. Lecture, lab, weekly field walks. One weekend field trip. prereq: Biol 1001 or Biol 2012

EEB 4329. Primate Ecology and Social Behavior. (3 cr.; A-F or Audit; Periodic Fall)
Primates as model system to explore animal/human behavior. Factors influencing sociality/group composition. Mating systems. Prevalence of altruistic, cooperative, and aggressive behavior. Strength of social bonds in different species. Evolution of intelligence/culture, prereq: BIOL 1009 or BIOL 1951 or BIOL 3411 or ANTH 1001 or instr consent

EEB 4330W. Animal Communication. (WI; 3 cr.; A-F or Audit; Fall Odd Year)

EEB 4609W. Ecosystem Ecology. (ENV, WI; 3 cr.; Student Option; Every Fall)
Regulation of energy and elements cycling through ecosystems. Dependence of cycles on kinds/numbers of species within ecosystems. Effects of human-induced global changes on functioning of ecosystems. prereq: Biol 3407 or instr consent

EEB 4611. Biogeochemical Processes. (3 cr.; Student Option; Periodic Spring)
Application of biochemistry, ecology, chemistry, and physics to environmental issues. Issues in biogeochemistry. Impact of humans on biogeochemical processes in soils, lakes, oceans, estuaries, forests, urban/managed ecosystems, and extreme environments (e.g., early Earth, deep sea vents, thermal springs). prereq: BIOL 2331, CHEM 2301, PHYS 1201 or instr consent

EEB 4793W. Directed Studies: Writing Intensive. (WI; 1-7 cr.; S-N or Audit; Every Fall, Spring & Summer)
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report. prereq: instr consent, dept consent

EEB 4794W. Directed Research: Writing Intensive. (WI; 1-6 cr.; max 42 cr.; S-N or Audit; Every Fall, Spring & Summer)
Laboratory or field investigation of selected areas of research, including written report. prereq: instr consent, dept consent

EEB 4839. Field Studies in Mammalogy. (4 cr.; A-F or Audit; Every Summer)
Techniques for studying small mammals. Lectures/field projects emphasize identification, distributions, community interactions, ecophysiology, population ecology. prereq: College-level biology course that includes study of animals or instr consent

EEB 4844. Field Ornithology. (4 cr.; A-F or Audit; Every Summer)
Biology of breeding birds through use of field techniques at Itasca Biological Station/Laboratories. Daily fieldwork emphasizes identification, behavioral observations, netting/censusing. prereq: One semester college biology or instr consent

EEB 4993. Directed Studies. (1-7 cr.; S-N or Audit; Every Fall, Spring & Summer)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature. prereq: instr consent, dept consent

EEB 4994. Directed Research. (1-6 cr.; max 42 cr.; S-N only; Every Fall, Spring & Summer)
Laboratory or field investigation of selected areas of research. prereq: instr consent, dept consent

EEB 5042. Quantitative Genetics. (3 cr.; A-F only; Every Fall)
Fundamentals of quantitative genetics. Genetic/environmental influences on expression of quantitative traits. Approaches to characterizing genetic basis of trait variation. Processes that lead to change in quantitative traits. Applied/evolutionary aspects of quantitative genetic variation. prereq: [BIOL 4003 or GCD 3022] or instr consent; a course in statistics is recommended

EEB 5053. Ecology: Theory and Concepts. (4 cr.; Student Option; Fall Odd Year)
Classical and modern mathematical theories of population growth, interspecific interactions, ecosystem dynamics and functioning, with emphasis on underlying assumptions and on effects of added biological reality on robustness of predictions, stability, interspecific interactions, ecosystem structure and functioning. prereq: Biol 3407 or instr consent

EEB 5068. Plant Physiological Ecology. (3 cr.; Student Option No Audit; Spring Even Year)
Plant function, its plasticity/diversity in ecological context. Impact of environmental stresses on major physiological processes of plants, including photosynthesis, respiration, water uptake/transport, and nutrient uptake/assimilation. Lab, field trip to Cedar Creek. prereq: BIOL 2022 or BIOL 3002 or BIOL 3407 or BIOL 3408W or instr consent

EEB 5221. Molecular Evolution. (3 cr.; A-F or Audit; Periodic Fall)
Molecular basis of evolutionary change. Selection, neutral evolutionary processes at molecular level. Evolution from gene to genome level: protein structure/function, multigene families, organelle genomes, genome organization. Lectures, current literature, workshops. prereq: [([BIOL 4003 or GCD 3022], grad student)] or instr consent

EEB 5322. Evolution and Animal Cognition. (3 cr.; Student Option; Periodic Fall)
Animal cognitive abilities. Learning, perception, memory, navigation, and communication from evolutionary/comparative perspective. Cognitive abilities as adaptations that solve specific environmental problems. Empirical methods for assessing cognitive abilities. Emphasizes parsimonious interpretations of data. Controversial topics such as animal intelligence, animal language and whether non-human animals have a "theory of mind." prereq: Biol 3411 or Psy 3061 or instr consent

EEB 5327. Behavioral Ecology. (3 cr.; Student Option; Spring Even Year)
Evolutionary principles applied to aggressive competition, mate choice, cooperation, and parental investment. Optimization models used to examine foraging strategies, predator/prey interactions, and territoriality. Evolution of sex, sexual selection, dispersal. Evolutionary game theory, prereq: Biol 3411 or instr consent

EEB 5371. Principles of Systematics. (3 cr.; Student Option; Spring Odd Year)
Theoretical/practical procedures of biological systematics. Phylogeny reconstruction. Computer-assisted analyses, morphological and molecular approaches, species concepts/speciation, comparative methods, classification, historical biogeography, nomenclature, use/value of museums. prereq: Grad student or instr consent

EEB 5407. Ecology. (3 cr.; Student Option; Every Fall)
Principles of ecology from populations to ecosystems. Applications to human populations, disease, exotic organisms, habitat fragmentation, biodiversity and global dynamics of the earth. prereq: [Math 1142, 1241, 1271 or equivalent]

EEB 5409. Evolution. (3 cr.; Student Option; Every Fall & Spring)
Diversity of forms in fossil record and in presently existing biology. Genetic mechanisms of evolution, including natural selection, sexual selection, genetic drift. Examples of ongoing evolution in wild/domesticated populations and
in disease-causing organisms. Lab. prereq: One semester college biology

EEB 5534. Biodiversity Sci: The origins, maintenance, consequences, detection and assessment of biodiversity. (ENV; 3 cr.; A-F only; Every Fall)

Biodiversity science is a rapidly expanding field of enquiry with increasing digital resources and global monitoring capabilities precisely at the moment in history that scientists recognize as the Sixth Extinction. In other words, we are currently facing a biodiversity crisis with threats to the Earth's biota not seen since the dinosaurs perished 65 million years ago. "Biodiversity" was coined by W.G. Rosen and E.O Wilson in the 1980s to describe the variation in all of life on Earth. The term is now widely used in both the scientific and popular literature and is at the center of scientific inquiry, conservation efforts, large-scale collaborative pursuits of technological advances to allow monitoring from space, and global assessments that interface with international policy. Biodiversity requires integration across multiple disciplines from evolution, to ecology, remote sensing, conservation biology, economics and the social sciences, including the environmental policy. Biodiversity science is thus inherently interdisciplinary. As a consequence, rarely does a single course provide students the opportunity to focus on this critical topic from multiple perspectives and dimensions. This new course seeks to provide students intensive study of biodiversity from six perspectives: 1) the origins of biodiversity, including the processes of speciation and extinction over macroevolutionary timescales and those involved in generating biological variation at microevolutionary scales; 2) the ecological problem of species coexistence, given the nature of competitive interactions and biological filters with a focus on the interactions of individual species and major threats to biodiversity; 3) the consequences of biodiversity and biodiversity loss for ecosystem functions, focusing on ecosystem scale processes; 4) the services or benefits to humans attributed to biodiversity, including cultural benefits of biodiversity; here we discuss both practical and ethical arguments for sustaining biodiversity; 5) methods of detecting biodiversity including classic field biodiversity observations and taxonomic collections and emerging remote sensing methods that harness hyperspectral data and satellite imagery; and 6) scientific assessments of biodiversity that communicate the science of biodiversity to policymakers, particularly the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). The IPBES involves scientists from around the world and integrates indigenous and local knowledge (ILK). The United Nations and governments around the globe are sponsoring the IPBES, building on earlier assessments such as a prominent one in the UK. Several guest lecturers from across the University will participate in discussions and aid in development of computer labs (including Sharon Jansa (CBS), Keith Barker (CBS), Joe Knight (CFANS), and others).

EEB 5601. Limnology. (3 cr.; Student Option; Every Fall) Advanced introduction to description/analysis of interaction of physical, chemical, and biological factors that control functioning of life in lakes and other freshwater aquatic environments. prereq: Grad student or instr consent

EEB 5605. Limnology Laboratory. (2 cr.; A-F or Audit; Every Fall) Field/lab methods to obtain information on environmental conditions in aquatic environments and measure abundance of aquatic organisms, especially plankton. Field/lab instruments, sampling devices, microscopy, water chemistry, data analysis. prereq: 3603 or instr consent

EEB 5609. Ecosystem Ecology. (3 cr.; Student Option; Every Spring) Regulation of energy and elements cycling through ecosystems. Dependence of cycles on kinds/numbers of species within ecosystems. Effects of human-induced global change on functioning of ecosystems. prereq: [Biol 4307 or Biol 5407] or instr consent

EEB 8100. EEB Department Seminar. (1 cr. [max 4 cr.]; S-N only; Every Fall & Spring) This seminar series is focused on topics of general interest to faculty and students in EEB and often are presented by visiting scientists, including leaders in specific fields.

EEB 8150. EEB Lab Tours. (1 cr. [max 2 cr.]; S-N only; Every Fall) Laboratory Tour seminar to acquaint incoming graduate students with the research of EEB graduate faculty, their postdocs and current graduate students. Faculty members will conduct lab tours in their laboratory and/or inform students about their research. This seminar will be organized by the DGS or a faculty member designated by the DGS.

EEB 8151. EEB Lab Tours. (1 cr.; S-N only; Every Spring) The goal of the Laboratory Tour seminar is to acquaint incoming graduate students with the research of EEB graduate faculty, their postdocs and current graduate students. Faculty members will conduct lab tours in their laboratory and/or inform students about their research. This seminar will be organized by the DGS or a faculty member designated by the DGS.

EEB 8200. Sustainability Science Distributed Graduate Seminar. (3 cr.; Student Option; Every Spring) The goal of the Sustainability Science Distributed Graduate Seminar is to acquaint students with the research of EEB graduate faculty, their postdocs and current graduate students. This seminar will be organized by the DGS or a faculty member designated by the DGS.

EEB 8201. Graduate Foundations in Ecology, Evolution and Behavior Semester 1. (4 cr.; A-F only; Every Fall) Foundation for the study of the interplay of science, evolution, behavior. prereq: Grad student in Ecology, Evolution and Behavior.

EEB 8202. Graduate Foundations in Ecology, Evolution and Behavior - Semester 2. (4 cr.; A-F only; Every Spring) Foundation for the study of the interplay of science, evolution, behavior. Second semester of two-semester sequence. prereq: 8501, EEB grad student

EEB 8301. Prelim Proposal Writing Seminar. (1 cr.; S-N only; Every Fall) Learn about structure/format of research proposal under guidance of three faculty members representing fields of Ecology, Evolution/Behavior. Prepare students for writing written preliminary exam. prereq: EEB grad student

EEB 8302. EEB Written Prelim Workshop. (1 cr.; S-N only; Every Spring) Provide time for students to meet/discuss issues associated with writing written preliminary exam. Workshop sections of written preliminary exam with peers. Exam should be reviewed informally by committee/revised by student before final submission. prereq: EEB grad student

EEB 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

EEB 8360. Behavioral Biology Seminar. (1 cr.; max 5 cr.; S-N or Audit; Every Fall & Spring) Research topics in selected areas. prereq: instr consent

EEB 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

EEB 8500. NSF GRF Graduate Research Fellowship Proposal Writing Seminar. (1 cr. [max 2 cr.]; S-N only; Every Fall) Prepare EEB students to submit a competitive fellowship proposal to an external organization (e.g., NSF Graduate Research Fellowship program). In addition to announced meeting time, students meet once a week in small groups to discuss proposals/provide each other with feedback. prereq: EEB grad student

EEB 8601. Introduction to Stream Restoration. (3 cr.; Student Option; Fall Even Year) Science/policy behind stream restoration. How to evaluating/critiquing a stream restoration project. Assess climate, geomorphic, hydrologic, and ecological data at watershed and reach scales to plan a restoration project. Developing a monitoring/assessment program for an existing or future restoration project. prereq: Grad student in [CE or GEO or EEB or WRS or FW or BAE or FR or HORT or ENR or LA or SRSE] or instr consent

EEB 8602. Stream Restoration Practice. (2 cr.; S-N only; Fall Odd Year) Field experience, group design project. Students provide an assessment of stream restoration project and design a stream restoration site. prereq: CE 8601 or GEO 8601
ECON 1101. Principles of Microeconomics.
(GP, SOCS; 4 cr.; Student Option; Every Fall, Spring & Summer)
Microeconomic behavior of consumers, firms, and markets in domestic and world economy. Demand and supply. Competition and monopoly. Distribution of income. Economic interdependencies in the global economy. Effects of global linkages on individual decisions. prereq: knowledge of plane geometry and advanced algebra

ECON 1102. Principles of Macroeconomics.
(4 cr.; Student Option; Every Fall, Spring & Summer)
Aggregate consumption, saving, investment, and national income. Role of money, banking, and business cycles in domestic and world economy. International trade, growth, and development. U.S. economy and its role in the world economy. International interdependencies among nations. prereq: [1101 or equiv], knowledge of plane geometry and advanced algebra

ECON 3101. Intermediate Microeconomics.
(4 cr.; A-F only; Every Fall, Spring & Summer)
Behavior of households, firms, and industries under competitive/monopolistic conditions. Factors influencing production, price, and other decisions. Applications of theory. Economic efficiency. Distribution of well-being. prereq: [1101, 1102] or equiv, [MATH 1271 or equiv]

ECON 3102. Intermediate Macroeconomics.
(4 cr.; A-F only; Every Fall, Spring & Summer)
Determinants of national income, employment, and price level; effects of monetary and fiscal policies; emphasis on a general equilibrium approach. Applications of the theory, especially to current macroeconomic policy issues. Students cannot take this course if they have taken ApEc 3006, however, ApEc 3006 does not contain all material in ECON 3102. Econ majors are encouraged to take ECON 3102 instead of ApEc 3006 prereq: 3101 or equiv

ECON 3951. Major Project Seminar.
(2 cr.; A-F only; Every Fall, Spring & Summer)
Students produce a significant written work in economics. Project demonstrate critical thinking, collection/analysis of data, problem solving, interpretation of findings. Modes of inquiry in economics. prereq: 3101, 3102, STAT 3011, [STAT 3022 or equiv], two [3xxx or 4xxx] ECON courses, at least one 4xxx ECON writing intensive course, freshman writing requirement satisfied

ECON 3960. Topics in Economics: Area Studies.
(3 cr.; maximum 6 cr.; A-F only; Every Fall & Spring) Topics specified in class schedule. prereq: [1101, 1102] or equiv

ECON 3970. Topics in Economics.
(3 cr.; maximum 6 cr.; A-F only; Periodic Fall & Spring) Topics specified in class schedule. prereq: [1101, 1102] or equiv, [MATH 1271 or equiv], Knowledge of plane geometry and advanced algebra

(1-10 cr.; Student Option; Every Fall & Spring) Individual research on a specialized topic. prereq: instr consent

ECON 3994. Directed Research.
(1-5 cr.; maximum 10 cr.; S-N or Audit; Every Fall & Spring) TBD prereq: instr consent

ECON 3997. Thesis Credits: Master's.
(1-18 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ECON 3998. Thesis Credit: Doctoral.
(1-24 cr.; maximum 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

ECON 3999. Seminar on Current Topics.
(1-3 cr.; maximum 30 cr.; S-N only; Every Fall & Spring) Current research in ecology, evolution, behavior. prereq: EEB grad student

ECON 8641. Spatial Ecology.
(3 cr.; Student Option; Periodic Fall & Spring) Introduction to spatial ecology. Role of space in population dynamics and interspecific interaction. Single species/multispecies models. Deterministic/stochastic theory. Modeling, effects of implicit/explicit space on competition, pattern formation, stability, diversity, and invasion. Reading/discussion of recent literature. prereq: [3407, 2 sem calculus] or instr consent

ECON 8666. Doctoral Pre-Thesis Credits.
(1-6 cr.; maximum 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ECON 8777. Thesis Credits: Master's.
(1-18 cr.; maximum 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ECON 8888. Thesis Credit: Doctoral.
(1-24 cr.; maximum 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

ECON 8890. Seminar on Current Topics.
(1-3 cr.; maximum 30 cr.; S-N only; Every Fall & Spring) Current research in ecology, evolution, behavior. prereq: EEB grad student

ECON 8891. Graduate Seminar.
(1-3 cr.; maximum 30 cr.; Student Option; Every Fall & Spring) Research topics in selected areas. prereq: instr consent

(1-10 cr.; Student Option; Every Fall & Spring) Individual research on a specialized topic. prereq: instr consent

ECON 8894. Directed Research.
(1-5 cr.; maximum 10 cr.; S-N or Audit; Every Fall & Spring) TBD prereq: instr consent

ECON 4106. Advanced Mathematical Economic Analysis I.
(2 cr.; A-F only; Every Fall) Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty. Seven-week course. prereq: 3101, 3102, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], dept consent

ECON 4162. Microeconomic Analysis II.
(2 cr.; A-F or Audit; Every Fall) Theories of consumer, producer, and market equilibrium. Includes general equilibrium, welfare, externalities, topics in information and uncertainty, and game theory. Seven-week course. prereq: 3101, 3102, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], dept consent

ECON 4163. Microeconomic Analysis.
(2 cr.; Student Option; Every Spring) Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty, and game theory. Seven-week course. Meets with 8003. prereq: 3101, 3102, 4162, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], dept consent

ECON 4164. Microeconomic Analysis.
(2 cr.; Student Option; Every Spring) Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty, and game theory. Seven-week course. Meets with 8004. prereq: 3101, 3102, 4162, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], dept consent
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
business theory. Prediction of business cycle facts. Course provides students some basic analytical and numerical tools that allows them to quantify the impact of fiscal and monetary policies on the macroeconomy. prereq: [Econ 3101, 3102] or equiv, [Stat 3011 or equiv]

ECON 4751. Financial Economics. (3 cr.; Student Option; Every Fall, Spring & Summer) Financial decisions of firms/investors. Determination of interest rates and asset prices. Role of risk/uncertainty. Emphasizes economic models. prereq: [3101 or equiv], [MATH 1271 or equiv], one sem statistics

ECON 4751H. Honors: Financial Economics. (4 cr.; A-F only; Every Fall & Spring) Efficiency of financial markets. Theoretical concepts, empirical evidence. prereq: 3101, [3102 or equiv], [Math 1271 or equiv], [Stat 3011 or equiv]


ECON 4821. Public Economics. (3 cr.; A-F only; Every Fall, Spring & Summer) Competing views on proper role of government in economy. Effects of tax/spending policies, taking into account private agents’ response to government actions/ways government officials may use powers. Optimal policies. Applications primarily to U.S. government. prereq: [3101, 3102] or equiv

ECON 4828. Advanced Public Economics. (4 cr.; A-F only; Every Fall & Spring) Competing views/models on the role of government in an economy. Effects of tax/spending policies, private agents’ response to government actions; optimal policies. Financial crisis and government policies on subsidizing private debt and private housing. Climate change policy of government. Government health care reforms. Tax issues of MNCs, tax evasion, industry relocations and corporate taxes. prereqs: Econ 3101 and 3102; advise completing Econometrics before taking this course.

ECON 4831. Cost-Benefit Analysis. (3 cr.; A-F only; Every Fall, Spring & Summer) Evaluation of benefits and costs of public projects and programs. Issues connected with definition and measurement of benefits and costs. Rate of return and discount. Market imperfections, risk, uncertainty. Case studies. prereq: ECON 3101

ECON 4960. Topics in Economics. (4 cr. [max 8 cr.]; A-F only; Periodic Fall & Spring) Topics specified in Class Schedule. prereq: [3101 or 3102 or equiv], MATH 1271

ECON 4968. Advanced Topics in Economics. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring) Topics specified in Class Schedule. prereq: [3101, 3102] or equiv, MATH 1271, [Stat 3011 or equiv], successfully complete at least two 4xxx level UMNTC economics courses.

ECON 4993. Directed Study. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study in areas not available in regular course offerings. prereq: dept consent

ECON 4993H. Directed Study Honors Thesis. (3 cr.; A-F only; Every Fall, Spring & Summer) Honors Thesis.

ECON 5109. Game Theory for Engineers. (3 cr.; A-F only; Every Spring) Introduction to game theory. Utility theory, non-cooperative/cooperative games, bargaining theory. Games in normal/extended form. Nash equilibrium/refinements. prereq: [Math 2283, 2373, 2374, 3283] or Math 4606, [M.S./Ph.D. student in engineering or comp sci or info tech or operations mgmt] or inst consent

ECON 5890. Economics of the Health-Care System. (3 cr.; A-F or Audit; Every Fall) Economic analysis of U.S. health-care sector. Emphasizes problems of pricing, production, distribution. Health-care services as one factor contributing to nation's health. prereq: 3101 or inst consent

ECON 8003. Microeconomic Analysis. (2 cr.; Student Option; Every Spring) Theories of consumer demand, producer supply, and market equilibrium; general equilibrium and welfare. Sample topics: externalities, economics of information and uncertainty, and game theory. This seven-week course meets with 4163, prereq: 8002

ECON 8004. Microeconomic Analysis. (2 cr.; Student Option; Every Spring) Theories of consumer demand, producer supply, and market equilibrium; general equilibrium and welfare. Sample topics: externalities, economics of information and uncertainty, and game theory. This seven-week course meets with 4164. prereq: 8003

ECON 8101. Microeconomic Theory. (2 cr.; Student Option; Every Fall) Decision problems faced by the household and firm; theories of choice under conditions of certainty and uncertainty. Partial equilibrium analysis of competition and monopoly. General equilibrium analysis. Welfare economics: economic efficiency of alternative market structures, social welfare functions. Dynamics: stability of markets, capital theory. Seven-week course. prereq: 8102, concurrent registration is required (or allowed) in Math 5616 or concurrent registration is required (or allowed) in Math 8602 or comparable abstract math course, grad econ major or inst consent

ECON 8104. Microeconomic Theory. (2 cr.; Student Option; Every Spring) Decision problems faced by the household and firm; theories of choice under conditions of certainty and uncertainty. Partial equilibrium analysis of competition and monopoly. General equilibrium analysis. Welfare economics: economic efficiency of alternative market structures, social welfare functions. Dynamics: stability of markets, capital theory. Seven-week course. prereq: 8103, concurrent registration is required (or allowed) in Math 5616 or concurrent registration is required (or allowed) in Math 8602 or comparable abstract math course, grad econ major or inst consent

ECON 8105. Macroeconomic Theory. (2 cr.; Student Option; Every Fall) Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, prices. Models with uncertainty, search, matching, indivisibilities, private information. Implications for measurement and data reporting. Overlapping generations and dynasty models. Variational and recursive methods. This seven-week course meets with 4165. prereq: 5152 or equiv, Math 2243, Math 2263 or equiv or inst consent

ECON 8106. Macroeconomic Theory. (2 cr.; Student Option; Every Fall) Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, prices. Models with uncertainty, search, matching, indivisibilities, private information. Implications for measurement and data reporting. Overlapping generations and dynasty models. Variational and recursive methods. This seven-week course meets with 4166. prereq: 8105

ECON 8107. Macroeconomic Theory. (2 cr.; Student Option; Every Spring) Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, prices. Models with uncertainty, search, matching, indivisibilities, private information. Implications for measurement and data reporting. Overlapping generations and dynasty models. Variational and recursive methods. This seven-week course meets with 4167. prereq: 8106
ECON 8108. Macroeconomic Theory. (2 cr.; Student Option; Every Spring)
Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, prices. Models with uncertainty, search, matching, indivisibilities, private information. Implications for measurement and data reporting. Overlapping generations and dynasty models. Variational and recursive methods. This seven-week course meets with 4168. prereq: 8107

ECON 8111. Introduction to Mathematical Economics. (2 cr.; Student Option; Every Fall & Spring)
Use of mathematical models in economic theory. prereq: Math 2243 or equiv, concurrent registration is required (or allowed) in Econ 8101, concurrent registration is required (or allowed) in Math 5615 or equiv or instr consent; Math 4242 recommended

ECON 8112. Introduction to Mathematical Economics. (2 cr.; Student Option; Periodic Fall)
Use of mathematical models in economic theory. Standard techniques. prereq: 8111, concurrent registration is required (or allowed) in 8102, concurrent registration is required (or allowed) in Math 5615 or comparable abstract math course

ECON 8113. Introduction to Mathematical Economics. (2 cr.; Student Option; Periodic Fall)
Use of mathematical models in economic theory. May include special topics. prereq: 8112, Math 5616 or comparable abstract math course, concurrent registration is required (or allowed) in 8103

ECON 8117. Noncooperative Game Theory. (2 cr.; Student Option; Every Fall)
Solution concepts for noncooperative games in normal form, including Nash and perfect equilibrium and stable sets of equilibria. Extensive form games of perfect and incomplete information, sequential equilibrium, and consequences of stability for extensive form. Applications including bargaining and auctions. Seven-week course. prereq: Math 5616 or equiv or instr consent

ECON 8118. Noncooperative Game Theory. (2 cr.; Student Option; Every Fall & Spring)
Solution concepts for noncooperative games in normal form, including Nash and perfect equilibrium and stable sets of equilibria. Extensive form games of perfect and incomplete information, sequential equilibrium, and consequences of stability for extensive form. Applications including bargaining and auctions. Seven-week course. prereq: 8117

ECON 8119. Cooperative Game Theory. (2 cr.; Student Option; Every Spring)
Basics of cooperative game theory, emphasizing concepts used in economics. Games with and without transferable utility; the core, the value, and other solution concepts. Recent results, including potentials, reduced games, consistency, and noncooperative implementation of cooperative solution concepts. Seven-week course. prereq: 8104, Math 5616 or equiv or instr consent

ECON 8181. Advanced Topics in Microeconomics. (2 cr. [max 4 cr.]; Student Option; Every Fall)
Faculty and student presentations based on recent literature. Seven-week course. prereq: 8104 or instr consent

ECON 8182. Advanced Topics in Microeconomics. (2 cr. [max 4 cr.]; Student Option; Every Spring)
Faculty and student presentations based on recent literature. Seven-week course. prereq: 8104 or instr consent

ECON 8185. Advanced Topics in Microeconomics. (2 cr. [max 4 cr.]; Student Option; Every Fall & Spring)
Faculty and student presentations based on recent literature. Seven-week course. prereq: 8108 or instr consent

ECON 8186. Advanced Topics in Microeconomics. (2 cr. [max 4 cr.]; Student Option; Periodic Spring)
Faculty and student presentations based on recent literature. Seven-week course. prereq: 8108 or instr consent

ECON 8191. Workshop in Mathematical Economics. (1-3 cr. [max 10 cr.]; Student Option; Every Fall)
Students conduct research and present papers under faculty supervision. prereq: 8104 or instr consent

ECON 8192. Workshop in Mathematical Economics. (1-3 cr. [max 10 cr.]; Student Option; Every Spring)
Students work on research and present papers under faculty supervision. prereq: 8104 or instr consent

ECON 8201. Econometric Analysis. (2 cr.; Student Option; Every Fall)
Basic linear regression model, its variants. Panel data, censored/truncated regression, discrete choice models, Time series, simultaneous equation models. prereq: [3101 or equiv], [Math 1272 or equiv], Stat 5102 or instr consent

ECON 8203. Econometric Analysis. (2 cr.; Student Option; Every Spring)
Basic linear regression model, its variants. Panel data, censored/truncated regression, discrete choice models. Time series, simultaneous equation models. prereq: 8202

ECON 8204. Econometric Analysis. (2 cr.; Student Option; Every Spring)
Basic linear regression model, its variants. Panel data, censored/truncated regression, discrete choice models. Time series, simultaneous equation models. prereq: 8203

ECON 8205. Applied Econometrics. (2 cr.; Student Option; Every Fall)
Application in research, including classical and Bayesian approaches; formulation, comparison, and use of models and hypotheses; inference and prediction in structural models; simulation methods. Seven-week course. prereq: Math 4242 or equiv, concurrent registration is required (or allowed) in Econ 8101, concurrent registration is required (or allowed) in Econ 8105, concurrent registration is required (or allowed) in Stat 5101 or instr consent

ECON 8206. Applied Econometrics. (2 cr.; Student Option; Every Fall)
Application in research, including classical and Bayesian approaches; formulation, comparison, and use of models and hypotheses; inference and prediction in structural models; simulation methods. Seven-week course. prereq: 8206, concurrent registration is required (or allowed) in 8102, concurrent registration is required (or allowed) in 8106, concurrent registration is required (or allowed) in Stat 5101 or instr consent

ECON 8207. Applied Econometrics. (2 cr.; Student Option; Every Spring)
Application in research, including classical and Bayesian approaches; formulation, comparison, and use of models and hypotheses; inference and prediction in structural models; simulation methods. Seven-week course. prereq: 8207, concurrent registration is required (or allowed) in 8104, concurrent registration is required (or allowed) in 8107, concurrent registration is required (or allowed) in Stat 5102 or instr consent

ECON 8208. Applied Econometrics. (2 cr.; Student Option; Periodic Spring)
Application in research, including classical and Bayesian approaches; formulation, comparison, and use of models and hypotheses; inference and prediction in structural models; simulation methods. Seven-week course. prereq: 8208, concurrent registration is required (or allowed) in 8108, concurrent registration is required (or allowed) in Stat 5102 or instr consent

ECON 8211. Econometrics. (2 cr.; Student Option; Every Fall)
Linear regression; general linear hypotheses; Gauss Markov Theorem, generalized least squares and their applications. Decision-theoretic choice among estimators. Simultaneous equations models; identification and estimation. Asymptotic distribution theory. Applications, including multivariate time series models and/or limited dependent variables models. Seven-week course. prereq: 5151, 5152, Math 4242 or equiv, Stat 5102 or instr consent

ECON 8212. Econometrics. (2 cr.; Student Option; Every Fall)
Linear regression; general linear hypotheses; Gauss Markov Theorem, generalized least squares and their applications. Decision-theoretic choice among estimators. Simultaneous equations models; identification and estimation. Asymptotic distribution theory. Applications, including multivariate time series models and/or limited dependent variables models. Seven-week course. prereq: 8211
Decision-theoretic choice among estimators. Simultaneous equations models; identification and estimation. Asymptotic distribution theory. Applications, including multivariate time series models and/or limited dependent variables models. Seven-week course. prereq: 8212

ECON 8281. Advanced Topics in Econometrics. (2 cr. [max 4 cr.]; Student Option; Periodic Fall & Spring) Faculty and student presentations based on recent literature. This is a 7-week course. prereq: 8213 or instr consent

ECON 8281. Workshop in Econometrics. (; 1-3 cr. [max 10 cr.]; Student Option; Every Fall) Workshop in Econometrics prereq: 8213 or instr consent

ECON 8282. Workshop in Econometrics. (; 1-3 cr. [max 10 cr.]; Student Option; Periodic Fall & Spring) Workshop in Econometrics prereq: 8213 or instr consent

ECON 8311. Economic Growth and Development. (; 2 cr.; Student Option; Every Fall) Methods of analyzing dynamical systems; applying methods to new models of growth and development; deriving and evaluating models' quantitative implications in light of growth and development in a number of countries. Seven-week course. prereq: 8104, 8106 or instr consent

ECON 8312. Economic Growth and Development. (; 2 cr.; Student Option; Every Fall & Spring) Methods of analyzing dynamical systems; applying methods to new models of growth and development; deriving and evaluating models' quantitative implications in light of growth and development in a number of countries. Seven-week course. prereq: 8311 or instr consent

ECON 8313. Economic Growth and Development. (; 2 cr.; Student Option; Every Spring) Methods of analyzing dynamical systems; applying methods to new models of growth and development; deriving and evaluating models' quantitative implications in light of growth and development in a number of countries. Seven-week course. prereq: 8312 or instr consent

ECON 8333. FTE: Master's. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ECON 8381. Advanced Topics in Economic Development. (; 2 cr. [max 4 cr.]; Student Option; Periodic Fall & Spring) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8312 or instr consent; offered when feasible

ECON 8381. Workshop in Economic Growth and Development. (; 1-3 cr. [max 10 cr.]; Student Option; Every Fall) Workshop in Economic Growth and Development prereq: instr consent

ECON 8391. Workshop in Economic Growth and Development. (; 1-3 cr. [max 10 cr.]; Student Option; Every Fall) Workshops in Economic Growth and Development prereq: instr consent

ECON 8392. Workshop in Economic Growth and Development. (; 1-3 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) TBD prereq: instr consent


ECON 8402. International Trade and Payments Theory. (; 2 cr.; Student Option; Every Fall & Spring) Tariffs, quotas, and other barriers to trade; gains from trade; trading blocs; increasing returns; growth. This is a seven-week course. prereq: 8401 or instr consent

ECON 8403. International Trade and Payments Theory. (; 2 cr.; Student Option; Every Spring) International business cycles; exchange rates; capital movements; international liquidity. This is a 7-week course. prereq: 8402 or instr consent

ECON 8404. International Trade and Payments Theory. (; 2 cr.; Student Option; Periodic Fall) Theoretical models of international trade. Trade data, empirical work on trade. Seven week course. prereq: [8402, 8403] or instr consent

ECON 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

ECON 8481. Advanced Topics in International Trade. (; 2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8403 or instr consent

ECON 8482. Advanced Topics in International Trade. (; 2 cr. [max 4 cr.]; Student Option; Periodic Fall & Spring) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8403 or instr consent

ECON 8491. Workshop in Trade and Development. (; 1-3 cr. [max 10 cr.]; Student Option; Every Fall) Workshop in Trade and Development prereq: instr consent

ECON 8492. Workshop in Trade and Development. (; 1-3 cr. [max 10 cr.]; Student Option; Every Spring) TBD prereq: instr consent

ECON 8501. Wages and Employment. (2 cr. [max 4 cr.]; Student Option; Every Fall) Economic analysis of labor markets and their operation under conditions of both individual and collective bargaining. Implications of labor market operations for resource allocation, wage and price stability, income and employment growth. Wage structures and wage levels. Wage and employment theories and practices. Economic impacts of unions. Seven-week course. prereq: 8102, 8106 or instr consent

ECON 8502. Wages and Employment. (; 2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Economic analysis of labor markets and their operation under conditions of both individual and collective bargaining. Implications of labor market operations for resource allocation, wage and price stability, income and employment growth. Wage structures and wage levels. Wage and employment theories and practices. Economic impacts of unions. Seven-week course. prereq: 8501 or instr consent

ECON 8503. Wages and Employment. (; 2 cr. [max 4 cr.]; Student Option; Every Spring) Economic analysis of labor markets and their operation under conditions of both individual and collective bargaining. Implications of labor market operations for resource allocation, wage and price stability, income and employment growth. Wage structures and wage levels. Wage and employment theories and practices. Economic impacts of unions. Seven-week course. prereq: 8502 or instr consent

ECON 8581. Advanced Topics in Labor Economics. (; 2 cr. [max 4 cr.]; Student Option; Every Fall, Spring & Summer) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8502 or instr consent

ECON 8582. Advanced Topics in Labor Economics. (; 2 cr. [max 4 cr.]; Student Option; Every Fall, Spring & Summer) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8502 or instr consent

ECON 8601. Industrial Organization and Government Regulation. (; 2 cr.; Student Option; Every Fall) Behavior of businesses and industries: productivity, firm size distributions, exit-entry dynamics, etc. Theories of the firm, industry structure and performance, invention and innovation, and technology adoption. Positive and normative theories of regulation. Seven-week course. prereq: 8102 or instr consent

ECON 8602. Industrial Organization and Government Regulation. (; 2 cr.; Student Option; Every Fall) Behavior of businesses and industries: productivity, firm size distributions, exit-entry dynamics, etc. Theories of the firm, industry structure and performance, invention and innovation, and technology adoption. Positive and normative theories of regulation. Seven-week course. prereq: 8601 or instr consent

ECON 8603. Industrial Organization and Government Regulation. (; 2 cr.; Student Option; Every Spring) Behavior of businesses and industries: productivity, firm size distributions, exit-entry dynamics, etc. Theories of the firm, industry structure and performance, invention and innovation, and technology adoption. Positive and normative theories of regulation. Seven-week course. prereq: 8601 or instr consent

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Role of financial institutions in efficient allocation of risk; multiperiod and continuous-time securities markets; theory of firm under uncertainty; financial intermediation; derivation of empirical asset-pricing relationships; tests concerning alternative market structures.

Seven-week course. prereq: 8705 or instr consent

ECON 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ECON 8781. Advanced Topics in Monetary Economics. (2 cr. [max 4 cr.]; Student Option; Every Spring) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8702 or instr consent

ECON 8791. Workshop in Macroeconomics. (1-3 cr. [max 10 cr.]; Student Option; Every Fall) Workshop in Macroeconomics prereq: instr consent

ECON 8792. Workshop in Macroeconomics. (1-3 cr. [max 10 cr.]; Student Option; Every Spring) Workshop in Macroeconomics prereq: instr consent

ECON 8801. Public Economics. (2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Theories of public choice and role of government in economy. Economic effects of taxes, public debt, and public expenditure. Current problems in economics of public sector, including political economy. Seven-week course. prereq: 8103, 8106 or instr consent

ECON 8802. Public Economics. (2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Workshop in Macroeconomics prereq: instr consent

ECON 8803. Public Economics. (2 cr. [max 4 cr.]; Student Option; Periodic Spring) (1-3 cr. [max 10 cr.]; No Grade Associated; Every Fall) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ECON 8881. Advanced Topics in Public Economics. (2 cr. [max 4 cr.]; Student Option; Every Fall) Faculty and student presentations based on recent literature. Seven-week course. prereq: 8802 or instr consent

ECON 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

ECON 8891. Workshop in Public Economics and Policy. (1-12 cr. [max 10 cr.]; Student Option; Periodic Fall & Spring) Workshop in Public Economics and Policy prereq: instr consent

ECON 8892. Workshop in Public Economics and Policy. (1-12 cr. [max 10 cr.]; Student Option; Periodic Fall & Spring) Workshop in Public Economics and Policy prereq: instr consent

ECON 8990. Individual Graduate Research. (1-7 cr.; ; Student Option; Every Fall, Spring & Summer) Individual Graduate Research prereq: instr consent

Ecuador (ECDR)

ECDR 1004. Intermediate Spanish IV. (4 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

ECDR 3001. Social Determinants of Health - Ecuador Case Study. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

ECDR 3011W. Spanish Grammar and Composition Workshop. (WI; 4 cr.; Student Option; Every Fall, Spring & Summer) ECDR 3011W Spanish Grammar and Writing Workshop is an intensive writing course designed to develop and strengthen the understanding and management of language skills acquired in previous courses and to develop knowledge about various cultures in Latin America and Ecuador. This course seeks to integrate the skills of speaking, writing, reading and understanding the real world of Ecuadorian and Latin American culture through the analysis of texts of varied socio-cultural, economic, political and other learning resources. The reading and writing tasks of this course will allow students through the reading and analysis of different texts an approach to the reality of Ecuadorian and Latin American culture. Students will be exposed to learning in real contexts and to the appropriate use of vocabulary. During the course, each student will produce a series of original compositions with the objective of learning to write texts in a clear, precise and formal in Spanish using various rhetorical strategies. It is a course that will give students the possibility of acquiring basic guidelines to improve their style and composition.

ECDR 3015W. Spanish Composition and Communication. (WI; 4 cr.; Student Option; Every Fall, Spring & Summer) ECDR Spanish 3015W is a Spanish course with an emphasis on Spanish Composition and Communication designed to develop and strengthen oral and written language and communication skills acquired in courses 1001 - 1004. This course seeks to integrate in real contexts the skills of speaking, writing, reading, listening and understanding of Spanish at a higher level. This course will systematically expose students to a variety of texts within the context of Ecuador and
Latin America that will enable them to improve their level of comprehension, analysis, discussion, reflection, enrich their vocabulary and accelerate their reading rhythm and comprehension. The development of language skills will allow students to gain a better understanding of Ecuador: their culture, history, economy and politics.

EDCR 3021. Advanced Spanish. (4 cr.; Max 8 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

EDCR 3030W. Introduction to Latin American Cultures. (WI; 4 cr.; Student Option; Every Fall, Spring & Summer)
EDCR 3030W, Introduction to Latin American Cultures, is an intensive writing course designed to develop and strengthen the understanding and management of language skills acquired in previous courses and to develop knowledge about various cultures in Latin America and Ecuador. This course seeks to integrate the skills of speaking, writing, reading and understanding the real world of Ecuadorian and Latin American culture through the analysis of texts and other learning resources. Course 3030W will evaluate the concept of “culture” from an intercultural perspective taking into account the cultural diversity of Ecuador and Latin America. 3030W introduces students to key writing and cultural analysis skills. The writing tasks of this course will allow students to approach the reality of Ecuadorian and Latin American culture through the reading and analysis of different texts. Students will be exposed to learning in real contexts and to the appropriate use of vocabulary. At the end of the program students must demonstrate competence in the handling of components of cultural analysis and familiarity with research components in cultural topics. This course offers students a panoramic view of the Latin American and Ecuadorian narrative, placing it in their historical and cultural contexts so as to allow an analysis of the styles of the mixture of our peoples. It is a course that will provide students with the possibility of acquiring basic guidelines to identify literary styles and narrative strategies.

Education (EDUC)

EDUC 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(NO description) prerequisite: Master's student, adviser and DGS consent

EDUC 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(NO description) prerequisite: Doctoral student, adviser and DGS consent

EDUC 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; Max 12 cr.; No Grade Associated; Every Fall, Spring & Summer)
TBD prerequisite: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

EDUC 8777. Thesis Credits: Master’s. (1-18 cr.; Max 50 cr.; No Grade Associated; Every Fall, Spring & Summer)
(NO description) prerequisite: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

EDUC 8888. Thesis Credit: Doctoral. (1-24 cr.; Max 100 cr.; No Grade Associated; Every Fall, Spring & Summer)
(NO description) prerequisite: Max 18 cr per semester or summer; 24 cr required

Educational Psychology (EPSY)

EPSY 1261. Understanding Data Stories through Visualization & Computing. (MA; 3 cr.; A-F only; Every Fall & Spring)
Academics and researchers have long used data visualization to support and illuminate particular narratives in their scholarship. Today, data visualizations are found not only in the pages of academic journals; many nonacademics, including journalists and activists, use increasingly complex data visualizations and statistical summaries to convey salient information and storylines. This course will help students build on their statistical thinking and understanding learned in high school to think critically about the use of summaries and visualization and their role in the data narrative. It will also cover the use of computational tools and methods for creating data summaries and visualization that facilitate seeing patterns and relationships in data, and producing better narrative through communicating with data. Students will learn course material through in-class activities and projects conducted in cooperative learning groups and through assignments requiring the application of concepts and technology presented in class to additional real-world examples of data visualization.

EPSY 1281. Psychological Science Applied. (SOC; 4 cr.; A-F only; Every Fall, Spring & Summer)
The course introduces students to applied psychology as a discipline and reviews fundamental principles of psychology through the lenses of applied and professional areas that are the foci of CEHD majors. Specifically, through the lenses of education, we review principles of learning, memory, development, intelligence, and interventions; through the lenses of health and wellness, we review personality, biological, social, and cognitive bases of normal and abnormal behavior, as well as treatments; and, through the lenses of business and organizations, we review principles of motivation, sensation perception, and social behavior. Thus, these psychological principles are considered theoretically, empirically, and through examples for application, with lab discussions and projects emphasizing education, business, health and wellness. The course serves as a foundation for future coursework in education, health sciences, and psychology, and is consistent with the APA’s public education effort to demonstrate how the science and application of psychology benefits society and improves lives.

EPSY 1905. Beginners' Chess and 21st Century Skills. (3 cr.; Student Option; Periodic Fall)
This course will include an examination of the basic components of chess, computer-based chess, and how chess players think, including visualspatial thinking and critical thinking, the psychology of critical thinking and other twenty-first century reasoning skills, and research on chess cognition.

EPSY 2601. Understanding Differences, Disabilities, and the Career of Special Education. (4 cr.; A-F only; Every Fall & Spring)
Impact of disabilities on individual/family. Support systems for persons with disabilities. Approaches for advocacy. Employ reflective practices when considering concept of disability. This course has an imbedded school-based practicum.

EPSY 3101. Creativity and Intelligence: an Introduction. (3 cr.; Student Option No Audit; Periodic Fall)
Classic/contemporary theories of creativity/intelligence, their development, implications for behavioral/social sciences and psychological/educational practices.

EPSY 3119. Learning, Cognition, and Assessment. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Principles of learning, cognition, cognitive development, classroom management, motivation, instruction, and assessment. Topics: behaviorism, cognitive and social constructivism, human information processing theory, intelligence, knowledge acquisition, reasoning skills, scholastic achievement, standardized testing, reliability, validity, student evaluation, performance assessment, and portfolios.

EPSY 3132. Psychology of Multiculturalism in Education. (DS; 3 cr.; A-F or Audit; Every Spring)
Course critically examines social and cultural diversity in the United States, confronting social issues of poverty, handicappism, homophobia, racism, sexism, victim-blaming, violence, and so on, and presenting models for change. Students examine how and why prejudices develop.

EPSY 3133. Practicum: Service Learning, Psychology of Multiculturalism in Education. (1-3 cr.; Student Option; Periodic Fall)
Thirty hours of service learning in multicultural communities. Students work with children, youth, or adults in ESL tutoring or after-school youth programs. Sensitivities/competencies related to multicultural issues in U.S. society. prerequisite: 3132 or concurrent registration is required (or allowed) in 3132, instr consent, enrollment in APECs minor

EPSY 3264. Basic and Applied Statistics. (MATH; 3 cr.; Student Option; Every Fall, Spring & Summer)
Introduction to Educational Psychology. (SOCS; 3 cr. ; Student Option No Audit; Every Fall)

History, current work. Future promise of educational psychology. Major topics in educational psychology. Focuses on interplay between theory, empirical research, and practical applications.

EPSY 3302. Introduction to Communication Skills for Educational and Community Settings. (3 cr. ; Student Option No Audit; Every Fall)

Working with diverse individuals/groups in educational/community settings. Communication skills/concepts. Self-reflection on communication style.

EPSY 3303. Educational Psychology Undergraduate Practicum. (3 cr. ; max 6 cr.) ; A-F or Audit; Every Fall)

This culminating course familiarizes students with the principles and practice of applied psychology in educational and community settings. Through supervised fieldwork experiences in either research or practice settings, students will develop an understanding of ethical considerations in educational psychology and explore how psychological research can be used to advance the practice of psychology in applied settings. This course is designed for undergraduate students completing an Educational Psychology undergraduate minor or the Special Education major. The course meets for 120 minutes weekly, and students complete 90 hours of fieldwork (approximately 8-10 hours/week). This is a community-engaged learning course. Fieldwork experiences can include: * A research experience conducted with an approved Educational Psychology faculty member. * A practical experience in an approved community engaged service-learning setting. Note: students in the special education major must complete fieldwork related to disabilities and/or special education.

EPSY 3701. Practicum: Field Experience in General Education - Inclusive Classrooms. (1-2 cr. ; S-N only; Every Fall & Spring)

Field-Based Practicum. Observe and actively participate in inclusive (and without disabilities) general education classroom. An emphasis is placed on communication skills and reflective practice.

EPSY 3801. The Science of Human Resilience and Wellbeing: Foundational Knowledge for Career and Life Success. (SOCS; 3 cr. ; A-F or Audit; Every Spring)

This course is for any undergraduate student interested in learning about and applying the theory and practice as it relates to resilience and wellbeing. This course integrates key cross-cutting, scientific findings from a range of psychological disciplines, including positive psychology, clinical psychology, developmental psychology, neuropsychology, and social psychology. Stated simply, resilience refers to the human capacity and ability to both survive and thrive in the face of life circumstances. Students will develop a deep understanding of the theoretical concepts of stress, resilience, and wellbeing, as well as specific resilience practices. Scientific research has shown that resilient people are better able to manage and bounce back from stressful situations and enhance their social, emotional, and behavioral functioning in career and personal aspects of life.

EPSY 4001. Teaching Students with Special Needs in Inclusive Settings. (1 cr. ; A-F only; Every Spring)

Historical perspectives, definitions/ professional language, characteristics, needs, service delivery systems for each area of exceptionality. Prereq: Must be enrolled in either the initial teaching license program for music education or agricultural education students. All other initial teaching license candidates should enroll in 5015 and 5016.

EPSY 5001. Learning, Cognition, and Assessment. (3 cr. ; Student Option; Every Fall, Spring & Summer)

Principles of learning, cognition, cognitive development, classroom management, motivation, instruction, assessment. Behaviorism, cognitive/social constructivism, human information processing theory. Intelligence, knowledge acquisition, reasoning skills, scholastic achievement, standardized testing, reliability/validity, student evaluation, performance assessment, portfolios, demonstrations. Applications to instruction/organization of curricular materials. Prereq: MED/initial licensure student or CLA music education major. 1 cr. ; A-F only; Every Spring)

EPSY 5015. Teaching Students with Special Needs in Inclusive Settings. (1 cr. ; A-F only; Every Summer)

Areas of exceptionality defined in federal/state regulations. Historical perspectives, definitions, etiology, characteristics, needs, and service delivery systems. Collaborating with special education personnel. Prereq: Enrolled in a teacher initial licensure program

EPSY 5016. Teaching Students with Special Needs in Inclusive Settings. (1 cr. ; A-F only; Every Fall)

Attending to constant transitions/development in which children/adolescents negotiate their road to adulthood. How to foster learning/ positive development. Prereq: Enrolled in teacher initial licensure program

EPSY 5017. Teaching Exceptional Students in General Education Classrooms. (2 cr. ; A-F or Audit; Every Summer)

This course will provide an overview of the areas of exceptionality defined in federal and state regulations. The focus of this course will be on historical perspectives, definitions, etiology, characteristics, needs, and service delivery systems for each area of exceptionality as well as the general educator's role in collaborating with special education personnel in order to meet the needs of students with special needs.

EPSY 5101. Intelligence and Creativity. (3 cr. ; A-F or Audit; Every Fall, Spring & Summer)

Contemporary theories of intelligence and intellectual development and contemporary theories of creativity and their implications for educational practices and psychological research.

EPSY 5113. Psychology of Instruction and Technology. (3 cr. ; Student Option; Periodic Spring)

Introduction to adult learning and instructional design. Application of core foundational knowledge to development of effective learning environments for adults. Topics include philosophy, learning theories, instructional models, development and experience, individual differences, evaluation, assessment, and technology.

EPSY 5114. Psychology of Student Learning. (3 cr. ; A-F or Audit; Every Fall & Spring)

This course is designed for students to engage in advanced study in the psychology of student learning, cognition, and development as it applies to educational psychology. Topics include: principles of learning, cognitive development, behaviorism, motivation, intelligence, reasoning, instruction, and assessment.

EPSY 5119. Mind, Brain, and Education. (3 cr. ; Student Option No Audit; Spring Odd Year)

How educationally relevant skills/concepts develop in both typical/atypical children. Prereq: 3301 or equiv

EPSY 5135. Human Relations Workshop. (4 cr. ; Student Option; Every Fall & Summer)

Experiential course addressing issues of prejudice and discrimination in terms of history, power, and social perception. Includes knowledge and skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, effective leadership, judgment and decision-making, prejudice reduction, conflict resolution.

EPSY 5151. Cooperative Learning. (3 cr. ; Student Option; Every Spring)

Participants learn how to use cooperative learning in their setting. Topics include theory and research, teacher's role, essential components that make cooperation work, teaching social skills, assessment procedures, and collegial teaching teams.

EPSY 5157. Social Psychology of Education. (3 cr. ; A-F or Audit; Every Fall)

Overview of social psychology and its application to education. Participants study the major theories, research, and major figures in field. Class sessions include lectures, discussions, simulations, role-plays, and experiential exercises.

EPSY 5191. Education of the Gifted and Talented. (3 cr. ; A-F or Audit; Every Spring & Summer)

Theories of giftedness, talent development, instructional strategies, diversity and
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

**EPSY 5200. Special Topics: Psychological Foundations.** (1-4 cr.; max 12 cr.; Student Option; Periodic Fall & Spring)
Focus on special topics in psychological and methodological concepts relevant to advanced educational theory, research, and practice not covered in other courses.

**EPSY 5216. Introduction to Research in Educational Psychology and Human Development.** (3 cr.; A-F or Audit; Every Fall)
Designing/conducting a research study. Reviewing literature, formulating research problem, using different approaches to gather data, managing/analyzing data, reporting results. prereq: 5261 or intro statistics course

**EPSY 5221. Principles of Educational and Psychological Measurement.** (3 cr.; Student Option; Every Fall)
Concepts, principles, and methods in educational/psychological measurement. Reliability, validity, item analysis, scores, score reports (e.g., grades). Modern measurement theories, including item response theory and generalizability theory. Emphasizes construction, interpretation, use, and evaluation of assessments regarding achievement, aptitude, interests, attitudes, personality, and exceptionality.

**EPSY 5243. Principles and Methods of Evaluation.** (3 cr.; Student Option; Every Fall, Spring & Summer)
Introductory course in program evaluation; planning an evaluation study, collecting and analyzing information, reporting results; overview of the field of program evaluation.

**EPSY 5244. Survey Design, Sampling, and Implementation.** (3 cr.; Student Option; Every Fall)
Survey methods, including mail, phone, and Web-based/e-mail surveys. Principles of measurement, constructing questions/forms, pilot testing, sampling, data analysis, reporting. Students develop a survey proposal and a draft survey, pilot the survey, and develop sampling/data analysis plans. prereq: 5221 or 5231 or 5261 or equiv. [CEHD grad student or MEd student]

**EPSY 5245. Advanced Survey Data Analysis for Categorical and Rating Scale Data.** (1 cr.; Student Option; Every Spring)
Practical course. Specific nature of survey data (typically categorical or ordinal). Appropriate data analytic methods. prereq: 5244, 5261

**EPSY 5246. Evaluation Colloquium: Psychological Foundations.** (1 cr.; max 8 cr.; S-N or Audit; Periodic Fall & Spring)
Informal seminar of faculty and advanced students interested in the issues and problems of program evaluation. prereq: 5243 or EdPA 5501

**EPSY 5247. Qualitative Methods in Educational Psychology.** (3 cr.; Student Option; Every Fall)
Introduction to qualitative methods of inquiry. Contrasting different research traditions (e.g., case study, phenomenology, ethnography, social interactionism, critical theory). Practice with field notes, observations, and interviewing. Use of NVIVO to track/code data. prereq: Graduate student or Applied Psychology in Educational and Community Settings Minor

**EPSY 5251. Becoming a Teacher of Statistics.** (3 cr.; Student Option; Periodic Fall & Spring)
Current methods of teaching first courses in statistics. Innovative teaching methods, materials, and technological tools. Types of first courses, reform recommendations, goals for student learning, recommended content, teaching methods, technology, student assessment. prereq: 5261 or equiv

**EPSY 5271. Introduction to Qualitative Methods.** (3 cr.; Student Option; Every Fall & Spring)
Application of statistical concepts/procedures. Analysis of variance, covariance, multiple regression. Experimental design: completely randomized, block, split plot/repeated measures. prereq: 3264 or 5261 or equiv

**EPSY 5272. Statistics Teaching Internship.** (1-3 cr.; S-N only; Every Fall & Spring)
Supervised teaching experience. prereq: Grad student, instr consent

**EPSY 5421. Leadership and Administration of Student Affairs.** (3 cr.; Student Option; Periodic Fall & Spring)
Theoretical approaches, administrative structure, and evaluation methods used in college/university student affairs.
This course explores ethical and professional considerations that pertain to the practice of applied behavior analysis as well as ethical and disciplinary standards of the profession. Specifically, this course examines the Professional and Ethical Compliance Code for Behavior Analysts. Emphasis will be placed upon ethical and professional conduct and legal issues relevant to BCBA level practitioners. Topics such as informed consent, due process, protection of confidentiality, and selection of least intrusive, least restrictive behavior change procedures will be discussed. This course will focus on ethical decision-making processes. Issues related to cultural and ethnic diversity and ethics in applied behavior analysis will also be explored.


EPSY 5625. Education of Infants, Toddlers, and Preschool Children with Disabilities: Introduction. (2 cr.; A-F or Audit; Every Fall) Overview of the issues, problems, and practical applications in designing early intervention services for young children with disabilities and their families.

EPSY 5626. Seminar: Developmental Disabilities and Instructional Management. (3 cr.; Student Option; Every Fall & Summer) Data-based strategies for school and nonschool instruction of learners with developmental disabilities including assessment, design, implementation, and evaluation of curriculum and instruction: curriculum content, concept and task analysis, classroom arrangements, natural and instructional cues, corrections, and consequences. prereq: [5621, 5622] or instr consent.

EPSY 5627. Seminar: Advanced issues in Learning Disabilities. (3 cr.; A-F only; Every Fall & Summer) Read, reflect, lead discussions related to issues in field of LD. Topics examined through relevant research in field of LD. prereq: Special Education graduate or licensure student or instr consent.

EPSY 5628. Characteristics of Moderate to Severe Learning Disabilities. (3 cr.; A-F only; Every Fall & Summer) Characteristics of moderate/severe learning disabilities including (but not limited to) cognitive processing, language, attention/memory, co-existing conditions. Dyslexia, dysgraphia, dyscalculia. prereq: Special Education graduate or licensure student or instr consent.

EPSY 5629. Strategic Instructional Methods for Students Academically At-Risk. (3 cr.; A-F only; Every Fall & Summer) Knowledge/skills needed to teach K-UCL research-based learning strategies for students considered academically at-risk. Content relevant to basic skills/content instruction for students in K-12 settings will be included. prereq: Special Education graduate or licensure student or instr consent.

EPSY 5631. Module 1: Introduction to Augmentative and Alternative Communication. (1 cr.; A-F only; Every Fall, Spring & Summer) Terms/concepts related to augmentative/alternative communication. Myths/facts regarding AAC.

EPSY 5632. Module 2: Evidence-based Methods for AAC Assessment and Intervention. (2 cr.; A-F only; Every Fall & Summer) Evidence-based tools to conduct augmentative/alternative communication (AAC) assessments. AAC intervention plans. Data-driven strategies to evaluate progress.

EPSY 5634. Module 4: Assistive technology with Deaf/Hard of Hearing Students. (2 cr.; A-F only; Every Spring) Theoretical/applied study communication modalities for children/adults who are Deaf or Hard of Hearing. Assessment/development of models including gestures, speech reading, Cued Speech, sign language, Picture Exchange Communication Systems, high/low tech devices. prereq: Special Education licensure student or instr consent.

EPSY 5636. Sensory Impairments of Students With Developmental Disabilities. (2 cr.; Student Option; Every Fall) Characteristics of learners with visual/auditory impairments. Design of instructional programs to remediate or circumvent disabilities, including use of prosthetic devices. prereq: 5613, 5614.

EPSY 5637. Core Practices in Special Education: Foundations of Special Education. (1 cr.; S-N only; Every Fall) This course is an online module designed to be taken the first semester of a 4-semester sequence in the Clinical EBD Licensure Program. All materials necessary for proficient completion of the course will be delivered via on-line course. There will be no additional readings associated with this online module. prereq: Enrolled in Special Ed Med or Special Ed ILP Med program with EBD Residency-Based subplan.

EPSY 5638. Core Practices in Special Education: IEP Writing. (1 cr.; S-N only; Every Spring) This course is an online module designed to be taken the second semester, in conjunction with the IEP Process course, of a 4-semester sequence in the Clinical EBD Licensure Program. All materials necessary for proficient completion of the course will be delivered via on-line course. There will be no additional readings associated with this online module.

EPSY 5641. Foundations of Deaf Education. (3 cr.; A-F only; Every Fall) Philosophical foundations of deaf and hard of hearing (DHH) education. Engage in discussion, debates and processes that have influenced deaf education, communication
EPSY 5642. Early Intervention for Infants, Toddlers and Families: Deaf and Hard of Hearing. (3 cr.; A-F only; Every Spring) Early identification and intervention with deaf and hard of hearing children including the development of ASL and English. Emphasis in the homes and the role of Deaf Mentors. Emphasis on the importance of early exposure to fully accessible language and addressing the issue of language deprivation. Prereq: Preservice teacher in deaf education licensing program or instr consent.

EPSY 5643. Seminar: Identity, Culture and Diversity in Deaf Education. (2 cr.; A-F only; Every Fall) Reflecting on your own identity as a future teacher of the deaf and how to facilitate the identity development of your students. Having a deep understanding of the diversity of students and their families and how best to foster these relationships and communication. Synthesis of previously learned material into practice.

EPSY 5644. Early Childhood Language and Literacy Development and Best Practices: Deaf and Hard of Hearing. (3 cr.; A-F only; Every Fall) Perspectives and best practices related to the development of early language and literacy skills in ASL and English for deaf and hard of hearing children. Prereq: Preservice teacher in deaf education licensing program or instr consent.

EPSY 5645. Deaf Plus: Educating and Understanding Deaf Students with Disabilities. (1 cr.; A-F only; Every Summer) Building an understanding of the complex issues and best practices involved in educating deaf learners with disabilities. Working with families and service providers, identifying resources, understanding identification, placement, assessment and intervention strategies to modify curriculum to work with deaf students with varying disabilities.

EPSY 5646. Best Practices Teaching Reading and Writing for School Age: Deaf and Hard of Hearing. (3 cr.; A-F only; Every Spring) Understanding and application of best practices for teaching reading/writing with DHH students in school age settings including incorporating bilingual strategies (making connections between ASL and English).

EPSY 5647. Spoken Language Practices and Assistive Technology: Deaf and Hard of Hearing. (2 cr.; A-F only; Every Summer) Study of the role and function of spoken English and Assistive technology in classrooms with students who are deaf or hard of hearing. Including understanding of speech and hearing mechanisms. Emphasis on application of spoken language practices in bimodal settings. Prereq: EPSY 5642, 5644

EPSY 5651. Best Practices Teaching Content Areas: Deaf Education. (3 cr.; A-F only; Every Spring) Problem solving related to individual needs of students including educational policies/educational procedures in variety of educational settings.

EPSY 5652. Incorporating Academic ASL in the Classroom: Deaf and Hard of Hearing. (3 cr.; A-F only; Every Fall) Understanding/application of best practices incorporating Academic ASL in classrooms for students who are hard of hearing. Practice their own academic ASL skills while learning to facilitate their future students academic language. Demonstrating complex ASL across all subject areas using bilingual strategies and conceptually accurate signs.

EPSY 5653. ASL/English Structure and Application. (3 cr.; A-F only; Every Fall) Understanding the structure and assessment of ASL and English in deaf and hard of hearing children and how to analyze each language. Students gain knowledge of the parts of each language, various assessments prepare future teachers to evaluate and facilitate the development of ASL and English. Readings drawn from both bilingual and Deaf education.

EPSY 5654. Current Research, Issues Trends in Deaf Education. (1 cr.; A-F only; Every Spring) Examining current research, issue trends in Deaf Education to help prepare future teachers to develop an understanding of research and apply critical thinking to analyze new issues, problem solve, and consider participating in research to practice opportunities that may arise during their career in Deaf Education.

EPSY 5655. Interventions for Behavioral Problems in School Settings. (3 cr.; A-F or Audit; Every Fall) Comprehensive behavioral programs for students with social and/or emotional disabilities. Instructing students with social and/or emotional disabilities.


EPSY 5657. Interventions for Behavioral Problems in School Settings. (3 cr.; A-F or Audit; Every Fall) Understanding issues of assessment/individualized intervention for students with severe emotional behavior disorders (EBD). Prereq: Special Education graduate or licensure student.

EPSY 5658. Characteristics of Moderate to Severe Emotional/Behavioral Disorders. (3 cr.; A-F only; Every Fall & Summer) Applying principles of assessment/individualized intervention for students with severe emotional behavior disorders (EBD). Prereq: Special Education graduate or licensure student.

EPSY 5659. Foundations of Behavior Analysis. (3 cr.; A-F only; Every Fall) Behavior analysis is the science of behavior along a continuum of basic to applied learning processes, both operant and respondent. Applied behavior analysis (ABA) is concerned with the improvement and understanding of human behavior. It is the science in which strategies derived from the principals of basic behavior analysis are applied systematically to improve socially significant behavior and experimentation is used to identify the variables responsible for change (Cooper, Heron, & Heward, 2007). This course focuses on basic concepts and methodologies involved in behavior analysis, and their relation to other theories of learning and behavior. This course is designed for individuals interested in learning from the perspective of behavior analysis and individuals who are interested in learning theory as it applies to individuals with significant cognitive and language impairments. This course is also designed to prepare students for the Behavior Analyst Certification Board (BACB) exam.

EPSY 5661. Introduction to Autism Spectrum Disorder. (3 cr.; A-F only; Every Fall) Knowledge/skills needed to promote learning/success for school age children with Autism Spectrum Disorder. Definition, etiology, and characteristics of ASD. Current research/issues. Collaborative problem solving, family-professional partnerships, educational programming.

EPSY 5662. Assessment and Identification of Autism Spectrum Disorders. (2 cr.; A-F only; Every Summer) Selection/use of assessment procedures that may be used to screen/identify children with autism spectrum disorders. Prereq: 5661, Spec Ed grad or licensure student or instr consent.

EPSY 5663. Assessment and Intervention for Individuals with Autism Spectrum Disorder. (3 cr.; A-F only; Every Spring) Selection/use of range of procedures, including non-biased, specific assessments to screen/identify children with autism spectrum disorder. Specific intervention strategies designed to teach beginning communication/social skills to children with Autism Spectrum Disorder (ASD). Prereq: 5661, Special Ed grad or licensure student or instr consent.

EPSY 5664. Transitions for Individuals with Autism Spectrum Disorders. (2 cr.; A-F only; Every Summer) Legal/practical aspects of transition planning, specifically for students with ASD. Prereq: 5661, [Spec Ed grad or licensure student or instr consent].

EPSY 5665. Education of Preschool Children With Disabilities: Methods and Materials. (3 cr.; A-F only; Every Spring) Methods and materials available to maximize developmental and educational outcomes for young children with disabilities, age 3 to 5, and their families in home, community, and school-based settings. Develop, implement, and evaluate individualized education and family service plans. Prereq: [5616, 5625] or instr consent.

EPSY 5662. Education of Infants and Toddlers with Disabilities: Methods and Materials. (3 cr.; A-F only; Every Spring) Methods and materials available to maximize developmental and educational outcomes for young children with disabilities, birth to age 3, and their families in home, community, and school-based settings. Students develop, implement, and evaluate individualized
EPSY 5690. Experimental Teaching Seminar: Med Culminating Project. (2 cr. ; A-F only; Every Fall & Spring)
Experimental teaching utilizing data based instruction for affecting student growth. Conduct experimental teaching project during student teaching year. Guided through formal writing process for submitting short literature review or research report for M.Ed. prereq: instr consent

EPSY 5701. Practicum: Field Experience in General Education - Inclusive Classrooms. (1-2 cr. ; S-N only; Every Fall & Spring)
Field-Based Practicum. Observe and actively participate in an inclusive (with and without disabilities) general education classroom. An emphasis is placed on communication skills and reflective practice.

EPSY 5704. Practicum: Special Education Field Experience in Middle and Secondary School Classrooms. (1-2 cr. ; S-N only; Every Fall & Spring)
Pre-Student Teaching/Field-Based Practicum. Gain a better understanding of the role of special education teachers (in a variety of settings) and related service professionals. Apply knowledge from University courses in school settings - connecting theory, research, and practice.

EPSY 5705. Practicum: Special Ed Field Experience in Early Childhood SpEd (ECSE) & Elementary School Classrooms. (1-2 cr. ; S-N only; Every Fall & Spring)
Pre-Student Teaching/Field-Based Practicum. Gain a better understanding of the role of special education teachers (in a variety of settings) and related service professionals. Apply knowledge from University courses in school settings - connecting theory, research, and practice.

EPSY 5706. Practicum in Moderate to Severe Developmental Disabilities. (2 cr. ; S-N only; Every Fall & Spring)
Practicing principles required for successful inclusion. Address model for best practices/requirements specified by Minnesota Board of Teaching.

EPSY 5707. Practicum in Moderate to Severe Learning Disabilities. (3 cr. ; S-N only; Every Fall & Spring)
Moderate/severe learning disabilities. Transfer of theoretical knowledge to practical application. Role of LD teacher in variety of settings.

EPSY 5708. Practicum in Moderate to Severe Emotional/Behavioral Disorders. (3 cr. ; S-N only; Every Fall & Spring)
Moderate/severe emotional behavior disorders. Transfer of theoretical knowledge to practical application. Role of EBD teacher in variety of settings.

EPSY 5720. Special Topics: Special Education. (; 1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Lab(fieldwork) approach. Generating action plan. Creating set of observation field notes.

Collecting data. Specific problems/possibilities related to special education.

EPSY 5741. Student Teaching: Academic and Behavioral Strategist. (3-6 cr. ; S-N only; Every Fall & Spring)
Transfer of theoretical knowledge to practical application. Responsibilities of special education teacher in variety of settings. prereq: Special education licensure program or instr consent

EPSY 5742. Student Teaching: Autism Spectrum Disorders. (; 6 cr. ; S-N only; Every Fall & Spring)
Transfer of theoretical knowledge to practical application. Role/responsibilities of special education teacher in settings of elementary/secondary age.

EPSY 5751. Student Teaching for Deaf Education. (; 1-6 cr. [max 60 cr.]; A-F only; Every Spring)
Students participate in educational programming for infants, children, and youth who are deaf or hard of hearing. On-site, directed experiences under supervision of master teachers of deaf/hard of hearing students.

EPSY 5752. Student Teaching: Learning Disabilities. (; 1-6 cr. [max 10 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Supervised experience in teaching or related work in schools or other agencies serving children and adolescents with learning disabilities. prereq: instr consent

EPSY 5754. Student Teaching: Social and Emotional Disabilities. (; 1-6 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Teach students with social and emotional disorders at public schools and other appropriate sites. Attend a weekly seminar on student teaching competencies. prereq: Completion of licensure courses for social and emotional disorders, instr consent

EPSY 5755. Student Teaching: Developmental Disabilities, Mild/Moderate. (; 1-6 cr. ; A-F or Audit; Every Fall & Spring)
Supervised student teaching, or special practicum project, in schools or other agencies serving students at elementary/secondary levels who have mild to moderate developmental disabilities. prereq: Completion of all licensure coursework, instr consent

EPSY 5756. Student Teaching: Developmental Disabilities, Moderate/Severe. (; 1-6 cr. ; A-F or Audit; Every Fall & Spring)
Supervised student teaching, or special practicum projects, in schools or other agencies serving students at elementary/secondary levels who have moderate to severe developmental disabilities. prereq: Completion of all licensure coursework, instr consent

EPSY 5761. Student Teaching in Early Childhood Special Education Settings for Children Aged Three to Five Years. (; 3 cr. [max 6 cr.]; S-N only; Every Fall & Spring)
Student teachers work closely with their cooperating teacher and University supervisor to design/implement programming for children in classrooms. Course includes a seminar with discussion, cooperative learning experiences, and some lectures. prereq: Licensure candidate in Early Childhood/Early Childhood Licensure Program, completion of all other licensure requirements for ECSE, instr consent; completion of Birth-3 student teaching should be completed after age 3-5 student teaching when possible

EPSY 5762. Student Teaching in Early Childhood Special Education for Children Aged Birth to Three Years. (; 3 cr. [max 6 cr.]; S-N only; Every Fall & Spring)
Student teachers work closely with cooperating teacher and University supervisor to design/implement programming for families with children aged birth-to-three in their homes. Course includes seminar with discussion, cooperative learning experiences, and some lectures. prereq: Licensure candidate in Early Childhood/Early Childhood Licensure Program, completion of all other licensure requirements for ECSE, instr consent; completion of Birth-3 student teaching should be completed after age 3-5 student teaching when possible

EPSY 5763. Practicum in Special Education: Behavior Intervention Planning and Implementation. (2 cr. ; S-N only; Every Fall)
This course will be delivered within a clinical model of instruction where the instructor serves as a coaching guide and the candidates participate in a community of practice with their peers. It is expected that given the instructor's coaching and the interactions within the community of practice, that the candidate will complete the portfolio associated with this course and, as part of that completion, demonstrate proficiency in all competencies associated with this course in order to earn a passing grade. As such, there is not a didactic instruction component or assigned readings for this clinical model of instruction-based course.

EPSY 5764. Practicum in Special Education: IEP Process. (2 cr. ; S-N only; Every Spring)
This course will be delivered within a clinical model of instruction where the instructor serves as a coaching guide and the candidates participate in a community of practice with their peers. It is expected that given the instructor's coaching and the interactions within the community of practice, that the candidate will complete the portfolio associated with this course and, as part of that completion, demonstrate proficiency in all competencies associated with this course in order to earn a passing grade. As such, there is not a didactic instruction component or assigned readings for this clinical model of instruction-based course.

EPSY 5765. Practicum in Special Education: Instructional Planning and Delivery. (2 cr. ; S-N only; Every Fall)
This course will be delivered within a clinical model of instruction where the instructor serves as a coaching guide and the candidates participate in a community of practice with their peers. It is expected that given the instructor's coaching and the interactions within the community of practice, that the candidate will complete the portfolio associated with this course and, as part of that completion,
demonstrate proficiency in all competencies associated with this course in order to earn apassing grade. As such, there is not a didactic instruction component or assigned readings for this clinical model of instruction-based course.

**EPSY 5800. Special Topics in School Psychology.** (1-9 cr. [max 36 cr.]; Student Option; Every Fall & Spring)
Current issues in school psychology or areas not normally available through regular curriculum offerings.

**EPSY 5801. Assessment and Decision Making in School and Community Settings.** (3 cr.; A-F or Audit; Every Fall & Spring)
Introduction to psychological and educational assessment for individuals who work with children, especially those experiencing academic and behavior problems. Study of standardized group and individual tests of intelligence, achievement, socio-emotional functioning, perception, reading, mathematics, adaptive behavior, and language.

**EPSY 5802. History & Scientific Bases of Psychology.** (3 cr.; A-F only; Every Fall)
The course is designed to provide discipline-specific knowledge comprising the core of psychology. Accordingly, students will attain substantial knowledge in (1) history and systems of psychology, (2) affective, (3) biological, (4) cognitive, (5) developmental, and (6) social aspects of behavior.

**EPSY 5849. Multi-tiered Systems of Support in Early Childhood Education.** (3 cr.; A-F only; Spring Even Year)
This course explores how multi-tiered systems of support (MTSS) are applied in early childhood settings. The course features content on early childhood assessment, intervention, data-based decision making, treatment integrity and information on how to apply MTSS models with unique early childhood populations. This course focuses on educational settings for children ages birth to 5 and is intended primarily for educational psychology students (or students from related disciplines) interested in basic and applied information regarding evidence-based service delivery for young children. The course will explore the three primary components of MTSS frameworks: assessment, intervention and data-based decision making including review of assessments and intervention techniques for infants and preschoolers in various developmental domains. Enrolled students will engage in a variety of instructional strategies to learn the noted content including large and small group discussion, lectures, active learning opportunities to practice and build capacity for specified interventions, technology-based interactions to support intervention, assessment and databased decision making and cooperative learning opportunities to engage content using dynamic methods.

**EPSY 5851. Engaging Diverse Students and Families.** (3 cr.; Student Option; Every Fall & Spring)
Theoretical, practical, scientific issues involved in school psychological practice/training.

Graduate students interested in cognitive psychology are invited to register for the course, regardless of disciplinary background.

**EPSY 8132. Personality Development and Socialization.** (3 cr.; Student Option; Every Spring)
Major research and theoretical work. Developmental and educational influences on personality. prereq: Personality or child psych course

**EPSY 8157. Key Topics and Issues in Applying Social Psychology to Education.** (3 cr.; Student Option; Every Spring)
This course, designed for advanced graduate students, covers a number of classic and contemporary topics in social psychological theory, research, and methods, examining core theories and how they have persisted or changed over time and how those theories and approaches have been applied to research in and issues of education broadly conceived.

**EPSY 8215. Advanced Research Methodologies in Education.** (3 cr.; Student Option; Every Fall)

**EPSY 8216. Seminar: Research Processes in Psychological Foundations of Education.** (3 cr.; A-F or Audit; Spring Even Year)
Advanced examination of research processes in educational psychology. Invited faculty discuss specific research designs. Students refine/implement research projects and present them in class. prereq: [5216, admitted to doctoral program in psych foundations] or instr consent

**EPSY 8220. Special Topics: Seminar in Quantitative Methods.** (1-6 cr. [max 15 cr.]; Student Option; Periodic Fall, Spring & Summer)
Seminars focus on specialized current topics in methodology in statistics, measurement, evaluation, and statistics education, including primary-source readings and in-depth exploration of advanced methodologies.

**EPSY 8222. Advanced Measurement: Theory and Application.** (4 cr.; Student Option; Spring Odd Year)
Generalizability theory, item response theory, factor models for test items, binomial model, Application to problems of designing, linking assessments. Includes computer lab. prereq: [5221 or PSY 5862 or equiv], [8252 or equiv]

**EPSY 8224. Performance Assessment Design and Analysis.** (3 cr.; Student Option; Spring Even Year)
Conceptualization, design, implementation, analysis of performance assessments as employed in both small-scale (e.g., classrooms), large-scale (e.g., statewide, national testing programs), professional (e.g., teacher assessment, professional certification)
EPSY 8225. Operational Measurement: Test Score Quality Assurance, Standard Setting, and Equating. (3 cr.; Student Option; Spring Even Year) Principles/practices of test score quality assurance, standard setting/equating. Operational testing programs. Focus on achievement tests. prereq: 8221, [8252 or equiv]

EPSY 8226. Item Response Models: Theory and Applications. (3 cr.; Student Option; Spring Even Year) Item response theory. Application in education/psychology/social science. 1-, 2-, 3-parameter models for dichotomous and polytomous response models. Partial credit models for polytomous data. prereq: [8221 or Psy 5862 or equiv], [8252 or equiv]

EPSY 8251. Statistical Methods in Education I. (3 cr.; Student Option; Every Fall, Spring & Summer) Statistical Methods in Education I is the first course in an entry-level, doctoral sequence for students in education. This course covers estimation and hypothesis testing with a particular focus on ANOVA and an introduction to multiple linear regression. Prepares students for EPSY 8252/8262. prereq: [EPSY 5261 or equiv] or undergrad statistics course

EPSY 8252. Statistical Methods in Education II. (3 cr.; Student Option; Every Fall & Spring) Statistical Methods in Education II is the second course in an entry-level, doctoral sequence for students in education. This course focuses on multiple linear regression and provides an introduction to linear mixed models. prereq: [8251, 8261 or equiv]

EPSY 8264. Advanced Multiple Regression Analysis. (3 cr.; Student Option; Every Fall) General linear model used as context for regression. Matrix algebra, multiple regression, path analysis, polynomial regression, standardized regression, stepwise solutions, analysis of variance, weighted least squares, logistic regression, prereq: [8252 or equiv], regression/ANOVA course, familiarity with statistical analysis package

EPSY 8265. Factor Analysis. (3 cr.; Student Option; Every Fall) Factor analytic techniques/applications. Component, common factor, confirmatory analysis. Factor extraction, estimating number of dimensions. Rotation, factor scores, hierarchical factor analysis. prereq: [8252 or equiv or instr consent]

EPSY 8266. Statistical Analysis Using Structural Equation Methods. (3 cr.; Student Option; Periodic Spring) Quantitative techniques using manifest/latent variable approaches for analysis of educational/social science data. Introduction to structural equation modeling approaches to multiple regression, factor analysis, path modeling. Developing, estimating, interpreting structural equation models. prereq: 8265, [8252 or equiv]

EPSY 8267. Applied Multivariate Analysis. (3 cr.; Student Option; Spring Even Year) Use/interpretation of results from several multivariate statistical techniques. Matrix algebra, variance/covariance, Hotelling's T2, GLM, MANOVA, MANCOVA, discriminant analysis, canonical correlations, dimensionality, principal components, latent composites, distance, hierarchical clustering. prereq: [8252 or equiv]. Familiarity with matrix algebra, knowledge of a computerized statistics package

EPSY 8268. Hierarchical Linear Modeling in Educational Research. (3 cr.; Student Option; Every Fall) Conceptual framework of hierarchical linear models for nested data, their application in educational research. Nature/effects of nested data, logic of hierarchical models, mixed-effects models. Estimation/hypothesis testing in these models, model-checking, nonlinear models. prereq: [8252 or equiv]

EPSY 8271. Statistics Education Research Seminar: Studies on Teaching and Learning. Statistics. (3 cr. [max 9 cr.]; Student Option: Periodic Fall & Spring) Introduction to classic/current research related to teaching/learning of statistics. Research from psychology, education, and statistics. Students focus on a particular research question and review the literature related to that question.

EPSY 8282. Statistical Analysis of Longitudinal Data. (3 cr.; Student Option; Every Fall) Traditional/modern approaches to analyzing longitudinal data. Dependent t-test, repeated measures ANOVA/MANOVA. Linear mixed models, multilevel models, generalized models. Required labs using SAS computer program. prereq: [8252 or equiv]

EPSY 8283. Research Synthesis and Meta-Analysis. (3 cr.; Student Option; Fall Even Year) Meta-analysis is a methodology for conducting quantitative literature reviews in which the outcomes of empirical research studies are aggregated and their variation studied. This course will cover topics on problem formulation, sampling, variable coding, data analysis, and presentation of results in meta-analytic research. prereq: EPSY 8252 or equiv

EPSY 8290. Special Topics: Seminar in Psychological Foundations. (1-6 cr. [max 15 cr.]; Student Option; Periodic Fall, Spring & Summer) Students formulate research designs. Learning and cognition, social psychology, measurement, and statistics. prereq: instr consent

EPSY 8300. Special Topics in Educational Psychology. (1-4 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Issues or related coursework in areas not normally available through regular curriculum offerings.

EPSY 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

EPSY 8400. Topics: Counseling and Student Personnel Psychology. (1-13 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Current issues in counseling and student personnel psychology, or related coursework in areas not normally available through regular curriculum offerings.

EPSY 8402. Individual Counseling: Theories, Applications & Counseling Skills. (4 cr.; A-F only; Every Fall) This course will give the student an opportunity to read, think critically about, dialogue, and write on central counseling theories and therapies. During this course, students will begin to develop a useful theoretical viewpoint that will guide their work with clients and assist them in understanding the work of other therapists. In addition, students will practice and receive feedback on basic (common factors) counseling skills as well as counseling skills that are specific to various types of treatment approaches.

EPSY 8403. Social/Cultural Contexts: Counseling and Skills. (3 cr.; A-F or Audit; Every Spring) Broad personal dimensions of race, ethnicity, gender, class, beliefs, disability, age, sexual orientation, and geographic origin. Societal and personal biases and stereotypes; multicultural concepts and culturally appropriate counseling procedures. prereq: Grad ed psy major with CSPP subprog or instr consent

EPSY 8404. Group Counseling: Theory, Applications, and Skills. (3 cr.; A-F or Audit; Every Spring) Theories, research, and procedures of group counseling and of groups such as psychoeducational groups. Applications to various settings and populations. Ethical issues in group work. Practice of group skills and techniques, including group participation and observation. prereq: Ed psy MA or PhD student with CSPP subprog or instr consent

EPSY 8405. Career Development: Theory, Skills, and Counseling Applications. (3 cr.; A-F or Audit; Every Fall) Career development theory/practice over life span. Emphasizes career counseling for individuals/organizations, systems approaches to career programs in education/business. Traditional/contemporary theories/practices. prereq: CSPP grad student

EPSY 8406. Professional Ethics for Counselors and Psychologists. (3 cr.; A-F only; Every Fall) Theory, research, and practice in counseling ethics. Scope/impact of professional ethics. Ethical decision making. Ethics and the law. Ethical practice in special settings. Scholarship/research in counseling ethics. Lectures, discussions, case studies, individual/group examination of original research. prereq: CSPP grad student

EPSY 8407. Assessing and Counseling Clients With Psychological Disorders. (4 cr.; A-F only; Every Spring) Etiology, symptom patterns, and assessment/treatment for various psychological disorders. DSM diagnoses. Empirically validated
psychological assessment and counseling methods. Field-based enquiry, prereq: CSPP PhD or MA student or instr consent

EPSY 8411. Advanced Counseling Research. (4 cr.; A-F or Audit; Every Fall) Focus on critically reviewing counseling research, qualitatively and quantitatively integrating research, and designing valid research. prereq: Ed psy PhD student with CSPP subprog or instr consent

EPSY 8412. Seminar: Advanced Counseling Theory and Ethics. (4 cr.; A-F or Audit; Every Spring) Comparative analysis of theoretical models and methods used in contemporary counseling and psychotherapy; ethical standards and models of ethical decision making for professional roles. prereq: Ed psy PhD student with CSPP subprog or instr consent

EPSY 8413. Personality Assessment of Adolescents and Adults. (3 cr.; A-F only; Every Spring) Assessment interviews, objective personality assessments (e.g., MMPI-2), projective tests (e.g., Thematic Apperception Test), and assessment report writing. prereq: PSY 5604H or PSY 8111 or PSY 8112, doctoral student, instr consent

EPSY 8431. Master's Research Seminar: CSPP. (3 cr. [max 4 cr.]; A-F or Audit; Every Spring) Survey of research methods, data-based decision making, basic research design skills, and research simulation. prereq: 5261 or equiv, 5221 or equiv, EPSY MA student with CSPP subprog or instr consent

EPSY 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

EPSY 8452. Psychological Aspects of Counseling Supervision. (3 cr.; Student Option; Every Fall) Theories, review of relevant research, demonstration, and in-class practice of supervision skills. prereq: Ed psy PhD student with CSPP subprog or instr consent

EPSY 8501. Counseling Pre-Practicum. (3 cr.; A-F or Audit; Every Fall) Overview of basic helping skills through demonstration, in-class practice. prereq: [CSPP or genetic counseling] grad student

EPSY 8502. Field Placement in Counseling and Student Personnel Psychology. (2 cr.; S-N or Audit; Every Fall & Spring) Students participate under supervision in practitioner activities within a counseling work environment. prereq: 8501 or instr consent

EPSY 8503. Counseling Practicum I. (1-4 cr.; A-F or Audit; Every Fall) Beginning-level supervised practice in counseling with individuals and groups; emphasizes systematic evaluation of student's counseling practice through direct observations, video, and audio tapes. prereq: 8502 or instr consent

EPSY 8504. Counseling Practicum II. (1-4 cr.; A-F or Audit; Every Spring) Intermediate supervised practice in counseling with individuals and groups; emphasizes ethical issues with systematic evaluation of student's practice through direct observations, video, and audio tapes. prereq: 8503 or instr consent

EPSY 8509. Supervision Practicum: CSPP. (1-2 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Doctoral students meet weekly with master's prepracticum or practicum students for didactic supervision activities. Specific activities determined by master's prepracticum or practicum instructor. Doctoral students meet weekly with master's prepracticum or practicum instructor and other doctoral student supervisors for consultation/ supervision. prereq: [Ed psy PhD student with CSPP subprog] or instr consent

EPSY 8512. Internship: CSPP. (1-12 cr.; S-N only; Every Fall, Spring & Summer) Supervised internship in counseling psychology. prereq: EdPsy PhD student with CSPP subprog

EPSY 8521. Practicum in Student Affairs and Student Development. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) Supervised practice in university and college student development offices. prereq: EdPsy MA or PhD student with CSPP subprog or instr consent

EPSY 8522. Counseling Practicum: Advanced. (3 cr. [max 12 cr.]; A-F only; Every Fall & Spring) Advanced skills practicum in counseling, counseling psychology, or student development. prereq: [Grad EPSy PhD student with CSPP subprog] or instr consent; instructor consent required after 2 repeats

EPSY 8600. Special Topics: Special Education Issues. (1-3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Current trends (e.g., schoolwide discipline, response to intervention, and diversion) investigated by formulating research projects. Students write a media piece describing an issue and its impact on the community.

EPSY 8602. Advanced Topics in Special Education Research. (3 cr. [max 12 cr.]; A-F only; Every Fall & Spring) This course will offer sections on varying topics focused on research, policy, practice, and related issues in special education and disability services for advanced graduate seminars. The course is intended to allow enrolled students to conduct in-depth and focused review and analysis of scholarship in a contemporary area of special education, and to provide each student the opportunity to develop in-depth understanding of a specific topic within this area. This is a seminar course, with a combination of faculty-presented, student-presented, and group discussion content. Course topics will include an overview of relevant theoretical models, research methods, empirical and other findings, and areas of emerging interest, scholarship, policy, and practice. prereq: Completion of EPSy 8701, 8702, and 8694 or equivalent coursework; doctoral Student in Special Education or a related academic area, or permission of instructor

EPSY 8612. Seminar: Students with Academic Difficulties. (3 cr.; A-F or Audit; Every Fall & Spring) Survey, analysis, and application of relevant theories and research related to current issues. Students in course develop skills in scholarly inquiry, writing, and debate.

EPSY 8651. Seminar on Social and Emotional Disabilities. (3 cr.; A-F or Audit; Every Fall & Spring) Review and critical analysis of current trends and future directions of education of students with social and emotional disabilities.

EPSY 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral Pre-Thesis Credits prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

EPSY 8694. Research in Special Education. (3 cr.; Student Option; Every Fall & Spring) Design and implementation of research related to the unique developmental characteristics of exceptional learners.

EPSY 8701. Doctoral Core Seminar: Special Education I. (3 cr. [max 6 cr.]; A-F or Audit; Every Fall) Required for students with a family/life span focus on social development, behavioral interaction, and cultural interactions. prereq: EdPsy PhD student with spec ed subprog or instr consent

EPSY 8702. Doctoral Core Seminar: Special Education II. (3 cr. [max 6 cr.]; A-F or Audit; Every Spring) Required for students focusing on communication/language/academics. prereq: 8701 or instr consent

EPSY 8706. Single Case Designs in Intervention Research. (3 cr.; Student Option; Periodic Spring) Design and analysis of single-case experiments to examine effects of interventions on individual behavior in school, home, and community.

EPSY 8707. Principles of Behavior Analysis and Learning. (3 cr.; A-F only; Every Fall) Historical development of behavioral science. Thinking about learning/behavior, applying principles to common human experiences. Scholarly leadership skills. prereq: [Grad student, foundational course in [learning or psychology]] or instr consent

EPSY 8708. Functional Behavior Assessment. (3 cr.; A-F only; Every Spring) Applications of principles of behavior. Historical/contemporary approaches. Functional analysis. Treatment of challenging
behavior/learning problems. prereq: [Grad student, one [learning or psychology] course] or instr consent

**EPSY 8709. Sp Ed Issues - Language & Early Literacy Dev., Assmnt, & Intervention for Young Children.** (3 cr.; A-F only; Fall Even Year) This seminar course will address contemporary issues in theory, assessment, and interventions to promote language and early literacy development for young children (typically, those not yet age-eligible to enroll in kindergarten) at risk for later reading delays. The course will review and analyze relevant theoretical models, basic research related to these theories, and applied research in assessment and intervention, particularly research conducted in the past five years as well as emerging issues of research and practice.

**EPSY 8772. Seminar in Early Intervention.** (2 cr.; Student Option; Every Fall & Spring) Explores research from diverse disciplines related to education of infants, toddlers, and preschool children with disabilities and their families. Discusses practical application of this research.

**EPSY 8777. Thesis Credits: Master's.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**EPSY 8800. Special Topics in School Psychology.** (1-4 cr. [max 9 cr.]; Student Option: Every Spring & Summer) Issues or related coursework in areas not normally available through regular curriculum offerings.

**EPSY 8811. Assessment in School Psychology I: Foundations of Academic Assessment.** (3 cr.; A-F or Audit; Every Fall) Theories and models of psychoeducational assessment of children and adolescents within home, school, and community. Conceptual and empirical foundations of ecodevelopmental assessment that lead to efficient but comprehensive assessment of children presented from problem-solving perspective. prereq: Grad ed psy major with school psy subprog or instr consent

**EPSY 8812. Assessment in School Psychology II: Intellectual and Social-Emotional Domains.** (3 cr.; A-F or Audit; Every Spring) Builds on EPSY 8811. Emphasizes gathering data on a child's intellectual and social-emotional functioning and educational progress, prereq: Grad ed psy major with school psy subprog or instr consent

**EPSY 8813. Introductory Practicum in School Psychology.** (2 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Students complete a variety of learning activities intended to foster familiarity with the school environment and role of the school psychologist including school observations, and formal and informal assessment techniques. All measures complement other facets of assessment presented in EPSY 8811 and 8812.

**EPSY 8815. Behavioral and Social Emotional Prevention and Intervention.** (3 cr.; A-F or Audit; Periodic Fall & Spring) Theories and research-based practices underlying prevention and intervention practices to support students? behavioral, social, and emotional development. Applied projects and assignments in practicum placements. prereq: 8821, 8811, 8812

**EPSY 8816. Academic Prevention and Intervention.** (3 cr.; A-F or Audit; Every Fall & Spring) Theories and research-based approaches to prevention, instruction, and intervention practices to support students? cognitive and academic development in core curricular domains. Applied projects and assignments in practicum placements.

**EPSY 8817. Problem Analysis and Consultation in School Psychology.** (3 cr.; A-F or Audit; Every Spring) Practical application of problem analysis and consultation models with school staff, parents, and students. Theories, approaches, and barriers to research-based indirect services in school psychology. Applied projects and assignments in practicum placements.

**EPSY 8818. Intermediate Practicum in School Psychology.** (2 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Students complete a variety of learning activities intended to foster familiarity with the role of the school psychologist including formal and informal assessment techniques, academic and social-emotional interventions, and consultation. All interventions and consultation activities are linked to didactic portions of EPSY 8815, 8816, 8817. prereq: concurrent registration is required (or allowed) in 8815 or concurrent registration is required (or allowed) in 8816

**EPSY 8819. Emotion & Childhood Psychopathology.** (3 cr.; A-F only; Every Spring) This seminar is designed to provide an overview of historical and current perspectives on emotion and childhood psychopathology, including current diagnostic and classification systems, with emphasis on specific disorders. The course will focus on disorders that are typically observed by psychologists working in schools and other applied settings.

**EPSY 8821. Issues in School Psychology.** (3 cr.; A-F or Audit; Every Fall & Spring) School psychology as professional field of specialization in psychology/education. Historical, theoretical, and research basis of school psychology. How school systems operate. Common roles/functions of school psychologists. In-class discussion, didactic/field-based assignments. prereq: EPSy grad student with SchPsy subprog

**EPSY 8822. Research in School Psychology.** (3 cr. [max 12 cr.]; A-F only; Every Fall & Spring) Integrative, developmental series of discussions/activities about research in school psychology. Instruction/discussion regarding consumption, synthesis, conduct, dissemination of school psychology research.

**EPSY 8823. Ethics and Professional Standards in School Psychology.** (3 cr.; A-F or Audit; Every Fall & Spring) Ethics, law, and current educational issues applied to study/practice of school psychology. Ethical principles, state/federal laws governing educational practices. How mandates are applied to work of school psychologists in general/special populations (e.g., special education, ESL, ethnic/racial minorities). Students apply learning as researchers and practicing school psychologists in schools. prereq: 8821

**EPSY 8831. Comprehensive School Practicum in School Psychology.** (3 cr.; Max 6 cr.); A-F only; Every Fall & Spring) Supervised school field placement requiring assessment, consultation, prevention, and intervention activities.

**EPSY 8832. Advanced Practicum in School Psychology.** (3 cr.; Max 6 cr.; A-F only; Every Fall, Spring & Summer) Supervised field placement individualized to student interests and training goals. May require variety of assessment, consultation, prevention, and intervention activities.

**EPSY 8841. Practicum: Instruction and Supervision in School Psychology.** (3 cr.; Max 6 cr.); A-F or Audit; Every Fall, Spring & Summer) Didactic training/supervised experience teaching. Knowledge/skills in strategies for effective classroom instruction/supervision in individual/small group instruction. Construct teaching portfolio. prereq: Grad ed psy major with school psy subprog or instr consent

**EPSY 8842. Internship: School Psychological Services.** (1-10 cr. [max 99 cr.]; S-N only; Every Fall, Spring & Summer) Advanced field placement. Full-time supervised experience for one year or part-time for no more than two years. prereq: Grad ed psy major with school psy subprog, instr consent

**EPSY 8843. Internship - School Psychology.** (1 cr. [max 4 cr.]; S-N only; Every Fall & Spring) Advanced field placement. Full-time supervised experience for one year or part-time for no more than two years. prereq: instr consent

**EPSY 8849. Assessment in Early Childhood.** (3 cr.; A-F or Audit; Spring Even Year) Training psychologists/researchers in use of various assessment tools, including observational assessment strategies, for children birth-age 7. Intended primarily for graduate level practitioners-in-training interested in applied information on assessment/intervention services. prereq: [8811, 8812] or equivalent in related programs

**EPSY 8850. Doctoral Seminar in School Psychology: Research, Training, Practice,
Policy Issues, and Action Plans. (3 cr.; A-F only; Every Fall & Spring)
Critical issues in school psychology, led by students or visiting professionals. Outside reading/research. Scientific findings/implications for training, practice, policy, and research. Students create professional-development plan. prereq: [Grad student in school psychology, coursework in school psychology] or advanced PhD student from related department]. instr consent

EPSY 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

EPSY 8905. History and Systems of Psychology: Landmark Issues in Educational Psychology. (3 cr.; Student Option; Every Spring)
Critical issues in learning and cognition, statistics and measurement, counseling, school psychology, social psychology of education, and special education. prereq: Ed psy PhD student

EPSY 8993. Directed Study: Educational Psychology. (1-10 cr. [max 20 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Arranged independently with individual faculty members. prereq: instr consent

EPSY 8994. Research Problems: Educational Psychology. (1-6 cr. [max 18 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Research methodology, techniques, and literature. Students participate in formulating/executing research proposal. prereq: instr consent

Educational/Human Development (EDHD)

EDHD 1051. Editing for Writers. (2 cr.; Student Option; Every Fall, Spring & Summer)

EDHD 1525V. First-Year Inquiry: Multidisciplinary Ways of Knowing. (WI; 4 cr. ; A-F only; Every Fall)
Writing intensive multidisciplinary approach to addressing the common question, "How can one person make a difference?" Students read a common book/work collaboratively to produce a final project. Active learning strategies to develop students' skills in critical reading, thinking, and writing. prereq: CEHD student, honors, 1st-term fr

EDHD 1525W. First-Year Inquiry: Multidisciplinary Ways of Knowing. (WI; 4 cr. ; A-F only; Every Fall)
Writing intensive multidisciplinary approach to addressing the common question, "How can one person make a difference?" Students read a common book/work collaboratively to produce a final project. Active learning strategies to develop students' skills in critical reading, thinking, and writing.

EDHD 1620. Current Topics: Strategies for Student Success. (1-4 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
For topics see Class Schedule.

EDHD 1701. Introduction to TRiO: Identity, Culture, and College Success. (1 cr.; A-F only; Every Fall)
How culture/identity play role in educational experience. Self-authorship skills to create educational/personal path that aligns with values/beliefs. Lecture, discussion, readings, activities. prereq: TRIO student

EDHD 1920. CEHD Special Topics. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
For topics, see Class Schedule.

EDHD 1921. America Reads: Literacy Support, Mentorship, & Academic Achievement. (1 cr.; Student Option No Audit; Every Spring)
America Reads: Literacy Support, Mentorship & Academic Achievement is a service-learning course specifically designed for UMN undergraduates that tutor and mentor children in literacy skill development. Literacy mentors will add dozens of research based literacy strategies to their tutoring repertoire through study, observation, application and reflection that can be referenced and implemented to support their current and future mentees in reading, writing, speaking & listening.

EDHD 2201H. Basics of Research Methods for Honors Students. (2 cr.; Student Option; Every Spring)
As part of a society that is saturated with "research," we have all at some point encountered at least one form of research--whether it is via election polls, market surveys, investigative findings reported on the 10pm news, or academic research for your papers. There is sometimes too much research to make sense of it all. As an undergraduate student, you have likely found many examples of research, and it will only become more important in your own academic career, and if you choose to pursue an academic route, in your own development as a scholar. Therefore, learning the basics of research--how it is conducted, how it can be used to answer everyday questions, and what makes it good quality--will make you not only a better researcher, but also a better consumer of academic and popular research. This course aims to introduce you, as an honors student, to these topics.

EDHD 2201H. Basics of Research Methods for Honors Students. (2 cr.; Student Option; Every Spring)
As part of a society that is saturated with "research," we have all at some point encountered at least one form of research--whether it is via election polls, market surveys, investigative findings reported on the 10pm news, or academic research for your papers. There is sometimes too much research to make sense of it all. As an undergraduate student, you have likely found many examples of research, and it will only become more important in your own academic career, and if you choose to pursue an academic route, in your own development as a scholar. Therefore, learning the basics of research--how it is conducted, how it can be used to answer everyday questions, and what makes it good quality--will make you not only a better researcher, but also a better consumer of academic and popular research. This course aims to introduce you, as an honors student, to these topics.

EDHD 2701. Your Future: Identity, Culture & Career Success. (2 cr.; Student Option No Audit; Every Spring)
One of the biggest challenges for any college student is choosing a major and career! Making decisions about your major and future career can be overwhelming, confusing, and intimidating. Students often wonder, "What is the right major/career for me?" How do I know my options? What steps do I need to take to reach my career goals? Who can I go to for help? In this course you'll develop a clearer sense of self and create greater awareness of your multiple identities and how they influence your career decision-making and future success. You'll also learn the importance of social and cultural capital and how to build the capital needed to move forward in your career journey. Through community building, storytelling, reflection, readings, lecture, discussion, in-class activities and projects, you'll be empowered to define career success through your own lived experiences and cultural lenses, gain confidence in your career decision-making abilities, and author your own career journey.

EDHD 3100. International Topics for Undergraduates. (1-12 cr.; Student Option; Every Fall, Spring & Summer)
Off-campus course. Topics from research exploration to academic/engagement activities. Delivered in international setting. Course requirements are determined by instructor(s) and reflect advanced undergraduate rigor. prereq: instr consent

EDHD 3161. Great Minds of the Renaissance. (GP,HIS; 4 cr.; A-F only; Every Spring)
The Great Minds of the Renaissance course focuses on the development of scientific thought and the great minds behind those ideas; it delves into the intersection of scientific ideas with art, culture, religion, politics, etc. In doing so, it also covers a wide range of general or liberal education objectives.

EDHD 3300. Special Topics in Education and Human Development. (1-6 cr. [max 12 cr.]; Student Option; Periodic Fall, Spring & Summer)
Special topics in education/human development.

EDHD 5004. Teaching Students With Special Needs in Inclusive Settings. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Exceptionalities in educational settings as defined in federal/state rules/regulations. Historical perspectives, definitions, etiology, needs, characteristics. Service delivery systems for each exceptionality. prereq: Teacher preparation program in [CEHD or music education or agriculture education or DirectTrack] or instr consent; licensure students must take this course for a grade

EDHD 5100. International Topics for Graduate Students. (1-12 cr.; Student Option; Every Fall, Spring & Summer)
Off-campus course. Topics from research exploration to academic/engagement activities. Delivered in international setting. Course requirements are determined by instructor(s) and reflect graduate-level rigor.

EDHD 5200. Special Topics: Professional Development for Educators. (1-3 cr. [max 12 cr.]; Student Option; Every Summer)
Special topics course that permits offering a variety of research-based and scholarly content to meet the needs of educators from P-12 settings.
EDHD 5300. Special Topics in Education and Human Development. (1-6 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer)
Special topics in education and human development.

Electrical & Computer Eng (EE)

EE 1. Refresher Course for Electrical Engineers. (0 cr.; A-F or Audit; Every Fall & Spring)
Review of electrical engineering fundamentals required to pass the Minnesota Professional Engineering Examination in electrical engineering. Organized review of material ordinarily contained in electrical engineering college curriculum. Emphasizes problem solving with orientation as close possible to type of questions in exam. prereq: [BSEE or BEE, pass EIT exam, four yrs elect eng experience

EE 1001. Introduction to Electrical and Computer Engineering. (1 cr.; S-N or Audit; Every Spring)
Introduction to engineering/computer engineering. Techniques and technologies developed by electrical and computer engineers.

EE 1301. Introduction to Computing Systems. (4 cr.; Student Option; Every Fall & Spring)
C/C++ programming constructs, binary arithmetic and bit manipulation, data representation and abstraction, data types/structures, arrays, pointer addressing, control flow, iteration, recursion, file I/O, basics of object-oriented programming. An Internet-of-Things lab is integral to the course. prereq: concurrent registration is required (or allowed) in MATH 1271 or concurrent registration is required (or allowed) in MATH 1371

EE 1701. Climate Crisis: Implementing Solutions. (PHYS, TS; 3 cr.; Student Option; Every Spring)
Energy from renewables such as solar and wind to combat potentially catastrophic climate change resulting from our use of fossil fuels; electrifying our transportation; ways to increase energy efficiency and energy conservation; need for energy storage to increase the penetration of renewables; role of technology, societal benefits and the ethics. Note: EE 1701 and EE 1703 (the lab) need to both be taken to fulfill the Physical Science Core requirement. EE 1701 alone fulfills the Technology and Society theme requirement.

EE 1703. Laboratory for Climate Crisis: Implementing Solutions. (PHYS; 1 cr.; Student Option; Every Fall & Spring)
Laboratory to complement and accompany EE 1701. Experiments to include among: 1) Demonstration of Global Warming by CO2, 2) characteristics of Light for Power Generation through PVs, Lighting through LEDs, and Growing Plants in Greenhouses, 3) Energy Generation Using PV Panels and the Maximum Power Point, 4) PV Panels in Series and Parallel combinations, 5) Wind Turbine Characteristics and the Maximum Coefficient of Performance, 6) Wind Turbine Characteristics for varying wind speeds and Pitch Control of Blades, 7) Battery Characteristics, 8) AC Electric Systems: Real and Reactive Power, 1-Phase, 9) Three-Phase Systems, Motors and Generators, 10) LEDs compared to Incandescent Lamps and CFLs, 11) Growing Plants using LEDs and batteries in Greenhouses, 12) Air Conditioning and Heat Pumps, 13) Simulation of various energy resources to meet the load demand on the electric grid, 14) Economic Calculations of using an Electric Vehicle and Participating in Community SolarGardens. EE 1701 and EE 1703 (the lab) need to both be taken to fulfill the Physical Science Core requirement. EE 1701 alone fulfills the Technology and Society theme requirement. prereq: EE 1701 or concurrent registration is required (or allowed) in EE 1701

EE 2001. Introduction to Circuits and Electronics. (3 cr.; Student Option; Every Fall, Spring & Summer)
Physical principles underlying circuit element models. Kirchhoff's laws. Independent/dependent sources. Opamps. Linearity in circuits. Diodes and rectification. FET characteristics, biasing, small signal models, and simple amplifiers. Transistors in first- and second-order circuits. CMOS-based logic gates. Circuit simulators. prereq: concurrent registration is required (or allowed) in PHYS 1302, concurrent registration is required (or allowed) in (MATH 2243 or MATH 2373 or MATH 2573)

EE 2002. Introductory Circuits and Electronics Laboratory. (1 cr.; Student Option; Every Fall & Spring)
Introductory lab in electronics to accompany 2001. Experiments with simple circuits. Familiarization with basic measurement tools and equipment. prereq: 2001 or concurrent registration is required (or allowed) in 2001

EE 2006. Introductory Circuits Laboratory. (0.5 cr.; Student Option; Every Fall & Spring)
Meets concurrently with an arranged 2001 section.

EE 2101. Introduction to Electronics I. (1.5 cr.; Student Option; Every Fall)
Diodes, field effect transistors and bipolar junction transistors, small signal transistor models. Amplifier circuits. Covers electronics content of 2001 in half a semester. prereq: Linear circuits

EE 2103. Introduction to Electronics II. (1 cr.; Student Option; Every Fall)
Active and passive analog filters, high frequency diode and transistor models, amplifier frequency response, multistage amplifiers. Covers electronics content of 2001 in half a semester. prereq: 2001 or 2101

EE 2301. Introduction to Digital System Design. (4 cr.; Student Option; Every Fall & Spring)
Boolean algebra, logic gates, combinational logic, logic simplification, sequential logic, design of synchronous sequential logic. VHDL modeling, design of logic circuits. Integral lab. prereq: MATH 1272 or MATH 1372 or MATH 1572

EE 2361. Introduction to Microcontrollers. (4 cr.; Student Option; Every Fall, Spring & Summer)
Basic computer organization, opcodes, assembly language programming, logical operations and bit manipulation in C, stack structure, timers, parallel/serial input/output, buffers, input pulse-width and period measurements, PWM output, interrupts and multi-tasking, using special-purpose features such as A/D converters. Integral lab. Prereq: 2301, [1301 or CSCL 1113] or [CSCI 1901]

EE 2701. Sustainable Electricity Supply: Renewables and Conservation. (TS; 3 cr.; Student Option; Every Spring)
This course is on the very timely topic of combating climate change by looking closely at electricity generation, delivery, and its use for a sustainable future. Generating electricity from renewables and conservation in all forms, including improving energy efficiency, are the most important tools we have for combating climate change. This course will help you understand the historical development of energy production, the economic impacts of energy sources, the political implications, and a technical understanding of solar power, wind power, electrical vehicles, fuel cells, energy distribution, and conservation. It will help you consider the potential societal benefits such as reduced energy bills, cleaner air and water, increased economic opportunities, and prepare you for exciting and meaningful careers in renewable energy and sustainability.

EE 2703. Sustainable Electricity Supply: Renewables and Conservation Lab. (1 cr.; Student Option; Every Spring)
This lab is to complement what students are learning in the associated three-credit course EE2701. Students will conduct experiments related to Wind Turbines, Electronic Converters, Photovoltaics, LEDs, and the Smart Grid.

EE 3005. Fundamentals of Electrical Engineering. (4 cr.; Student Option; Every Fall, Spring & Summer)
Fundamentals of analog electronics, digital electronics, and power systems. Circuit analysis, electronic devices and applications, digital circuits, microprocessor systems, operational amplifiers, transistor amplifiers, frequency response, magnetically coupled circuits, transformers, steady state power analysis. prereq: Math 2243, Phys 1302; not for EE majors

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
EE 3006. Fundamentals of Electrical Engineering Laboratory. (1 cr.; Student Option; Every Fall, Spring & Summer)
Lab to accompany 3005, prerequisite: Concurrent enrollment in 3005 is allowed but not required.

EE 3015. Signals and Systems. (3 cr.; Student Option; Every Fall & Spring)

EE 3025. Statistical Methods in Electrical and Computer Engineering. (3 cr.; Student Option; Every Fall, Spring & Summer)

EE 3041. Industrial Assignment I. (2 cr.; A-F only; Every Fall, Spring & Summer)
Industrial work assignment in engineering co-op program. Evaluation based on student's formal written report covering semester's work assignment. prerequisite: [EE or CompE upper div], enrolled in ECE co-op program.

EE 3101. Circuits and Electronics Laboratory I. (2 cr.; Student Option; Every Fall, Spring & Summer)
Experiments in circuits/electronics. prerequisite: [2002, [3115 or concurrent registration is required (or allowed) in 3115], CSE] or dept consent.

EE 3102. Circuits and Electronics Laboratory II. (2 cr.; Student Option; Every Fall, Spring & Summer)
Experiments in circuits/electronics. Team design project. prerequisite: [3101 or CSE or dept consent], attendance first day of class.

EE 3115. Analog Electronics. (3 cr.; Student Option; Every Fall, Spring & Summer)

EE 3161. Semiconductor Devices. (3 cr.; Student Option; Every Fall & Spring)
Elementary semiconductor physics; physical description of pn junction diodes, bipolar junction transistors, field-effect transistors. prerequisite: Upper div CSE, 2011, Phys 1302, Phys 2303 or Chem 1022.

EE 3601. Transmission Lines, Fields, and Waves. (3 cr.; Student Option; Every Fall, Spring & Summer)
Properties of transmission lines, electrostatics, magnetostatics, and electromagnetic waves in unbounded space. Guides, cavities, radiation theory, antennas. prerequisite: [2011, [Math 2423 or Math 2373 or Math 2573], [Phys 1302 or Phys 1402], CSE] or dept consent.

EE 3940. Special Topics in Electrical and Computer Engineering. (1-4 cr.; max 8 cr.; Student Option; Every Summer)
Topics that are not available in regular courses. prerequisite: instr consent.

EE 3990. Curricular Practical Training. (1-2 cr.; max 12 cr.; S-N only; Every Fall, Spring & Summer)
Industrial work assignment involving advanced electrical engineering technology. Reviewed by faculty member. Final report covering work assignment prerequisite: instr consent, undergrad EE or CompE major.

EE 4043W. Industrial Assignment II. (WI; 4 cr.; A-F only; Every Fall, Spring & Summer)
Solution of systems design problems that require developing criteria, evaluating alternatives, and generating a preliminary design. Final report emphasizes design communication and describes design decision process, analysis, and final recommendations. prerequisite: 3041.

EE 4044. Industrial Assignment III. (2 cr.; A-F only; Every Fall, Spring & Summer)
Industrial work assignment in engineering co-op program. Evaluation based on student's formal written report covering semester's work assignment. prerequisite: 4043W.

EE 4111. Advanced Analog Electronics Design. (4 cr.; Student Option; Every Spring)

EE 4161W. Energy Conversion and Storage. (WI; 3 cr.; Student Option; Every Spring)
Fundamental physics/chemistry of selected energy conversion and energy storage devices. Connections with their electric power applications. Role of grid, application to electric vehicles. Lectures, lab, student presentations. prerequisite: 3161 or instr consent.

EE 4163. Energy Conversion and Storage Laboratory. (1 cr.; Student Option; Every Spring)
Provides laboratory experiences with the topics of 4161W, including the fundamental physics and chemistry of selected energy conversion and energy storage devices, their application, and their connection strategies in electric power applications. prerequisite: concurrent registration is required (or allowed) in 4161W.

EE 4231. Linear Control Systems: Designed by Input/Output Methods. (3 cr.; Student Option; Every Fall)
Modeling, characteristics, performance of feedback control systems. Stability, root locus, frequency response methods. Digital implementation, hardware considerations. prerequisite: [3015, [upper div CSE or grad student in CSE major]] or instr consent.

EE 4233. State Space Control System Design. (3 cr.; Student Option; Every Spring)
State space models, performance evaluation, numerical issues for feedback control. Stability, state estimation, quadratic performance.

EE 4301. Digital Design With Programmable Logic. (4 cr.; Student Option; Every Fall & Summer)
Introduction to system design/simulation. Design using Verilog code/synthesis. Emulation using Verilog code. prerequisite: 2301, [1301 or CSCI 1113 or CSCI 1901].

EE 4303. Introduction to Programmable Devices Laboratory. (1 cr.; Student Option; Periodic Spring)
Verilog Language. Combinatorial and sequential logic synthesis with Verilog. Implementation in Field Programmable Gate Arrays (FPGAs). prerequisite: 2301, 2361; cannot receive cr for 4303 if cr granted for EE 4301.

EE 4341. Embedded System Design. (4 cr.; Student Option; Every Spring)

EE 4363. Computer Architecture and Machine Organization. (4 cr.; Student Option; Every Fall & Spring)
Introduction to computer architecture. Aspects of computer systems, such as pipelining, memory hierarchy, and input/output systems. Performance metrics. Examines each component of a complicated computer system. prerequisite: 2361.

EE 4389W. Introduction to Predictive Learning. (WI; 3 cr.; Student Option; Fall Odd Year)
Empirical inference and statistical learning. Classical statistical framework, model complexity control. Vapnik-Chervonenkis (VC) theoretical framework, philosophical perspective. Nonlinear methods. New types of inference. Application studies. prerequisite: [3025, ECE student] or STAT 3022; computer programming or MATLAB or similar environment is recommended for ECE students.

EE 4505. Communications Systems Laboratory. (1 cr.; Student Option; Every Fall) Experiments in analysis/design of wired/wireless communication systems. Lab to accompany 4501. prereq: 4501 or concurrent registration is required (or allowed) in 4501


EE 4607. Wireless Hardware System Design. (3 cr.; Student Option; Every Spring) Random processes, noise, modulation, error probabilities, Antenna operation, power transfer between antennas, r-f propagation phenomena, transmitters/receivers, transmission lines, effect of antenna performance on system performance, r-f/microwave device technologies, small-signal amplifiers, mixers, power amplifiers, r-f oscillators. prereq: [3015, 3115, 3601, CSE student] or dept consent

EE 4701. Electric Drives. (3 cr.; Student Option; Every Spring) AC/DC electric-machine drives for speed/position control. Integrated discussion of electric machines, power electronics, and control systems. Computer simulations. Applications in electric transportation, robotics, process control, and energy conservation. prereq: 3015

EE 4703. Electric Drives Laboratory. (1 cr.; Student Option; Every Spring) Laboratory to accompany 4701. Simulink-based simulation of electrical machines/drives in applications such as energy conservation and motion control in robotics. prereq: 4701 or concurrent registration is required (or allowed) in 4701

EE 4721. Introduction to Power System Analysis. (3 cr.; Student Option; Every Fall) AC power systems. Large power system networks. Mathematics/techniques of power flow analysis. Short-circuit analysis, transient stability analysis. Use of power system simulation program for design. prereq: 2011

EE 4722. Power System Analysis Laboratory. (1 cr.; Student Option; Every Fall) Lab analysis of AC power systems, power system networks, power flow, short circuit, transient stability. prereq: 4721 or concurrent registration is required (or allowed) in 4721

EE 4741. Power Electronics. (3 cr. [max 4 cr.]; Student Option; Every Fall) Switch-mode power electronics. Switch-mode DC power supplies. Switch-mode converters for DC and AC motor drives, wind/photovoltaic inverters, interfacing power electronics equipment with utility system. Power semiconductor devices, magnetic design, electro-magnetic interference (EMI). prereq: 3015, 3115

EE 4743. Switch-Mode Power Electronics Laboratory. (1 cr.; Student Option; Every Fall) Laboratory to accompany 4741. PSpice/Simulink-based simulations of converters, topologies, and control in switch-mode dc power supplies, motor drives for motion control, and inverters for interfacing renewable energy sources to utility grid. prereq: 4741 or concurrent registration is required (or allowed) in 4741

EE 4930. Special Topics in Electrical and Computer Engineering Laboratory. (1-2 cr. [max 6 cr.]; A-F only; Periodic Fall, Spring & Summer) Lab work not available in regular courses. Topics vary. prereq: CSE sr or grad student or instr consent

EE 4940. Special Topics in Electrical and Computer Engineering. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Topics that are not available in regular courses. Topics vary. prereq: CSE or instr consent

EE 4951W. Senior Design Project. (WI; 4 cr.; Student Option; Every Fall & Spring) Team participation in formulating/solving open-ended design problems. Oral/written presentations. prereq: 3015, 3115, 3102, attendance first day of class

EE 4970. Directed Study. (1-3 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Studies of approved projects, either theoretical or experimental. prereq: Cr ar [may be repeated for cr]; dept consent

EE 4981H. Senior Honors Project I. (2 cr.; Student Option; Every Fall) Experience in research/design for electrical/computer engineering. Oral/written reports. prereq: ECE honors, sr, instr consent

EE 4982V. Senior Honors Project II. (WI; 2 cr.; Student Option; Every Spring) Experience in research/design for electrical/computer engineering. Oral/written reports. prereq: 4981

EE 4999. Special Exam. (2 cr.; Student Option; )

EE 5041. Industrial Assignment for Graduate Students. (1 cr.; S-N only; Every Fall) Spring & Summer) Optional industrial work assignment. Evaluation based on student's formal written report covering semester's work assignment. This course counts for 6 credits of Academic Progress for the semester in which it is taken. prereq: Consent of Advisor and Office of the DGS

EE 5121. Transistor Device Modeling for Circuit Simulation. (3 cr.; Student Option; Periodic Fall & Spring) Basics of MOS, bipolar theory. Evolution of popular device models from early SPICE models to current industry standards. prereq: [3115, 3161, CSE grad student] or dept consent

EE 5141. Introduction to Microsystem Technology. (4 cr.; Student Option; Every Spring) Microelectromechanical systems composed of micromotors, microactuators, and electronics integrated onto common substrate. Design, fabrication, and operation principles. Labs on micromachining, photolithography, etching, thin film deposition, metalization, packaging, and device characterization. prereq: [3161, 3601, CSE grad student] or dept consent

EE 5163. Semiconductor Properties and Devices I. (3 cr.; Student Option; Every Fall) Principles/properties of semiconductor devices. Selected topics in semiconductor materials, statistics, and transport. Aspects of transport in p-n junctions, heterojunctions. prereq: [3161, 3601, CSE grad student] or dept consent

EE 5164. Semiconductor Properties and Devices II. (3 cr.; Student Option; Every Spring) Principles/properties of semiconductor devices. Charge control in different FETs, transport, modeling. Bipolar transistor models (Ebers-Moll, Gummel-Poon), heterostructure bipolar transistors. Special devices. prereq: 5163 or instr consent

EE 5171. Microelectronic Fabrication. (4 cr.; Student Option; Every Fall) Fabrication of microelectronic devices. Silicon integrated circuits, GaAs devices. Lithography, oxidation, diffusion. Process integration of various technologies, including CMOS, double poly bipolar, and GaAs MESFET. prereq: CSE grad student or dept consent

EE 5173. Basic Microelectronics Laboratory. (1 cr.; Student Option; Every Fall) Students fabricate a polysilicon gate, single-layer metal, NMOS chip, performing 80 percent of processing, including photolithography, diffusion, oxidation, and etching. In-process measurement results are compared with final electrical test results. Simple circuits are used to estimate technology performance, prereq: [5171 or concurrent registration is required (or allowed) in 5171], CSE grad student or dept consent

EE 5181. Micro and Nanotechnology by Self Assembly. (3 cr.; Student Option; Spring Odd Year) Self-assembly process of micro and nano structures for realization of 1-, 2-, 3-dimensional micro- and nano-devices. Micro and nanoscale fabrication by electrostatic, magnetic, surface tension, Capillary, intrinsic and extrinsic forces. Nanoscale lithographic patterning. Devices packaging, Self-healing process. prereq: EE 3161, Phys 1902

EE 5231. Linear Systems and Optimal Control. (3 cr.; Student Option; Every Fall)
Properties and modeling of linear systems. 
Linear quadratic and linear-quadratic-Gaussian regulators. Maximum principle. prereq: [3015, CSE grad student] or instr consent

EE 5325. Robust Control System Design. (3 cr.; Student Option; Every Fall) 
Development of control system design ideas; frequency response techniques in design of single-input/single-output (and MIMO) systems. Robust control concepts. CAD tools. prereq: CSE grad, 3015, 5231 or instr consent

EE 5329. VLSI Digital Signal Processing Systems. (3 cr.; Student Option; Periodic Fall & Spring) 
Programmable architectures for signal/ media processing. Data-flow representation. Architecture transformations. Low-power design. Architectures for two's complement/ redundant representation, carry-save, and canonical signed digit. Scheduling/allocation for high-level synthesis. prereq: [5323 or concurrent registration is required (or allowed) in 5323], CSE grad student or dept consent

EE 5333. Analog Integrated Circuit Design. (3 cr.; Student Option; Every Fall) 
Fundamental circuits for analog signal processing. Design issues associated with MOS/BJT devices. Design/testing of circuits. Selected topics (e.g., modeling of basic IC components, design of operational amplifiers or comparator or analog sampled-data circuit filter). prereq: [3115, CSE grad student] or dept consent

EE 5340. Physics of Computing: Basics. (3 cr.; Student Option; Every Spring) 
Physics of Computation will explore how physical principles and limits have been shaping paradigms of computing. A key goal of this course is to understand how (and to what extent) a paradigm shift in computing can help with emerging energy problems. Topics include: Physical limits of computing, coding and information theoretical foundations, computing with beyond-CMOS devices, reversible computing, quantum computing, stochastic computing. Previous course in Computer Architecture is suggested but not required.

EE 5351. Applied Parallel Programming. (3 cr.; Student Option; Every Fall) 
Parallel programming/architecture. Application development for many-core processors. Computational thinking, types of parallelism, programming models, mapping computations effectively to parallel hardware, efficient data structures, paradigms for efficient parallel algorithms, application case studies. prereq: [4363 or equivalent], programming experience (C/C++ preferred)

EE 5355. Algorithmic Techniques for Scalable Many-core Computing. (3 cr.; Student Option; Spring Odd Year) 
Algorithm techniques for enhancing the scalability of parallel software: scatter-together, problem decomposition, binnning, privatization, tiling, regularization, compaction, double-buffering, and data layout. These techniques address the most challenging problems in building scalable parallel software: limited parallelism, data contention, insufficient memory bandwidth, load balance, and communication latency. Programming assignments will be given to reinforce the understanding of the techniques. prereq: basic knowledge of CUDA, experience working in a Unix environment, and experience developing and running scientific codes written in C or C++. Completion of EE 5531 is not required but highly recommended.

EE 5364. Advanced Computer Architecture. (3 cr.; Student Option; Every Fall) 
Instruction set architecture, processor microarchitecture. Memory and I/O systems. Interactions between computer software and hardware. Methodologies of computer design. prereq: [4363 or CSci 4203], CSE grad student or dept consent

EE 5371. Computer Systems Performance Measurement and Evaluation. (3 cr.; Student Option; Periodic Fall & Spring) 
Tools/techniques for analyzing computer hardware, software, system performance. Benchmark programs, measurement tools, performance metrics. Deterministic/probabilistic simulation techniques, random number generation/testing. Bottleneck analysis. prereq: [4363 or 5361 or CSci 4203 or 5201]; [CSE grad student] or dept consent

EE 5373. Data Modeling Using R. (1 cr.; A-F only; Periodic Fall & Spring) 
Introduction to data modeling and the R language programming. Multi-factor linear regression modeling. Residual analysis and model quality evaluation. Response prediction. Training and testing. Integral lab. An introductory course in probability and statistics is suggested but not required; basic programming skills in some high-level programming language, such as C/C++, Java, Fortran, etc also suggested.

EE 5381. Telecommunications Networks. (3 cr.; Student Option; Periodic Fall & Spring) 
Fundamental concepts of modern telecommunications networks, mathematical tools required for their performance analysis. Layered network architecture, point-to-point protocols/links, delay models, multiaccess communication/routing. prereq: [4501, 5531, CSE grad student] or dept consent

EE 5391. Computing With Neural Networks. (3 cr.; Student Option; Periodic Fall & Spring) 
Neural networks as a computational model. Connections to AI, statistics and model-based computation. Associative memory and matrix computation; Hopfield networks. Supervised networks for classification and prediction. Unsupervised networks for data reduction. Associative recognition/retrieval, optimization, time series prediction, knowledge extraction. prereq: [5025 or Stat 5091], CSE grad student or dept consent

EE 5393. Circuits, Computation, and Biology. (3 cr.; Student Option; Periodic Fall & Spring) 

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
EE 5501. Digital Communication. (3 cr.; Student Option; Every Fall)

EE 5505. Wireless Communication. (3 cr.; Student Option; Every Spring)
Introduction to wireless communication systems. Propagation modeling, digital communication over fading channels, diversity and spread spectrum techniques, radio mobile cellular systems design, performance evaluation. Current European, North American, and Japanese wireless networks. prereq: [4501, CSE grad student] or dept consent; 5501 recommended

EE 5531. Probability and Stochastic Processes. (3 cr.; Student Option; Every Fall)

EE 5542. Adaptive Digital Signal Processing. (3 cr.; Student Option; Periodic Fall & Spring)

EE 5545. Digital Signal Processing Design. (3 cr.; Student Option; Every Spring)

EE 5549. Digital Signal Processing Structures for VLSI. (3 cr.; Student Option; Periodic Fall & Spring)

EE 5551. Multiscale and Multirate Signal Processing. (3 cr.; Student Option; Periodic Fall & Spring)

EE 5561. Image Processing and Applications. (3 cr.; Student Option; Every Spring)
Two-dimensional digital filtering/transforms. Application to image enhancement, restoration, compression, and segmentation. prereq: [4541, 5581, CSE grad student] or instr consent

EE 5583. Error Control Coding. (3 cr.; Student Option; Periodic Spring)
Error-correcting codes. Concepts, properties, polynomial representation. BCH, Golay, Reed-Muller/Reed-Solomon codes. Convolutional codes. Iterative codes. prereq: [3025, Math 2373] or equiv. [CSE grad student or dept consent

EE 5585. Data Compression. (3 cr.; Student Option; Periodic Fall & Spring)

EE 5586. Introduction to RF/Microwave Engineering. (3 cr.; Student Option; Periodic Fall & Spring)

EE 5587. RF/Microwave Circuit Design. (3 cr.; Student Option; Periodic Fall & Spring)
Transmission lines, network analysis concepts. CAD tools for passive/active designs. Diode based circuit designs (detectors, frequency multipliers, mixers). Transistor based circuit design (amplifiers, oscillators, mixer/doubler). prereq: [5061 or equiv]. [CSE grad student or instr consent

EE 5601. Introduction to RF/Microwave Circuit Design. (3 cr.; Student Option; Periodic Fall & Spring)
Transmission lines, network analysis concepts. CAD tools for passive/active designs. Diode based circuit designs (detectors, frequency multipliers, mixers). Transistor based circuit design (amplifiers, oscillators, mixer/doubler). prereq: [5061 or equiv]. [CSE grad student or instr consent

EE 5621. Physical Optics. (4 cr.; Student Option; Every Fall)

EE 5622. Physical Optics Laboratory. (3 cr.; Student Option; Every Spring)
Fundamentals of lasers, including propagation of Gaussian beams, optical resonators, and theory of laser oscillation. Polarization optics, electro-optic, acousto-optic modulation, nonlinear optics, phase conjugation. prereq: [3601 or Phys 3002], CSE grad student] or dept consent

EE 5627. Optical Fiber Communication. (3 cr.; Student Option; Periodic Fall & Spring)

EE 5628. Fiber Optics Laboratory. (1 cr.; Student Option; Spring Odd Year)
Experiments in fiber optics. Dielectric waveguides, modes in optical fibers, fiber dispersion/attenuation, properties of light sources/detectors, optical communication systems. prereq: [5627 or concurrent registration is required (or allowed) in 5627], CSE grad student] or instr consent

EE 5629. Optical System Design. (2 cr.; Student Option; Periodic Fall & Spring)
Experiments in fiber optics. Dielectric waveguides, modes in optical fibers, fiber dispersion/attenuation, properties of light sources/detectors, optical communication systems. prereq: [5627 or concurrent registration is required (or allowed) in 5627], CSE grad student] or instr consent

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in instrument design. Fourier optics and image quality. Design examples: telescopes, microscopes, diffraction-limited lenses, projectors, scientific instruments. prereq: CSE grad student or dept consent

EE 5640. Introduction to Nano-Optics. (3 cr.; Student Option; Every Fall) This course will cover the physics and technology of nano-optics and plasmonics and their potential applications in biochemical sensing, super-resolution imaging, optical trapping, light emission, and spectroscopy. The following topics will be covered: - Maxwell’s equations, E&M of metals - Fresnel’s equations, light propagation in periodic media - Physics of surface plasmon waves - Metallic waveguides: metal-insulator-metal vs. insulator-metal-insulator - Optical antennas - Noble metal nanoparticles: Synthesis, optical properties, and applications - Optical biosensors based on surface plasmon resonance (SPR) - Surface enhanced Raman scattering (SERS) - Surface enhanced Infrared Absorption (SEIRA) - Super-resolution imaging and near-field optical microscopy - Light transmission through nano-apertures (extraordinary optical transmission) - Plasmonics at long wavelengths (infrared and terahertz) - Plasmonics in atomically thick materials Knowledge of Maxwell’s equations, Matlab, or Mathematica coding is suggested but not required.

EE 5649. Infrared Devices and Technology. (3 cr.; Student Option; Periodic Fall) One of the most economically and scientifically important but relatively unknown device technologies is infrared detection, sensing and imaging. Today the application space is much larger than traditional military applications and includes weather and climate satellites, industrial process control, petrochemical analysis, pollution sensing, astronomy, and biomedical clinical diagnostics. This class covers the basic physics of infrared emission and absorption in solid-state materials, molecules, and the atmosphere. It also discusses detector technology (with particular emphasis on types of semiconductor and quantum-dot photon detectors, microbolometers, and thermoelectric detectors) and the infrared spectroscopy of molecules to show why the infrared is so important in the study of chemical, biological, and atmospheric systems. The class will also examine types of commonly used spectrometers: cavity, dispersive, and FTIR and sampling of important applications and active standoff detection, satellite climate and atmospheric monitoring, industrial and petrochemical analysis, and LIDAR. Other topics will be introduced as time allows.

EE 5653. Physical Principles of Magnetic Materials. (3 cr.; Student Option; Every Fall) Physics of diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, ferrimagnetism. Ferromagnetic phenomena. Static/dynamic theory of micromagnetics, magneto-optics, and magnetization dynamics. Magnetic material applications. prereq: CSE grad student or dept consent

EE 5655. Magnetic Recording. (3 cr.; Student Option; Periodic Spring) Magnetic fundamentals, recording materials, idealized models of magnetic record/reproduction, analytic models of magnetic record heads, sinusoidal magnetic recording, digital magnetic recording, magnetic recording heads/media, digital recording systems. prereq: CSE grad student or dept consent

EE 5657. Physical Principles of Thin Film Technology. (4 cr.; Student Option; Every Fall) Fabrication, characterization, and application of thin film and nanostructured materials and devices. Focuses on vacuum deposition. Materials science. Hands-on, team-based labs.

EE 5670. Spintronic Devices. (3 cr.; Student Option; Spring Odd Year) Basic concepts and physical principles underlying spintronic devices: engineering designs and basic features of matured spintronic devices: GMR and MTJ sensor, MRAM, etc; new opportunities and engineering designs and challenges of spintronic devices: STT-RAM, spin torque oscillator and all spin logic, etc.

EE 5705. Electric Drives in Sustainable Energy Systems. (3 cr.; Student Option; Periodic Spring) Role of electric drives in wind-electric systems, inertial storage, elec/hybrid vehicles. AC machines for energy-efficient operation using d-q axis modeling. Vector-/direct-torque-controlled induction motor drives. Permanent-magnet and interior-permanent magnet ac motor drives. Sensorless drives. Voltage space-vector modulation technology. prereq: [4701, CSE grad student] or dept consent

EE 5707. Electric Drives in Sustainable Energy Systems Laboratory. (1 cr.; Student Option; Periodic Spring) Lab to accompany 5705. prereq: 5705 or concurrent registration is required (or allowed) in 5705

EE 5721. Power Generation Operation and Control. (3 cr.; Student Option; Spring Odd Year) Engineering aspects of power system operation. Economic analysis of generation plants & scheduling to minimize total cost of operation. Scheduling of hydro resources and thermal plants with limited fuel supplies. Loss analysis, secure operation. State estimation, optimal power flow. Power system organizations. prereq: [4721, CSE grad student] or dept consent

EE 5725. Power Systems Engineering. (3 cr.; Student Option; Spring Even Year) Reliability analysis of large power generation/transmission systems. Writing programs for state-by-state analysis and Monte Carlo analysis. Power system protection systems, circuit current calculations, short circuit detection, isolating faulted components. Characteristics of protection components. prereq: [4721, CSE grad student] or dept consent

EE 5741. Advanced Power Electronics. (3 cr.; Student Option; Periodic Spring) Physics of solid-state power devices, passive components, magnetic optimization, advanced topologies. Unity power factor correction circuits, EMI issues, snubbers, soft switching in dc/ac converters. Practical considerations. Very low voltage output converters. Integrated computer simulations. prereq: CSE grad student] or dept consent

EE 5745. Wind Energy Essentials. (2 cr.; Student Option; Every Fall) Design, planning, development/operation of wind energy facilities. Wind turbine generator types, wind forecasting/assessment, wind farm project development, grid integration, wind turbine controls, blade aerodynamics/acoustics, mechanical/thermal/hydrostatic transmissions, materials/structural reliability, wind turbine foundations, radar interference, role of public policy in wind energy. prereq: CSE grad student or dept consent

EE 5811. Biological Instrumentation. (3 cr.; Student Option; Spring Odd Year) This course will cover the physics and technology of biological instruments. The operating principles of optical, electrical, and mechanical biosensors will be discussed, followed by transport and delivery of biomolecules to the sensors. Techniques to manufacture these sensing devices, along with microfluidic packaging, will be covered. Lectures will be complemented by lab demo sessions to give students hands-on experiences in microfluid chip fabrication, microscopy, and particle trapping experiments.

EE 5940. Special Topics in Electrical Engineering I. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Special topics in electrical and computer engineering. Topics vary.

EE 5950. Special Topics in Electrical Engineering II. (1-4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Special topics in electrical and computer engineering. Topics vary.

EE 5960. Special Topics in Electrical Engineering III. (1-4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Special topics in electrical and computer engineering. Topics vary.

EE 5970. Special Topics in Electrical Engineering IV. (1-4 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Special topics in electrical and computer engineering. Topics vary. prereq: EE or CompE grad student or instr consent; only available for Rochester Campus

EE 5980. Teaching, Grading, and Lab Instruction Seminar. (1 cr.; No Grade Associated; Every Fall) The purpose of this course is to provide guidance and instruction in teaching, grading, and laboratory procedures. In addition, you will be provided with structured links to self-help resources, support from faculty, peers, and staff that will improve your effectiveness and efficiency while teaching and grading. The course is broken out into four components:

- A pre-semester orientation and series of
three workshops (4 hours) - A series of bi-weekly seminars spaced throughout the semester (approx. 4 hours) - A private teaching consultation by CEI (3 hours, lab TAs only) - A wrap-up discussion session (2 hours)

EE 5990. Curricular Practical Training. (1-2 cr. [max 6 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Industrial work assignment involving advanced electrical engineering technology. Review by faculty member. Final report covering work assignment. prereq: Grad student, instr consent

EE 8100. Advanced Topics in Electronics. (1-3 cr. [max 12 cr.]; Student Option; Periodic Fall)
Topics vary according to needs and staff availability. prereq: instr consent

EE 8141. Advanced Heterojunction Transistors. (3 cr.; Student Option; Periodic Fall)
Recent developments in device modeling with emphasis on bipolar junction transistors. High-level effects in base and collector regions and their interrelationship. prereq: 5664 or instr consent

EE 8161. Physics of Semiconductors. (3 cr.; Student Option; Periodic Fall & Spring)

EE 8163. Quantum Electronics. (3 cr.; A-F or Audit; Periodic Fall & Spring)

EE 8190. Electronics Seminar. (1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Current literature, individual assignments. prereq: instr consent

EE 8210. System Theory Seminar. (1 cr. [max 3 cr.]; S-N or Audit; Periodic Fall & Spring)
Current literature, individual assignments.

EE 8213. Advanced System Theory. (3 cr.; Student Option; Periodic Fall)
Generalized linear systems; applications, structural properties, computational approaches, classification, functional behavior, and synthesis. prereq: IT grad student, instr consent

EE 8215. Nonlinear Systems. (3 cr.; Student Option; Periodic Fall & Spring)
Current topics in stability analysis of nonlinear systems, design of controllers for nonlinear systems, discrete-time and stochastic nonlinear systems. prereq: instr consent

EE 8230. Control Theory Seminar. (1 cr. [max 3 cr.]; S-N or Audit; Periodic Fall & Spring)
Current literature, individual assignments.

EE 8231. Optimization Theory. (3 cr.; Student Option; Periodic Fall)
Introduction to optimization in engineering: approximation theory. Least squares estimation, optimal control theory, and computational approaches. prereq: instr consent

EE 8235. Advanced Control Topics. (3 cr.; Student Option; Periodic Spring)

EE 8300. Advanced Topics in Computers. (1-3 cr. [max 12 cr.]; Student Option; Periodic Fall)
Topics vary according to needs and staff availability. prereq: instr consent

EE 8310. Advanced Topics in VLSI. (1-3 cr. [max 12 cr.]; Student Option; Periodic Fall)
Topics vary according to needs and staff availability. prereq: instr consent

EE 8320. Advanced Topics in Design Automation. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall)
State-of-the-art automated design tools for electronic system design. Topics vary. prereq: Grad student or instr consent

EE 8331. CMOS Data Converters: A/D and D/A. (3 cr.; Student Option; Every Fall & Spring)
Data converters, low power low voltage analog circuits. Basic background in design of CMOS analog-to-digital and digital-to-analog converters. Special circuit design techniques for low power design. Students design/test several design problems. prereq: 5333 or instr consent

EE 8333. FTE: Master’s. (1 cr. [max 3 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

EE 8337. Analog Circuits for Wire/Wireless Communications. (3 cr.; A-F or Audit; Every Spring)
Basic background, advanced design concepts necessary to design integrated CMOS RF circuits. Emphasizes CMOS and RF. Where appropriate, mention is made of bipolar circuits and applications to other communications areas. prereq: 5333

EE 8350. Advanced Verification Methodologies for VLSI Systems. (3 cr.; Student Option; Every Fall)
Object-oriented programming in SystemVerilog. Randomization techniques, threads, interprocess communication, and functional coverage determination. Advanced interfaces and assertion-based verification. UVM tests, components, agents, environments, factory pattern, transactions, and sequences. Formal and semi-formal verification methods. Other advanced verification techniques of current research interest. Prerequisites: EE 5327 VLSI Design Lab or equivalent

EE 8351. Design Automation Techniques for Variation-Aware Computing. (3 cr.; Student Option; Fall Even Year)
High-performance chip design can only be performed with the assistance of design automation tools that comprehend the needs of the designer and deliver solutions that can correctly analyze and optimize these systems. The objective of this class is to provide a view of this emerging universe and acquaint students with new research in this area. Specific topics to be covered include 1) Overview of technology trends and emerging systems 2) Variation-aware design and 3) Design automation issues. Prerequisites: CSE grad student. Some background in VLSI design and/or design automation is suggested but not required. Such prior exposure will make the experience in the class much more meaningful.

EE 8360. Computer Systems Seminar. (1-3 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Current literature, individual assignments.

EE 8367. Parallel Computer Organization. (3 cr.; Student Option; Every Spring)
Design/implementation of multiprocessor systems. Parallel machine organization, system design. Differences between parallel, uniprocessor machines. Programming models. Synchronization/communication, Topologies, message routing strategies. Performance optimization techniques. Compiler, system software issues. prereq: 5364 or CSci 5204

EE 8370. Computer Aided Design Seminar. (1-3 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Current literature, individual assignments. prereq: [EE or CompE or CSci] grad major, instr consent

EE 8444. FTE: Doctoral. (1 cr. [max 3 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

EE 8500. Seminar: Communications. (1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Current literature, individual assignments.

EE 8510. Advanced Topics in Communications. (1-3 cr. [max 12 cr.]; Student Option; Periodic Fall)
Topics vary according to needs and staff availability. prereq: instr consent

EE 8520. Advanced Topics in Signal Processing. (1-3 cr. [max 12 cr.]; Student Option; Every Spring)
Topics vary according to needs and staff availability. prereq: instr consent

EE 8581. Detection and Estimation Theory. (3 cr.; Student Option; Periodic Spring)
Risk theory approach to detection and estimation, random process representation, signal parameter estimation. Waveform estimation; detection of phase, frequency,
and delay in signals. Applications to communications and radar-sonar signal design and processing. prereq: 5531 or instr consent

EE 8591. Predictive Learning from Data. (; 3 cr.; Student Option; Fall Even Year) Methods for estimating dependencies from data have been traditionally explored in such diverse fields as: statistics (multivariate regression and classification), engineering (pattern recognition, system identification), computer science (artificial intelligence, machine learning, data mining) and bioinformatics. Recent interest in learning methods is triggered by the widespread use of digital technology and availability of data. Unfortunately, developments in each field are seldom related to other fields. This course is concerned with estimation of predictive data-analytic models that are estimated using past data, but are used for prediction or decision making with new data. This course will present general conceptual framework for learning predictive models from data, using Vapnik-Chervonenkis (VC) theoretical framework, and then discuss various methods developed in statistics, pattern recognition and machine learning. Course descriptions will emphasize methodological aspects of machine learning, rather than development of "new" algorithms. prereq: CSE grad student or instr consent

EE 8601. Advanced Electromagnetic Theory. (; 3 cr.; A-F or Audit; Periodic Fall) Aspects of electromagnetic theory. Review of introductory material. Scattering theory, geometric theory of diffraction, integral equation methods, Green's functions. prereq: 4601 or equiv

EE 8610. Seminar: Electronics, Fields, and Photonics. (; 1 cr.; [max 3 cr.]; S-N or Audit; Every Fall & Spring) Students are assigned readings from current literature and make individual presentations to class. From time to time outside speakers present research papers. prereq: EE grad major or instr consent

EE 8611. Plasma Physics. (; 3 cr.; Student Option; Periodic Fall) Plasma theory and charged particle transport phenomena: collision processes, orbit theory, kinetic theory, Boltzmann transport equation, moment (continuity) equations, magnetohydrodynamics, transport properties. Applications of plasma theory to modeling of dc, rf, and microwave discharges. prereq: instr consent

EE 8620. Advanced Topics in Magnetics. (; 1-3 cr.; [max 12 cr.]; Student Option; Periodic Fall) Topics vary according to needs and staff availability. prereq: 5653 or instr consent

EE 8630. Advanced Topics in Electromagnetics. (; 1-3 cr.; [max 12 cr.]; Student Option;) Topics vary according to needs and staff availability.

EE 8660. Seminar: Magnetics. (; 1 cr.; [max 3 cr.]; S-N or Audit; Every Fall & Spring) Current literature, individual assignments.

EE 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr.; [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

EE 8725. Advanced Power System Analysis and Economics. (; 3 cr.; Student Option; Periodic Fall) Solving sets of equations that involve large sparse matrices. Sparse matrix storage, ordering schemes, application to power flow, short circuit calculation, optimal power flow, and state estimation. prereq: 4721, CSE grad student or instr consent

EE 8741. Power Electronics in Power Systems. (; 3 cr.; Student Option; Periodic Fall) Impact of power electronics loads on power quality. Passive and active filters. Active input current wave shaping, HVDC transmission. Static VAR control, energy storage systems. Interconnecting photovoltaic and wind generators. Static phase shifters and circuit breakers for flexible AC transmission (FACTS). prereq: 4741, IT grad student or instr consent

EE 8744. Modeling, Analysis, and Control of Renewable Energy Systems. (3 cr.; Student Option; Every Fall) The electrical power system has been widely recognized as the most important engineering achievement of the 20th century. High power quality and availability are maintained in the bulk power system mainly by enforcing hierarchical operational practices, central decision making, and topological redundancy. However, this status quo is being challenged by changing generation, consumption and operational landscapes. Particularly, increased renewable generation, supply scarcity, the impetus to improve resiliency to extenuating weather impacts, and expanding electricity access call for the development of transformative architectural and operational paradigms. Recognizing these developments, this course will present enabling modeling, analysis, and control methods that will be integral to architect next-generation renewable-based power systems. These methods will be developed adopting a bottom-up approach by leveraging recent theoretical advances in circuit theory, nonlinear systems, complex networks, and stochastic processes.

EE 8777. Thesis Credits: Master's. (; 1-18 cr.; [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

EE 8888. Thesis Credit: Doctoral. (; 1-24 cr.; [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credit.

EE 8920. Teaching Experience in Electrical and Computer Engineering. (1 cr.; [max 3 cr.]; S-N only; Every Spring) Coteach class under guidance of faculty mentor. Students directly teach approximately half of the classes. Feedback to improve teaching effectiveness. Meet regularly with peers and instructor to discuss teaching concerns/issues. prereq: PhD candidate in electrical engineering, passed written preliminary exam

EE 8925. Ethics in Electrical and Computer Engineering. (; 1 cr.; S-N only; Every Fall) Topics on issues such as data integrity, professional conduct, authorship, plagiarism, patents, copyrights, conflicts, and disclosures. Students study cases, present findings, and write report. prereq: Grad student in electrical engineering

EE 8940. Special Investigations. (; 1-3 cr.; Student Option; Every Fall, Spring & Summer) Studies of approved theoretical or experimental topics. prereq: 1-3 cr [may be repeated for cr]; IT grad student or instr consent

EE 8950. Advanced Topics in Electrical and Computer Engineering. (; 1-3 cr.; [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Topics vary according to needs and staff availability. prereq: Cr [may be repeated for cr]; instr consent

EE 8965. Plan C Project I. (; 3 cr.; Student Option; Every Fall, Spring & Summer) Project topics arranged between student and adviser. Written reports. prereq: Grad EE major or instr consent

EE 8967. Plan C Project II. (; 1-3 cr.; Student Option; Every Fall, Spring & Summer) Project topics arranged between student and adviser. Written reports. prereq: EE grad student

EE 8970. Graduate Seminar I. (; 1 cr.; [max 3 cr.]; S-N or Audit; Every Fall) Recent developments in electrical engineering, related disciplines. prereq: Grad student

EE 8980. Graduate Seminar II. (; 1 cr.; [max 3 cr.]; S-N or Audit; Every Spring) Recent developments in electrical engineering, related disciplines.
Endodontics (ENDO)

ENDO 5300. Endodontics Orientation. (2 cr. ; A-F or Audit; Every Fall & Summer)

ENDO 5304. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Fall & Summer)
Diagnosis/treatment of clinical cases. Complex cases, new/unique techniques.

ENDO 5305. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Fall)
Diagnosis/treatment of clinical cases. Complex cases, new techniques. prereq: 5304

ENDO 5306. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Spring)
Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 5307. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Summer)
Diagnosis/treatment of clinical cases. Complex cases, new techniques. prereq: 5306

ENDO 5308. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Fall)
Diagnosis/treatment of clinical cases. Complex cases, new techniques. prereq: 5307, dept consent

ENDO 5309. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Spring)
Diagnosis/treatment of clinical cases. Complex cases, new techniques. prereq: 5308

ENDO 5310. Advanced Clinical Endodontics. (1-6 cr. ; A-F or Audit; Every Summer)
Diagnosis/treatment of clinical cases. Complex cases, new techniques. prereq: 5309

ENDO 5311. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Summer)
Each student is assigned weekly periods (8 hours/week) and is responsible for all emergencies in the endodontic clinic during this time. prereq: dept consent

ENDO 5312. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Fall)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic. prereq: 5311

ENDO 5313. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Spring)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic. prereq: 5312

ENDO 5314. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Summer)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic. prereq: 5313

ENDO 5315. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Fall)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic. prereq: 5314, dept consent

ENDO 5316. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Spring)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic. prereq: 5315

ENDO 5317. Advanced Endodontic Emergency. (1 cr. ; S-N or Audit; Every Summer)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic. prereq: 5316

ENDO 5329. Clinical Seminar I. (1 cr. ; A-F or Audit; Every Fall)

ENDO 5330. Review of Endodontic Cases. (1-2 cr. ; A-F or Audit; Every Spring & Summer)
Critical review of classic and current endodontic literature. prereq: dept consent

ENDO 5331. Review of Endodontic Cases. (1 cr. ; A-F or Audit; Every Fall)
Critical review of classic and current endodontic literature. prereq: dept consent

ENDO 5332. Review of Endodontic Cases. (1 cr. ; A-F or Audit; Every Spring)
Critical review of classic and current endodontic literature. prereq: dept consent

ENDO 5333. Review of Endodontic Cases. (1-2 cr. ; A-F or Audit; Every Fall)
Critical review of classic and current endodontic literature. prereq: dept consent

ENDO 5334. Review of Endodontic Cases. (1-2 cr. ; A-F or Audit; Every Spring)
Critical review of classic and current endodontic literature. prereq: dept consent

ENDO 8001. Research in Endodontics. (1-2 cr. ; Student Option; Every Fall)
Organized literature review in area of student's interest, selection of thesis project, and completion of research and thesis. prereq: dept consent

ENDO 8002. Research in Endodontics. (1-2 cr. ; Student Option; Every Spring & Summer)
Organized literature review in area of student's interest, selection of thesis project, and completion of research and thesis. prereq: dept consent

ENDO 8004. Research in Endodontics. (1-2 cr. ; Student Option; Every Fall)
Organized literature review in area of student's interest, selection of thesis project, and completion of research and thesis. prereq: dept consent

ENDO 8005. Research in Endodontics. (1-2 cr. ; A-F only; Every Spring)
Organized literature review in area of student's interest, selection of thesis project, and completion of research and thesis. prereq: dept consent
ENSO 8312. Literature Review. (2 cr.; A-F or Audit; Every Fall) Critical review of classic/current endodontic literature. prereq: 8311

ENSO 8313. Literature Review. (2 cr.; A-F or Audit; Every Spring) Critical review of classic/current endodontic literature. prereq: 8312

ENSO 8320. Advanced Endodontic Lecture. (1 cr.; A-F or Audit; Every Fall) Pulpal and periapical pathology, diagnosis, and treatment planning. prereq: dept consent

ENSO 8321. Advanced Endodontic Lecture. (1 cr.; A-F or Audit; Every Spring & Summer) Pulpal/periapical pathology, diagnosis, treatment planning. prereq: 8320

ENSO 8322. Advanced Endodontic Lecture. (1 cr.; A-F or Audit; Every Fall) Pulpal/periapical pathology, diagnosis, treatment planning. prereq: 8321

ENSO 8323. Advanced Endodontic Lecture. (1 cr.; A-F or Audit; Every Spring) Pulpal/periapical pathology, diagnosis, treatment planning. prereq: 8322

ENSO 8335. Endodontics/Periodontics Seminar. (1 cr.; S-N or Audit; Every Spring) Discussions of endo-perio problems. prereq: dept consent

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**English as a Second Language (ESL)**

ESL 5. SIEP: Beginning Grammar. (0 cr.; S-N or Audit; Every Summer) Develop English grammar skills by focusing on meaning, form, use of basic grammar structures. Intended for students with some prior English. prereq: Non-native English speaker

ESL 10. Beginning Grammar. (0 cr.; S-N or Audit; Every Fall & Spring) Meaning/form/use of fundamental grammar structures. Appropriate for students with some prior English. prereq: Non-native English speaker

ESL 15. SIEP: Beginning Reading and Composition. (0 cr.; S-N or Audit; Every Summer) Develop skills/strategies for reading/writing in English. Read variety of short/simplified texts. Learn fundamentals of writing at sentence/basic paragraph level. Vocabulary development. Intended for students with some prior English. prereq: Non-native English speaker

ESL 20. Beginning Reading and Composition. (0 cr.; S-N or Audit; Every Fall & Spring) Skills/strategies for reading/writing in English. Fundamentals of writing at sentence/basic paragraph level. Vocabulary development. Appropriate for students with some prior English. prereq: Non-native English speaker

ESL 25. SIEP: Beginning Oral Skills. (0 cr.; S-N or Audit; Every Summer) Designed for beginning level non-native speakers of English with some prior English instruction. Develop skills/strategies for speaking/comprehending. Short simplified texts. Develop spoken fluency/accuracy in conversations/discussions. prereq: Non-native English speaker

ESL 30. Beginning Oral Skills. (0 cr.; S-N or Audit; Every Fall & Spring) Skills/strategies for speaking/comprehending English. Vocabulary development. Appropriate for students with some prior English. prereq: Non-native English speaker

ESL 105. SIEP: High Beginning Grammar. (0 cr.; S-N or Audit; Every Summer) Form, function, meaning of English grammar. prereq: Non-native speaker of English; see English as a Second Language Program for override

ESL 110. High-Beginning Grammar. (0 cr.; S-N or Audit; Every Fall & Spring) Grammatical structures. Meaning, use, form. prereq: Non-native English speaker

ESL 115. SIEP: High Beginning Reading and Composition. (0 cr.; S-N or Audit; Every Summer) English language reading and composition skills. prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override

ESL 120. High-Beginning Reading and Composition. (0 cr.; S-N or Audit; Every Fall & Spring) Reading short passages of limited difficulty. Main ideas, vocabulary, reading speed, skimming/scanning. Writing fundamentals, spelling, punctuation, paragraphing, organization. Writing exercises, free writing. prereq: Non-native English speaker

ESL 125. SIEP, High Beginning Oral Skills. (0 cr.; S-N only; Every Summer) English spoken language skills, community contact. prereq: Non-native speaker of English

ESL 130. High Beginning Oral Skills. (0 cr.; S-N or Audit; Every Fall & Spring) English listening/speaking language skills. prereq: Non-native speaker of English

ESL 205. SIEP: Intermediate Grammar. (0 cr.; S-N or Audit; Every Summer) English grammar skills. prereq: Non-native speaker of English; see English as a Second Language Program for override

ESL 210. Intermediate Grammar. (0 cr.; S-N or Audit; Every Fall, Spring & Summer) Increasingly complex structures. Form, meaning, use. Verb phrases. Practice of structures in controlled speaking/writing activities. prereq: Non-native speaker of English

ESL 215. SIEP: Intermediate Reading and Composition. (0 cr.; S-N or Audit; Every Summer) English reading and composition skills. prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override

ESL 220. Intermediate Reading and Composition. (0 cr.; S-N or Audit; Every Fall, Spring & Summer) Reading for main/supporting ideas with increased speed. Vocabulary development through study of word formation and use of dictionary. Writing fundamentals. Organization. Writing as process. prereq: Nonnative English speaker

ESL 225. SIEP, Intermediate Oral Skills. (0 cr.; S-N only; Every Summer) English spoken language skills, community contact. prereq: Non-native speaker of English

ESL 230. Intermediate Oral Skills. (0 cr.; S-N or Audit; Every Fall, Spring & Summer) Fluency/accuracy. Language for specific functions. Communication strategies. Standard forms of organization for academic lectures. Conversational speech. prereq: Nonnative English speaker

ESL 305. SIEP: Advanced Grammar. (0 cr.; S-N or Audit; Every Fall) English grammar skills. prereq: Non-native speaker of English; see English as a Second Language Program for override

ESL 310. Advanced Grammar. (0 cr.; S-N or Audit; Every Fall & Spring) Difficult areas of grammar, resources to work on them. Meaning, use, form. Complex sentence patterns. prereq: Non-native speaker of English

ESL 315. SIEP: Advanced Reading and Composition. (0 cr.; S-N or Audit; Every Summer) English reading/composition skills. prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override

ESL 320. Advanced Reading and Composition. (0 cr.; S-N or Audit; Every Fall, Spring & Summer) Improving reading efficiency. Strategy development, vocabulary building. Using reading to support academic writing. prereq: Non-native speaker of English

ESL 325. SIEP, Advanced Oral Skills. (0 cr.; S-N only; Every Summer) English spoken language skills, community contact. prereq: Non-native speaker of English

ESL 330. Advanced Oral Skills. (0 cr.; S-N or Audit; Periodic Fall) Listening/speaking skills in academic/conversational situations. Listening to lectures, note taking, giving speeches/presentations, readings, film, discussion. Pronunciation focuses on individual need. prereq: Non-native speaker of English

ESL 405. SIEP: High-Advanced Grammar. (0 cr.; S-N or Audit; Every Summer) English grammar skills. prereq: Non-native speaker of English; see English as a Second Language Program for override

ESL 410. English Grammar for Academic Purposes. (0 cr.; S-N or Audit; Every Fall, Spring & Summer)
Production of grammatically sophisticated structures in writing. Students edit their assignments. prereq: Non-native speaker of English

ESL 415. SIEP: High-Advanced Reading and Composition. (0 cr.; S-N or Audit; Every Summer) English reading/composition skills. prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override

ESL 420. High Advanced Reading/Composition. (0 cr.; S-N or Audit; Every Fall, Spring & Summer) Reading for academic purposes. Comprehension of scholarly reading selections. Increasing reading efficiency. Writing process, academic-style assignments. prereq: Non-native speaker of English

ESL 425. SIEP, High Advanced Oral Skills. (0 cr.; S-N or Audit; Every Summer) English spoken language skills, community contact. prereq: Non-native speaker of English

ESL 430. High Advanced Oral Skills. (0 cr.; S-N or Audit; Every Fall & Spring) Listening/speaking skills. Understanding U.S. culture through interaction with American students. Weekly seminar with American university students. Students visit local schools and present about their home country. Pronunciation instruction focuses on individual needs. prereq: Non-native speaker of English

ESL 900. Current Issues in the Media. (0 cr.; S-N or Audit; Every Fall) News media as means of English improvement and as source of information/entertainment. International news events via radio broadcasts, newspaper, and other sources. Understanding American culture. Developing listening/speaking skills using American movies/television. prereq: Non-native speaker of English; see Minnesota English Language Program (MELP). prereq: Non-native English Speaker, dept consent

ESL 905. Current Issues in English. (0 cr.; S-N or Audit; Fall, 2018) Zero-credit course is designed for high-intermediate to advanced non-native speakers of English in Intensive English Program (IEP) preparing for admission to science/engineering programs at university level. Open to students at higher levels in Intensive English Program in Minnesota English Language Program (MELP). prereq: Non-native English Speaker, dept consent

ESL 906. English for Business Interactions. (0 cr.; S-N or Audit; Every Fall & Spring) Zero-credit course designed for high-intermediate to advanced non-native speakers of English currently working in professional settings or wish to study business. Writing for business communication, self-editing skills, communication styles, presentations, telephone communication. prereq: Non-native English speaker

ESL 907. English for Science and Engineering. (0 cr.; S-N or Audit; Every Fall & Spring) Zero-credit course is designed for students who are high-intermediate to advanced non-native speakers of English in Intensive English Program (IEP) preparing for admission to science/engineering programs at university level. Open to students at higher levels in Intensive English Program in Minnesota English Language Program (MELP). prereq: Non-native English Speaker, dept consent

ESL 909. Reading for Academic Purposes. (0 cr.; S-N or Audit; Every Fall & Spring) This zero-credit course is designed for students who are high-intermediate to advanced non-native speakers of English in the Intensive English Program (IEP) in the Minnesota English Language Program (MELP), and are preparing for admission to academic programs at the university level. Students taking this course will develop skills and strategies for reading authentic college-level texts and managing unfamiliar vocabulary. Students will improve their ability to apply reading strategies, analyze, critique, and use critical thinking to synthesize information from a variety of texts such as authentic college textbook chapters, shorter essays, and news articles. Students will respond with their own ideas in writing and discussion and will demonstrate comprehension through tests, quizzes, written assignments, and discussion. This course is open to students at higher levels in the Intensive English Program in the Minnesota English Language Program (MELP).

ESL 911. Academic Reading. (0 cr.; S-N or Audit; Every Fall & Spring) Reading for academic purposes. prereq: Non-native speaker of English

ESL 912. Academic Writing. (0 cr.; S-N or Audit; Every Fall & Spring) Writing for academic purposes. prereq: Non-native speaker of English

ESL 931. Academic Speaking. (0 cr.; S-N or Audit; Every Fall & Spring) American academic interactions. Lectures, presentations, seminar-style discussions, informal exchanges. Presenting oneself professionally/socially in collegial settings with accuracy, variety, and flexibility. prereq: Non-native speaker of English

ESL 941. Research Writing for the American University. (0 cr.; S-N only; Every Fall & Spring) Methods of citation, conventions of style and organization, and critical thinking skills necessary for writing college-level research papers. Students select topics derived from a contemporary academic theme and apply a process approach to produce a research paper. Students learn to use the library effectively. Structure and vocabulary usage, prereq; [Non-native speaker of English, [TOEFL iBT 79 or IELTS 6.5] or MNBAIT 80 or equiv]] or dept consent


ESL 3001. Integrated Skills for Academic English. (2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) This course focuses on the academic and language skills necessary to thrive in a US university setting. Students will strengthen English language communication skills, both written and oral, that will help them succeed in their other content area courses at the University. Focus is on setting and achieving goals for academic success, understanding and using academic resources for the US university, and building strategies and language for more effective communication with instructors and peers in academic writing, presentations, discussions, and group projects. prereq: Non-native speaker of English

ESL 3006. English for Business Interactions. (2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Designed for high-intermediate to advanced non-native speakers of English who are currently business majors or in closely related major. Writing for business communication, self-editing skills, communication styles, presentations, telephone communication. prereq: Non-native English speaker

ESL 3007. English for Physics. (1 cr. [max 2 cr.]; Student Option; Every Fall & Spring) One-credit course designed for non-native speakers of English who have high-intermediate to advanced English skills and are currently enrolled in an introductory physics course. Students taking this course will gain more support and practice with the conventions of scientific lab report writing, applying the concepts of academic integrity, interacting and participating in lab-type discussions, interpreting authentic texts (both text and aural-based), and understanding the cultural norms for seeking additional academic/social support. One of the goals of this course is to equip participants with techniques to aid in continual improvement of English skills for
science and engineering contexts beyond the class. prereq: Non-native English speaker

**ESL 3008. English for Chemistry.** (1 cr. ; 5 cr. ; 2 cr. ; 2 cr. ; 5 cr. ; 3 cr. ; Student Option; Every Fall & Spring)
This course is designed for non-native speakers of English who are currently enrolled in an introductory chemistry course (CHEM 1061 or 1065). Students taking this course will gain more support and practice with the conventions of writing scientific lab reports, interacting and participating in classroom and lab discussions, interpreting authentic texts (both written and aural), applying the concepts of academic integrity, and understanding the cultural expectations for seeking additional academic/social support. One of the goals of this course is to equip participants with techniques to aid in continual improvement of English skills for science contexts beyond the class.

**ESL 3101. Advanced English Grammar.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Form, meaning, and use of common English grammatical structures in written/oral discourse. Adverb, adjective, and noun clauses. Verb tense, aspect, and modality. Grammar beyond sentence level. Application to development of revision/editing skills. prereq: dept consent, non-native speaker of English, [C-TOEFL score 153-187 or equiv], ESL program consent

**ESL 3102. English Grammar for Academic Purposes.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall)
Form, meaning, and use of an expanded repertoire of complex English grammatical structures used in academic written/oral discourse. Subordination, coordination, transition. Complex referential expressions. Complementation. Lexical grammar. Independent self-editing of academic writing. prereq: 3101, [Non-native speaker of English, [C-TOEFL score of at least 190 or equiv], dept consent

**ESL 3201. Advanced English Reading and Composition.** (5 cr. ; max 10 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Comprehension of main ideas, organization, and support in longer authentic English texts. Expanded vocabulary comprehension. Fluency, focus, and persuasiveness through draft/revision. Focuses on accuracy/variety of expression. prereq: Non-native speaker of English, [IBT score of 53-67 or equiv]

**ESL 3202. Academic Reading and Composition.** (5 cr. ; max 10 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall)
Academic writer’s purpose, main ideas, and supporting evidence in English language texts. Expansion of academic vocabulary. Use of source material in English research writing in different academic genres. Focuses on revision to improve fluency/accuracy. prereq: 3201, Non-native speaker of English, [IBT score of at least 68 or equiv], dept consent

**ESL 3302. Writing for Academic Purposes.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall)
Writing process. Idea generation/development, drafting, revision, editing. Focuses on different genres of academic writing, including critical response to scholarly argument, scholarly review, and incorporation of source material in writing. “Rush writing” under time pressure to improve fluency in writing. prereq: 3202, non-native speaker of English, [C-TOEFL score of at least 190 or equiv], dept consent

**ESL 3402. Research Writing for the American University.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Methods of citation, conventions of style and organization, and critical thinking skills necessary for writing college-level research papers. Students select topics derived from a contemporary academic theme and apply a process approach to produce a research paper. Students learn to use the library effectively. Structure and vocabulary usage. prereq: [Non-native speaker of English, [TOEFL iBT 79 or IELTS 6.5 or MNBatt 80 or equiv]] or dept consent

**ESL 3501. Advanced English Listening and Speaking.** (5 cr. ; max 10 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Understanding lectures and academic discussions. Focuses on critical listening. Students produce academic presentations and participate in discussions on subjects of general academic interest. Cross-cultural awareness. Negotiation of disagreement/ununderstanding. prereq: 3501, non-native speaker of English, [IBT score of at least 68 or equiv], dept consent

**ESL 3502. Academic Listening and Speaking.** (5 cr. ; max 10 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Understanding lectures and academic discussions. Focuses on critical listening. Students produce academic presentations and participate in discussions on subjects of general academic interest. Cross-cultural awareness. Negotiation of disagreement/ununderstanding. prereq: 3501, non-native speaker of English, [IBT score of at least 68 or equiv], dept consent

**ESL 3550. Pronunciation Improvement.** (2 cr. ; max 4 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Summer)

**ESL 3551. English Pronunciation.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)

**ESL 3602. Speaking for Academic Purposes.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Spring)
Students participate in American academic interactions of various types: lectures, presentations, seminar-style discussions, informal exchanges. Presenting oneself professionally/socially in collegial settings with accuracy, variety, and flexibility. prereq: 3502, non-native speaker of English, [C-TOEFL score of at least 190 or equiv], dept consent

**ESL 3900. Special Topics in ESL.** (1-5 cr. ; max 10 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Topics vary. prereq: Non-native speaker of English

**ESL 5006. English for Business Interactions.** (2 cr. ; max 4 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
Designed for high-intermediate to advanced non-native speakers of English who are currently business majors or in closely related major. Writing for business communication, self-editing skills, communication styles, presentations, telephone communication. prereq: Grad. non-native English speaker

**ESL 5008. Speaking for Professional Settings.** (2 cr. ; Student Option; Every Fall & Spring)
This course is designed for graduate students who are non-native speakers of English seeking to improve their English speaking skills for professional contexts. The course assumes that students already have a high level of proficiency in English; this course will help students refine their skills for specific professional situations. The course covers topics such as small talk, networking, interviewing, and presentation skills. Students will increase their confidence to communicate in a variety of settings including informal exchanges, career fairs, conference presentations, and job interviews. prereq: Graduate student

**ESL 5302. Academic Writing.** (4 cr. ; max 8 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Every Fall & Spring)
This four credit course is designed for graduate students for whom English is not a native language. This course focuses on foundational writing skills and emphasizes the writing process - developing ideas, drafting, revising, and editing. Guided textual analyses of readings are used to develop writing skills through the close examination of strategies employed by accomplished writers. Through ongoing, active participation, students learn to (1) match writing to audience and purpose, (2) produce different genres of academic writing, (3) incorporate source material into writing, and (4) critique their writing and that of others. Gains in basic writing skills culminate in students’ ability to transfer acquired skills into discipline-specific writing. Through development of personal voice and an appreciation for the importance of the credibility of the writer, students also learn to recognize and avoid plagiarism. Problems with sentence structure, lexical grammar, and diction are addressed individually.

**ESL 5900. Special Topics in English Language.** (1-5 cr. ; max 15 cr. ; 5 cr. ; 5 cr. ; 10 cr. ; 10 cr. ; Student Option; Periodic Fall, Spring & Summer)
Topics vary. prereq: Non-native speaker of English
ENGL 1001W. Introduction to Literature: Poetry, Drama, Narrative. (LITR; 4 cr.; Student Option; Every Fall & Spring)
This writing-intensive course is designed for students who wish to develop a foundational understanding of literary study, inquiry, and analysis. This course is organized around literary genres, and thus will introduce students to the fundamentals of fiction, poetry, and drama. This course will also question the boundaries of genre and of the category "literature" itself. Throughout the semester, we will reflect on the central questions: "What is Literature" and "Why do we study it?" After successfully completing this class, students will be equipped with the basic critical vocabulary and toolset for engaging in literary study. They will be prepared to analyze literary voice, tone, symbol, motif, theme, imagery, narrative, and form, among other aspects. They will also be equipped with several critical cultural lenses, among them gender, race, ethnicity, class, language, and national identity.

ENGL 1003W. Women Write the World. (GP,WI,LITR; 3 cr.; Student Option; Every Fall) Concepts in literary studies. Poems, plays, short stories, novels, essays, letters by women from different parts of world. Focuses on lives, experiences, and literary expression of women, including basic concepts of women's studies.

ENGL 1031. Introduction to the Short Story. (LITR; 3 cr.; Student Option; Every Fall) English literature boasts some of the most powerful, beautifully crafted short stories in world literature. In this class, we will use the short story as a path for understanding the craft of writing: how writers use language to present a vividly imagined world in a short number of pages. We will also examine the importance of genre: how, for example, a detective short story differs from a slice of life story. This is a lecture course, but will involve substantial student discussion. There will be 2 papers, a mid-term, and a final.

ENGL 1041. Adaptation: Literature into Film. (AH; 3 cr.; Student Option; Every Fall & Spring) Do you refuse to see a film until you've first read the book on which it is based, so it doesn't affect how you imagine the characters? Or does a film inspire you to go back and read the original book? Do you ever consider what the film-makers changed or left out? Either way, if you love book covers that say "Now a major motion picture," this is the class for you. "Adaptation: Literature to Film" explores the historical, cultural, and aesthetic contexts in which both literary and cinematic texts are produced and received. We will ask such questions as: When we read a book or a play and then watch an adaptation of it, are we in any sense encountering the "same" text? Does the intention of the author necessarily define the meaning of a text, as readers see it? What other elements enter into the formulation of meaning(s)? How are elements of an inter-textual system always, in some sense, "in dialogue" with each other, and how do different media affect us differently -- whether emotionally, aesthetically, or intellectually? In this class you will learn skills related to interpreting and writing about both literature and moving image media (i.e., film, television, animation, etc.), including concepts and vocabulary specific to each, and your written assignments will include close readings of both books and films.

ENGL 1051. Progress & Madness: Literature, Science & Technology. (LITR; 3 cr.; Student Option; Every Fall) This introductory, Liberal Education course explores the conflicts and conversations that occur at the frontiers of scientific thinking and technological innovation by examining select literary and cinematic texts from a variety of historical moments and points of view. We will consider the ambivalence and anxiety that attend progress via topics such as electricity, telegraphy, photography, the railroad, the cinema, Fordism, the atomic bomb, genetic engineering, and the Internet. We will also track the archetype of the mad scientist, whose dangerous knowledge and often-fatal hubris typically turn a tale "cautionary." Students engage in detailed analysis of and reflection on works of literature and film that address both historical and contemporary developments in science and technology. The course introduces students to a range of technologies that have had a measurable impact on contemporary society. Class discussion uses the representation of these innovations as case studies in how technologies develop through the application of individual and collective effort, as well as how society adopts or resists these technologies. By considering a variety of points of view on these developments, students are exposed to multiple perspectives through which a technology can be understood, and they develop skills in evaluating conflicting views that provide a framework with which to evaluate new technology in the future.

ENGL 1172. The Story of King Arthur. (LITR; 3 cr.; Student Option; Every Spring) Of all the stories familiar to the western world, few have exerted a greater influence on literary, pictorial, and musical productions than the legend of King Arthur and his Round Table. Although thousands of years have passed since the earliest versions of the story appeared, creative artists and their audiences continue to be fascinated by stories about Arthur, Merlin, Lancelot, Guinevere, Gawain, and Tristan. In this course, we will study adaptations of the legend in order to understand how literary writers and their readers remade the story to fit specific, historical circumstances. The course will pay particular attention to two related aspects of the legend. The first is the way that stories about Arthur emphasize the importance of personal integrity, as exemplified by characters such as Gawain and Tristan. The second is the relationship between personal responsibility and communal or civic order. We will see how these ideas are reshaped by writers in various times and places (ranging from early medieval Wales and England to twenty-first-century America). We will think comparatively about these times and places by paying close attention to the literary traditions and forms that are employed by writers who remake the story of Arthur.

ENGL 1181W. Introduction to Shakespeare. (LITR,WI; 4 cr.; Student Option; Every Fall & Spring) This course explores the richness and variety of the playwright William Shakespeare through intensive study of representative plays and poems. Although Shakespeare died over 400 years ago, he is now more popular than ever. In his own day, Shakespeare was able to entertain, shock, amuse, and inform his audiences. Today, his work continues to have a global influence in nearly every corner of the world. Through class lectures, discussions and written work, students will be challenged and inspired by the many complexities and connections that we still have with the world's greatest playwright.

ENGL 1201W. Contemporary American Literature. (LITR,WI; 4 cr.; Student Option; Every Fall & Summer) In this course, we will focus on the analysis of literature, specifically novels and short stories published since 1960 by American authors. We will emphasize close reading, consistently and specifically addressing issues of language and meaning. Our books will also fuel an ongoing discussion of the formal aspects of literature, including style, characterization, plot, theme, tone, and symbolism, and their capacity to evoke a powerful response from readers. This four-credit writing intensive class requires attendance at a twice-weekly lecture and once-weekly discussion section.

ENGL 1301W. Introduction to Multicultural Literatures of the United States. (DSJ,WI,LITR; 4 cr.; Student Option; Every Fall & Summer) This course will include representative works by American Indian, African American, Asian American, Chicano/Chicana writers, and/or Jewish American writers, ranging from Nobel and Pulitzer prize-winning masters to upcoming genre authors and debut authors. In reading these works, we will discuss social and cultural factors informing America's literary past and present. As these authors honor identity, celebrate community, and deal with the complexities of the modern age, they also explore America's shared and problematic past. Because this course is Writing Intensive, we will spend considerable time drafting, discussing, and revising papers. Techniques for writing a paper, close reading strategies, and relevant critical approaches will be discussed. As we tease out the meanings and methods of our texts, we'll also identify and analyze key literary devices.

ENGL 1401W. Introduction to World Literatures in English. (GP,WI,LITR; 4 cr.; Student Option; Every Fall & Spring) This writing-intensive course will introduce you to texts from geographical locations such as Africa, Asia, and the Caribbean with the aim of examining the impact that colonialism has had on previously colonized nations, as well as the world as a whole. Through close readings of these texts, we will examine questions related...
to concepts such as "third world," nationalism, difference, representation, and displacement.

**ENGL 1501W. Literature and Public Life.**

(WI,LITR,CIV; 4 cr.; A-F only; Every Fall & Spring)

This course explores how literary language builds the collective knowledge, shared reality, and civic relationships that make up public life. Literature's power in the public sphere goes far beyond the quiet experience of reading. We will investigate how telling stories, documenting events, imagining possibilities, communicating ideals, representing conflict, and even creating fictional characters contribute to public life. Through a wide variety of texts, we will reflect on the nature of public life and on how reading and writing build civic relationships and democratic potential. This course will also offer you two tracks for actively engaging in public life. A service-learning option will give you the experience of building literacy, developing skills in communication and public media, and strengthening roles in work and family. This recommended learning framework can engage your role as a citizen, broaden the impact of your education, and help you explore potential professional interests. Alternatively, an individually designed public project will prompt you to consider the links between literary/media culture, personal action, and public life, and to make your own intervention in these fields. To succeed in all areas of this class you must display active engagement, independent thinking and motivation, and organization.

**ENGL 1701. Modern Fiction.**

(LITR; 3 cr.; Student Option; Every Fall, Spring & Summer)

In Modern Fiction, we will study a selection of novels and short stories by some of the most compelling and original writers of our time. We will read work by contemporary authors and classic modernists whose stylistic innovations influenced a generation. Because literature is a continuous and responsive to the past, we'll note evolutions and developments in the genre over time. We will identify and analyze such elements of fiction as theme, genre, structure, form, language, and context.

**ENGL 1701H. Honors: Modern Fiction.**

(LITR; 3 cr.; A-F only; Every Fall & Spring)

In Modern Fiction, we will study a selection of novels and short stories by some of the most compelling and original writers of our time. We will read work by contemporary authors and classic modernists whose stylistic innovations influenced a generation. Because literature is a continuous and responsive to the past, we'll note evolutions and developments in the genre over time. We will identify and analyze such elements of fiction as theme, genre, structure, form, language, and context. prereq: Honors or inst consent

**ENGL 1912. America in Crisis.**

(DSJ; 3 cr.; A-F or Audit; Periodic Fall)

America has a long history of injustice that lives on today in diverse forms. This course focuses on current crises in our economy, society, and (presumably democratic) government. We will analyze and try to solve some of the pressing questions. How did we end up with the largest wage and wealth disparities in the developed world? Why are low-income and even middle-income families struggling to make ends meet? Why did our K-12 education system, once in first place, drop behind education in all developed nations? Why does our healthcare system cost more yet provide less access and quality than systems elsewhere? In short, what forces created the gulf between the lived experiences of ordinary Americans and the high ideals articulated in the US Constitution?

**ENGL 1915. Poetry and Poetic Form.**

(3 cr.; A-F or Audit; Periodic Fall)

"Poetry," William Wordsworth tells us, "is the spontaneous overflow of powerful feelings," but he goes on to insist that these emotions must be "recollected in tranquility," that is, they are put into some kind of form by the work of the poet. In this seminar, we will pay close attention to the powerful images, flights of intelligence, and depths of feeling that good poetry often provides, and we will also focus on technical matters such as rhyme and meter, the characteristics of various "fixed forms" (the sonnet, the villanelle, the pantoum) and "open forms" (the elegy, the ode), and on the special features of free verse. As part of their work as readers, students will be encouraged to experiment with writing in certain verse forms.

**ENGL 1916. Wilde Nineties!.

(3 cr.; A-F or Audit; Periodic Fall)

The Fin de Siècle, the decade from 1890 to 1900, remains one of the most dynamic cultural periods of the decade that witnessed technological wonders (the transatlantic cable, the telephone, the invention of the internal combustion engine), but rather open themselves to many different interpretations. She will work with the basics of argumentation: developing a strong, coherent thesis, drafting, the logic of argument, revision, proper citation and effective use of primary and secondary sources, and more. prereq: Honors. [English major or minor or approved BIS or IDIM program with English area]

**ENGL 1917. Historical Survey of British Literature I.**

(HIS,WI; 4 cr.; A-F only; Every Fall & Spring)

This course is designed for English majors and minors, as well any students interested in and attracted to literature and reading. Our concern will be to develop the intellectual foundations to move past our base, instinctive reactions to literature to deeper modes of reading, interpretation, and written analysis/argument. Our goal will be to develop the skills of slow-motion, skeptical reading: to savor the crafting of literary form and to explore how literary rhetoric engages our intellect and emotions; to read not simply for superficial content, but to engage and question the multi-faceted operation of literary texts. In terms of foundational writing skills for the English major, we will work on the development of compelling written literary arguments by breaking the writing process down into various phases. We will work with the basics of argumentation: developing a strong, coherent thesis, drafting, the logic of argument, revision, proper citation and effective use of primary and secondary sources, and more. prereq: Honors. [English major or minor or approved BIS or IDIM program with English area]

**ENGL 1918. American in Crisis.**

(DSJ; 3 cr.; A-F or Audit; Periodic Fall)

This course will work on the development of compelling written literary arguments by breaking the writing process down into various phases. We will work with the basics of argumentation: developing a strong, coherent thesis, drafting, the logic of argument, revision, proper citation and effective use of primary and secondary sources, and more. prereq: Honors. [English major or minor or approved BIS or IDIM program with English area]

**ENGL 2001. Historical Survey of British Literature II.**

(HIS,WI; 4 cr.; A-F only; Every Fall & Spring)

This course is designed for English majors and minors, as well any students interested in and attracted to literature and reading. Our concern will be to develop the intellectual foundations to move past our base, instinctive reactions to literature to deeper modes of reading, interpretation, and written analysis/argument. Our goal will be to develop the skills of slow-motion, skeptical reading: to savor the crafting of literary form and to explore how literary rhetoric engages our intellect and emotions; to read not simply for superficial content, but to engage and question the multi-faceted operation of literary texts. In terms of foundational writing skills for the English major, we will work on the development of compelling written literary arguments by breaking the writing process down into various phases. We will work with the basics of argumentation: developing a strong, coherent thesis, drafting, the logic of argument, revision, proper citation and effective use of primary and secondary sources, and more. prereq: Honors. [English major or minor or approved BIS or IDIM program with English area]

**ENGL 3002. Modern Literary Criticism and Theory.**

(3 cr.; Student Option; Every Fall & Spring)

This course is an introduction to contemporary literary criticism and theory. The goal is to provide you with a foundation in theory's terminologies, the different methodologies used in literary and cultural analysis, and a sense of the various schools of criticism that have developed in the postwar period. We will look at the ways that various texts perform as texts; they are not transparent or one dimensional, but rather open themselves to many different readings and styles of engagement.

**ENGL 3003. Historical Survey of British Literature I.**

(HIS,WI; 4 cr.; Student Option; Every Fall & Spring)

This course will provide a historical survey of British literature from the Middle Ages to the end of the eighteenth century. Our focus will be on tracing the interactions between literature and wider British culture as well as on tracing the development of literary form during this period. You should leave this course being able to identify major literary trends and authors and link them to corresponding formal techniques and innovations. You should also have a sense of the major historical and political events, rulers, and social conditions in Britain at this time. Additionally, because
This is a writing intensive course, you will familiarize yourself with the process of writing a research paper with a literary focus, which includes finding and successfully incorporating contemporary scholarly research about your topic into your paper, crafting an original argument, utilizing textual evidence, and evaluating existing scholarship.

**ENGL 3004W. Historical Survey of British Literatures II.** (HIS; WI; 4 cr.; Student Option; Every Fall, Spring & Summer)
In this wide-ranging survey of British and post-colonial literature from the late eighteenth century to the present, we will explore representative literary texts and genres from British Romanticism, the Victorian period, Modernism, and the postwar era. Besides analyzing the language, aesthetic features, and technical construction of these literary artifacts, we will examine our readings as reflections of and reactions to social upheavals like the Industrial Revolution, challenges to the traditional roles of women, scientific discoveries that sparked religious doubt, and the First World War. Additionally, because this is a writing intensive course, you will familiarize yourself with the process of writing a research paper with a literary focus, which includes finding and successfully incorporating contemporary scholarly research about your topic into your paper, crafting an original argument, utilizing textual evidence, and evaluating existing scholarship.

**ENGL 3005W. Survey of American Literatures and Cultures I.** (DSJ; WI, LITR; 4 cr.; Student Option; Every Fall, Spring & Summer)
This writing-intensive course will survey the Anglophone literature of what would become the United States from the arrival of English settlers to the Civil War. We will define "literature" broadly to not only include fiction and poetry but also the sermon, the letter, the essay, the autobiography, and other non-fictional forms. Course topics will include the Puritan theology that cast such a long shadow over the American cultural imagination; the fraught literary construction in the Revolutionary era of a national identity under the influence of such Enlightenment ideals as reason, civility, cosmopolitanism, and sympathy; the Gothic doubts about democracy that attended the literature of the early republic; the rise in the mid-nineteenth century of a radical intellectual and social movement in Transcendentalism; the antebellum ideological struggles over issues as slavery, industrialism, women's rights, and Native American rights; and the self-conscious cultivation of a national literary aesthetic in the Romantic prose and poetry of the period later critics would come (controversially) to call "the American Renaissance."

**ENGL 3006W. Survey of American Literatures and Cultures II.** (DSJ, WI, LITR; 4 cr.; Student Option; Every Fall, Spring & Summer)
This course will survey some of the major literary figures, aesthetic movements, and thematic concerns of US literature from the Civil War to the present. Our investigation will focus on how the American literature of the United States distinctly "American" during a period that extends from the Civil War and the outlawing of slavery to women's suffrage, workers' movements, the Great Depression, the First and Second World Wars, and the civil rights movement. In addition to reading and analyzing the literary text itself in terms of style, form, genre, and language, we will study it in historical context: the complex interplay between the political, the social, the cultural, and the literary in the United States. This approach rests upon the notion that literature is not created in a vacuum; it is influenced by and influences the world in which it is created.

**ENGL 3006W. Survey of American Literatures and Cultures II.** (DSJ, WI, LITR; 4 cr.; Student Option; Every Fall, Spring & Summer)
This course will survey some of the major literary figures, aesthetic movements, and thematic concerns of US literature from the Civil War to the present. Our investigation will focus on how the American literature of the United States distinctly "American" during a period that extends from the Civil War and the outlawing of slavery to women's suffrage, workers' movements, the Great Depression, the First and Second World Wars, and the civil rights movement. In addition to reading and analyzing the literary text itself in terms of style, form, genre, and language, we will study it in historical context: the complex interplay between the political, the social, the cultural, and the literary in the United States. This approach rests upon the notion that literature is not created in a vacuum; it is influenced by and influences the world in which it is created.

**ENGL 3007. Shakespeare.** (LITR; 3 cr.; A-F or Audit; Every Fall, Spring & Summer)
This course is a sampling of Shakespeare's works in depth. Our goal will be to view these works simultaneously as cultural artifacts of sixteenth and seventeenth-century England and as enduring classics of world literature that seem to transcend their cultural moment. To this end, we will apply various biographical, social, linguistic, generic, theatrical, political, and intellectual contexts to the plays. We will attempt to understand how these documents from early modern England have spoken so profoundly about the enduring mysteries of human experience from the moment of their inception to the present day. English majors/minors must take this course A-F only grading basis.

**ENGL 3010. Studies in Poetry.** (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Special topics related to reading poetry in various interpretive contexts.

**ENGL 3011. Jewish American Literature: Toward a Poetics of Diasporic Identity.** (DSJ, HIS; 3 cr.; Student Option; Every Spring)
Why is it frequently asked whether Saul Bellow was really a Jewish writer, but it is impossible to read Philip Roth as anything other than that? How does Grace Paley's Jewishness come through even when she is writing about non-Jewish characters? We will address these issues and others by employing two terms that frame this course in Jewish American literature. "Poetics" refers to the structural and functional principles of literary works, and more broadly to the process by which meaning is made. Diaspora, used for millennia to describe the experience of the Jewish people after the expulsion from their Holy Land, has emerged as a term attached more generally to migrant and displaced peoples who maintain meaningful connections to their ancestral region and culture, while also creating meaningful identities in a new land. Metaphorically, the term implies a point of view that is displaced, meanings created by an outsider. In this course we will combine the critical paradigms and use these terms to engage in a highly contextualized and historicized study of Jewish American literature from the 19th century to today. We will discover in these texts how inherited Jewish culture and literary imaginings, developed over centuries of diasporic interaction between Jewish communities and the outside world? get reexamined, questioned, rejected, reimagined, reintegrated, and transformed within the crucible of American experience. The meanings and literary modes that develop through the creative engagement of Jewish American literature are fascinating in and of themselves in their specifically Jewish context, and even more so in their interrogation of core understandings of identity and indeed of the boundaries of such a thing as a specifically Jewish context. The literature we read in this course and the discussions that ensue will therefore also provide a framework and method for engaging with the creative energies and cultural productivity of more recent diasporic communities in the United States and beyond. Immigration and the experience of immigrant communities continues to be at the forefront of American consciousness, as immigrants work...

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to create new meanings and new narratives for their lives, and as those who immigrated before them provide contested meanings for the impact of immigration on their own narratives. This course, though grounded in Jewish narratives, will provide students with an expanded vocabulary and perspective for engaging in this central debate within the American experience.

ENGL 3013. Poems about Cities. (3 cr.; Student Option; Periodic Spring) Read/respond to selection of poems about various cities. Emphasis on poetry written in English from 18th through 21st century. Some poetry in translation/from other periods.

ENGL 3020. Studies in Narrative. (; 3 cr; max 6 cr; ; Student Option; Periodic Fall & Spring) Examine issues related to reading and understanding narrative in a variety of interpretive contexts. Topics may include "The 19th-century English (American, Anglophone) Novel," "Introduction to Narrative," or "Techniques of the Novel." Topics specified in the Class Schedule

ENGL 3021. Captivity in Literature and Film: From the Barbary Coast to Guantanamo Bay. (; 3 cr; ; Student Option; Spring Even Year) Whether there is a captivity genre in English/Global literature, from early modern period to 21st century. Texts/films from numerous civilizations/histories.

ENGL 3022. Science Fiction and Fantasy. (; 3 cr; ; Student Option; Every Fall & Spring) Science Fiction and Fantasy will introduce students to the study of classic and contemporary science fiction and fantasy literature. Using literary techniques, students will explore the alternate realities, characters, cultures, genders, races, ecologies, politics, settings, and technologies of science fiction and fantasy primarily through reading novels and stories. Questions may include: What does speculation about the future tell us about our present and past? What does the unreal reveal about our real lives? To what extent does science fiction function as both escapist fantasy and prophetic reality?

ENGL 3023. Children's Literature. (; 3 cr; ; Student Option; Every Fall & Spring) This course provides an overview of the traditions of children's and young adult literature. The course will address the following questions among others: What is "children's literature"? What are some of its persistent themes and stylistic traits? In what ways may we say it has changed over time? What distinguishes children's literature, from, say, "grown-up" literature? Our readings will include classic and contemporary works with a focus on diversity regarding the authors, themes, and readership. In addition to becoming familiar with this body of knowledge, we will be developing critical reading skills within a "literary" context. We will also look into how, when, and where literature (specifically children's and young adult literature) and our everyday lives intersect, impact, and interact with each other.

ENGL 3024. The Graphic Novel. (; 3 cr; ; Student Option; Every Fall & Spring) This course aims to read and study a specific kind of narrative we call "graphic novel." The term itself is often a point of contention, but the purpose of this course is not to defend the validity of the term or the medium. "Comic books" and "graphic novels" are not endangered animals. Rather, we will use this example of "sequential art" to think through the ways this genre intersects, uses, and informs various other narrative and artistic forms as well as the way the genre may be unique with its own way of producing meaning. Comics involve a hybrid interplay of image and text, so we will attempt to keep both aspects in mind throughout the semester, never forgetting that comics are neither purely "visual" nor purely "textual." Since comics are often wedded-in mainstream culture-with certain kinds of content (e.g. superheroes), we will also investigate the characteristics of different "genres" within comics, as well as various questions about literariness.

ENGL 3025. The End of the World in Literature and History. (HIS; 3 cr; ; Student Option; Periodic Fall & Spring) For at least two and a half millennia, prophets, politicians, and poets have crafted terrifying accounts about the end of the world. This comparatist seminar examines the ways different cultures have imagined a final apocalypse with particular attention to the political and social consequences of their visions. Students will read texts that focus on pandemic, extraterrestrial attack, nuclear holocaust, prophecy, cybernetic revolt, divine judgment, resource depletion, meteoric impact, or one of the many other ways in which humans write of their demise. They will use literary analysis to explore the many historical and contemporary wastelands they will encounter. They will write short papers and give in-class presentations on different kinds of apocalypse.

ENGL 3026. Mediterranean Wanderings: Literature and History on the Borders of Three Continents. (GP; 3 cr; ; Student Option; Every Spring) Situated between three continents and at the intersection of numerous ethnic and national cultures, the Mediterranean is like no other place on earth. A place of diverse languages, religions, economies, governments, and ways of daily life, it serves as a microcosm for the world itself imagined as an integrated global system. This course explores the history of the Mediterranean with particular emphasis on the literatures it has produced over the last three millennia. As the protagonists of these epic poems, religious texts, and novels travel from one shore to another, they experience the Mediterranean as a place of violence, conflict, and cultural change. This course will focus on exploring the literary, historical, and political dimensions of the Mediterranean. We will learn how to read and write about the region's history as its cultural productions. With that in mind, reading may include David Abulafia's The Great Sea in addition to The Odyssey, The Aeneid, the biblical books of Joshua and Acts, Tasso's Gerusalemme Liberata (an epic set during the first crusade), Shakespeare's The Merchant of Venice and Antony and Cleopatra, Flaubert's Salammbo, Aki Tadjer's Les ANI du Tassaï, A.b. Yehoshua's Mr. Mani, and Pamuk's The White Castle.

ENGL 3027W. The Essay. (WI; 4 cr; ; Student Option; Every Fall, Spring & Summer) Incorporating narrative, descriptive, analytical, and persuasive techniques into writing on general topics. Effective argumentation through critical reading. Use of library resources. Awareness of context/audience.

ENGL 3028. "Spy-Fi": The Rise of British Espionage Fiction. (LITR; 3 cr; ; Student Option; Periodic Fall & Spring) From xenophobia and fear of invasion to anxieties over imperial campaigns and national rivalries, this course traces the rise of British spy fiction from its 19th century forerunners to its later Cold War practitioners in order to have a clearer understanding of the historical, political, and cultural forces that led to its growth. The course will provide a challenging and useful means to consider the emergence of spy fiction in the modern era. Readings may include works by John Buchan, Joseph Conrad, Arthur Conan Doyle, Ian Fleming, Rudyard Kipling, John Le Carré, and Helen MacInnes.

ENGL 3032. Shakespeare in London. (; 3 cr; ; Student Option; Summer Odd Year) How are different interpretations of Shakespeare's works embodied in the theater? How are they transformed by location/context? Students attend/discuss theatrical productions.

ENGL 3040. Studies in Film. (; 3 cr; max 9 cr; ; Student Option; Every Fall, Spring & Summer) Topics regarding film in a variety of interpretive contexts, from range/historic development of American, English, Anglophone film.

ENGL 3045. Cinematic Seductions: Sex, Gender, Desire. (; 3 cr; max 4 cr; ; Student Option; Spring Odd Year) Gender/sexuality in cinema. Sexuality/identity. Historical contexts of films. Theoretical debates regarding gender/sexuality.

ENGL 3060. Studies in Literature and the Other Arts. (; 3 cr; max 9 cr; ; Student Option; Spring Odd Year) Examine literature's role in conjunction with other arts, including music, visual arts, dance, etc. Topics specified in Class Schedule.

ENGL 3061. Literature and Music. (LITR; 3 cr; ; Student Option; Every Spring) In this course, we will explore the connections and parallels between music and literature, assessing both form and content and drawing up various genres from both arts. We will examine some of the ways that musical and literary texts can change, subvert, or augment each other by applying critical and literary theories to intertextual readings. Among the subjects we may discuss are how authors use music in their work, both structurally and topically: how musicians use literature, both as lyric and as subject matter; and how members

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of each group engage the artistic assumptions of the other. Students will gain a greater appreciation of the varied forms of creative expression and an increased understanding of how they influence each other through close reading and listening, discussions, reflective writing, and presentations.

**ENGL 3070. Studies in Literary and Cultural Modes.** (3 cr.; max 9 cr.; Student Option; Fall Odd Year) Modes of literary expression/representation that transcend conventional demarcations of genre and historical periods. Topics may include horror, romance, mystery, comedy, and satire.

**ENGL 3071. The American Food Revolution in Literature and Television.** (CIV; 3 cr.; Student Option; Every Fall) Native food landscape in 1930s. Classic literature from rise of movement. Recent work that focuses on personal/environmental ethics of food.

**ENGL 3090. General Topics.** (3 cr.; max 9 cr.; Student Option; Every Fall, Spring & Summer) Topics specified in Class Schedule.

**ENGL 3091. The Literature and Film of Baseball.** (LITR; 3 cr.; Student Option; Every Spring) Baseball is the national pastime, often evoked with Mom and apple pie in a trinity of American-ness. How do Americans represent something they see as so quintessentially themselves? In this class, we will look at the variety and complexity of answers given to that question, from sunny nostalgia, to valorization of the individual, valorization of the team, depictions of the dark side of the American dream, critiques of racial relations, and an approach that strives to eliminate both the poetry and the hand-wringing with a long hard look at numbers and facts. In this journey, we will study and participate in a number of ways that literature teaches us to understand society and ourselves. We will examine the idea of American pastoral and anti-pastoral. We will use the great variety of ways to write about baseball as a platform to consider how we come to know and believe. Throughout the course, we will examine the way baseball writing treats race and gender. We will also look at excerpts of films made from some of the texts. Comparing the films to the literature allows us to discuss what representations of America seem more palatable to producers aiming for a larger audience than literature usually reaches and to highlight ways writing makes arguments that films cannot.

**ENGL 3092. The Original Walking Dead: Misbehaving Dead Bodies in the 19th Century.** (3 cr.; Student Option; Every Fall) Examination and analysis of 19th-century British literature about dead bodies, the science of death, burial practices and anxieties, and theories of the supernatural. This course includes fiction and poetry but also non-fiction, historical documents, and sensationalist media.

**ENGL 3101. Survey of Medieval English Literature.** (3 cr.; A-F or Audit; Periodic Fall & Spring) Major/representative Medieval English works, including Sir Gawain the Green Knight, Chaucer's Canterbury Tales, Piers Plowman, Book of Margery Kempe, Julian of Norwich's Revelations, and Malory's Morte D'Arthur.

**ENGL 3102. Chaucer.** (3 cr.; A-F or Audit; Every Fall & Spring) Major/representative works written by Chaucer, including The Canterbury Tales, Troilus and Criseyde, and the dream visions. Historical, intellectual, and cultural background of the poems. Language, poetic theory, form.

**ENGL 3110. Medieval Literatures and Cultures: Intro to Medieval Studies.** (3 cr.; Student Option; Every Spring) Major and representative works of the Middle Ages. Topics specified in the Class Schedule.

**ENGL 3114. Dreams and Dream Visions.** (3 cr.; Student Option; Fall Even Year) Introduction to the literary genre known as the medieval English "dream vision" and to the historical and theoretical discussion of dreams. We concentrate on four late medieval dream visions: Langland's Piers Plowman; Chaucer's Book of Duchess and House of Fame; and the Gawain-Poet's Pearl.

**ENGL 3116. Early Modern Drama.** (3 cr.; Student Option; Every Spring) Reading of selected British plays ranging from the Reformation to the French Revolution. Plays show the evolution of English society and reflect changing social mores from the era of Shakespeare and Jonson to the rise of the bourgeoisie.

**ENGL 3132. The King James Bible as Literature.** (3 cr.; Student Option; Fall Odd Year) Literature of Jewish Bible ("Old Testament"). Narratives (Torah through Kings), prophets (including Isaiah), writings (including Psalms, Job, Ecclesiastes). God's words/deeds as reported by editors/translators.

**ENGL 3133. Stuart England: 17th-Century Literature and Culture.** (3 cr.; Student Option; Fall Odd Year) Major/representative works of the Restoration and 18th century (1660-1798). Typical authors: Dryden, Pope, Swift, Johnson, Boswell, Fielding.

**ENGL 3134. Milton and Rebellion.** (3 cr.; A-F or Audit; Periodic Fall & Spring) Milton's prose/minor poems from the Revolution (1641-1660). Post-revolutionary works (Paradise Lost, Samson Agonistes). Emphasizes Milton's lifelong effort to bring about reform ("change").

**ENGL 3141. The Restoration and the Eighteenth Century: Sex, Satire, and Sentiment.** (3 cr.; A-F or Audit; Periodic Fall & Spring) This course will introduce you to some of the best literature of the Restoration and eighteenth century in England. Think of this course as a challenge: how can you, as someone who will spend most of your life in the 21st century, learn to appreciate and learn from literature written in far different times and places? A lot depends on your willingness to empathize with ways of thinking and being that are quite different from your own and your comfort with believing that other ages were just as complicated and as interesting as the one you live in. Typical authors include Dryden, Behn, Swift, Pope, Fielding, and Bunyan.

**ENGL 3151. Romantic Literatures and Cultures.** (3 cr.; A-F only; Every Fall & Spring) British literature written between 1780 and 1830. Concept of Romanticism. Effects of French Revolution on literary production. Role of romantic artist.

**ENGL 3161. Victorian Literatures and Cultures.** (3 cr.; Student Option; Periodic Fall & Spring) The literature of the British Victorian period (1832-1901) in relation to its cultural and historical contexts. Typical authors include Tennyson, the Brownings, Dickens, Arnold, Hopkins, and the Brontes.

**ENGL 3161H. Honors: Victorian Literatures and Cultures.** (3 cr.; A-F only; Periodic Fall & Spring) The literature of the British Victorian period (1832-1901) in relation to its cultural and historical contexts. Typical authors include Tennyson, the Brownings, Dickens, Arnold, Hopkins, and the Brontes.

**ENGL 3171. Modern British Literatures and Cultures I.** (3 cr.; Student Option; Periodic Fall) Survey of principal writers, intellectual currents, conventions, genres, and themes in Britain from 1950 to the present. Typically included are Beckett, Golding, Kingsley and Martin Amis, Murdoch, Larkin, Hughes, Heaney, Lessing, Shaffer, Stoppard, Fowles, and Drabble.

**ENGL 3175. 20th-Century British Literatures and Cultures I.** (3 cr.; Student Option; Periodic Fall) Survey of principal writers, intellectual currents, conventions, and genres/themes in Britain/Ireland, from 1900 to 1945. Fiction/nonfiction by Conrad, Richardson, Forster, Joyce, Mansfield, Rhys, West, Woolf, Lawrence, and Huxley. Poetry by Hardy, Hopkins, Loy, H.D., Yeats, Pound and Eliot. Drama by Synge and Shaw.

**ENGL 3180. Contemporary Literatures and Cultures.** (3 cr.; max 9 cr.; Student Option; Every Fall & Summer) Examine issues related to the reading and understanding of British, American, and Anglophone fiction and poetry in a variety of interpretive contexts.

**ENGL 3181. Contemporary Literary Nonfiction.** (LITR; 3 cr.; Student Option; Every Spring) Contemporary literary nonfiction from the 1960s to the present, covering developments in narrative nonfiction, memoir, and personal essay.

**ENGL 3182. Irish Literature.** (3 cr.; Student Option; Every Spring) Against competing historical and political narratives, this study of 20th century Irish writers will show how their writing challenges assumptions about identity and nation.
producing literature that pointedly does not carry a flag but instead explores the oppression, injustice, and violence that the individual being suffers as a consequence of it, and INSISTS on the right to resist, create, and misbehave. Authors will include Yeats, Joyce, Beckett, as well as others.

ENGL 3201W. American Indian Literature. (DSJ, WI, LITR; 3 cr. : A-F only; Every Fall & Spring)
Comparative studies of oral traditions and modern literature from various tribal cultures.

ENGL 3212. American Poetry from 1900. (;
3 cr. ; Student Option; Spring Even Year)
Famous and lesser-known poems from the Modernist era, the time of Frost, HD, Pound, Eliot and the Harlem Renaissance. The course attends to the intellectual and cultural background of the poets, poetic theory and form.

ENGL 3221. American Novel to 1900. (;
3 cr. ; Student Option; Fall Even Year)
Novels, from early Republic, through Hawthorne, Melville, and Stowe, to writers at end of 19th century (e.g., Howells, Twain, James, Chopin, Crane). Development of a national literature. Tension between realism and romance. Changing role of women as writers and as fictional characters.

ENGL 3222. American Novel from 1900. (3 cr. ; Student Option; Every Fall & Spring)
In this course, we will read and study novels of twentieth and twenty-first century American writers, from classic realism to realism through Modernists (e.g., Faulkner, Hemingway, Fitzgerald) to more contemporary writers (e.g., Baldwin, Ellison, Erdrich, Roth, Pynchon). We will explore each text in relation to literary, cultural, and historical developments and question the narrative and stylistic strategies specific to each work.

ENGL 3231. LGBTQ Literature. (;
3 cr. ; Student Option; Spring Odd Year)
LGBTQIA life in the US has changed significantly over the past few decades. By examining a selection of poetry, prose, and film, our class will try to answer the questions: “How did we get to where we are today?” and “Where do we go next?” We will look at classic works in their historical contexts to see what was revolutionary about their public reception; we will trace how they paved the way for all that followed. We will look at very new works to understand the concerns of twenty-first century LGBTQIA writers and readers. From the “lavender scare” to the Stonewall Riots to the AIDS pandemic to marriage equality and trans movements, we will explore how LGBTQIA authors and filmmakers have both responded to and shaped the ethos of our times.

ENGL 3301. Asian America through Arts and Culture. (AH, DSJ; 3 cr. ; Student Option; Spring Even Year)
The course focuses on the close analysis and interpretation of individual works by a range of modern and contemporary artists. Students will analyze, critique, and interpret these works in light of the historical and social contexts in which they were produced, their creation and uses of aesthetic form, and their impact on individuals and communities. Discussion, writing assignments, and oral presentations will focus on different ways of encountering and evaluating artistic work; for instance, students will write critical analyses and production reviews as well as dialogue more informally through weekly journal entries and online discussion forums. We will examine what it means to define artists and their work as being “Asian American” and explore how other categories of identity such as gender, sexuality, or class intersect with race. We will study how art works not only as individual creativity but also as communal and social practice; for instance, we look at the history of theaters, such as East-West Players or Pan Asian Repertory Theatre, that have sustained Asian Americans as actors, playwrights, and designers.

ENGL 3303W. Writing differences: Literature by U.S. Women of Color. (DSJ, WI, LITR; 3 cr. ; Student Option; Fall Odd Year)
Explore contemporary texts from multiple disciplines to analyze the role of stories in interpreting nature. Emphasis on lived experience, civic motivation, and observational research that enrich effective nature writing. Optional service-learning component.

ENGL 3304. The American Novel. (;
3 cr. ; Student Option; Every Fall & Spring)
Explore contemporary texts from multiple disciplines to analyze the role of stories in interpreting nature. Emphasis on lived experience, civic motivation, and observational research that enrich effective nature writing. Optional service-learning component.

ENGL 3305. Protest Literature and Community Action. (DSJ; 4 cr. ; A-F or Audit; Every Fall)
This course combines academic analysis and experiential learning to understand, in both theory and practice, different perspectives on the power of protest in civic life. We will read a selection from the vast genre of progressive protest literature (pamphlets, poems, polemics, lists of demands, teaching philosophies, organizing principles, cultural histories, newsletter articles, movement chronicles, and excerpts from novels and biographies) from four key social-justice movements: the American Indian Movement, the Black Power movement, the post-Great Recession struggle for economic power, and the battle for immigrant rights. We'll also learn about this experientially as we roll up our sleeves and get involved in local community-based education initiatives and local social-justice organizations through our service-learning. Students receive initial training from CLA Career Services, The Center for Community-Engaged Learning, the Minnesota Literacy Council, as well as orientations at community sites.

ENGL 3306. Social movements & Community Education. (CIV; 4 cr. ; A-F or Audit; Every Spring)
This course, we'll examine four progressive social movements. After beginning with a foundational civil rights movement example, we will learn about the antiracist feminism branch of the women’s movement, often referred to as third-wave feminism. We'll also study the Occupy movement that arose in response to the Great Recession (the financial crisis beginning in 2008). Then we'll take a look at two social movements that, while by no means underground, tend to fly below the radar: the prison abolition movement and the fight for public schools. While all of these social movements have different emphases, they also overlap quite a bit in their systemic analysis of society and their strategies for action. As activist, organizer, and trainer Rinku Sen observes, "the history of community organizing and social movements is replete with tactics learned in one movement being applied to another." As we study these social movements, community organizing will be of particular interest to us. How do the groups, collectives, nonprofits, and communities propelling these different social movements organize themselves, their leadership, their strategies, and their activities? How do they make decisions? What do meetings and
The literature of African American women writers explored in novels, short stories, essays, poetry, autobiographies, and drama from the 18th to the late-20th century.

ENGL 3593. The African American Novel. (3 cr.; Student Option; Every Spring)

ENGL 3597W. Introduction to Chicana/o Literature. (DSJ,WI,LITR; 3 cr.; Student Option; Every Fall)
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

ENGL 3598W. Introduction to African American Literature and Culture I. (LITR,WI; 4 cr.; Student Option; Every Spring)
American Literature and Culture II.

ENGL 3601. Analysis of the English Language. (3 cr.; Student Option; Every Fall, Spring & Summer)

ENGL 3711. Literary Magazine Production Lab I. (4 cr.; A-F only; Every Fall)
First of two courses. Students produce undergraduate art/literary magazine The Tower. Students decide upon identity, tone, and direction of the issue. They take on magazine staff responsibilities, call for submissions, make selections, edit/design, set budget, and begin fund-raising. Prereq: [instructor consent required, instr consent]

ENGL 3712. Literary Magazine Production Lab II. (4 cr.; A-F only; Every Spring)
ENGL 3712 is the second of a two-semester course. In this hands-on, experiential lab, we solicit, acquire, edit, copyedit, design, typeset, proofread, print, publicize and distribute the upcoming edition of The Tower, the magazine of undergraduate art and creative writing by University of Minnesota students. This is the semester in which we bring out the finished, printed magazine, and in which we host a launch party on campus. We’ll continue to apply and expand the lessons from our exploration in ENGL 3711 of the theory and history of literary magazine production in any number of ways: we’ll revise our mission and theme as we draft and revise ancillary copy for the issue itself and as we refresh the marketing copy for our social media, blog, and website; we’ll hone our design and typesetting skills as we lay out the issue; we’ll refine our aesthetic sensibilities as we collaborate on final selections, strengthening our willingness to revise our opinions as compromise for the greater good; we’ll add to our firsthand valuable on-the-job skills of budgeting, scheduling, and vendor relations; and we will deepen our understanding of the publishing profession as it exists today, locally, and nationally. Prereq: [3711, instr consent]

ENGL 3714. The Business of Publishing. (3 cr.; Student Option; Every Fall)
The Business of Publishing course, by focusing primarily on book publishing, will give a wide variety of students—from budding writers to business majors—exposure to a major industry (valued at $125 billion worldwide) that curates, promotes and monetizes the written word. There are approximately 12,000 publishers in the U.S., and of those an estimated 3,000 are literary presses. An estimated 600,000 books are published in the U.S. annually; Nielsen Book Scan reports 674 million unit sales in 2016. Book, magazine, and newspaper publishing are still the most stable types of publishing in our society and form the nexus between commerce and culture. Broadly understood, “publishing” means “to make words and images public.” It encompasses many activities and forms—for instance, business newsletters and websites; social media (Facebook, Twitter, and Snapchat); and organizational and personal blogs. More specifically, it is a profession with specialized components—marketing, design, sales, subsidiary rights, bookselling—each with its own standards and best practices. It is also a field rife with innovation, producing multiple "start-ups" constantly. To "publish well" means not only to deliver content to a page or screen but also to deliver it to an audience. Publishing crosses disciplines, and innovates new channels and modes of production. As such, publishing well has implications for all of us in our daily personal and professional lives. At the University of Minnesota, we have the advantage of living in a metro area that is regularly ranked near or at the top of lists for most literate cities in the U.S. We have one of the largest concentrations of literary presses in the country outside of the East Coast. This course will take advantage of guest lecturers from Minnesota’s nationally recognized publishing community. It encourages students to discuss the work of publishing with these professionals, and provides them with networking opportunities. As well as exploring in-depth the specific components of the publishing process, this class also broadens our sense of what “publishing” is. It is a process as much as it is a product. Why publishing? Why is a whole profession devoted to it? Why might we want to dedicate our own lives to it, or value the portion it already plays in them? How does our culture consume the written word? How might we want to shape that consumption? How can we improve it? In this class, we will discuss the role of publishing in our society and form the nexus between commerce and culture. Broadly understood, “publishing” means “to make words and images public.” It encompasses many activities and forms—for instance, business newsletters and websites; social media (Facebook, Twitter, and Snapchat); and organizational and personal blogs. More specifically, it is a profession with specialized components—marketing, design, sales, subsidiary rights, bookselling—each with its own standards and best practices. It is also a field rife with innovation, producing multiple “start-ups” constantly. To “publish well” means not only to deliver content to a page or screen but also to deliver it to an audience. Publishing crosses disciplines, and innovates new channels and modes of production. As such, publishing well has implications for all of us in our daily personal and professional lives. At the University of Minnesota, we have the advantage of living in a metro area that is regularly ranked near or at the top of lists for most literate cities in the U.S. We have one of the largest concentrations of literary presses in the country outside of the East Coast. This course will take advantage of guest lecturers from Minnesota’s nationally recognized publishing community. It encourages students to discuss the work of publishing with these professionals, and provides them with networking opportunities. As well as exploring in-depth the specific components of the publishing process, this class also broadens our sense of what “publishing” is. It is a process as much as it is a product. Why publishing? Why is a whole profession devoted to it? Why might we want to dedicate our own lives to it, or value the portion it already plays in them? Through this course, we will understand firsthand how a book makes its way out into the world, and why that process is so important to culture and community.

ENGL 3741. Literary and American Cultural Diversity. (DSJ; 4 cr.; Student Option; Every Fall & Spring)
ENGL 3833V. Honors Thesis. (WI; 1-4 cr.; A-F or Audit; Every Fall & Spring) See guidelines available from English honors adviser. Prereq-Honors candidacy in English, consent of English honors advisor.

ENGL 3960W. Capstone Seminar in English. (WI; 4 cr.; A-F only; Every Fall & Spring) This course is devoted to the writing of the senior paper in English. To graduate with a BA in English, students must write a 13-17 page (4,000-5,500 word) senior paper that contains substantive and original analytical insights. In this rigorous and intensive seminar, students receive instruction on writing this paper from tenured and tenure-track faculty in English. Students learn how to choose a topic and formulate a research question, conduct primary and secondary research, and produce a written document that incorporates research and analysis. Faculty teach students to produce an extended, scholarly essay though discussions of method, research, and development; instruction in specific writing techniques; workshops and revising drafts; solving problems; and creating a coherent and elegant final product. While the subjects about which students write vary depending on student interest and faculty expertise, at least 50% of the course grade is determined by students' writing performance. Most students fulfill the senior paper requirement with a traditional seminar paper, but students sometimes complete alternative projects, such as blogs, analytic projects that incorporate creative or personal elements, collaborative projects, or projects that involve the creation of a podcast, video, web site, or some other means of documenting student learning and writing skills. The senior seminar also functions as a capstone experience that fulfills many of the Student Learning Outcomes for the English major. Prerequisites for Admission: Admission to ENGL 3960W requires English major status and completion of ENGL 3001W with a minimum grade of C-minus. Priority will be given to students with senior status who have completed the majority of the major requirements, as well as to students who plan to graduate in the term they are requesting to take the senior seminar.

ENGL 3993. Directed Study. (1-4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq-One 3xx, [English major or minor or [BIS or IDIM or ICP with English concentration],[ or or sr], instr consent, dept consent, college consent.

ENGL 4003. History of Literary Theory. (.; 3 cr.; A-F or Audit; Fall Odd Year) How thinkers from classical to modern times posed/answered questions about language (how words mean), audience (to whom they mean), and the literary (how literary writing differs from other forms of writing). Works by Plato, Aristotle, Augustine, Christine de Pizan, Dante, Sidney, Behn, Wordsworth, Shelley, and Woolf.

ENGL 4090. General Topics. (.; 1-4 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

ENGL 4152. Nineteenth Century British Novel. (3 cr.; A-F or Audit; Every Fall & Spring) British novel during the century in which it became widely recognized as a major vehicle for cultural expression. Possible topics include the relation of novel to contemporary historical concerns: rise of British empire, developments in science, and changing roles for women; formal challenges of the novel; definition of realism.

ENGL 4232. American Drama by Writers of Color. (DSJ; 3 cr.; A-F or Audit; Periodic Fall & Spring) Selected works by African American, Latinx, Native American, and Asian American playwrights. How racial/ethnic differences are integral to shaping different visions of American drama. History of minority/ethnic theaters, politics of casting, mainstreaming of the minority playwright. Students in this class will have the opportunity to participate in service-learning.

ENGL 4233. Modern and Contemporary Drama. (.; 3 cr.; A-F or Audit; Periodic Fall & Spring) Works written for theater in 19th/20th century. Emphasizes how major aesthetic forms of modern drama (the well-made play, realism, expressionism, symbolism, epic theater, absurdism) presented not just distinctive theatrical styles, but also new ways of seeing, for the theatrical spectator. How social differences, as informed by gender, class, and race, inform content/presentation.

ENGL 4311. Asian American Literature and Drama. (DSJ,LITR; 3 cr.; A-F or Audit; Fall Odd Year) Literary/dramatic works by Asian American writers. Historical past of Asian America through perspective of writers such as Sui Sin Far and Carlos Bulosan. Contemporary artists such as Frank Chin, Maxine Hong Kingston, David Henry Hwang, and Han Ong. Political/historical background of Asian American artists, their aesthetic choices.

ENGL 4612. Old English I. (3 cr.; Student Option; Periodic Fall) Introduction to the language through 1150 A.D. Culture of Anglo-Saxons. Selected readings in prose/poetry.

ENGL 4613. Old English II. (.; 3 cr.; Student Option; Periodic Spring) The second semester of Old English is devoted to a full translation and study of the great Anglo-Saxon epic "Beowulf." J.R.R. Tolkien wrote of the poem that "its maker was telling of things already old and weighted with regret, and he expended his art in making keen that touch upon the heart which sorrows have that are both poignant and remote." "Beowulf" is an exciting tale of strife and heroism; but it is also a subtle meditation upon the character of humanity as it struggles to understand the hazards of a harsh world, the inscrutability of fate, and the nature of history itself. "Beowulf" is not only important for a detailed understanding of Anglo-Saxon culture, but it is also a significant and moving poetic achievement in the context of world literature.

ENGL 5401. Writing the 19th Century. (4 cr.; Student Option; Every Fall & Spring) Works written for the American marketplace for someone who knows how to turn pulp into paper. In this class, we will study editing as a process, a protocol, and a philosophy. To elaborate, we will study the conventions of editing (grammar, story, and style) and we will meet professionals who do it well. (Recent guests have included a super freelancer and founding editor at Thirty Two magazine, a political reporter for Politics in Minnesota, and a first-time novelist and page proofer with a book on Coffee House Press.) We will analyze why creative collaboration can feel like a playground brawl. Mostly, using real, raw manuscripts from newspapers, magazines, and books, we will practice how to screw up the written word—with the ultimate goal of screwing up a little less. prereq: jr or senior or grad student Credit will not be granted if credit has been received for ENGW 5401, ENGL 5711, or ENGL 5401

ENGL 4721. Electronic Text. (.; 3 cr.; Student Option; Periodic Fall) Status/function of text, related questions as framed by electronic text.

ENGL 4722. Alphabet to Internet: History of Writing Technologies. (.; 3 cr.; Student Option; Every Fall) Equivocal relation of memory and writing. Literacy, power, control. Secrecy and publicity. Alphabetization and other ways of ordering world. Material bases of writing. Typographical design/expressions. Theories of technological determinism.

ENGL 5001. Ph.D. Colloquium: Introduction to Literary Theory and Literary Studies in the Modern University. (.; 3 cr.; Student Option; Every Fall) Where and what is literary study vis-à-vis the history of the discipline, of the humanities, and of the university—all in the context of a graduate education. Literary theory focusing on key theoretical works that address the discipline, the humanities, and the university.

We will read and translate the poem in the original Old English; thus ENGL 4612 (or a similar course resulting in a basic reading knowledge of Old English) is a prerequisite. "Beowulf" has been the object of intensive scholarly study; we will delve into the debates over the poem's date, genesis, manuscript and historical context and critical interpretation. Spending an entire semester studying one complex work can be an invaluable experience. Please contact the instructor for any questions concerning the prerequisite.
ENGL 5020. Studies in Narrative. (3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring) Examine issues related to reading and understanding narrative in a variety of interpretive contexts. Topics may include "The 19th-century English (American, Anglophone) Novel," "Introduction to Narrative," or "Techniques of the Novel." Topics specified in the Class Schedule.

ENGL 5040. Theories of Film. (3 cr.; max 9 cr.; Student Option; Periodic Fall) Advanced topics regarding film in a variety of interpretive contexts, from the range and historic development of American, English, and Anglophone film (e.g., "Fascism and Film," "Queer Cinemas"). Topics and viewing times announced in Class Schedule. prereq: Grad student or instr consent

ENGL 5090. Readings in Special Subjects. (1-4 cr. max 12 cr.; Student Option; Every Fall & Spring) General background preparation for advanced study. Diverse selection of literatures written in English, usually bridging national cultures and time periods. Readings specified in Class Schedule.

ENGL 5110. Medieval Literatures and Cultures: Intro to Medieval Studies. (3 cr.; max 9 cr.; Student Option; Every Spring) Major and representative works of the Middle Ages. Topics specified in the Class Schedule.

ENGL 5121. Readings in Early Modern Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Topical readings in early modern poetry, prose, fiction, and drama. Attention to relevant scholarship or criticism. Preparation for work in other courses or seminars. prereq: Grad student or instr consent

ENGL 5140. Readings in 18th Century Literature and Culture. (3 cr.; Student Option; Every Spring) Literature written in English, 1660-1798. Topics may include British literature of Reformation and 18th century, 18th-century American literature, a genre (e.g., 18th-century novel). prereq: Grad student or instr consent

ENGL 5150. Readings in 19th-Century Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall, Spring & Summer) Topics may include British Romantic or Victorian literatures, American literature, important writers from a particular literary school, a genre (e.g., the novel). Readings.

ENGL 5170. Readings in 20th-Century Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall) British, Irish, or American literatures, or topics involving literatures of two nations. Focuses either on a few important writers from a particular literary school or on a genre (e.g., drama). Topics specified in Class Schedule.

ENGL 5300. Readings in American Minority Literature. (3 cr.; max 9 cr.; Student Option; Every Fall) Contextual readings of 19th-/20th-century American minority writers. Topics specified in Class Schedule.

ENGL 5501. Origins of Cultural Studies. (3 cr.; Student Option; Periodic Fall & Spring) Intellectual map of the creation of cultural studies as a unique approach to studying social meanings. Key figures and concepts, including nineteenth- and early twentieth century precursors.


ENGL 5597. Seminar: Harlem Renaissance. (3 cr.; Student Option; Every Fall & Spring) Multidisciplinary review of Jazz Age's Harlem Renaissance: literature, popular culture, visual arts, political journalism, major black/white figures. prereq: Grad student or instr consent

ENGL 5701. Great River Review. (4 cr.; Student Option; Every Spring) Students will be assigned roles, both editorial and managerial, to assist in production of The Great River Review journal. They will explore and present on the history of the small magazine in American literature and meet with Twin Cities publishing professionals.

ENGL 5743. History of Rhetoric and Writing. (3 cr.; Student Option; Periodic Fall & Spring) Assumptions of classical/contemporary rhetorical theory, especially as they influence interdisciplinary field of composition studies. prereq: Grad student or instr consent

ENGL 5790. Topics in Rhetoric, Composition, and Language. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule. prereq: Grad student or instr consent

ENGL 5800. Practicum in the Teaching of English. (1-3 cr.; Student Option; Every Fall) Discussion of and practice in recitation, lecture, small-groups, tutoring, individual conferences, and evaluation of writing/reading. Emphasizes theory informing effective course design/teaching for different disciplinary goals. Topics vary. See Class Schedule. prereq: Grad student or instr consent

ENGL 5805. Writing for Publication. (3 cr.; Student Option; Fall Even Year) Conference presentations, book reviews, revision of seminar papers for journal publication, and preparation of a scholarly monograph. Style, goals, and politics of journal and university press editors/readers. Electronic publication. Professional concerns. prereq: Grad student or instr consent

ENGL 5992. Directed Readings, Study, or Research. (1-3 cr.; max 45 cr.; Student Option; Every Fall, Spring & Summer) TBD Prereq-Grad student or inst. consent.

ENGL 8090. Seminar in Special Subjects. (3 cr. max 12 cr.; Student Option; Every Fall) Sample topics: literature of World War II, writings of the Holocaust, literature of English Civil War, advanced versification.

ENGL 8110. Seminar: Medieval Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Sample topics: "Chaucer; "Piers Plowman"; Middle English literature, 1300-1475; medieval literary theory; literature/class in 14th-century; texts/heresies in late Middle Ages.

ENGL 8120. Seminar in Early Modern Literature and Culture. (3 cr. max 12 cr.; A-F or Audit; Every Fall & Spring) British writers/topics, from Reformation to French Revolution. In first half of period (which divides at 1640), a typical topic is Spenser and epic tradition; in second half, women historians before Wollstonecraft.

ENGL 8140. Seminar in 18th Century Literature and Culture. (3 cr. max 12 cr.; Student Option; Periodic Fall & Spring) Advanced study of literature written in English, 1660-1798. Topics may include British literature of Reformation and 18th century, 18th-century American literature, a genre (e.g., 18th-century novel). prereq: Grad student or instr consent

ENGL 8150. Seminar in Shakespeare. (3 cr. max 9 cr.; Student Option; Every Fall & Spring) Perspectives/workshops vary with offering and instructor. Recent topics include Global Shakespeare, Shakespearean Comedy, Shakespeare and Performance.


ENGL 8180. Seminar in 20th-Century British Literature and Culture. (3 cr. max 12 cr.; A-F or Audit; Periodic Fall) Sample topics: modernism, Bloomsbury Group, working-class/immigrant literature. Topics specified in Class Schedule.

ENGL 8190. Seminar in 20th-Century Anglophone Literatures and Cultures. (3 cr. max 12 cr.; Student Option; Periodic Fall & Spring) Topics in Anglophone literatures of Canada, Africa, the Caribbean, India and Pakistan, and the Pacific. Sample topics: Stuart Hall and Black Britain; Salman Rushdie and cosmopolitan literatures; national literatures
ENGL 8200. Seminar in American Literature. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)

ENGL 8290. Topics, Figures, and Themes in American Literature. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Sample topics: Dickinson, 19th-century imperialism, Faulkner, San Francisco poets, humor, Chaplin, Hitchcock, and popular culture. Topics specified in Class Schedule.

ENGL 8300. Seminar in American Minority Literature. (3 cr. [max 12 cr.]; Student Option; Periodic Fall)
Sample topics: Harlem Renaissance, ethnic autobiographies, Black Arts movement. Topics specified in Class Schedule.

ENGL 8333. FTE: Master's. (1 cr. ; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

ENGL 8400. Seminar in Post-Colonial Literature, Culture, and Theory. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Sample topics: Marxism and nationalism; modern India; feminism and decolonization; "the Empire Writes Back"; Islam and the West. Topics specified in Class Schedule.

ENGL 8444. FTE: Doctoral. (1 cr. ; No Grade Associated; Every Fall, Spring & Summer)
FTE Doctoral credits

ENGL 8510. Studies in Criticism and Theory. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Development within critical theory that has affected literary criticism, by altering conceptions of its object ("literature") or by challenging conceptions of critical practice. Topics specified in Class Schedule.

ENGL 8520. Seminar: Cultural Theory and Practice. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Sample topics: semiotics applied to perspective paintings, numbers, and money; analysis of a particular set of cultural practices by applying various theories to them. Topics specified in Class Schedule.

ENGL 8530. Seminar in Feminist Criticism. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Brief history of feminist criticism, in-depth treatment of contemporary perspectives/issues. Topics specified in Class Schedule.

ENGL 8600. Seminar in Language, Rhetoric, Literacy, and Composition. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Students read/conduct research on theories/literature relevant to cross-disciplinary fields committed to writing and to teaching writing.

ENGL 8610. Seminar in Language and Discourse Studies. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)

ENGL 8625. Dissertation Seminar: Preparing the Book List and Prospectus. (2 cr. ; Student Option; Every Spring)
Assembling book list, defining field of study, and articulating a rationale for list. How to conceptualize/develop dissertation prospectus. Students work with faculty instructor, advising committee, and peer writing group. prereq: Engl PhD student in [3rd or 4th yr], at least 12 cr completed

ENGL 8626. Dissertation Seminar: Writing the Dissertation. (2 cr. ; Student Option; Every Spring)
Conceptualizing dissertation (using model of Graduate School doctoral Dissertation Fellowship application). Producing dissertation draft chapter/proposal. Students work with instructor, advising committees, and peer writing groups. prereq: English PhD student, passed prelim exam

ENGL 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Doctoral Pre-Thesis Credits prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ENGL 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

ENGL 8992. Directed Reading in Language, Literature, Culture, Rhetoric, Composition, or Creative Writing. (1-9 cr. [max 15 cr.]; Student Option; Every Fall & Spring)
Directed Reading in Language, Literature, Culture, Rhetoric, Composition, or Creative Writing prerequisite: instr consent, dept consent.

English: Creative Writing (ENGW)

ENGW 1101W. Introduction to Creative Writing. (LITR-WI; 4 cr. ; Student Option No Audit; Every Fall & Spring)
Writing poetry/prose. Small group workshops, lectures by visiting writers. prereq: Students may not audit this course

ENGW 1102. Introduction to Fiction Writing. (3 cr. ; Student Option No Audit; Every Fall & Spring)
Beginning instruction in art of fiction: characterization, plot, dialogue, and style. Writing exercises to generate ideas. Students read/discuss published fiction and their own writing.

ENGW 1103. Introduction to Poetry Writing. (3 cr. ; Student Option No Audit; Every Fall, Spring & Summer)
Beginning instruction in art of poetry. Discussion of student poems and contemporary poetry. Ideas for generating material. Writing exercises in/out of class.

ENGW 3102. Intermediate Fiction Writing. (3 cr. ; Student Option No Audit; Every Fall & Spring)
Exercises, experiments, assigned readings, discussion of student work. prereq: [EngW 1101 OR 1102 OR 1103 OR 1104], students cannot audit course.

ENGW 3104. Intermediate Poetry Writing. (3 cr. ; Student Option No Audit; Every Fall & Spring)
Exercises, experiments, assigned readings, discussion of student work. prereq: [1101 or 1102 or 1103 or 1104], students cannot audit course.

ENGW 3106. Intermediate Literary Nonfiction Writing. (3 cr. ; Student Option No Audit; Every Fall & Spring)
Exercises, experiments, assigned readings, discussion of student work. prereq: [1101 or 1102 or 1103 or 1104], students cannot audit course.

ENGW 3110. Topics in Creative Writing. (3 cr. [max 9 cr.]; Student Option No Audit; Every Fall, Spring & Summer)
Topics specified in Class Schedule. prereq: 1101 or 1102 or 1103 or 1104 or dept consent.

ENGW 3801W. Eat, Write, Learn: Creative Writing in Spain. (AH,WI; 3 cr. ; Student Option No Audit; Periodic Spring & Summer)
This undergraduate creative writing class which satisfies both the LE and the Writing-Intensive requirements focuses on the experience and the literary evocation of travel, with students based first in the capital, Madrid, and then in Toledo, a medieval city in the center of Spain. In Madrid, students will write about the Spanish tradition of eating twelve grapes at the stroke of midnight on New Year's eve; they will compare the characteristics of two different plazas; they will write poetry about art in the Prado Museum. In Toledo, they will wander through tangled streets, shops, cathedrals, fortresses, synagogues and museums, taking notes for poems, stories, and essays as they go. Madrid is a vibrant, modern European center; Toledo, a beautifully preserved city on a hill, has been declared, in its entirety, a national monument.

For centuries an historic, scholarly and artistic center, Toledo was long famed for its religious tolerance, with Christian, Jewish, and Muslim populations coexisting within its walls. In both locations, we will have guided tours of Spanish monuments and museums, and...
ENGW 3960W. Capstone Seminar in Creative Writing. (WI; 4 cr.; A-F only; Every Fall & Spring) This course is devoted to the writing of the senior paper in creative writing. To graduate with a BA in English, students with an interest in creative writing may choose to produce a substantial manuscript of poetry, literary fiction, or literary nonfiction rather than an extended, scholarly essay. In this advanced creative writing workshop, students receive instruction on writing this manuscript from tenured and tenure-track faculty in English. Class sessions typically include in-class writing exercises, which are then expanded into more finished works of poetry or prose reviewed by the faculty and discussed in workshops by the students themselves. Writing exercises and assignments lead, at the end of the semester, to a finished, thoroughly revised manuscript of at least 2,500 words. Faculty teach students to produce a significant body of poetry, fiction, or creative nonfiction through discussions of method, craft, and development; instruction in specific writing techniques; workshop and revising drafts; solving problems; and creating a coherent and elegant final product.

While the subjects about which students write vary depending on student interest and faculty expertise, at least 50 percent of the course grade is determined by students' writing performance. The senior seminar also functions as a capstone experience that fulfills many of the Student Learning Outcomes for the English major and the capstone course for those who are pursuing a Minor in Creative Writing. Prerequisites for Admission: Admission to ENG 3960W requires: (1) English major status and completion of ENGL 3001W with a minimum grade of C-minus; (2) completion of at least six credits of creative writing courses, including one intermediate (ENGW 3xxx-level) or advanced creative writing workshop, preferably in the genre of the ENGW 3960W workshop to which you are applying; and (3) submission of a creative writing sample. Admission is by permission of the instructor. Priority will be given to students with senior status who have completed the majority of the major requirements, as well as to students who plan to graduate in the term they are requesting to take the senior seminar.

ENGW 4205. Screenwriting. (3 cr.; Student Option No Audit; Every Fall & Spring) An introductory workshop to screenwriting basics, including formatting, style and structure. In-class and take-home exercises will assist the students in learning techniques for developing engaging characters, writing concise description and vivid dialogue, and outlining a usable plot. prereq: One EngW or EngL 3xxx course, [permission number available in creative writing office]

ENGW 5102. Graduate Fiction Writing. (4 cr.; [max 8 cr.]; Student Option No Audit; Every Fall & Spring) Advanced workshop for graduate students with considerable experience in writing fiction. 

ENGW 5104. Graduate Poetry Writing. (4 cr.; [max 8 cr.]; Student Option No Audit; Every Fall) Advanced workshop for graduate students with considerable experience in writing poetry. Students will explore new poetic possibilities while studying contemporary poetry and poets.

ENGW 5106. Graduate Literary Nonfiction Writing. (4 cr.; [max 8 cr.]; Student Option No Audit; Periodic Fall) Advanced workshop for graduate students with considerable experience in writing literary nonfiction.

ENGW 5130. Topics: Graduate Creative Writing. (4 cr.; [max 16 cr.]; Student Option; Every Fall & Spring) Workshop. Might include work in more than one genre. prereq: instr consent

ENGW 5310. Reading as Writers. (4 cr.; [max 8 cr.]; Student Option No Audit; Every Fall) Special topics in reading fiction, literary nonfiction, poetry. Topics specified in Class Schedule.

ENGW 5606W. Literary Aspects of Journalism. (WI; 3 cr.; Student Option; Every Spring) Journalism isn’t fiction. Yet the relationship between what is true and what is artfully constructed toward a “larger truth” – beyond the facts – has a complex and intriguing history. This writing-intensive course explores that relationship through close readings of some of the best writers of long-form nonfiction, starting with the birth of the novel from journalistic roots in the 18th century and ending with postmodern forms that challenge the notion of what we can ever know. Discover the literary devices used by Stephen Crane’s reported street scenes or Nellie Bly’s first-hand investigations into conditions for the mentally ill in the 19th century, and, later, Truman Capote’s nonfiction novel about a Kansas farm family’s murder. Readings include works by pivotal 20th-century writers such as John Hersey, Joseph Mitchell, Lillian Ross, Michael Herr, Norman Mailer, Gay Talese, Joan Didion, Tom Wolfe, and Hunter S. Thompson, and will trace how their pioneering methods influenced contemporary journalism as well as the documentary films of Errol Morris and contemporary nonfiction writers expanding into new forms.

ENGW 5701. Great River Review. (4 cr.; Student Option; Every Spring) Students will be assigned roles, both editorial and managerial, to assist in production of The Great River Review journal. They will explore and present on the history of the small magazine in American literature and meet with Twin Cities publishing professionals.

ENGW 5993. Directed Study in Writing. (1-4 cr. [max 18 cr.]; Student Option; Every Spring & Summer) Projects in writing poetry, fiction, drama, and nonfiction, or study of ways to improve writing. Prereg- instr consent, dept consent, college consent.

ENGW 8101. Reading Across Genres. (4 cr.; Student Option No Audit; Every Fall) Contemporary writing in fiction, poetry, creative nonfiction. Primarily reading course rather than writing course. prereq: Students may not audit this course.

ENGW 8110. Seminar: Writing of Fiction. (4 cr.; [max 16 cr.]; Student Option; Every Spring) Focuses on full-length book (e.g., novel, short story collection). Assignments in common. Individual project. prereq: dept consent

ENGW 8120. Seminar: Writing of Poetry. (4 cr.; [max 8 cr.]; Student Option; Every Fall & Spring) Advanced workshop. Assignments in common and individual projects. prereq: dept consent

ENGW 8130. Seminar: Writing of Literary Nonfiction. (4 cr.; [max 8 cr.]; Student Option; Every Fall & Spring) Advanced workshop. Assignments in common and individual projects. prereq: dept consent

ENGW 8140. Thesis Seminar: Fiction. (4 cr.; [max 8 cr.]; Student Option; Every Fall & Spring) For students working on their creative project. prereq: Creative writing MFA student, instr consent

ENGW 8150. Thesis Seminar: Fiction. (4 cr.; [max 8 cr.]; Student Option; Every Fall & Spring) For students working on creative project. prereq: Creative writing MFA student, instr consent

ENGW 8160. Thesis Seminar: Nonfiction. (4 cr.; [max 8 cr.]; Student Option; Every Fall & Spring) For students working on their creative project. prereq: Creative writing MFA student, instr consent

ENGW 8170. MFA Practicum: EngW 1101W. (1-3 cr.; S-N only; Every Fall & Spring) Teaching Practicum for Teaching Assistants assigned to EngW 1101W. prereq: Creative writing MFA student, instr consent

ENGW 8180. Thesis Seminar: Multi-Genre. (4 cr.; A-F only; Every Fall) Thesis preparation course for advanced graduate students in the creative writing MFA program. prereq: MFA creative writing grad student

ENGW 8310. Topics in Creative Writing. (4 cr.; [max 8 cr.]; Student Option; Periodic Fall & Spring) Special topics in fiction, literary nonfiction, poetry. Topics specified in Class Schedule. prereq: [English or creative writing] grad major or dept consent

ENGW 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent
ENT 1902. Bugs in Bodies: Forensic Entomology. (1 cr.; A-F only; Periodic Fall, Spring & Summer) What can maggots and beetles collected at a crime scene tell investigators about the body? Often, insect evidence collected at the scene of a crime can help experts make a variety of conclusions, such as time of death and whether or not the body has been moved from the original crime scene. In this seminar, students will explore how insects can be useful but is not required.

ENT 2920. Introductory Lectures in Entomology. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) For students working on their creative project.

ENGW 8990. MFA Creative Thesis. (2-8 cr. [max 48 cr.]; Student Option; Every Fall, Spring & Summer) For students working on their creative project.

Professional experience in entomology firms or government agencies through supervised practical experience; evaluative reports and consultations with faculty advisers and employers. prereq: COAFES jr or sr, complete internship contract available in COAFES Career Services before enrolling, UC only, instr consent.

ENT 4251. Forest and Shade Tree Entomology. (3 cr.; Student Option; Every Fall) Biology, ecology, population management of forest/shade tree insects. Emphasizes predisposing factors/integrated management. Lecture/lab.

ENT 4021. Honey Bees and Insect Societies. (3 cr.; Student Option; Fall Odd Year) Natural history, identification, and behavior of honey bees and other social insects. Evolution of social behavior, pheromones and communication, organization and division of labor, social parasitism. Lab with honey bee colonies. Emphasizes predisposing factors/integrated management. Lecture/lab.

ENT 3294. Introduction to Research in Entomology. (1-6 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) This course will provide the framework for offering field, lab, or library-based entomological research under the supervision of faculty or graduate-faculty staff in the Department of Entomology. It is anticipated that this course will provide students with the experience and skills to pursue research topics in entomology.

ENT 5051. Insect Structure and Function. (4 cr.; A-F or Audit; Every Spring) Comparative study of insect structures/ functions from evolutionary perspective. Introduction to physiology of digestion, respiration, other organ systems.


ENT 4251. Forest and Shade Tree Entomology. (3 cr.; Student Option; Every Fall) Biology, ecology, population management of forest/shade tree insects. Emphasizes predisposing factors/integrated management. Lecture/lab.

ENT 4011. Ornamentals and Turf Entomology. (3 cr.; Student Option; Every Spring) Diagnosis and management of insect pests in landscape plants. Emphasis on the principles of biological control, biorational pesticides, and integrated pest management. prereq: 1xxx course in biol or hort or forest resources.

ENT 3281. Veterinary Entomology. (3 cr.; A-F or Audit; Every Fall) Biology/mangement of insects, mites, ticks that affect livestock, poultry, companion animals. Emphasizes problem identification/solving. Lecture, lab.

ENT 3292. Insects, Aquatic Habitats, and Pollution. (3 cr.; A-F or Audit; Every Fall) Effects differing classes of pollutants have on insects that are aquatic. Insect life-cycle dynamics, trophic guilds, community structure. Hypotheses to explain community structure in streams, rivers, wetlands, ponds, lakes, reservoirs. Organic pollution, eutrophication, heavy metal pollution, runoff/siltation, acidification, thermal pollution. Changes in aquatic insect community structure. Designing/maintaining biological monitoring networks. prereq: [3005 or Biol 3407 or FW 2001], Jr or Sr or instr consent.

ENT 3925. Insects, Aquatic Habitats, and Pollution. (3 cr.; A-F or Audit; Every Fall) Effects differing classes of pollutants have on insects that are aquatic. Insect life-cycle dynamics, trophic guilds, community structure. Hypotheses to explain community structure in streams, rivers, wetlands, ponds, lakes, reservoirs. Organic pollution, eutrophication, heavy metal pollution, runoff/siltation, acidification, thermal pollution. Changes in aquatic insect community structure. Designing/maintaining biological monitoring networks. prereq: [3005 or Biol 3407 or FW 2001], Jr or Sr or instr consent.

ENT 4001. Agroecology and Insect Pests. (3 cr.; A-F or Audit; Every Fall) Evaluation of the ecological processes that operate in agricultural production systems as they relate to insect pest management, emphasizing an ecologically-based, integrated approach to managing arthropod pests of agronomic and horticulture crops. prereq: CFANS3333 OR CFANS3001, General Biology (BIOL 1009) or equivalent, or instructor consent. A course in insect biology will be useful but is not required.

ENT 3925. Insects, Aquatic Habitats, and Pollution. (3 cr.; A-F or Audit; Every Fall) Effects differing classes of pollutants have on insects that are aquatic. Insect life-cycle dynamics, trophic guilds, community structure. Hypotheses to explain community structure in streams, rivers, wetlands, ponds, lakes, reservoirs. Organic pollution, eutrophication, heavy metal pollution, runoff/siltation, acidification, thermal pollution. Changes in aquatic insect community structure. Designing/maintaining biological monitoring networks. prereq: [3005 or Biol 3407 or FW 2001], Jr or Sr or instr consent.

ENT 3021. Honey Bees and Insect Societies. (3 cr.; Student Option; Fall Odd Year) Natural history, identification, and behavior of honey bees and other social insects. Evolution of social behavior, pheromones and communication, organization and division of labor, social parasitism. Lab with honey bee management and maintenance of other social bees for pollination. prereq: Biol 1009 or instr consent.

ENT 3921. Honey Bees and Insect Societies. (3 cr.; Student Option; Fall Odd Year) Natural history, identification, and behavior of honey bees and other social insects. Evolution of social behavior, pheromones and communication, organization and division of labor, social parasitism. Lab with honey bee management and maintenance of other social bees for pollination. prereq: Biol 1009 or instr consent.

ENT 4096. Professional Experience Program: Internship. (1-3 cr.; S-N or Audit; Every Fall, Spring & Summer) Professional experience in entomology firms or government agencies through supervised practical experience; evaluative reports and consultations with faculty advisers and employers. prereq: COAFES jr or sr, complete internship contract available in COAFES Career Services before enrolling, UC only, instr consent.


ENT 5041. Insect Ecology. (3 cr.; Student Option; Fall Even Year) Synthetic analysis of the causes of insect diversity and of fluctuations in insect abundance. Focus on abiotic, biotic, and evolutionary mechanisms influencing insect populations and communities. prereq: Biol 5041 or EBB 5122 or instr consent.


ENT 5061. Insect Molecular Science. (2 cr.; Student Option; Periodic Fall & Spring) Molecular genetic techniques and their applications. Emphasizes insect species other than Drosophila. Application of genetic techniques to physiological processes. prereq: [5011, basic genetics course] or instr consent.

eutrophication, heavy metal pollution, runoff/ siltation, acidification, thermal pollution. Changes in aquatic insect community structure according to original literature sources for each class of pollutant. Biological monitoring networks, prereq: [3005, Biol 3407, FW 2001, EEB 4601] or instr consent

ENT 5121. Applied Experimental Design. (4 cr.; Student Option; Periodic Fall) Principles of designing and analyzing experiments, experimental design, and statistical analyses. Methods/procedures in generating scientific hypotheses. Organizing, initiating, conducting, and analyzing scientific experiments using experimental designs and statistical procedures. Offered with AGRO 5121. prereq: Stat 5021 or equiv or instr consent

ENT 5126. Spatial and Temporal Analysis of Ecological Data. (3 cr.; max 6 cr.; A-F or Audit; Spring Even Year) This course covers linear models (regression and ANOVA) and extensions to temporal data and spatial point processes, lattice/areal data, and geostatistics. The course bridges sufficient theory to understand why contending with spatiotemporal dependence is important with enough application to make students confident in their own data analyses.

ENT 5275. Medical Entomology. (3 cr.; Student Option; Every Fall) Biology of arthropod vectors of human disease. Emphasizes disease transmission and host, vector, and pathogen interactions. prereq: instr consent

ENT 5341. Biological Control of Insects and Weeds. (3-4 cr.; Student Option; Periodic Spring) Biological control of arthropod pests and weeds. Analysis of relevant ecological theory and case studies; biological control agents. Lab includes natural enemy identification, short experiments, and computer exercises. prereq: 3001, Biol 1009, EEB 3001 or grad

ENT 5361. Aquatic Insects. (4 cr.; A-F or Audit; Every Spring) Taxonomy, natural history of aquatic insects including their importance in aquatic ecology, water resource management, recreation, and conservation. Emphasizes family-level identification of immatures/adults. Field trips scheduled to local aquatic habitats. A collection is required. prereq: instr consent

ENT 5900. Basic Entomology. (1-6 cr.; max 12 cr.; Student Option; Every Fall & Spring) For graduate students who need to make up certain deficiencies in their biological science background. prereq: instr consent

ENT 5910. Special Problems in Entomology. (1-6 cr.; max 10 cr.; Student Option; Every Fall & Spring) Individual field, lab, or library studies in various aspects of entomology. prereq: instr consent

ENT 5920. Special Lectures in Entomology. (1-4 cr.; max 12 cr.; S-N only; Every Fall & Spring) Lectures or labs in special fields of entomological research. Given by visiting scholar or regular staff member.

ENT 8006. Supervised Laboratory or Extension Teaching Experience. (1-3 cr.; A-F or Audit; Every Fall, Spring & Summer) Training/experience conducting lab or extension based educational activities in Entomology. Students select a faculty member to serve as their sponsor, and develop lecture outlines or instructional aids such as web sites, web-based training sites, print materials, demonstration aids, and demonstration projects. Students prepare/conduct lab or extension presentations. Overviews of web-based instructional aids. prereq: 3005 or equiv or instr consent

ENT 8051. Toxicology. (2 cr.; Student Option; Periodic Fall) Chemistry, mode of action of conventional insecticides. Insect growth regulators, microbial pesticides. Transgenic viruses, genetically modified plants. Offered alternate years. prereq: [5011, organic, inorganic] chem courses, biochem course or instr consent

ENT 8061. Scientific Communication and Ethics. (1 cr.; S-N or Audit; Every Fall) Students develop/use critical elements of scientific communication, within an ethical framework. Elements in writing scientific manuscripts and research proposals. Oral communication for scientific, outreach, and classroom presentations.

ENT 8200. Colloquium in Social Insects. (1-3 cr.; Student Option; Periodic Spring) Current research on bees, wasps, ants, and termites. Student critiques and research reports. prereq: 3020 or 3200

ENT 8210. Colloquium in Insect Evolution. (1-3 cr.; Student Option; Periodic Fall) Research issues in systematics and evolution. Comparative biology, biogeography, and molecular evolution. Students may re-enroll as topics alternate. Students critique papers from primary literature. prereq: 5371 or instr consent

ENT 8240. Colloquium in Insect Ecology. (1-2 cr.; Student Option; Every Fall & Spring) Advanced topics. prereq: 5041 or 5045 or instr consent

ENT 8300. Graduate Seminar. (1-2 cr.; S-N or Audit; Every Fall & Spring) Oral and written reports on and discussion by students of selected topics from current literature. prereq: instr consent

ENT 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ENT 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

ENT 8594. Research in Entomology. (1-16 cr.; max 96 cr.; S-N or Audit; Every Fall & Spring) Directed research.

ENT 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ENT 8777. Thesis Credits: Master's. (1-18 cr.; max 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; minimum of 10 cr required [Plan A only]

ENT 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Entrepreneurship (ENTR)

ENTR 6010. Opportunity Identification and Evaluation. (4 cr.; A-F only; Periodic Fall) Developing the ability to spot, select, and evaluate business opportunities for new firm startups and corporate ventures. Core concepts, models, guidelines. Acquisition of practical knowledge/skill through direct observation, interaction, and practice. prereq: MBA student


ENTR 6021. Preparing and Implementing the Business Plan. (2 cr.; max 4 cr.; A-F only; Every Fall & Spring) Students work collaboratively to develop/ implement business plans for a business venture launch via startup or acquisition. Student teams present aspects of their business plan: “elevator pitch,” company mission, product/service value proposition, market segmentation, competitive analysis, strategy, marketing plan, financial projections. Students comment on each other’s plans. prereq: MBA student

ENTR 6023. Financing Business Ventures. (4 cr.; A-F only; Every Spring & Summer) Translating a business plan into a financing plan. Developing alternative financing. Choosing a plan, based on financial/nonfinancial criteria. Types of non-Fortune 1,000-type businesses as financiers view them. U.S. financial institutions: what they finance, their financing criteria. Financing instruments used in the United States, when/why to use them. Cases, exercises, guest speakers. prereq: MBA student

ENTR 6036. Managing the Growing Business. (2 cr.; A-F only; Every Spring & Summer) Challenges posed by rapid growth/change in independent startups. Infrastructure
development, radical changes in strategy, continuous needs for substantial additional resources. Emphasizes analysis of factors accelerating/impeding growth and review/creation of growth strategies. Integration of concepts from strategy, operations, marketing, finance, and human resource management. prereq: MBA student

ENTR 6037. Corporate Venturing. (2 cr.; A-F or Audit; Every Fall & Summer) Entrepreneurial role of top management in maintaining/increasing stakeholder value through formation/acquisition of new businesses, products, or markets within established corporations. Strategic role of corporate venturing. Cases, guest speakers, group projects. prereq: MBA student

ENTR 6041. Initiating New Product Design and Business Development. (2-4 cr. [max 10 cr.]; A-F only; Every Fall & Spring) Product development projects sponsored by business organizations. Supervision by faculty advisor/executives from sponsoring company. Lectures, workshops, guest speakers, team meetings, company visits, projects. prereq: MBA student

ENTR 6042. Implementing New Product Design and Business Development. (4 cr. [max 8 cr.]; A-F only; Every Spring) Implementation of product development projects begun in the Fall term in Entr 6041. Projects are sponsored by businesses. Supervision by faculty advisors and sponsoring executives. Lectures, workshops, guest speakers, team meetings, company visits, and projects. prereq: MBA student

ENTR 6080. Technology Commercialization for Scientists and Engineers. (1-2 cr.; S-N or Audit; Periodic Fall) Theoretical knowledge and real-world examples of skills/knowledge required to commercialize scientific discoveries/engines of innovation. Commercializing technology process, including starting/running a new company. prereq: Registered Ph.D. student in [IT or College of Biological Sciences or College of Agriculture, Food and Environmental Sciences or Medical School], instr consent


ENTR 6087. New Product Design and Business Development. (6 cr.; A-F only; Periodic Fall, Spring & Summer) Nine month project course in designing new products and business plans through prototype stage. Teams of CSOM and CSE students work with personnel from sponsoring organizations. Weekly lectures and team meetings. Formal design reviews and presentations. prereq: Grad student in CSOM or CSE or instr consent

ENTR 6089. Research Seminar in Entrepreneurial Studies. (6 cr.; A-F only; Periodic Fall) Research into populations of individual new and growing businesses. Evaluation of existing studies. development of research questions; selection of research methods, information collection and analysis. Final report suitable for publication. prereq: CSOM grad student or instr consent

ENTR 6090. Topics in Entrepreneurship. (2-4 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Selected topics in value creation; in business formation, growth, restructuring; in social and economic impact of new businesses, and entrepreneurship and public policy. prereq: CSOM grad student or instr consent

Environment Sci, Policy, Mgmt (ESPM)

ESPM 1001. Freshmen Orientation to Environmental Sciences, Policy, and Management. (1 cr.; A-F or Audit; Every Fall) Academic planning, ESPM careers, liberal education requirements, internships. Building relationships with other students/faculty, student life, information technology, critical computer skills. New freshmen.

ESPM 1002. Transfer Orientation Seminar. (1 cr.; A-F or Audit; Every Fall) Academic planning, ESPM careers, liberal education requirements, internships. Building relationships with other students/faculty, student life, information technology, critical computer skills. Transfer and continuing students.


ESPM 1012H. Environmental Science and Society. (ENV; 3 cr.; A-F only; Every Spring) Selection of current environmental issues affecting our daily lives. Evaluate the scientific and social approaches necessary to resolve environmental issues. Students explore how everything we do affects the environment in different ways.


ESPM 1425. Introduction to Weather and Climate. (ENV,PHYS; 4 cr.; Student Option; Every Fall & Spring) pre-calculus introduction to the nature of the atmosphere and its behavior. Topics covered include atmospheric composition, structure, stability, and motion; precipitation processes, air masses, fronts, cyclones, and anticyclones; general weather patterns; meteorological instruments and observation; weather map analysis; and weather forecasting.


ESPM 2401. Environmental Education/Interpretation. (3 cr.; Student Option; Every Fall) Foundational view of environmental education/interpretation, its history, theories, and methodologies. Practical skills for teaching in the outdoors. Educational content, state/national standards, effective pedagogy for informal learning environments.

ESPM 3000. Seminar on Current Issues for ESPM. (1 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) Environmental issues students will have to address in their future careers. Small group discussion, in-depth/focused intellectual debate. Topics depend on faculty selection or student interest. prereq: Jr

ESPM 3011W. Ethics in Natural Resources. (WI,CIV; 3 cr.; Student Option; Every Fall & Spring) Normative/professional ethics, and leadership considerations, applicable to managing natural resources and the environment. Readings, discussion.

ESPM 3012. Statistical Methods for Environmental Scientists and Managers. (MATH; 4 cr.; A-F or Audit; Every Spring) Introduction to statistical principles, foundations, and methods for examining data and drawing conclusions. Regression modeling of relationships in environmental and natural resource science and management problems. prereq: Two yrs of high school math

ESPM 3015. Invasive Plants and Animals. (3 cr.; Student Option; Fall Odd Year) Overview of invasive plants/animals in North America and around the world. A range of taxa are covered along with their impact and
approaches to control. Readings, discussions, and lectures from experts on topics such as invasion theory and real world management.


ESPM 3072. Site Assessment for Ecological Restoration. (1 cr.; Student Option; Every Fall, Spring & Summer) Introduction to site assessment/goal-setting for ecological restoration projects. Topography, soil, land use, hydrology, vegetation, biodiversity. Pre-requisite for other courses in series.

ESPM 3073. Designing and Using Seed Mixes in Restoration. (1 cr.; Student Option; Every Fall, Spring & Summer) Various steps of restoration including designing seed mixes, preparing planting sites, obtaining seed, installing seed, caring for establishing vegetation.

ESPM 3074. Designing, Installing, & Managing Native Plantings in Restoration. (1 cr.; Student Option; Every Fall, Spring & Summer) Successful steps for designing, installing, managing native species planting project.

ESPM 3075. Vegetation Management of Restored Ecosystems. (1 cr.; Student Option; Every Fall, Spring & Summer) Re-establishing natural disturbances, controlling invasive species.

ESPM 3076. Monitoring Ecological Restorations. (1 cr.; Student Option; Every Fall, Spring & Summer) How to design efficient/effective monitoring program that yields information helpful for ongoing restoration management decisions/problem solving.

ESPM 3102. Managing International Natural Resources Programs and Projects: Forests, Water and Land Use. (3 cr.; A-F only; Every Spring) Global hot spots where biodiversity is threatened by multiple stressors (zoonotic disease, rapid growth, opening of new frontiers, climate change). Strategies to address complex situations. Interdisciplinary applied skills, best management practices, hands-on techniques of international organizations.

ESPM 3108. Ecology of Managed Systems. (ENV; 3 cr.; Student Option; Every Fall) Ecology of ecosystems that are primarily composed of managed plant communities, such as managed forests, field-crop agroecosystems, rangelands and nature reserves, parks, and urban open-spaces. Concepts of ecology and ecosystem management. Prereq: BIOL 1001 or BIOL 1009 or HORT 1001 or instr consent


ESPM 3131. Environmental Physics. (3 cr.; A-F or Audit; Every Spring) Concepts and principles of classic and modern physics applied to environmental problems arising from interaction between humans and the natural environment. Forms of pollution (e.g., land, water, air). Transport mechanisms. Anthropogenic greenhouse gas emissions. Global climate change. Social issues related to environmental problems. Prereq: Phys 1101

ESPM 3202W. Environmental Conflict Management, Leadership, and Planning. (WI; 3 cr.; A-F or Audit; Every Spring) Negotiation of natural resource management issues. Use of collaborative planning. Case study approach to conflict management, strategic planning, and building leadership qualities. Emphasizes analytical concepts, techniques, and skills.

ESPM 3211. Survey, Measurement, and Modeling for Environmental Analysis. (3 cr.; Student Option; Every Spring) Survey, measurement, modeling concepts/methods for study of natural resources/ environmental issues. Emphasizes survey design for data collection, estimation. Analysis for issues encompassing land, water, air, vegetation, animal, soil, human/social variables. Prereq: MATH 1031 or MATH 1051. [3012 or FW 4001 or STAT 3011 or SOC 3811], computer competency

ESPM 3221. Soil Conservation and Land-Use Management. (3 cr.; Student Option; Every Spring) This course is designed to provide a local and global historical perspective of soil erosion (causes and consequences); develop a scientific understanding of soil erosion processes; and relates various soil conservation and land-use management strategies to real-world situations. Basics of soil erosion processes and prediction methods will be the fundamental building blocks of this course. From this understanding, we will discuss policies and socioeconomic aspects of soil erosion. Lastly, we will focus on effective land-use management using natural resource assessment tools. Case studies and real-world and current events examples will be used throughout the course to relate course material to experiences. Prereq: SOIL 2125 or instr consent

ESPM 3241W. Natural Resource and Environmental Policy. (CIV, WI, SOCS; 3 cr.; Student Option; Every Spring) Political processes in management of the environment. How disagreements are addressed by different stakeholders, private-sector interests, government agencies, institutions, communities, and nonprofit organizations.

ESPM 3245. Sustainable Land Use Planning and Policy. (ENV; 3 cr.; A-F or Audit; Every Fall) Policies affecting land use planning at local, state, and federal levels. Ecosystem and landscape scale planning. Collaborative and community-based approaches to planning for ecological, social, and economic sustainability. Class project applies interdisciplinary perspectives on planning and policy, including information gathering techniques, conservation planning tools, and evaluation of planning options.

ESPM 3251. Natural Resources in Sustainable International Development. (GP; 3 cr.; A-F or Audit; Every Fall) International perspectives on resource use and sustainable development. Integration of natural resource issues with social, economic, and policy considerations. Agriculture, forestry, agroforestry, non-timber forest products, water resources, certification, development issues. Global case studies. Impact of consumption in developed countries on sustainable development in lesser developed countries.

ESPM 3261. Economics and Natural Resources Management. (ENV, SOCS; 4 cr.; A-F or Audit; Every Spring) Microeconomic principles, their application to natural resource management problems. Tools to address market failure, project analysis. Economic/financial considerations. Benefit/cost analysis. Valuation/assessment methods for property/market/non-market benefits. Planning/management problems. Managing renewable natural resources. Case studies. Prereq: MATH 1031 or MATH 1051 or MATH 1142 or MATH 1155 or MATH 1271 or ESPM 3012 or STAT 3011 or SOC 3811 or equiv

ESPM 3271. Environmental Policy, Law, and Human Behavior. (CIV, SOCS; 3 cr.; A-F or Audit; Every Fall) What is necessary to achieve sustainable societies. What influences societal deliberation/decisions about environmental issues. How our behaviors affect natural systems. Key theoretical concepts of environmental social psychology and political science. How people respond to policies, using theoretical concepts from social psychology and social norms; applying these ideas to specific environmental problems and ethical debates.

ESPM 3480. Topics in Natural Resources. ( ; 1-4 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

ESPM 3575. Wetlands. (; 3 cr.; Student Option; Every Spring)
Freshwater wetland classification, wetland biota, current/historic status of wetlands, value of wetlands. National, regional, Minnesota wetlands conservation strategies, ecological principles used in wetland management.

ESPM 3601. Sustainable Housing--Community, Environment, and Technology. (TS; 3 cr.; A-F or Audit; Every Fall & Spring)
How sustainable housing practices build community. How community growth has impacted the environment and how natural events impact our communities. Science and technology required to build high performance houses.

ESPM 3602. Regulations and Corporate Environmental Management. (; 3 cr.; A-F only; Every Spring)
Concepts/issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels. prereq: APEC 1101 or ECON 1101 or 3261W

ESPM 3603. Environmental Life Cycle Analysis. ( ; 3 cr.; A-F only; Every Fall)
Concepts/issues relating to inventory, subsequent analysis of production systems. Production system from holistic point of view, using term commonly used in industrial ecology: "metabolic system."

ESPM 3604. Environmental Management Systems and Strategy. (; 3 cr.; A-F only; Every Fall)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

ESPM 3605. Recycling: Extending Raw Materials. (TS; 3 cr.; A-F only; Every Spring)
Basic principles of recycling and its role in raw materials utilization, energy, and the environment. Recycling processes for commonly recycled materials, products, and their properties and environmental implications of recycling.

ESPM 3607. Natural Resources Consumption and Sustainability. (GP; 3 cr.; A-F only; Every Spring)
Current world trends for industrial raw materials; environmental/other tradeoffs related to options for satisfying demand/needs; global and systemic thinking; provides a framework for beginning a process of thinking critically about complex environmental problems' potential solutions in a diverse global economy.

ESPM 3612W. Soil and Environmental Biology. (WI; 4 cr.; Student Option; Every Fall)
Properties of microorganisms that impact soil fertility, structure, and quality. Nutrient requirements of microbes and plants and mineral transformations in biogeochemical cycling. Symbiotic plant/microbe associations and their role in sustainable agricultural production. Biodegradation of pollutants and bioremediation approaches. prereq: Biol 1009 or equiv, Chem 1021 or equiv; SOIL 2125 recommended

ESPM 3703. Agroforestry in Watershed Management. (3 cr.; Student Option; Spring)
Biological, physical, and environmental attributes of agroforestry as pertains to watershed management. Coupling production with watershed protection benefits. Implications for policy, economics, and human dimensions in sustainable development. Examples, case studies from North America and from developing countries.

ESPM 3777. Climate Change- Physics, Myths, Mysteries, and Uncertainties. (3 cr.; A-F only; Every Spring)
Climate variations are the norm; not the exception. The geological and archaeological records are rich with evidence of a climate system that is dynamic and non-steady state. Yet, we face the challenges of understanding the complexities of this system in order to manage our natural resources and to prepare wisely for the future. This class examines the basic theory and Physics behind the atmospheric greenhouse effect and radiative forcings in the climate system. The Myths, Mysteries, and Uncertainties about the climate record and feedback processes operating in the Earth-Atmosphere system will be examined. Simple models will be used to demonstrate the atmospheric greenhouse effect. Sophisticated numerical weather models, such as the Regional Weather and Forecast Chemistry (WRF-CHEM) model, will be used to demonstrate climate predictions and biophysical feedback processes. We will also study some of the classic Warming Papers that provide the physical scientific basis for the anthropogenic greenhouse effect. Finally, we will explore the uncertainties related to climate predictions and how scientists use fingerprint techniques to diagnose natural versus anthropogenic climate signals. There is no prerequisite required for this course, but first year calculus and one other first year science course is recommended.

ESPM 4021W. Problem Solving: Environmental Review. (WI; 4 cr.; Student Option; Every Spring)
Roles of governmental agencies, consultants, and private citizens in EIS process. Students read EIS/EAW, analyze their content/scope, and prepare an EAW and EIS according to Minnesota EOB guidelines. prereq: ESPM 2021 and jr or sr

ESPM 4041W. Problem Solving for Environmental Change. (WI; 4 cr.; A-F or Audit; Every Fall)
Capstone course. Students working with a team on a real world project related to selected track, gather/analyze data relevant to client's objectives, and make recommendations for future use. Students produce a final written report and formal presentation, and present findings to client group.

ESPM 4061W. Water Quality and Natural Resources. (ENV, WI; 3 cr.; Student Option; Every Fall)
Water quality decision making. International focus. Ecology of aquatic ecosystems, how they are valuable to society and changed by landscape management. Case studies, impaired waters, TMDL process, student engagement in simulating water quality decision making.

ESPM 4093. Directed Study. ( ; 1-7 cr.; max 20 cr.; Student Option; Every Fall, Spring & Summer)
Research, readings, and instruction. prereq: instr consent

ESPM 4094. Directed Research. ( ; 1-7 cr.; Student Option; Every Fall, Spring & Summer)
Research under the direction of department faculty. prereq: instr consent

ESPM 4096. Professional Experience Program: Internship. ( ; 1 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Students create oral/written report based on paid or volunteered work or field experience. prereq: CFANS undergrad, instr consent, completed internship contract

ESPM 4216. Contaminant Hydrology. (3 cr.; A-F or Audit; Every Fall)
Principles of contaminant transport in percolate solution and in overland flow. Hydrologic cycle, percolation/runoff processes, contaminant transport, leachate sampling methods, remediation technologies, scale effects on runoff water quality, tillage technologies, control of sediment/chemical losses. Discussions mostly descriptive, but involve some computations.

ESPM 4242. Methods for Environmental and Natural Resource Policy Analysis. ( ; 3 cr.; A-F only; Fall Even Year)
Methods, formal/informal, for analyzing environmental/natural resource policies. How to critically evaluate policies, using economic/non-economic decision-making criteria. Application of policy analysis to environmental/natural resource problems. Recognizing politically-charged environment in which decisions occur, use, management, and protection of resources often occur. Prereqs: ESPM 3241W or ESPM 3271 and ESPM 3261, undergrads with jr or sr standing.

ESPM 4256. Natural Resource Law and the Management of Public Lands and Waters. ( ; 3 cr.; A-F or Audit; Every Spring)

ESPM 4295W. GIS in Environmental Science and Management. (WI; 4 cr.; A-F or Audit; Every Fall)
Application of geographic information science and technologies (GIS) in complex
environmental problems. Students gain experience in spatial data collection, database development, and spatial analysis, including GNSS and field attribute collection, image interpretation, and existing data fusion, raster/vector data integration and analysis, information extraction from LiDAR data, DEM conditioning and hydrologic analysis, neighborhood analysis, bulk processing and automation, and scripting. Problems vary depending on topics, often with extra-University partners. prereq: FNRM 3131 or Geog 3561 or instr consent

ESPM 4601. Environmental Pollution. (3 cr.; Student Option; Every Spring) This course uses the principles of chemistry, microbiology, physics, and toxicology to understand the fate and behavior of environmental contaminants and the pollution of soils, surface waters, groundwater, and sediments. The course is structured around a semester-long risk assessment project that provides a framework for integrating concepts of pollution, contaminant movement, contaminant degradation, human health risk, ecological risk, risk mitigation, environmental remediation processes, and interactions among them. The history of federal regulations concerning environmental contamination is presented in the context of the major episodes of environmental pollution that motivated legislative action. prereq: SOIL 2125, CHEM 1061 and 1062 or equiv, or permission

ESPM 4607. Industrial Biotechnology and the Environment. (3 cr.; A-F only; Every Spring) Biotechnology pertaining to biobased products development, their environmental impact. prereq: BIOL 1009, CHEM 1021


ESPM 5015. Invasive Plants and Animals. (3 cr.; Student Option; Fall Odd Year) Overview of invasive plants/animals in North America and around the world. A range of taxa are covered along with their impact and approaches to control. Readings, discussions, and lectures from experts on topics such as invasion theory and real-world management.

ESPM 5031. Applied Global Positioning Systems for Geographic Information Systems. (3 cr.; A-F or Audit; Every Spring) GPS principles, operations, techniques to improve accuracy. Datum, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/carryer phase GPS used in exercises. GPS handheld units, PDA based ArcPad/GPS equipment. Transferring field data to/from desktop systems, integrating GPS data with GIS. prereq: Grad student or instr consent

ESPM 5061. Water Quality and Natural Resources. (3 cr.; Student Option; Every Fall & Spring) Recent literature in field. Complements 4061. Ecology of aquatic ecosystems, how they are valuable to society and changed by landscape management. Case studies, impaired waters, TMDL process, student engagement in simulating water quality decision making.

ESPM 5071. Ecological Restoration. (4 cr.; Student Option; Every Fall) Ecological/physiological concepts for revegetation of grasslands, wetlands, forests, and landscapes. Plant selection, stand establishment/evaluation. State/federal programs that administer restoration/reclamation. Field trips. prereq: [One college course in ecology, one college course in [plant science or botany]] or instr consent

ESPM 5102. Managing International Natural Resources Programs and Projects: Forests, Water and Land Use. (3 cr.; A-F only; Every Spring) Global hot spots where biodiversity is threatened by multiple stressors (zoonotic disease, rapid growth, opening of new frontiers, climate change). Strategies to address complex situations. Emphasis on learning interdisciplinary applied skills, management practices, hands-on techniques.

ESPM 5108. Ecology of Managed Systems. (4 cr.; A-F or Audit; Every Fall) Analysis of functioning of ecosystems primarily structured by managed plant communities. Managed forests, field-crop agroecosystems, rangelands, aquatic systems. Structure-function relations. Roles of biodiversity in productivity, resource-use efficiency, nutrient cycling, resilience. Emerging principles for design of sustainable managed ecosystems, provision of ecological services. prereq: Sr or grad student

ESPM 5111. Hydrology and Water Quality Field Methods. (3 cr.; A-F or Audit; Every Spring) Integrates water quality, surface/groundwater hydrology. Case studies, hands-on field data collection, calculations of hydrological/water quality parameters. Meteorological data, snow hydrology, stream gauging, well monitoring, automatic water samplers. Designing water quality sampling program. Geomorphology, interception, infiltration. prereq: Grad student or instr consent


ESPM 5211. Survey, Measurement, and Modeling for Environmental Analysis. (3 cr.; Student Option; Every Spring) Introduction to survey, measurement, and modeling concepts/methods for study of natural resources and environmental issues. Emphasizes survey design for data collection, estimation, and analysis for issues encompassing land, water, air, vegetation, animal, soil, and human/social variables.

ESPM 5241. Natural Resource and Environmental Policy. (3 cr.; Student Option; Every Spring) Political processes at play in management of environment and how disagreements are addressed by different stakeholders, private-sector interests, government agencies and institutions, communities, and nonprofit organizations. prereq: Grad student or instr consent

ESPM 5242. Methods for Environmental and Natural Resource Policy Analysis. (3 cr.; A-F only; Fall Even Year) Methods, formal and informal, for analyzing environmental and natural resource policies. How to critically evaluate policies, using economic and non-economic decision-making criteria. Application of policy analysis principles/concepts to environmental/natural resource problems. Recognizing politically-charged environment in which decisions over use, management, and protection of these resources often occur. prereq: grad student

ESPM 5245. Sustainable Land Use Planning and Policy. (3 cr.; A-F or Audit; Every Fall) Planning theories, concepts, and constructs. Policies, processes, and tools for sustainable land use planning. Scientific/technical literature related to land use planning. Skills needed to participate in sustainable land use planning.

ESPM 5251. Natural Resources in Sustainable International Development. (3 cr.; A-F or Audit; Every Fall) International perspectives on resource use in developing countries. Integration of natural resource issues with social, economic, and policy considerations. Agriculture, forestry, agroecology, non-timber forest products, water resources, certification, development issues. Latin American case studies. prereq: Grad student or instr consent

ESPM 5256. Natural Resource Law and the Management of Public Lands and Waters. (3 cr.; A-F or Audit; Spring Odd Year) This course is intended to provide non-law students with an understanding of the role of the judiciary in the management of public lands and public waters. The course will examine Constitutional provisions affecting the management of public resources, the concept of property rights, major principles of water law, the role of the legal system in environmental review, the scope of legal authority granted to administrative agencies, and limitations of private property rights to protect public lands and public waters. The class will introduce students to the concepts of legal reasoning including case synthesis and analysis. The class will be taught using a combination of lecture, guest lectures, written exercises and class participation. prereq: grad student

ESPM 5261. Economics and Natural Resources Management. (4 cr.; A-F or Audit; Every Spring)

ESPM 5295. GIS in Environmental Science and Management. (4 cr.; A-F or Audit; Every Fall) Application of geographic information science and technologies (GIS) in complex environmental problems. Students gain experience in spatial data collection, database development, and spatial analysis, including GNSS and field attribute collection, image interpretation, and existing data fusion, raster/vector data integration and analysis, information extraction from LiDAR data, DEM conditioning and hydrologic analysis, neighborhood analysis, bulk processing and automation, and scripting. Problems vary depending on topics, often with extra-University partners. *Please note that students should have completed a semester-long, introductory lab/lecture GIS course at the graduate or undergraduate level before enrolling in this course, e.g., FNRM 5131. We do not require any given course because students come from varied universities and backgrounds. That said, we assume a knowledge commensurate with a comprehensive introductory course. Students seeking a first course are directed to FNRM 5131. If you have questions regarding your capabilities, please contact the instructor prior to enrolling.

ESPM 5480. Topics in Natural Resources. (1-4 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) This course examines the interactions between the atmosphere and the Earth's surface. We will discuss the principles of the surface energy and radiation balance, air motion in the atmospheric boundary layer, land surface parameterization for climate models, boundary layer budgets, and field research methods. The course aims to achieve exemplary learning through hands-on activities and examining recent field studies conducted in natural and managed ecosystems. prerequisites: MATH 1271, PHYS 1201, STAT 3011, [inistr consent]

ESPM 5480. Topics in Natural Resources. (1-4 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) Lectures by visiting scholar or regular staff member. Topics specified in class schedule.

ESPM 5555. Wetland Soils. (3 cr.; A-F or Audit; Every Fall) Morphology, chemistry, hydrology, formation of mineral/organic soils in wet environments. Soil morphological indicators of wet conditions, field techniques of identifying hydric soils for wetland delineations. Peatlands. Wetland benefits, preservation, regulation, mitigation. Field trips, lab, field hydric soil delineation project. prerequisite: SOIL 1125 or 2125 or equiv or instr consent; concurrent registration is required (or allowed) in SOIL 4511 recommended.

ESPM 5575. Wetlands. (3 cr.; Student Option; Every Spring) Freshwater wetland classification, wetland biota, current/historic status of wetlands, value of wetlands. National, regional, Minnesota wetlands conservation strategies. Ecological principles used in wetland management. prerequisite: 3575, [or grad student or instr consent]


ESPM 5602. Regulations and Corporate Environmental Management. (3 cr.; A-F only; Every Spring) Concepts, major issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels. prerequisites: APEC 1101 or ECON 1101

ESPM 5603. Environmental Life Cycle Analysis. (3 cr.; A-F only; Every Fall) Concepts, major issues relating to inventory and subsequent analysis of production systems. Production system from holistic point of view, using term commonly used in industrial ecology: "the metabolic system." prerequisites: [Math 1142 or Math 1271, Math 1282], [Econ 1101 or ApEc 1101]

ESPM 5604. Environmental Management Systems and Strategy. (3 cr.; A-F only; Every Fall) Environmental problems such as climate change, ozone depletion, and loss of biodiversity.


ESPM 5607. Industrial Biotechnology and the Environment. (3 cr.; A-F only; Every Spring) Biotechnology pertaining to biobased products development and their environmental impact. prerequisite: BIOL 1009, CHEM 1021

ESPM 5703. Agroforestry in Watershed Management. (3 cr.; Student Option; Spring Every Year) Biological, physical, and environmental attributes of agroforestry as pertains to watershed management. Coupling production with watershed protection benefits. Implications for policy, economics, and human dimensions in sustainable development. Examples/case studies from North America and developing countries. prerequisite: Grad student or instr consent


ESPM 5620. Drug Metabolism and Disposition. (3 cr.; A-F or Audit; Spring Even Year) Oxidative/conjugative enzymes systems involved in human drug metabolism/disposition. Various in vitro models used to evaluate drug metabolism or chemical entity, pros/cons of each. Factors involved in conducting in vivo studies. Components used to predict in vivo drug disposition from in vivo studies. prerequisites: Grad student or instr consent

ECP 5220. Regulatory Issues in Drug Research. (2 cr.; Student Option; Every Fall) Regulatory issues encountered in conducting drug research trials. Performing different aspects of clinical trials. Lectures, readings, small group discussions, homework assignments. prerequisite: ECP grad student or Pharm.D. professional student or instr consent

ECP 5290. Clinical Clerkship. (1-8 cr.; max 16 cr.; Student Option; Every Fall) Supervised study of pharmaceutical services at University of Minnesota Medical Center, Fairview or affiliated institutions. prerequisite: Grad experimental and clinical pharmacology

ECP 5620. Drug Metabolism and Disposition. (3 cr.; A-F or Audit; Spring Even Year) Oxidative/conjugative enzymes systems involved in human drug metabolism/disposition. Various in vitro models used to evaluate drug metabolism or chemical entity, pros/cons of each. Factors involved in conducting in vivo studies. Components used to predict in vivo drug disposition from in vivo studies. prerequisites: Grad student or instr consent

ECP 5993. Directed Study in Experimental and Clinical Pharmacology. (1-4 cr.; max 8 cr.; Student Option; Every Fall & Spring) Student working with faculty member designs a directed study course, including a complete syllabus, appropriate time commitment, and workload for number of credits.

ECP 5994. Directed Research in Experimental and Clinical Pharmacology. (1-4 cr.; Student Option; Every Fall & Spring) Student works with faculty adviser to design a scientific research project.

ECP 8100. Seminar. (1-2 cr.; max 16 cr.; Student Option; Every Fall & Spring) Selected topics in experimental/clinical pharmacology. prerequisite: ECP grad student or instr consent

ECP 8200. Research Problems. (1-8 cr.; max 16 cr.; Student Option; Every Fall, Spring & Summer) Individually designed research experience directed at contemporary problems related to drug use. prerequisite: Grad SAPC major (ECP Track) or instr consent

ECP 8210. Clinical Therapeutics. (3 cr.; Student Option; Periodic Fall) Topics in clinical pharmacology that illustrate continuum of pathophysiology of a disease

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
state, its contemporary treatment, problems or controversial issues with treatment approaches, strategies to advance therapy. Lectures, readings. prereq: SACP grad major in ECP track or instr consent

ECP 8220. Experimental and Clinical Pharmacology. (3 cr.; Student Option; Every Fall) Theory of advanced methodologies, applications, and evaluation techniques used to determine efficacy/toxicity of new drug therapies. Techniques for collecting/evaluating data. prereq: SACP grad major (ECP track) or instr consent

ECP 8230. Principles of Clinical Pharmacology. (2 cr.; A-F only; Every Fall) Factors determining drug exposure, drug receptor pharmacology, drug response. Personalized medicine including drug interactions, obesity, age (geriatrics/pediatrics), critical illness, therapeutic evaluation, drug development. prereq: Grad student in Experimental and Clinical Pharmacology or instr consent

ECP 8290. Clinical Clerkship. (2 cr.; Student Option; Periodic Fall & Spring) Supervised study of pharmaceutical services at Fairview-University Medical Center or affiliated institutions. prereq: Grad SACP major in ECP track or instr consent

ECP 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) FTE: Master’s. Prereq: Master’s, student, advisor, and DGS consent.

ECP 8400. Pharmacometrics. (3 cr.; Student Option; Every Fall) Theory/application of contemporary methods for analysis of concentration-time data and exposure-response relationships. prereq: ECP grad major or instr consent

ECP 8410. Population Pharmacokinetic Modeling. (2 cr.; A-F or Audit; Every Spring & Summer) Theoretical background for using mixed effects model in population analysis. Building fixed/random effects into a pharmacostatistical model. Project allows students to become familiar with a contemporary population pharmacokinetic analysis program.

ECP 8420. Clinical Trial Simulation. (2 cr.; Student Option; Every Spring) Theory/application of contemporary methods of using simulations to design more efficient/informative clinical trials. prereq: ECP grad or instr consent

ECP 8430. Advances in Pharmacometrics Modeling and Simulation. (1 cr. [max 6 cr.]; S-N only; Every Fall & Spring) Modeling/simulation at interface between physiological/pharmacological processes. Current literature, discussion groups. Computer applications using relevant software programs. prereq: Grad student in ECP or PHM or instr consent

ECP 8440. Modeling Biologics. (2 cr.; A-F only; Periodic Fall & Spring) This course will develop computer skills to apply nonlinear regression models to describe the pharmacokinetics and pharmacodynamics of biologics. prereq: A course in basic pharmacokinetics; enrollment in the Experimental & Clinical Pharmacology or Pharmaceutics graduate program, or instructor consent

ECP 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) FTE: doctoral. Prereq: Doctoral student, adviser and DGS consent.

ECP 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

ECP 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credits: master's. prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

ECP 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credit: doctoral. prereq: Max 18 cr per semester or summer; 24 cr required

ECP 8900. Advanced Topics in Experimental and Clinical Pharmacology. (1-4 cr. [max 8 cr.]; Student Option; Every Fall & Spring) Topic varies depending on faculty teaching course. prereq: ECP grad program or instr consent

ECP 8992. Directed Readings in Experimental and Clinical Pharmacology. (1-2 cr. [max 4 cr.]; Student Option; Every Fall & Spring) TBD

ECP 8993. Directed Study in Experimental and Clinical Pharmacology. (1-4 cr.; Student Option; Every Fall & Spring) TBD

ECP 8994. Directed Research in Experimental and Clinical Pharmacology. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Directed research in experimental and clinical pharmacology. prereq: [Grad ECP, adviser, DGS] consent

Family Med & Community Health (FMCH)

FMCH 5345. Curriculum Design and Teaching Strategies for Medical Education I. (3 cr.; A-F or Audit; Every Spring) Identifying/developing course goals. Developing course, teacher, learner evaluations. Students must also take 5346, which follows immediately after 5345. prereq: concurrent enrollment in 5346, instr consent

FMCH 5346. Curriculum Design and Teaching Strategies for Medical Education II. (1 cr.; A-F or Audit; Summer Every Year) Taken with 5345. Practicum of lecture, demonstration, small-group discussion, clinical teaching, and computer-assisted instruction. Academic ethics, policies, copyright issues, tenure, academic freedom, problem-based learning. prereq: concurrent registration is required (or allowed) in 5345, instr consent

FMCH 5564. Family Practice Seminar. (1 cr. [max 9 cr.]; O-N or Audit; Every Fall & Spring) Knowledge, skills, and attitudes in biomedical and behavioral sciences that form foundation for academic discipline of family medicine; medical decision making, common problems and procedures, family theory and assessment, clinical pharmacy, human sexuality. prereq: MD or DO degree

FMCH 5565. Principles of Geriatrics II. (1 cr. [max 5 cr.]; P-N or Audit; Periodic Fall) Second in two-course sequence. Survey of major topics in geriatric medicine. Epidemiology, etiology, diagnosis, and treatment of major geriatric syndromes and illnesses. prereq: Medical School or dental school or GNP school graduate

FMCH 5950. Clinical Issues in Human Sexuality. (2 cr.; O-N or Audit; Every Fall & Spring) Assessment and treatment techniques pertaining to common sexual problems. prereq: Enrollment in health sci grad programs in CSPP, Psy, PubH, SW or FSoS or instr consent

FMCH 5955. Directed Study. (1-10 cr.; O-N or Audit; Every Fall, Spring & Summer) Studies on special topics as arranged between student and faculty. prereq: instr consent; qualified students may arrange for work on a tutorial basis

FMCH 7200. Introduction to Residency in Family Medicine. (2 cr.; H-N only; Every Fall, Spring & Summer) This 2-week elective is offered at all of the University of Minnesota-affiliated Twin Cities residency programs in Family Medicine, and select other local programs. This elective provides students the opportunity to experience the full spectrum of Family Medicine and Community Health at that program. All efforts will be made to place the student at the program of their choice. The student will work with Family Medicine faculty physicians and residents in all the facets of Family Medicine care including: office, inpatient hospital service, labor and delivery, overnight call, procedures and, where applicable, nursing home rounds or home visits.

FMCH 7500. Sub-internship in Family Medicine. (4 cr.; P-N only; Every Fall, Spring & Summer) This elective is offered at all the University of Minnesota-affiliated Twin Cities Residency Programs in Family Medicine and selected other local programs. This elective provides students the opportunity to experience the full...
Audit; Every Fall & Spring)

Program (RPAP): Pediatrics. Community-based elective with extensive pediatrics experience in a rural setting. prereq: 7501

FMCH 7507. Rural Physician Associate Program (RPAP): Otolaryngology. (2-4 cr.; P-N or Audit; Every Spring)

Community-based elective with extensive otolaryngology experience in a rural setting.

FMCH 7508. Rural Physician Associate Program (RPAP): Urology. (2-4 cr.; P-N or Audit; Every Fall, Spring & Summer)

Community-based elective with extensive urology experience in a rural setting.

FMCH 7509. Rural Physician Associate Program (RPAP): Primary Care Clerkship I. (4 cr.; H-N or Audit; Every Fall & Spring)

Community-based elective with extensive primary care experience in a rural setting. prereq: 7501

FMCH 7510. Rural Physician Associate Program (RPAP): Primary Care Clerkship II. (4 cr.; H-N or Audit; Every Fall, Spring & Summer)

Community-based elective with extensive primary care experience in a rural setting. prereq: 7509

FMCH 7511. Urban Community Ambulatory Medicine (UCAM). (4 cr.; H-N only; Every Fall, Spring & Summer)

UCAM provides 12 weeks of ambulatory continuity experience in an underserved urban community Family Medicine Clinic. UCAM expands the Family Medicine Clerkship exposure to patient diversity, low income, multicultural urban medicine, and community health. Students are required to attend the Family Medicine Clerkship/Primary Care Selective seminars as well as 4 UCAM seminars. From a scheduling point of view, UCAM combines the 8 weeks of Family Medicine Clerkship/Primary Care Selective with 4 extra weeks of elective credit. The principles of urban medicine will be blended throughout the 12 weeks, as will the project. Each student will participate in a community health project and complete a journal about his/her experience. The community health project ideally combines the EBM focus of the Family Medicine clerkship project with a longitudinal project. Prereq: FMCH 7600 and FMCH 7700

FMCH 7512. Urban Community Ambulatory Medicine (UCAM). (4 cr.; H-N or Audit; Every Fall, Spring & Summer)

Expands primary-care clerkship (PCC) into 16 weeks of primary care experience in one underserved urban clinic. Students attend PCC seminars during first eight weeks, followed by weekly seminars covering patient diversity, indigenous medicine, and community health. prereq: 7511, InMd 5508, InMd 7509

FMCH 7513. Rural Physician Associate Program (RPAP): Orthopaedic SurgeryRSU. (2-4 cr.; P-N or Audit; Periodic Fall & Spring)

Community-based elective with extensive orthopaedic surgery experience in a rural setting. prereq: Accepted into RPAP

FMCH 7515. RPAP: Emergency Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer) tbd

FMCH 7516. Research in Human Sexuality. (2-4 cr. [max 8 cr.]; H-N only; Every Fall, Spring & Summer)

This elective consists of clinical and/or laboratory research related to human sexuality in areas such as incest, rape, gender dysphoria, compulsive sexual behavior, sex offenses, and sexual dysfunction. It is adaptable to the specific interests of the student and faculty.

FMCH 7518. Inpatient Family Medicine. (2 cr.; H-N only; Every Fall, Spring & Summer)

Students will participate in the family medicine residency inpatient teaching service. This service consists of a variety of patients including pediatric, obstetric, geriatric, and other adult patients. Supervision and teaching are provided by a family medicine faculty who participates daily in didactic teaching, x-ray rounds, and hospital rounds. Members of the team include a medical student, first and second year resident, and the chief resident. These individuals share responsibility for patients on the service and perform initial histories and physicals, write daily orders and progress notes, complete discharge summaries, and communicate with consultants and family members. Students will also attend daily noon conferences. Call is required at some sites. Prereq: FMCH 7600 or FMCH 7523; and MED 7500

FMCH 7519. Clinical Practice of Occupational Medicine. (2-4 cr.; H-N or Audit; Every Fall, Spring & Summer)

Students perform complete occupational health history, set up basic problem-solving approaches to occupational health problems.

FMCH 7520. Rural Rotation in Family Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer)

This course is intended for students interested in observing and participating in Family Medicine in the rural setting. Students participate in patient care in the patient's home, in long-term facilities, in the doctor's office and in the hospital. Students observe close interrelationships between practicing physicians and the community.

FMCH 7521. Topics in Immigrant Health. (4 cr.; H-N only; Every Spring)

Course is designed to offer an intensive multidimensional exploration of immigrant health using clinical, multimedia, academic and on-line learning. The course will include an individualized in-depth project and an individualized learning plan will be developed between each student and the course director after assessing the student's experience, background and interest. This course will combine clinical experiences at a variety of sites which serve immigrant patients with text-based and web-based reading, on-line research, group and individual community visits and on-line and class discussions to provide students with an opportunity to study in-depth the issues that communities and methods by which those barriers are being overcome.

FMCH 7524. Rotation in Palliative Medicine and Hospice. (2 cr.; H-N only; Every Fall, Spring & Summer)
Introduces students to the field of palliative care and hospice medicine. Students will participate in patient care with hospice staff and palliative care physicians and other practitioners in the hospital, nursing home, clinic, and patient's homes. Students will directly work with interdisciplinary teams in their daily work, and spend time with practitioners in social work, nursing, spiritual health, music therapy, and physicians.

**FMCH 7525. Cardiovascular Medicine.** (2 cr.; H-N only; Every Fall & Spring) Students will participate in daily cardiology inpatient rounds. They will work 1:1 with the rounding cardiologist for the week. Responsibilities include the initial cardiology consultation and daily rounds on patients in the hospital. prereq: Med 7500

**FMCH 7526. Medicine and the Arts.** (2 cr.; P-N only; Every Fall) Students will work with the course directors to tailor a course of study that will immerse them in forms of art and creative expression (such as literature, film, visual art, music, etc.) that reflect--and are inspired by--the practice of medicine.

**FMCH 7527. Lesbian, Gay, Bisexual, and Transgender (LGBT) Health.** (2 cr.; P-N only; Every Fall) In this course, students will gain an understanding of health risks experienced by LGBT individuals and will practice assessing sexual orientation, gender identity, sexual health, and discussing specific health concerns and treatment options in order to become comfortable working with this population. Students will also hear from LGBT individuals themselves about their healthcare experiences and how they wish to be treated. In addition, physicians who are LGBT or transgender will talk about managing their professional and personal identities, as well as being “out” in the community and identifying as an LGBT-friendly healthcare provider.

**FMCH 7530. Preceptorship in Community Family Medicine.** (2 cr.; H-N only; Every Fall, Spring & Summer) This course is intended for students interested in pursuing family medicine as a career, or for students wishing to acquire a broadly-based clinical experience in primary care or a specific area of primary care medicine. Students will gain experience in the field of family medicine including exposure to the disciplines of primary care medicine, orthopaedic sports medicine, sports physical therapy, and athletic training.

**FMCH 7535. Community Health in Family Medicine.** (3-5 cr.; H-N or Audit; Every Fall, Spring & Summer) Individually designed outpatient rotation. Combines clinical work in urban setting with a series of experiences in the community. prereq: At least two six-week rotations in medicine or pediatrics or obstetrics or surgery

**FMCH 7537. Sports Medicine.** (4 cr.; H-N only; Every Fall & Spring) Students will gain experience in the field of sports medicine including exposure to the disciplines of primary care sports medicine, orthopedic sports medicine, sports physical therapy, and athletic training.

**FMCH 7538. Sports Medicine in Duluth.** (4 cr.; H-N only; Every Fall, Spring & Summer) This course is an opportunity for students interested in primary care or a musculoskeletal specialty to develop an appreciation for the role of sports medicine in his/her practice. The student will work closely with full-time sports medicine physicians and allied health providers, including physical therapists and athletic trainers.

**FMCH 7540. Sports Medicine: USA Soccer Cup.** (2 cr.; H-N only; Every Summer) Course held immediately prior to the start of the USA Soccer Cup Tournaments every July. This course consists of didactic lectures and hands on workshops focusing on sports medicine topics with an emphasis on soccer.

**FMCH 7544. Outpatient-HIV Management in Family Medicine.** (2 cr.; H-N only; Every Fall, Spring & Summer) The overall goal of this course is to familiarize the student with the many illnesses and complications of HIV disease, current Hepatitis C treatment, and some travel medicine. This includes the medical, psychological, social and economic problems which the HIV patient faces. The student will become familiar with the many antiviral medications used in HIV disease.

**FMCH 7551. Rural Community Ambulatory Medicine PCC.** (12 cr. [max 24 cr.; H-N only; Every Fall, Spring & Summer) Twelve-week core course. Four weeks in a Twin Cities Family Residency clinic, eight weeks in a selected Rural Community. Exposure to patients from diverse backgrounds in an outpatient setting to rural medicine, delivery systems, and community health. Small-group seminars, one-day Hospice experience, project, final exam.

**FMCH 7560. Alcohol and Drug Addiction Treatment.** (2 cr.; H-N only; Every Fall, Spring & Summer) Intensive exposure to current approaches to therapy and rehabilitation of chemically dependent patients. For most of these patients, alcohol is the most abused drug. The course includes participant observation in group therapy sessions and lectures.

**FMCH 7577. An Introduction to Complementary and Alternative Therapies.** (3 cr.; O-N or Audit; Periodic Fall & Spring) Complementary therapies and their integration with allopathic treatments. Observation of complementary care providers in community. Examines culturally-based approaches to health care. Weekly seminars, special project, use of Internet. prereq: Internet access, basic e-mail skills; Nurs 5609 recommended

**FMCH 7585. Sexual Problems in Clinical Practice.** (2 cr.; P-N only; Every Fall, Spring & Summer) This course requires a minimum commitment of 40 hours per week (some evening time possible) over a 2-4 week period. Students will have the opportunity for observation and practice of sex-related education and counseling through participation in intake and assessment sessions, individual and conjoint sessions, and group sex therapy. Each student will be supervised by a member of the Program in Human Sexuality staff. The student is expected to participate in several hours of staff conferences and seminars each week. Readings will be assigned.

**FMCH 7595. Family Medicine Research.** (2-8 cr.; H-N only; Every Fall, Spring & Summer) Academic research in collaboration with member of academic or clinical faculty. Identification of parameters/methodological components of family medicine research. Develops knowledge/skills essential for academic careers in family medicine.

**FMCH 7599. Family Medicine Independent Study.** (2-8 cr.; H-N only; Every Fall, Spring & Summer) This course is intended for a student interested in pursuing a Family Medicine project that does not fit well in one of the other Family Medicine elective descriptions. For any directed study project, there will be a written agreement between the student and Course Director.

**FMCH 7600. Family Medicine Four-Week Clerkship.** (4 cr.; H-N only; Every Fall, Spring & Summer) Ambulatory four-week clerkship.

**FMCH 7700. UCAM Family Medicine Selective.** (4 cr.; P-N only; Every Fall, Spring & Summer) Four-week ambulatory experience in family medicine clinic.

**FMCH 7701. RPAP: Family Medicine Clerkship.** (4 cr.; H-N only; Every Fall, Spring & Summer) Community-based elective. Extensive primary care experience in rural setting.

**FMCH 7702. RPAP: Primary Care Selective.** (4 cr.; P-N only; Every Fall, Spring & Summer) Community-based elective. Extensive primary care experience in rural setting.
FMCH 7910. Family Medicine Med
Residency. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Family Medicine medical residency.

FMCH 7930. Family Medicine Med Fellowship. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Family medicine medical fellowship.

Family Policy Minor (FPOL)

FPOL 8000. Family Policy Perspectives. (3; A-F or Audit; Every Spring)
Policies that effect families, from perspective of several academic disciplines. Faculty from academic units across the University teach policy analysis skills from their disciplines. How to analyze public/private policies for their impact on families. Advocacy. Current policy making activities at the legislature, county boards, and other public sector policymaking bodies.

Family Social Science (FSOS)

FSOS 1101. Intimate Relationships. (SOCS; 4; Student Option; Every Fall & Spring)
Couple dynamics. Overview of how to develop, maintain, and terminate an intimate relationship. Communication, conflict resolution, power, roles. Programs for marriage preparation, marriage enrichment, and marital therapy.

FSOS 1201. Human Development in Families: Lifespan. (DSJ,SOCS; 4; Student Option; Every Fall & Spring)
Human development in a family context. Life-course and human development theories. Individual/family development, mate selection, birth, life cycle. Physical, cognitive, language, social, social, and personality development. Historical, social, and cultural factors. How theory/research are applied to everyday lives.

FSOS 1211. An Interdisciplinary Look at the Family in Multicultural America. (SOCS,DSJ; 4; A-F or Audit; Every Fall & Spring)
This course is designed as an introduction to multicultural families using an ecological lens. The institution of the family is recognized globally as a basic unit of a society that produces, develops, socializes, and launches the next generation of its citizenry. This course will focus on families in contemporary America, a society that has grown increasingly diverse, and faces many complex challenges in modern global environment. Using a human ecological lens allows us to examine families in their nested and individual environments--how individuals shape and are shaped by families, their human built environments, their socio-cultural environments, and their natural-physical environments. This is a service learning class.

FSOS 1301. Cash or Credit: You Need to Know. (1; A-F only; Every Fall, Spring & Summer)
Factual information about basic money management skills. Topics covered can be applied to everyday life. Online, interactive learning based class.

FSOS 1461. Presentations at Work: Families, Communities, Nonprofits, and Schools. (CIV; 3; A-F or Audit; Every Fall & Spring)
This course prepares students to present information and adjust their messages based on audience need in a variety of future work contexts. Students interested in majoring in Family Social Science, Education, Youth Studies, and Kinesiology will take this course in order to develop the disciplinary practices used in counseling, community-based organizations, education, and health sciences to convey important, and often sensitive, material to specific audiences.

FSOS 2101. Preparation for Working With Families. (3; A-F or Audit; Every Fall & Spring)
Systematic preparation for upper division education, research/field internships, and career possibilities in Family Social Science.

FSOS 2103. Family Policy. (3; Student Option; Every Fall & Spring)
Connections between policies that governments enact, and families and their well-being. Conceptual frameworks for influences underlying policy choices. Evaluating consequences of such choices for diverse families.

FSOS 2105. Methods in Family Research. (3; Student Option; Every Fall & Spring)
Scientific method. Major questions/objectives of family research. Data collection/analysis/reporting. Social context of family research. Prereq: STAT 3011 or PSTL 1004 or STAT 1001 or ESPY 3264 or SOC 3811 or SOC 2550 or PSY 3801 or instr consent

FSOS 2106. Family Resource Management. (3; Student Option; Every Fall & Spring)
Analysis of how individuals/families use interpersonal, economic, natural, and community resources to make decisions, solve problems, and achieve central life purposes.

FSOS 2107. Preparation for Family and Community Engagement. (3; Student Option; Every Fall & Spring)
This course will focus on preparing students to work with families in a community context. Central themes of the course include strategies for family and community engagement, understanding how families interact with community organizations and institutions, how to mobilize family and community assets, collaborating with families to create systems change and build positive community resources. The course will pose questions for students about the roles of family professionals in supporting families in community contexts. The course will utilize readings about best practices in family and community engagement, both from the family studies literature and from cutting edge community-based organizations. Students will participate in a community project with a community organization that focuses on supporting families. This will enable them to attend community meetings, shadow family/community liaisons, and better understand the interface between families, community organizations, and institutions. Class assignments will allow students to engage in reflective practice and pull learning from their community-based experiences. They will learn concrete skills like meeting facilitation through a workshop format.

FSOS 2108. Preparation for Family Financial Studies: Money Matters in Families. (3; Student Option; Every Fall & Spring)
The goal of this course is to help students understand the role that money plays in the health and well-being of individuals, couples and families across differing social contexts over the life course. The course will teach student how values about money develop within families and society; how these values influence the choices made by families; and the impact of these choices on the quality of couple and family relationships. The course will introduce students to a variety of career paths related to families and money including financial coach, counselor and educator.

FSOS 2191. Independent Study in Family Social Science. (1-4; max 12 cr.); Student Option; Every Fall, Spring & Summer)
Independent reading or writing or research under faculty supervision. Prereq: Soph, instr consent

FSOS 3101. Personal and Family Finances. (3; Student Option; Every Fall, Spring & Summer)
Analysis of personal/family financial management principles. Financial planning of savings, investments, credit, mortgages, and taxation. Life, disability, health, and property insurance. Public/private pensions. Estate planning. Prereq: FSOS 4106 is a recommended prerequisite for this course.

FSOS 3102. Family Systems and Diversity. (SOCS,DSJ; 3; Student Option; Every Fall, Spring & Summer)
Family systems/theories applied to dynamics/processes relevant to family life. Diversity issues related to gender, ethnicity, sexual orientation, and disability. Divorce, single parenthood, remarriage. Family strengths/problems. Prereq: At least soph or instr consent

FSOS 3104. Global and Diverse Families. (SOCS,GP; 3; Student Option; Every Fall & Spring)
Perspectives on family dynamics of various racial/ethnic populations in the United States/other countries in context of national/international economic, political, and social processes. Prereq: at least Soph or instr consent

FSOS 3105. Technology in Parenting and Family Relationships. (TS; 3); Student Option; Every Fall)
The role of information and communications technologies in contemporary family life is explored through examination of theory, and research on technology use and family and family member outcomes. Applications of technology in family practice and issues regarding professional preparation will identify avenues for support and development.
FSOS 3191. Independent Study in Family Social Science. (; 1-5 cr. ; [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Independent reading or writing or research under faculty supervision. prereq: Jr, instr consent

FSOS 3426. Alcohol and Drugs: Families and Culture. (3 cr.; Student Option; Every Fall & Spring) Psychology/sociology of drug use/abuse. Life-span, epidemiological, familial, cultural data regarding use. Fundamentals of licit/illicit drug use behavior. Variables of gender, ethnicity, social class, sexuality, sexual orientation, disability.

FSOS 3429. Counseling Skills Practicum I. (3 cr.; Student Option; Every Fall & Spring) Basic counseling skills. Counselor needs/motivations, non-verbal communication, basic/advanced empathy, identifying strengths, maintaining focus, challenging discrepancies, use of self. Emphasizes building from client strengths, learning through role-playing.


FSOS 4101. Sexuality and Gender in Families and Close Relationships. (; 3 cr.; Student Option; Every Fall, Spring & Summer) Human ecology/development as frameworks for examining sexuality in close relationships. Diversity of sexual beliefs, attitudes, behaviors within differing social contexts. Using scientific knowledge to promote sexual health among individuals, couples, families through various life stages. prereq: At least jr or instr consent

FSOS 4104. Family Psychology. (3 cr.; Student Option; Every Fall & Spring) Processes in families of origin, families of choice, and other close relationships, within diverse social contexts. Evaluating current research on family dynamics within/across generations.

FSOS 4107. Traumatic Stress and Resilience in Vulnerable Families Across the Lifespan. (3 cr.; Student Option; Every Fall) This course will focus on stress contexts that place families at risk across the life span such as poverty, war/civil conflict, disability, social disparities/discrimination, and family dissolution. An examination of family strengths, cultural diversity, and approaches for working with families across the life course in community based settings including classrooms, programs, and agencies will be emphasized. This course focuses on vulnerable families and those affected by historical and traumatic stress. It covers family members of all ages who face particular challenges, such as intergenerational exposure to traumatic events, persistent and structural inequality, and health disparities. This course is designed to increase awareness of the conditions that place families and children at risk, the theories and frameworks available to understand these risks, and both individual and family resiliency to these conditions. The course will primarily focus on a) individual, family, community, and developmental contexts of risk and resiliency, and b) family-level preventive and intervention frameworks and approaches to support individuals and families.

FSOS 4108. Understanding and Working with Immigrants and Refugee Families. (DSJ,SOCS; 3 cr.; Student Option; Every Fall & Spring) This course focuses on the impact of immigration? (i.e., refugee vs. various types of immigration statuses) on family relationships, specifically how culture of origin and acculturation processes influence individuals and families over time; explores issues faced by various immigrant family systems, including a consideration of generational status, gender identities, social classes, and ethnic/racial group identities; develops intercultural interaction skills that prepare students to effectively engage with diverse immigrant families in multiple contexts; and builds practical skills that enhance students’ abilities to work in and collaborate with community- and faith-based organizations to strengthen cultural resources while overcoming barriers to increase service utilization.

FSOS 4109W. Family Theories. (WI; 3 cr.; Student Option; Every Fall & Spring) This course will include the review of current family theories, Bloom’s Taxonomy of critical thinking, self-assessments, and application in a capstone paper.

FSOS 4110. Introduction to Family Therapy. (3 cr.; Student Option; Every Fall & Spring) This course is designed as an introduction to the field of Family Therapy. Students who successfully complete the course should be well versed in the basics of both the foundational and contemporary theories of the discipline. Further, students will be exposed to a number of clinical vignettes and case scenarios that demonstrate the application of the theories in pre-recorded family therapy sessions. Through class assignments and discussions, students will be able to make a more informed decision as to whether or not family therapy is a field that holds potential for them in their own professional pursuits. Other mental health disciplines attend to family variables but having a background in family systems theory and family therapy theories will provide a solid knowledge base for someone embarking on a career in family clinical work. Systems theory guides the majority of what will be discussed in class.

FSOS 4150. Special Topics in Family Social Science. (; 1-4 cr. ; [max 8 cr.]; Student Option; Every Summer) Review of research/scholarly thought. Topics specified in Class Schedule. prereq: [Varies by topic]


FSOS 4153. Family Financial Counseling. (; 3 cr.; A-F only; Every Fall) Family financial issues are studied with an emphasis on the role of the family counselor. This course emphasizes the development of professional skills for assisting individuals and families to cope with financial concerns in their day-to-day lives. This course includes a required service-learning component where students will work throughout the semester with local non-profit organizations focused on financial literacy, financial counseling, financial curriculum development, and/or researching financial dependence. This course will be for students to produce video recordings. At minimum students will need recording equipment that captures both video and audio. The resulting file will need to be uploaded to the internet. Laptops with webcams and smart phones with video capabilities should be sufficient for this purpose. Equipment and training are available from the Library’s SMART Learning Commons. prereq: [3101, 3102, 3429] or instr consent

FSOS 4154. Families and Aging. (; 3 cr.; Student Option; Periodic Fall & Spring) Aging families from diverse socioeconomic/cultural groups as complex multigenerational systems interacting within ever-changing social structures.

FSOS 4155. Parent-Child Relationships. (3 cr.; A-F or Audit; Every Fall & Spring) History, theories, research, and contemporary practice of parent-child relationships in diverse families/families across the life span. Preparation for professionals in education, social work, and other human service occupations. prereq: At least jr or instr consent

FSOS 4158. Thailand: Global Change, Communities and Families. (GP; 3 cr.; A-F only; Periodic Spring) This interdisciplinary course uses social justice and human ecological lenses to examine global change that is occurring at the intersections among Thailand’s natural environment, communities, families, and culture. Topics include globalization, human trafficking, education, religion, environmental issues, and cultural integration/identity formation, particularly among indigenous populations in northern Thailand. Students interact with key community leaders, village leaders, elders, and students who serve as teachers; this leads to critical understanding of Thai culture and the contemporary issues faced by Thailand’s families and communities. Through journaling, digital stories, blogging, and discussions, students will synthesize, integrate, apply, and communicate what they’ve learned.

FSOS 4160H. Honors Capstone Project. (; 1-4 cr.; [max 8 cr.]; A-F only; Every Fall & Spring)
Individualizes the honors experience by connecting aspects of major program with special academic interests.

FSOS 4191. Independent Study in Family Social Science. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Independent reading or writing or research under faculty supervision. prereq: Sr, instr consent

FSOS 4294. Research Internship. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Research project with faculty. May include planning, proposal writing, literature review, data collection/coding/cleaning/analysis, and reporting. prereq: [FSOS major, at least jr] or instr consent

FSOS 4296. Field Study: Working With Families. (1-12 cr. [max 24 cr.]; S-N or Audit; Every Fall & Spring) Directed paraprofessional work experience related to student's area of study. prereq: 2101 or instr consent

FSOS 5014. Quantitative Family Research Methods I. (3 cr.; Student Option; Every Fall) Family research methods, issues associated with multiple levels of analysis. Conducting family-focused data analyses using basic/intermediate methods (through ANOVA and multiple regression), including power analysis. Ethical issues involved in family research such as IRB/HIPAA regulations. prereq: Grad student or instr consent

FSOS 5015. Family Research Laboratory. (1 cr.; S-N or Audit; Every Fall) Application of basic family research methods into experiential learning using statistical software. Analyses that correspond with problem situations in 5014 and that involve secondary data analyses. Using statistical software for basic family research. Preparation to work with quantitative family data sets. prereq: Grad student or instr consent

FSOS 5032. Family Systems Theories and Interventions. (3 cr.; Student Option; Periodic Fall) Systemic/cybernetic frameworks as they apply to diverse families. Thinking systematically about families across multiple ecological systems. How to identify crucial epistemological issues in theoretical/applied areas of family science. Theoretical frameworks, Experiential role-playing, guest presenters, videos, field work, research projects, reading clubs, class discussion. prereq: Grad student or instr consent

FSOS 5150. Special Topics in Family Social Science. (1-4 cr. [max 12 cr.]; Student Option; Every Fall & Summer) Review of research and scholarly thought. Topics specified in Class Schedule. prereq: instr consent

FSOS 5193. Directed Study in Family Social Science. (1-6 cr.; Student Option; Every Fall, Spring & Summer) tbd prereq: FSoS or grad student in related field

FSOS 5426. Alcohol and Drugs: Families and Culture. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Overview of psychology/sociology of drug use/abuse. Life-span, epidemiological, familial, cultural data regarding use. Fundamentals of licit/illicit drug use behavior. Gender, ethnicity, social class, sexuality, sexual orientation, disability.

FSOS 5429. Counseling Skills Practicum I. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Basic counseling skills. Counselor needs/motivations, non-verbal communication, basic/advanced empathy, identifying strengths, maintaining focus, challenging discrepancies, use of self. Emphasizes building from client strengths, learning through role-playing.


FSOS 5702. Prevention Science Research Methodology. (3 cr.; A-F or Audit; Every Fall & Spring) This course is intended to provide students with broad exposure to topics in research methodology within the field of prevention science. Prevention science as a discipline focuses on the etiology and prevention of social, physical and mental health problems and the translation of that information to promote health and well-being. This course will emphasize research methodology as it pertains to preventive interventions in youth and family contexts. The course is intended to serve as a survey of a wide range of topics within these areas, with research design, measurement issues, and analytic methods representing the major foci. Topics will be covered with attention to the community contexts within which prevention research often occurs as well as the ethical and human subjects issues that may arise. Students who successfully complete the course are expected to be able to interpret and critically evaluate prevention research methodology as well as identify appropriate methodological strategies to address research questions within prevention science.

FSOS 5703. New Topics in Prevention: Implementation and Dissemination. (3 cr.; A-F or Audit; Every Spring) This is an interdisciplinary course focused on the new science of implementation and dissemination of evidence-based/empirically-supported family-focused psychosocial prevention programs. Course content will include an overview of conceptual and theoretical foundations of implementation research, key research questions, methods for evaluating implementation and dissemination efforts, and case examples from the empirical literature. The course will take an ecological perspective to the implementation of family-based prevention programs, addressing questions such as how widespread efforts to install programs in communities can ensure that programs create change in children and families.

FSOS 5900. Special Topics in Family, Youth, and Community. (1-4 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Topics not dealt with in regular courses. Topics vary by offering.

FSOS 5902. Family Education Perspectives. (3 cr.; A-F only; Every Fall) Origins, evolution, and critique of alternative perspectives on family education. Implications for educators, programs, and participants.


FSOS 5932. Introduction to Parent Education. (1 cr.; A-F only; Every Fall & Summer) Philosophy, history, and models of parent education. Ethical, critically reflective professional practice. Observation of parent and family education practice.


FSOS 5942. Everyday Experiences of Families. (2 cr.; A-F only; Every Spring & Summer) Culture and everyday experiences of diverse families. Relevance to parent education and to professional development of parent educators. Research/theoretical knowledge woven with observation/personal reflection.


FSOS 5944. Parent Education Curriculum. (2 cr.; A-F only; Every Fall) How parent learning and development, child development, and family systems theories influence curriculum approaches and materials in parent education. Student develop construct, critique curriculum on self-selected topics in parent and family education.

FSOS 5945. Teaching and Learning in Parent Education. (2 cr.; A-F only; Every Fall) Students select/use parent education teaching strategies/processes to meet needs of various populations of adult learners. Critical
reflection, ethical practices, parent educator competencies. preq: 5943 or instr consent


FSOS 5949. Student Teaching in Parent Education. (; 2 cr.; A-F only; Every Spring) Supervised parent education practice to meet individual student needs and interests. Online discussion, reflection, and cooperative learning. preq: Application for student teaching; FSoS 5937, 5942, 5943, 5944, 5945.

FSOS 8001. Conceptual Frameworks in the Family. (3 cr.; A-F only; Every Fall) Major theoretical models about families, emphasizing sociocultural context.

FSOS 8002. Advanced Family Conceptual Frameworks. (3 cr.; A-F only; Every Spring) Builds on FSoS 8001 by focusing specifically on family level research questions. Family development/critical theoretical perspectives that can be used to understand/study family processes/contemporary ecological issues. preq: 8001 or instr consent

FSOS 8003. Current Issues in Family Science. (; 3 cr.; Student Option; Every Spring) Content, theories, and methodologies in family science. Emphasizes findings of recent/emerging areas of research. Readings covering a wide range of topics. Critical examination of research studies. Targeted class discussion.


FSOS 8007. Ethical Issues and Moral Dilemmas in Family Life. (; 3 cr.; Student Option; Periodic Fall) Multidisciplinary perspectives of ethics, social norms, family law, family policy, family economics, and family decision-making. Focuses on differing perspectives of individuals representing various ethnicities, socio-economic levels, religions, and sexual orientations.

FSOS 8013. Qualitative Family Research Methods. (3 cr.; A-F only; Periodic Fall & Spring) Approaches to qualitative family research evaluation. Phenomenological, feminist, grounded theory, content analytic, ethnographic, ethnographic, program evaluation. Theory, research examples, student projects.

FSOS 8014. Quantitative Family Research Methods II. (3 cr.; A-F only; Every Spring) Quantitative research process, from developing research question to putting findings to use. Major course project basis for class discussion. Family research. Applying research knowledge to study of families. preq: [5014 or equiv], [8001 or equiv], [8001 or equiv], 8013 or equiv consent

FSOS 8015. Advanced Qualitative Family Research Methods. (3 cr.; A-F only; Every Fall) Applying qualitative research methods to understand individual/collective meaning, experience within/across diverse family systems. preq: 8013 or instr consent

FSOS 8031. Family of Origin. (; 3 cr.; S-N or Audit; Periodic Fall & Spring) In-depth study of each student's family of origin in a group of other students and a clinical faculty therapy supervisor. preq: Preference given to marriage and fam therapy students

FSOS 8033. Problems in Families. (; 3 cr.; Student Option; Periodic Spring) Family therapy assessment/treatment approaches to problems such as depression, alcoholism, and sexual abuse, and to challenges of varying family structures, such as single-parent/remarried families. preq: [8032 or equiv], instr consent

FSOS 8034. Marriage and Family Therapy Supervision. (3 cr.; Student Option; Periodic Fall) Theories of supervision, structures for supervision, methods of supervision, evaluation process, legal/ethical issues. Therapist-client-supervisor relationships, potential problems, contextual issues. preq: FSOS doctoral student enrolled in Couple Family Therapy (CFT) or instr consent

FSOS 8035. Assessment of Couples and Families. (; 3 cr.; A-F or Audit; Periodic Fall) Issues in research and clinical assessment. Assumptions and values underlying assessment approaches. Specific assessment techniques discussed, evaluated, and administered. Ethical, legal, and practical issues. preq: 8014 or equiv or instr consent

FSOS 8036. Couple/Marriage and Family Therapy Research. (3 cr.; A-F only; Periodic Fall & Spring) Recent/contemporary approaches to C/MFT research with emphasis on prevention, intervention, dissemination from variety of perspectives. preq: FSOS doctoral student enrolled in Couple Family Therapy (CFT) or instr consent

FSOS 8037. Ethical, Legal, and Professional Issues in Mental Health Practice: Issues with Couples and Families. (; 2-10 cr.; A-F or Audit; Periodic Fall & Spring) Boundaries and triangles, gender inequities, family law, confidentiality and reporting requirements, dual roles, client diversity, and value clashes. preq: [8032, practicum or internship exper] or [grad student in cooperating mental hlth practice prog who has completed 1 course on therapy with children

FSOS 8039. Clinical Interventions for Couples. (; 3 cr.; A-F or Audit; Periodic Fall) Interventions into problems faced by couples at various ages and stages of their relationship. Developing and implementing effective strategies for problem solving, relationship maintenance, and partner growth, including integration of sex therapy into ongoing couple therapy. preq: 8032 or equiv or instr consent

FSOS 8043. Family Theory Development: A Systemic Perspective. (; 3 cr.; Student Option; Periodic Fall & Spring) Concepts and principles of systems and ecosystems and their applications in family science; emphasizes theoretical integration and development of research models with appropriate methodologies. preq: 8001 or equiv or instr consent, FSoS PhD student beyond 1st yr

FSOS 8047. Integrative Research Seminar. (; 3 cr.; Student Option; Every Spring) For advanced doctoral students primarily in family social science who are working on independent research projects. Giving and receiving of constructive criticism and support in integrating theories, methods, and applications in order to create a totality that is logically coherent and conceptually and methodologically sound. preq: 8001 or equiv, 8013 or equiv, 8014 or equiv

FSOS 8101. Family Stress, Coping, and Adaptation. (; 3 cr.; Student Option; Periodic Fall & Spring) Helping families become more resilient to stress by decreasing vulnerability to crises and traumatic stress disorders. Students develop research or intervention proposal on family stress, coping, adaptation, crisis, trauma, or resilience. preq: 8001 or equiv, research methods course

FSOS 8104. Family Policy Seminar. (; 3 cr.; Student Option; Periodic Spring) Distinguishing family policy research from other family research. Conceptual frameworks, methods, and roles family policy research can play in policy-making and knowledge-building processes.

FSOS 8105. Family Gerontology. (; 3 cr.; Student Option; Periodic Spring) Integrates gerontology and family studies; new lines of inquiry, qualitative and quantitative, into aging families. Family gerontological research, family relationships, family and long-term care institutions, theoretical frameworks and research methods, and research and interventions. preq: 4154 or equiv or instr consent

FSOS 8107. Family Values Research: Theories and Critical Methods. (3 cr.; Student Option; Periodic Fall)
Interdisciplinary seminar on critical modes of inquiry in the family domain that require designing studies using normative theories, examining values as units of observation, and solving practical problems by collaborative strategies designed to encourage change. prereq: 8013 or equiv, 8014 or equiv or instr consent; WCCE 8920 recommended

FSOS 8150. Topics in Family Social Science. (1-6 cr.; Student Option; Every Fall, Spring & Summer)
Special seminars on timely topics. prereq: FSOS grad student or instr consent

FSOS 8151. Preparation for Independent Teaching in Family Studies. (1 cr. [max 3 cr.]; S-N only; Every Fall & Spring)
Skills to independently teach family sciences courses to undergrads. prereq: instr consent

FSOS 8160. Topics in Marriage and Family Therapy. (1-6 cr.; Student Option; Periodic Fall)
Special seminars on timely topics. prereq: MFT grad student or instr consent

FSOS 8193. Directed Study in Family Social Science. (1-6 cr.; max 12 cr.); Student Option; Every Fall, Spring & Summer
Directed study. prereq: Doctoral student in FSOS or related field

FSOS 8200. Orientation for Family Social Science. (1 cr.; S-N or Audit; Every Fall) TBD

FSOS 8201. Teaching Family Courses in Higher Education I. (3 cr.; S-N or Audit; Periodic Fall & Spring)
Students cooperatively plan, administer, and evaluate (with a graduate faculty supervisor) an undergraduate core course. Improvement of teaching and evaluation methods, and conceptualization and presentation of research-based course in family studies. prereq: 12 FSOS grad cr; teaching assistant exper recommended

FSOS 8202. Teaching Family Courses in Higher Education II. (3 cr.; S-N or Audit; Periodic Fall & Spring)
Under faculty supervision, students teach an undergraduate course in family social science for which they have appropriate academic preparation and professional experience. prereq: 8201 or equiv

FSOS 8275. Clinical Consultation with Couples and Families. (3 cr.; S-N or Audit; Periodic Fall & Spring)
Supervised students serve as a consultation group working with community clinicians and their clients, utilizing a one-way window and observation room; opportunities for cotherapy. prereq: instr consent; required for grad FSOS majors in marriage and family therapy prog

FSOS 8295. Couple/Marriage Family Therapy Practicum. (1-6 cr. [max 24 cr.]; S-N only; Every Fall, Spring & Summer)

FSOS 8296. Couple/Marriage Family Therapy Internship. (1-12 cr.; S-N only; Every Fall, Spring & Summer)
Supervised clinical/other professional practical experiences in couple/marriage, family therapy. prereq: FSOS doctoral student enrolled in Couple Family Therapy (CFT) or instr consent

FSOS 8297. Supervision of Supervision. (1-3 cr. [max 12 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Hands-on practicum to gain AAMFT-approved supervisor status. prereq: MFT student, instr consent

FSOS 8333. FTE: Masters. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

FSOS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

FSOS 8550. Advanced Topics in Family Social Science. (1-6 cr.; A-F or Audit; Every Fall & Spring)
Special seminars on topics suited to student needs.

FSOS 8560. Advanced Clinical Topics in Marriage and Family Therapy. (1-6 cr. [max 36 cr.]; A-F or Audit; Periodic Spring)
Special advanced topics or seminars.

FSOS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

FSOS 8755. Master's Paper: Plan B Project. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer)
Graduate faculty work with students on research for Plan B paper. prereq: FSOS MA student

FSOS 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

FSOS 8794. Directed Research in Family Social Science. (1-6 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer)
Directed research in family social science.

FSOS 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

Finance (FINA)

FINA 3001. Finance Fundamentals. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)


FINA 4121. Financial Markets and Interest Rates. (2 cr.; A-F or Audit; Every Fall & Spring)

FINA 4121H. Financial Markets and Interest Rates. (2 cr.; A-F only; Every Spring)

FINA 4122. Banking Institutions. (2 cr.; A-F or Audit; Every Spring)

FINA 4221. Principles of Corporate Finance. (2 cr.; A-F only; Every Fall & Spring)
Theoretical/applied corporate finance, impact on investment decisions. Financing decisions, payout decisions, tax effects, managerial incentives. prereq: 3001, CSOM major, actuarial science major

FINA 4242W. Corporate Investment Decisions. (WI: 4 cr.; A-F or Audit; Every Fall & Spring)
Managing firm’s investment in working capital/ fixed assets. Capstone course requiring application of corporate valuation principles from earlier coursework to cases involving working capital management, making capital budgeting decisions, targeting/evaluating firm performance, assessing mergers/acquisitions, and other topics. prereq: 3001, 4121 or 4121H, 4321 or 4321H, 4422, 4522, CSOM major

FINA 4321. Portfolio Management and Performance Evaluation. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Portfolio management. Concepts used to manage security portfolios. Risk/return tradeoffs, diversification. Asset allocation,
Active portfolio management versus indexed portfolios. Portfolio performance evaluation. prereq: 3001, CSOM major, can take concurrent registration is required (or allowed) in 4522


FINA 4325. Behavioral Finance. (2 cr.; A-F only; Every Spring) How to use psychology/realistic settings to guide/develop alternative theories of financial market. How insights of behavioral finance complement traditional paradigm/shed light on trading patterns, behavior of asset prices, corporate finance, various Wall Street practices. prereq: 4321 or 4321H

FINA 4329. Security Analysis Capstone. (2 cr.; A-F only; Every Fall & Spring) Valuation of equity securities. Principles. Relationship between various valuation approaches. Tools to test self-designed security selection rules. prereq: 4121 or 4121H, 4321 or 4321H, 4422, 4522, ACCT 5100 or ACCT 5101

FINA 4422. Financial Modeling. (2 cr.; A-F only; Every Fall & Spring) Projecting financial statements to identify financing needs and perform DCF analysis in decision making. APV-, FCF-, and WACC-based methods. prereq: FIN 3001 or 3001H, 4221, ACCT 5101, CSOM major

FINA 4522. Options & Derivatives I. (2 cr.; A-F only; Every Fall & Spring) Forwards/futures, options, swaps. Markets these derivatives trade in, their valuation, how they are used to speculate/manage risk in financial markets. Multi-period binomial model. prereq: 3001 or 3001H, or APEx, 4121 or 4121H, 4321 (can be concurrent) 4321H (can be concurrent), CSOM major

FINA 4529. Derivatives II Capstone. (2 cr.; A-F only; Every Spring) Quantitatively advanced material such as Black-Scholes model for valuing option sensitivities (the Greeks), Value-at-risk methods. Valuation/uses of credit derivatives such as default swaps/collateralized debt obligations. prereq: 4522 or 4523

FINA 4621. The Global Economy (Macro). (2 cr.; A-F only; Every Fall & Spring) Survey of macroeconomic policies in emerging markets and developed countries. International dimensions of corporate finance. Exchange rates, interest rate parity, trade deficit/surplus. prereq: 3001, CSOM major

FINA 4622. International Finance. (2 cr.; A-F only; Every Fall & Spring) Corporate investment, risk management decision making in international context. International capital markets, cost of capital in emerging economies. Measuring/managing currency risk. prereq: CSOM major, 3001 or 3001H, 4121 or 4121H, 4221

FINA 4920. Finance Topics. (2-4 cr. [max 10 cr.]; A-F or Audit; Periodic Fall & Spring) Discussion and analysis of current topics and developments in Finance.

FINA 5422. Financial Econometrics and Computational Methods I. (2 cr.; A-F only; Every Fall) This course provides an introduction to the methods used in empirical finance. A review of statistics is followed by intensive instruction on matrix algebra that culminates in a fundamental understanding of linear regression, the basic empirical tool. Asset pricing theories are discussed and developed and then methods are derived to test them. The course will emphasize estimation and inference using computer-based applications.

FINA 5423. Financial Econometrics and Computational Methods II. (2 cr.; A-F only; Every Fall) This course builds on Financial Econometrics I and provides instruction on the econometrics used in empirical finance. Topics will include time series analysis, parametric models of volatility, evaluation of asset pricing theories, and models for risk management. The course will emphasize estimation and inference using computer-based applications.


FINA 6122. Financial Management of Depository Institutions. (2 cr.; A-F only; Every Spring) Commercial banks, other depository institutions. Asset/liability management, risk management, geographic expansion, investment banking, public policy issues. Lectures, student presentations, project. prereq: MBA 6230, MBA student

FINA 6123. Financial Services Industry. (2 cr.; A-F only; Every Fall) This course gives an overview of the U.S. financial services industry, emphasizing the overall environment, key institutional details, and underlying economic functions. After introducing financial markets and institutions and their functions, we look at the biggest sectors of this industry (banking, insurance, securities dealing, money management, etc.) in more depth. We conclude with a discussion of the impact of “fintech” on this sector.


FINA 6241. Corporate Finance Analysis and Decisions. (4 cr.; A-F only; Every Fall & Spring) Theoretical/applied understanding of corporate financial decisions. Adjusted present value, economic value added options. Impact of financing decisions on real asset valuation, managerial incentives, corporate strategy. prereq: MBA 6230, MBA student

FINA 6242. Advanced Corporate Finance Analysis and Decisions. (4 cr.; A-F only; Every Fall) Theory/practice of efficiently managing working capital, fixed assets. Emphasizes mergers/acquisitions, corporate restructuring, real options. Use of derivatives as financing tools, in deal structure. prereq: 6241, MBA student

FINA 6321. Portfolio Analysis and Management. (2 cr.; A-F only; Every Fall & Spring) Introduces analytical concepts used to manage security portfolios from perspective of an institutional investor. Market microstructure. Margin purchasing, short selling. Portfolio risk management, risk/return tradeoffs, strategic/tactical asset allocation, active versus passive management. Portfolio revision, performance evaluation. prereq: MBA 6120, MBA 6230, MBA student

FINA 6322. Advanced Corporate Financial Analysis and Decisions. (4 cr.; A-F only; Every Fall) Advanced financial modeling tools to build, operate, and understand business performance, and M&A, equity, and credit securities analysis models that have become central to sophisticated financial analysis of all operating businesses, transactions, and securities. How to analyze by way of financial models.

FINA 6324. Securitization Markets. (2 cr.; A-F only; Every Spring) splitting risks. Redirecting risks to investors able to analyze and take on those risks. Reasons for development of securitization. Products, their similarities in character. How to build simple models and analyze examples of actual securitized liabilities. prereq: 6121, MBA student

FINA 6325. Behavioral Finance. (2 cr.; A-F only; Every Spring) Psychology/realistic settings that guide/develop alternative theories of financial market. How behavioral finance complements traditional paradigm on investors’ trading patterns, behavior of asset prices, corporate finance,
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
FIN 1001. Beginning Finnish I. (3 cr.; Student Option; Every Fall)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include every day subjects (shopping, directions, family, food, housing, etc.).

FIN 1002. Beginning Finnish II. (3 cr.; Student Option; Every Spring)
Continues the presentation of all four language modalities (listening, reading, speaking, writing) with a proficiency emphasis. Topics include free-time activities, careers, and the Finnish culture. prerequisite: FIN 1001

FIN 1003. Intermediate Finnish I. (5 cr.; Student Option; Every Fall)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments. prerequisite: 1002

FIN 1004. Intermediate Finnish II. (5 cr.; Student Option; Every Spring)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. prerequisite: 1003

FIN 3011. Advanced Finnish. (3 cr.; Student Option; Every Fall)
Designed to help students achieve advanced proficiency in Finnish. Discussion of fiction, film, journalistic, and professional prose is complemented by grammar, vocabulary building exercises, and review of oral/written modes of communication. prerequisite: 1004 or 4004

FIN 3012. Advanced Finnish. (3 cr.; Student Option; Every Spring)
Discussion of novels, short stories, plays, articles. Structural, stylistic, vocabulary-building exercises. prerequisite: 3011 or 4011

FIN 4001. Beginning Finnish for Graduate Research I. (4 cr.; Student Option; Every Fall)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include every day subjects (shopping, directions, family, food, housing, etc.). Meets concurrently with 1001.

FIN 4002. Beginning Finnish for Graduate Research II. (4 cr.; Student Option; Every Spring)
Continues the presentation of all four language modalities (listening, reading, speaking, writing) with a proficiency emphasis. Topics include free-time activities, careers, and the Finnish culture. Meets concurrently with 1002.

FIN 4003. Intermediate Finnish for Graduate Research I. (5 cr.; Student Option; Every Fall)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments. Meets concurrently with 1003.

FIN 4004. Intermediate Finnish for Graduate Research II. (5 cr.; Student Option; Every Spring)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. Meets with 1004.

FIN 4011. Advanced Finnish for Graduate Research. (3 cr.; Student Option; Every Fall)
Designed to help students achieve advanced proficiency in Finnish. Discussion of fiction, film, journalistic, and professional prose is complemented by grammar, vocabulary building exercises, and review of oral/written modes of communication. Meets with 3011.

FIN 4012. Advanced Finnish for Graduate Research. (3 cr.; Student Option; Every Spring)

Fisheries and Wildlife (FW)

FW 1001. Orientation in Fisheries, Wildlife, and Conservation Biology. (1 cr.; A-F or Audit; Every Fall)
Survey of technical requirements and education needed for careers in fisheries, wildlife, and conservation biology. Introduction to fields of work, problems, career opportunities.

FW 2001W. Introduction to Fisheries, Wildlife, and Conservation Biology. (ENV,WI; 3 cr.; Student Option; Every Fall)
Fish, wildlife, and other forms of biodiversity. Single species, populations, ecosystem, and landscape approaches. Experiential/interactive course. Decision-case studies. prerequisite: BIOL 1001 or BIOL 1009

FW 2003. Introduction to Marine Biology. (3 cr.; Student Option; Every Spring)
Nature of oceans, their role sustaining life on planet. Diversity/ecology of organisms that live in coastal, deep, open seas. Effects of humans on marine life. Resilience of marine life, its importance to human society. Cultures of oceanic peoples. Selected topics. prerequisite: BIOL 1001 or BIOL 1009 or BIOL 2002 or ESCI 1006 or ESCI 1106 or instr consent

FW 3104. Skills for Field Techniques in Habitat Assessment, Research, and Conservation. (2 cr.; A-F only; Every Summer)
In this field-preparation and application class, students develop skills required for the field session (FW 3106 + FW 3108) and future professional positions in fisheries, wildlife, and conservation biology. Students complete a series of online activities that prepare them to use analytical tools (e.g., tools for statistical analysis, GIS/GPS, spatial methodology, advanced lab- and field-based skills). Students build knowledge about Minnesota species including identification and natural history information of plants, amphibians and reptiles, birds, fish, and mammals. Students demonstrate readiness for fieldwork by conducting an independent, field-focused project. This course is taken concurrently with the field session.

FW 3106. Vegetation Sampling for Habitat Assessments. (1 cr.; A-F or Audit; Every Spring)
Common vegetation sampling methods used for habitat assessments. Identify approximately 75 vascular plant species typical of Minnesota terrestrial and aquatic ecosystems using taxonomic keys and readily observable traits. Importance of plants for providing food, cover, and nesting habitat.
FW 3108. Field Methods in Research and Conservation of Vertebrate Populations. (3 cr.; A-F or Audit; Every Spring & Summer) Planning/implementation of research management projects. Collect/analyze data in groups. Group/individual oral/written reports. Keep field journal. prereq: soph, jr, sr, FW major

FW 3480. Topics in Fisheries, Wildlife & Conservation Biology. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

FW 3925. Human Dimensions of Fisheries and Wildlife Management. (3 cr.; A-F only; Every Spring) Human dimensions of fish and wildlife concerns. Theory and methods from social sciences to address challenges and issues of managing fish and wildlife resources. Integrating social science information into fish and wildlife decision-making. Guest lecturers.

FW 4001. Biometry. (4 cr.; A-F or Audit; Every Fall) This course covers the basic foundations of statistical methods. In contrast to traditional methods of teaching statistics based on analytical formulas and hand-calculations, we will initially emphasize simulation-based methods (randomization tests, bootstrapping) for analyzing data. Students will learn how to implement common statistical methods (e.g., one and two sample tests, interval estimation techniques, linear regression) in the R programming language, and gain experience analyzing real data from a variety of fields, with particular emphasis on biological examples and applications.

FW 4101. Herpetology. (4 cr.; Student Option; Spring Odd Year) Reptiles/amphibians, their systematics, behavior, ecology, physiology, development, and morphology. Diversity of reptiles/amphibians. Focuses on Minnesota fauna. Lab. prereq: BIOL 1001 or BIOL 2012

FW 4102. Principles of Conservation Biology. (ENV; 3 cr.; Student Option; Every Spring) Introduction to themes/concepts of diverse, dynamic, evolving field. Biological/social underpinnings of conservation problems/solutions. prereq: Introductory biology course

FW 4103. Principles of Wildlife Management. (3 cr.; Student Option; Every Spring) Foundation for understanding discipline of wildlife management. Preparation for upper division wildlife courses. prereq: Intro biology course. [jr or sr]

FW 4107. Principles of Fisheries Science and Management. (3 cr.; A-F only; Every Spring) Principles of Fisheries Management is an engaging and dynamic exploration to the principles and practices of fisheries management. The course is designed as a major requirement for Fisheries subplan majors in Fisheries, Wildlife, and Conservation Biology. It is also appropriate as an elective course for other majors and minors in FWCB, ESPM, or related biological disciplines. We cover the basics of fisheries science (habitats, ecology, and population dynamics) and management (e.g., goals, tools, implementation, and assessment) with an emphasis on human intervention and regulation. We first cover management approaches and planning, the development of an information base, and the identification of problems. We then provide a brief overview of applied limnology, fish ecology, and population dynamics, followed by approaches to manage fishery populations and habitats in freshwater and marine systems along with methods to assess management outcomes. Throughout, we demonstrate applications to specific fisheries and habitats. This is primarily a lecture-based course that also integrates field trips, group discussions, and activities. We use exams to measure comprehension, and case studies and assignments to encourage practical application. Prerequisite: Intro biology course. [jr or sr]

FW 4136. Ichthyology. (4 cr.; Student Option; Every Fall) Fish biology, adaptations to different environments and modes of living, and environmental relationships. Lab emphasizes anatomy and identification of Minnesota fishes. prereq: BIOL 1001 or BIOL 2012

FW 4291. Independent Study: Fisheries. (1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) Individual field, library, and lab research in fisheries. prereq: instr consent

FW 4301. Conservation Genetics. (3 cr.; A-F or Audit; Spring Even Year) This course introduces students to fundamental principles of population genetics and molecular phylogenetics and explores their applications to problems in the conservation, management, and restoration of biodiversity.

FW 4391. Independent Study: Wildlife. (1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) Individual field, library, and lab research in wildlife. prereq: instr consent

FW 4392. Special Lectures: Wildlife. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Lectures on special topics of wildlife given by visiting scholar or regular staff member. prereq: Grad student or instr consent

FW 5292. Special Lectures: Fisheries. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Lectures in special fields of fisheries given by visiting scholar or regular staff member. prereq: Grad student or instr consent

FW 5392. Special Lectures: Wildlife. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Lectures given by visiting scholar or staff member.

FW 5401. Fish Physiology and Behavior. (3 cr.; Student Option; Every Fall) Fish mechanisms/behavior. Links between fish biology, fisheries ecology, management, aquaculture. Homeostasis, neurobiology, bioenergetics, reproduction, movement. prereq: 4136, BIOL 2012, CHEM 1021 (may be taken concurrently)

FW 4603. Preparing Research Proposals for Wildlife Biologists. (1 cr.; A-F only; Every Fall) This course will give students experience developing research proposals and presentations. The course material will focus primarily on how to identify research questions, develop a budget, construct a written proposal, and present the proposal verbally. Students will work in small groups throughout the semester to develop their proposal and will gain skills in peer review and reference management. Prerequisites: EEB 3407 OR 3408 OR 3807, FW 4102 OR 4103, or permission from instructor, concurrent with FW 5603W.

FW 4629. Wildlife Care and Handling Externship. (3 cr.; A-F only; Every Spring) This externship class is the capstone experience of the wildlife care and handling minor curriculum. The class synthesizes the practical skills and experience you have developed in earlier classes in the minor. The capstone is a guided, supervised, hands-on, on-site experience in a wildlife handling setting, complemented by pre-, during- and post-experience reflection and analysis.

FW 5003. Human Dimensions of Biological Conservation. (3 cr.; Student Option; Every Fall) Survey of social, psychological, economic, policy aspects of managing/conerving wildlife, fisheries, and related resources. prereq: [Biol 1001 or Biol 1009], Biol 3407

FW 5051. Analysis of Populations. (4 cr.; Student Option; Every Spring) Regulation, growth, general dynamics of populations. Data needed to describe populations, population growth, population models, regulatory mechanisms, prereq: [4001 or STAT 3011 or ESPM 3012], [Biol 3407 or Biol 3408W or Biol 3807], Senior or grad student

FW 5136. Ichthyology. (4 cr.; Student Option; Every Fall) Fish biology, adaptations to different environments and modes of living, and evolutionary relationships. Laboratory emphasizes anatomy and identification of Minnesota fishes.

FW 5292. Special Lectures: Fisheries. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Lectures in special fields of fisheries given by visiting scholar or regular staff member. prereq: Grad student or instr consent

FW 5392. Special Lectures: Wildlife. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Lectures given by visiting scholar or staff member.

FW 5401. Fish Physiology and Behavior. (3 cr.; Student Option; Every Fall) Fish mechanisms/behavior. Links between fish biology, fisheries ecology, management, aquaculture. Homeostasis, neurobiology, bioenergetics, reproduction, movement.

FW 5459. Stream and River Ecology. (3 cr.; Student Option; Fall Even Year) Structure/dynamics of running waters from ecosystem perspective. Historical perspective, basic hydrology/fluvial geomorphology, terrestrial-aquatic interactions, detrital dynamics, metabolism, drift, trophic relations,
biotic/abiotic interactions, ecosystem experiments and natural alterations, stability/succession, ecosystem dynamics in a watershed. prereq: Limnology course or instr consent

**FW 5601. Fisheries Population Analysis.** (3 cr.; A-F or Audit; Every Fall)
Introduction to theory/methods for estimating vital statistics of fish populations. Using microcomputer/statistical software to describe, analyze, model attributes of fish populations. Case studies from literature of marine/freshwater fisheries management, prereq: [4001 or Stat 5021], Biol 3407, [Math 1142 or Math 1271]

**FW 5603W. Habitats and Regulation of Wildlife.** (WI; 3 cr.; A-F or Audit; Every Fall)
Environmental interactions of wildlife at population/community levels. Environmental threats from human activities. Habitat management practices. Objectives, policies, regulations in population management. prereq: [FW 4102 or FW 4103]. [EEB 3407 or EEB 3408 or EEB 3807]

**FW 5604W. Fisheries Ecology and Management.** (WI; 3 cr.; Student Option; Every Spring)

**FW 5625. Wildlife Handling and Immobilization for Research and Management.** (2 cr.; S-N or Audit; Every Spring)
Practical techniques to maximize human/animal safety and encourage effective operations. Preparation procedures, legal responsibilities, capture drugs/delivery systems, safety measures, ethical issues, basic veterinary procedures for handling wildlife. Field courses, use live animals, prereq: General biology, [grad student or vet med student or FW sr]

**FW 8051. Statistical Modeling of Ecological Data using R and WinBugs/JAGS.** (4 cr.; Student Option; Every Spring)
Regression methods for modeling ecological data. Real world examples from ecology, as well as environmental/natural resource sciences/management. Computer-based solutions using R/Bayesian modeling software, prereq: Graduate-level statistics class, [working knowledge of program R or instr consent]

**FW 8200. Seminar.** (1-4 cr.; max 16 cr.; S-N or Audit; Every Fall & Spring)
Oral and written student reports on selected topics from current literature in fisheries biology and management and wildlife. Lectures by and discussions with faculty and visiting specialists.

**FW 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
[No description] prereq: Master’s student, adviser and DGS consent

**FW 8394. Research in Fisheries.** (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Directed research.

**FW 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
[No description] prereq: Doctoral student, adviser and DGS consent

**FW 8452. Conservation Biology.** (3 cr.; A-F or Audit; Every Fall)
Seminar examining population-to-system-level biological issues (genetics; demographic processes; community, ecosystem, and landscape scale interaction; restoration of ecology; ex situ strategies for restoration and recovery) and societal issues (social, economic, cultural perspectives; sustainable development strategies; roles of institutions; international and U.S. policies).

**FW 8459. Stream and River Ecology.** (3 cr.; Student Option; Fall Even Year)
Structure/dynamics of running waters from ecosystem perspective. Historical perspective, basic hydrology/fluvial geomorphology, terrestrial-aquatic interactions, detrital dynamics, metabolism, drift, trophic relations, biotic/abiotic interactions, ecosystem experiments and natural alterations, stability/succession, ecosystem dynamics in a watershed. prereq: Limnology course or instr consent

**FW 8461. Advanced Topics in Fish Physiology.** (1 cr.; Student Option; Periodic Fall)
Lectures, discussion, current literature. Complements 5459. prereq: Vertebrate physiology course or instr consent

**FW 8462. Advanced Topics in Fish Behavior.** (1 cr.; Student Option; Periodic Fall & Spring)
Current literature. Complements 5459. prereq: 5459 or behavior course or instr consent

**FW 8465. Fish Habitats and Restoration.** (3 cr.; Student Option; Fall Odd Year)
Mechanisms underlying physiology/behavior that shape fish community structure in specific northern temperate habitats. Techniques and planning procedures for restoring lakes/streams. prereq: Intro ecology course or instr consent

**FW 8494. Research in Wildlife.** (1-4 cr.; Student Option; Every Fall)
Directed research. prereq: instr consent

**FW 8576. Biology and Management of Large Mammals.** (2 cr.; A-F or Audit; Every Fall)
Ungulates. Ecology, population dynamics, energy, nutrition, predation, disease/parasites, social behavior. Research approaches, management implications/practices. Key information on North American species. prereq: [Ecology course, [wildlife, forestry, and ecology grad student]] or instr consent

**FW 8666. Doctoral Pre-Thesis Credits.** (1-6 cr.; max 12 cr.) [No Grade Associated; Every Fall, Spring & Summer]
[No description] prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**FW 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
[No description] prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**FW 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
[No description] prereq: Max 18 cr per semester or summer; 24 cr required

**Food Science and Nutrition (FSCN)**

**FSCN 1001. Orientation to the Majors: Food Science and Nutrition.** (1 cr.; S-N only; Every Fall)
Advising, student opportunities, networking, what kinds of jobs will be available after graduating.

**FSCN 1011. Science of Food and Cooking.** (PHYS; 4 cr.; Student Option; Every Fall & Spring)
Souffles, custards, sauces, coffee brewing, candy making used to examine physics/chemistry of heat transfer, foams, gels, emulsions, extractions, crystallization.

**FSCN 1012. Sports Nutrition.** (2 cr.; Student Option; Every Fall, Spring & Summer)
Physiological function and metabolic fate of all six classes of nutrients ingested by active individuals to improve athletic performance. Impact on physiology of ergogenic aids and various dietary supplements. Overview of these components in fulfilling energy/recovery needs for continual/progressive athletic performance. Web-based course.

**FSCN 1013. Dietary Supplements: scientific, regulatory, and cultural aspects.** (OIV; 3 cr.; Student Option; Every Fall & Spring)

**FSCN 1102. Food: Safety, Risks, and Technology.** (OIV; 3 cr.; Student Option No Audit; Every Fall & Spring)
Introduction to inherent risks/safety of food supply. Use of public policy and food technology to reduce risks. Microbiological, chemical, and environmental hazards, government/industry controls.

**FSCN 1112. Principles of Nutrition.** (TS; 3 cr.; Student Option; Every Fall, Spring & Summer)
This course explores fundamental concepts of nutrition, nutrient functions, human nutritional requirements, and food sources. We will learn about evaluating nutrition information and food safety, and investigate the role of nutrition in chronic disease, public policy, and the environment. Nutrition is both a science.
FSCN 1905. Antioxidants: How They Protect Your Food and Body. (2 cr. ; A-F only; Every Fall)
This course will review how changes take place in food and biological systems in the absence and presence of antioxidants. We will concentrate on what antioxidants are, how they act, and how they protect food from deterioration and the body from deteriorative changes.

FSCN 2001. Healthy Foods, Healthy Lives: A Food System Approach to Cooking. (3 cr. ; Student Option; Every Spring)
Skills/resources for food choices based on nutritional, environmental, local/global societal implications. Ethical/civic themes that guide food choices. Discussion/writing on how environmental, cultural, social, health issues impact personal food choices. prereq: [soph, jr, sr] or instr consent

FSCN 2002. Healthy Foods, Healthy Lives - Cooking on a Student's Budget. (1 cr. ; Student Option; Every Fall & Spring)
Skills/tools necessary to be comfortable/confident home cooks, knowledgeable about preparation of nutritional/safely prepared foods. Food safety, basic nutrition, technique instruction, budgeting, time management, menu design, measuring, cooking methods, preservation.

FSCN 2021. Introductory Microbiology. (4 cr. ; A-F only; Every Fall & Spring)
How microbes impact our world in deadly/life-saving ways. Roles of bacteria, fungi, and viruses as agents of human diseases; in food spoilage/food borne diseases; and in food preservation/health promotion. Preventing plant diseases, food/drug production, cleaning up oil spills. Genetic engineering.

FSCN 3102. Introduction to Food Science. (3 cr. ; Student Option; Every Fall)
Introduction to chemical/physical properties of foods. Evaluating interaction/reaction of foods due to formulation, processing, preparation. prereq: CHEM 1022 or [CHEM 1062 and CHEM 1066]

FSCN 3301. Food Choices: Healing the Earth, Healing Ourselves. (3 cr. ; Student Option; Every Spring)
Link between our food/diet, agricultural practices, and health of planet. Food security. Cultural/personal context of food choices. Ways that food is produced, especially industrial monoculture. Food choices and the earth's bio diversity. Land use, water use, pollution, energy needs, climate change. Alternatives: organic/sustainable, fair trade. Economic policies/choices. Global tradeoffs. prereq: Jr or sr or grad student

FSCN 3612. Life Cycle Nutrition. (3 cr. ; Student Option; Every Fall)
Nutritional changes throughout lifecycle. Pregnancy, lactation, childhood, adulthood, aging. Topics relevant to lifecycle changes (e.g., body composition, immunity, sports nutrition). prereq: CHEM 1061/1065

FSCN 3614. Nutrition Education and Counseling. (3 cr. ; Student Option; Every Fall)
Effective communication skills are essential for all food and nutrition professionals whether working in clinical, community, management, or food service settings. This course is divided into two components: nutrition education and counseling. These two components will first teach the necessary knowledge and skills required of entry level dietitians such as educational theory and techniques, counseling theory and methods, interviewing techniques, and health literacy. You will also develop and practice these skills through application verbally in breakout sessions as well as written. The written component for the education section will include an interview paper; several informal activities in class all which will help develop and practice skills to complete the final project of developing a nutrition education lesson plan. The syllabus will focus on the nutrition education component. prereq: 1112

FSCN 3615. Sociocultural Aspects of Food, Nutrition, and Health. (GP; 3 cr. ; A-F only; Every Spring)
Sociocultural aspects of regional/cultural diversity in food preferences and food behavior, food habits, demographics, lifestyles, food consumption expenditures. Effect of socioeconomic status, religious beliefs, age and cultural meaning of foods on food choices.

FSCN 3731. Food Service Operations Management Laboratory. (2 cr. ; A-F or Audit; Every Fall)
Experience in managing a food service operation. On- and off-campus commercial and institutional restaurants used as labs. Required field trips, prereq: [3102 or concurrent registration is required (or allowed) in 3102]. [3732 or concurrent registration is required (or allowed) in 3732]

FSCN 3732. Food Service Operations Management. (3 cr. ; A-F or Audit; Every Fall)
Planning, preparing, delivering, serving, managing foods served away from home.

FSCN 4096. Professional Experience Program: Internship. (1-4 cr. ; max 24 cr. ; A-F only; Every Fall, Spring & Summer)
Apply knowledge from Food Science BS or Nutrition BS program to real-life problems in professional internship. Performance evaluated for credit. prereq: To register, students must fill out FScN Internship Agreement form, available at http://fscn.cfans.umn.edu. Contact fscnрг@umn.edu with questions.

FSCN 4112. Food Chemistry and Functional Foods. (3 cr. ; Student Option; Every Fall)
Most important food constituents, their occurrence, structures, functional properties, and health benefits. Proteins, lipids, carbohydrates, water. Vitamins, minerals, enzymes, phytochemicals, food additives, contaminants. prereq: 3102, BIOC 3021

FSCN 4121. Food Microbiology. (3 cr. ; Student Option No Audit; Every Spring)
Microorganisms involved in food-borne disease, food fermentations, and food spoilage. Methods for their control/detection. Food microbiology. Foodborne pathogens. Microbial food spoilage. Control of microorganisms in food. prereq: BIOC 3021, [2012 or VBS 2032 or MICB 3301]

FSCN 4122. Food Fermentations and Biotechnology. (2 cr. ; Student Option; Every Fall)
Major food fermentations important for food industry. Microbiological components. Impact of biotechnology on food production. Genetic tools. Improvement of microbes used in food production by biotechnological approaches. prereq: [MICB 3301, BIOL 4003] or instr consent

FSCN 4123. Molecular Biology for Applied Scientists. (1 cr. ; A-F only; Every Fall)

FSCN 4131. Food Quality. (3 cr. ; Student Option; Every Fall)
This course is designed to give students an overview of the management systems, statistical procedures, and regulatory requirements involved with producing quality food and ingredients. The course material includes risk assessment and management, good manufacturing practices, hazard analysis critical control point (HACCP), statistical methods for process control, total quality management, and food and drug laws. The course is intended primarily for upper division undergraduates majoring in food science. prereq: jr

FSCN 4210. Topics in Food Science and Nutrition. (1-4 cr. ; max 8 cr. ; Student Option; Every Summer)
Indepth investigation of specific topic in nutrition/food science not yet covered by other courses, topic announced in advance. prereq: instr consent

FSCN 4291. Independent Study. (1-4 cr. ; Student Option; Every Fall, Spring & Summer)
Individual lab or library research in an area related to food science or nutrition. prereq: Undergrads, instr consent

FSCN 4311. Chemical Reactions in Food Systems. (2 cr. ; Student Option; Every Spring)
Chemical structure of major food constituents, carbohydrates, lipid, and proteins. Reaction/interaction pathways. Function within complex food matrix under various storage/processing conditions. prereq: 4112, 4312W

FSCN 4312W. Food Analysis. (WI; 4 cr.; Student Option; Every Fall)
The course covers major analytical tools needed for any investigation in food science and technology, whether by the food industry, governmental agencies, or universities. Specifically, the course covers: application of quantitative and qualitative physical, chemical, and instrumental methods used for analysis and examination of food constituents, ingredients, and products; sensory evaluation techniques; and evaluation of methods and interpretation of results. The course covers methods used for: compositional analysis of foods; chemical characterization of foods and food constituents; and spectroscopic, chromatographic, and spectrometric analysis used for the detection, identification, and quantification of food macro- and micro-components. In this course the students will learn to identify the appropriate methods of analysis based on the investigation purpose, either nutrition labeling, quality control, product development, or scientific research. prereq: FSCN 4112

FSCN 4332. Food Processing Operations. (3 cr.; A-F or Audit; Every Spring)
Engineering principles applied to commonly used food processing operations. Blanching, pasteurization, sterilization, freezing, baking, milling, extrusion. Meat processing, water treatment, waste management. Prerequisite: BBE 4744

FSCN 4349. Food Science Capstone. (2 cr.; A-F only; Every Fall & Spring)
Planning of process or product development project. Defining goals, preparing/following time line, reviewing literature, coordinating with experts, procuring supplies, writing progress reports. Determining ingredient specifications, lab/pilot plant production. Chemical, microbiological, sensory testing. Oral/written presentations. prereq: 4112, 4121, 4131, 4312, 4332, BBE 4744, Food Science Major, senior

FSCN 4481. Sensory Evaluation of Food Quality. (1 cr.; A-F only; Every Spring)
Fundamentals of sensory perception. Test designs and methods used in studying sensory qualities of foods and consumer responses to foods. prereq: 3102, Stat 3011

FSCN 4612. Advanced Human Nutrition. (4 cr.; Student Option; Every Fall)
Advanced study of digestion/absorption of nutrients. Research techniques in nutrition, including human/epidemiological studies. Health promotion, disease prevention theories. prereq: 1112, [CHEM 1022 or CHEM 1062 and CHEM 1066], [BioC 3021 or PHSL 3051 or ANSC 3301 or BIOL 3211]

FSCN 4613. Experimental Nutrition. (2 cr.; Student Option; Every Spring)
Lab in chemical/biochemical methods of analysis of nutritional status.

FSCN 4614W. Community Nutrition. (DSJ,WI,SOCS; 3 cr.; A-F only; Every Spring)
Nutrition risks associated with different age, sex, ethnic, and socioeconomic groups. Community needs assessment. Program planning and evaluation. Programs developed to address the needs and interests of people at different stages of the life cycle, ethnic or cultural backgrounds, and literacy levels.

FSCN 4621. Nutrition and Metabolism. (4 cr.; Student Option; Every Fall)
Carbohydrate, lipid, protein metabolism. Uses systems/holistic approach to emphasize how metabolic pathways interrelate. Prequisite courses: FSCN 4612, BioC 3021, ANSC 3301

FSCN 4622. Nutritional Toxicology, the basic science of diet-related toxicants. (3 cr.; A-F only; Every Spring)
Concepts of toxicity. Molecular mechanism behind dietary chemical-induced toxicities. Impact/risk of dietary chemicals for human health. prereq: BioC 3021; designed for students majoring in nutrition or food science or toxicology

FSCN 4664. Senior Capstone: Becoming a Registered Dietitian. (1 cr.; S-N or Audit; Every Fall)
Preparation for advancement in career as registered dietitian, including completion of dietetic internship application. Current issues in dietetics. prereq: [4665 or concurrent registration is required (or allowed) in 4665]. Nutrition/dietetics subplan of nutrition major or instr consent

FSCN 4665. Medical Nutrition Therapy I. (3 cr.; A-F or Audit; Every Fall)
Nutrition care process, with a focus on nutrition assessment and support, and on pathophysiology, management, and nutrition care of disease and injury, e.g. gastrointestinal (GI), pancreatic, hepatic, and pulmonary disorders; surgery/trauma/burns; and cancer. prereq: BioC 3021, Phys 3051, FSCN 4612

FSCN 4666. Medical Nutrition Therapy II. (3 cr.; A-F or Audit; Every Spring)
Nutrition care process, with a focus on pathophysiology, management, and nutrition care of diabetes mellitus, cardiovascular, gastrointestinal, renal disorders, and obesity.

FSCN 4667. Senior Seminar for the Didactic Program in Dietetics. (2 cr.; S-N only; Every Fall)
Preparation for advancement in career as registered dietitian, including completion of dietetic internship application. Current issues in profession of dietetics. prereq: Senior Nutrition Major with DPD subplan, [FSCN 4665 or concurrent registration is required (or allowed) in 4665]

FSCN 4732. Food and Nutrition Management. (3 cr.; A-F or Audit; Every Spring)
Financial and human resource management applied to a variety of business and institutional settings. Field trips may be required. prereq: 3732

FSCN 5123. Molecular Biology for Applied Scientists. (1 cr.; A-F only; Every Fall)
Half semester course. Two hours per week for 8 weeks. Basics of molecular biology/ how it has been used for biotechnological applications. Origins of molecular biology from discovery of DNA as inheritance material within cells to advent of gene cloning/sequencing technologies. prereq: MicB 3301 or FSCN 2021 or instr consent

FSCN 5131. Food Quality for Graduate Credit. (3 cr.; Student Option; Every Fall)
Management systems, statistical procedures, regulatory requirements involved with producing quality food/ingredients. Risk assessment/management, good manufacturing practices, hazard analysis critical control point (HACCP), statistical methods for process control, total quality management, food/drug laws. prereq: Food Science Grad Student
Student may select grading basis if instructor approves. A-F registration is required for class to count toward degree.

FSCN 5312. Food Analysis. (4 cr.; A-F or Audit; Every Fall)
Analytical tools needed for investigation in Food Science/Technology, whether by food industry, governmental agencies, or universities. Application of quantitative/qualitative physical, chemical/instrumental methods used for analysis/examination of food constituents. Sensory evaluation techniques, evaluation of methods/interpretation of results. prereq: 4112, STAT 3011

FSCN 5441. Introduction to New Product Development. (2 cr.; Student Option; Fall Even, Spring Odd Year)
This course is designed to give students an overview of the product development process including management systems, team dynamics, technical problem solving, idea generation, and differences between different categories of food R&D. Prerequisites: FSCN 4112

FSCN 5461. Food Packaging. (2 cr.; Student Option; Fall Odd Year)
Materials, principles, and procedures of packaging as they apply to food products. Emphasis is on consumer products, but the principles also apply to bulk and institutional foods and ingredients. prereq: 1102, 3102, Phys 1102 or Phys 1302

FSCN 5481. Sensory Evaluation of Food Quality. (2 cr.; Student Option; Periodic Spring)

FSCN 5521. Flavor Technology. (2 cr.; Student Option; Spring Even Year)

Major food fermentations important for today's food industry, with particular focus on microbiological components. Fermentations cover all major commodity food groups of dairy, central, meat, vegetables, fruits. prereq: MicB 3301, BIOL 4003
Overview of flavor chemistry/related technology. Analytical techniques, mechanisms of flavor development (chemical/biogenesis), off-flavors, industrial production/application of food flavorings. prereq: 4112

FSCN 5531. Grains: Introduction to Cereal Chemistry and Technology. (1-2 cr.; Student Option; Periodic Fall & Spring) Origins, structure, biochemistry, and cellular properties of major cereal grains as they relate to primary processing (milling) and secondary processing (production of cereal products). prereq: Biol 1009, Chem 1022

FSCN 5541. Dairy Product Chemistry and Technology. (2 cr.; Student Option; Fall Odd Year) Designed for upper division Food Science undergraduate/graduate students. Physiology of milk production in ruminants. Resulting composition. Chemical, physical, microbiological properties of milk components. How milk products are manufactured. prereq: 3102, 4112, Food Science major, upper division undergraduate or graduate student

FSCN 5601. Management of Eating Disorders. (3 cr.; Student Option; Every Fall & Spring) Etiology, occurrence, course, treatment, prevention of eating disorders from multidisciplinary perspective. Roles and responsibilities of eating disorder treatment team members of varying types across various treatment milieus. prereq: Junior, senior or graduate student in nutrition or health related program or instructor consent.

FSCN 8310. General Seminar. (1 cr.; max 2 cr.; S-N or Audit; Every Fall & Spring) Presentations by faculty, graduate students, and outside speakers. prereq: instr consent

FSCN 8318. Current Issues in Food Science. (2 cr.; max 4 cr.; A-F or Audit; Every Spring) Current issues in Food Science and how they impact the food industry. Prerequisites: FSCN 4112, FSCN 4121, Department Consent.

FSCN 8320. Advanced Topics in Food Science. (1-3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring) Recent research or special topics.

FSCN 8330. Research Topics. (1 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) Seminar in which faculty member or group of faculty/graduate students discuss research progress or review/discuss current research literature.

FSCN 8331. Food Proteins. (2 cr.; Student Option; Spring Even Year) Protein biochemistry as applied to food systems/processing. Forces that determine protein structure. Isolation/characterization of food proteins. Structure/function relationships in handling/processing food protein systems. prereq: 4112, 4312

FSCN 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

FSCN 8335. Carbohydrate Chemistry in Food and Nutrition. (2 cr.; Student Option; Every Spring) Carbohydrates as food components, their use as food ingredients. Reactions of mono/di/poly saccharides during food processing. Biosynthesis of carbohydrates, their metabolism. Methods in carbohydrate analysis. prereq: 4112

FSCN 8336. Lipid Chemistry and Rancidity of Foods. (2 cr.; Student Option; Periodic Fall) Chemistry of food lipid oxidation/rancification. Protective functions of antioxidants. prereq: 4112

FSCN 8337. Flavor Chemistry. (2 cr.; Student Option; Periodic Fall) Chemical involvement in flavor, analysis, and release of flavoring materials in foods. prereq: 4111

FSCN 8338. Antioxidants in Food: Practical Applications. (2 cr.; Student Option; Every Spring) Mechanisms of antioxidant activities in food systems. Free radical scavengers, hydroperoxide stabilizers, synergists, metal chelators, singlet oxygen quenchers, substance reducing hydroperoxides. Practical applications of antioxidants in various food systems, effects of antioxidants on health/diseases. prereq: 4111, Bioc 3021, food chemistry, organic chemistry, biochemistry

FSCN 8391. Independent Study: Food Science. (1-4 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) Includes written reports. prereq: instr consent

FSCN 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

FSCN 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) Incomplete prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

FSCN 8777. Thesis Credits: Master's. (1-18 cr.; max 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

FSCN 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Food Systems (FDSY)

FDSY 1016W. Growing Food & Building Community: Urban Agriculture in the Twin Cities. (WI; 3 cr.; A-F only; Every Fall) The capacity and support for urban agriculture is expanding globally. It is estimated that 25-30% of urban dwellers worldwide are involved in agriculture. In the future, we can expect that more of our food will be grown in urban centers. Urban farms and food businesses, food hubs, neighborhood community gardens, schoolyard and residential gardens are all part of the current urban food movement. As the first year colloquium for food systems majors, this course will integrate academic and orientation learning objectives and allow students to gain practice in systems thinking--exhibited through in-class discussion and writing--using urban agriculture as a framework. In this course, we will evaluate the direct and indirect benefits and challenges of urban agriculture by looking through environmental, political and social lenses. Class field trips and a service learning activity are used to demonstrate the various ways food is grown and how food may be used as a vehicle to achieve social goals. We will discuss a broad array of topics including horticultural production practices, soil health and environmental sustainability issues, social justice and food access, and public policy and regulations constraining urban farms, with an emphasis on the Minneapolis/St. Paul metro area. Students in this course will deepen their understanding of the complexity of urban food systems, while also recognize social differences of race, ethnicity and class; improve intercultural competence skills as a foundation for positive cross-cultural relationships; and gain an awareness of how urban agriculture can be a force for change.

FDSY 1903. An Eater’s Guide to the Food System. (3 cr.; A-F only; Every Fall) In this course we will explore the plants that are the basis for our food system and how natural and human forces influence their abundance and quality. We will highlight sustainability through evaluation of environmental, economic, and social impacts on the food system and how consumers can effect change. Coursework will include assigned readings, discovery of new information shared with the class through written reviews and oral summaries, discussions, and hands-on plant growth and food production activities.

FDSY 2101. Plant Production Systems. (3 cr.; Student Option; Every Spring) How food production systems fit within overall food system. Fundamentals of soils, plant nutrition, plant production metabolites as they affect food production systems. Decisions that differentiate among conventional sustainable/organic systems. prereq: College level general biology course or Hort 1001 or instr consent

FDSY 4110. Holistic Approaches to Improving Food Systems Sustainability. (3 cr.; A-F only; Every Spring) Students in this capstone course address food system sustainability challenges both in the classroom and via service-learning, where they spend 45 hours engaged with a food justice-
Foreign Study (FOST)

**FOST 1040. Study Abroad.** (1-12 cr. [max 128 cr.]; Student Option; Every Fall, Spring & Summer)
Course used to grant credit for a new study abroad course or program that, by the time recruiting begins, has not had time to go through the normal approval process.

**FOST 1201. Study Abroad.** (1-32 cr.; Student Option; )
Not published in catalog. prereq: dept consent

**FOST 1202. Study Abroad.** (1-32 cr.; Student Option; Every Fall, Spring & Summer)
Not published in course catalog. prereq: dept consent

**FOST 1203. Study Abroad.** (1-32 cr.; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Designated Theme in International Perspectives. prereq: dept consent

**FOST 1440. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Designated Theme in International Perspectives. prereq: dept consent

**FOST 1450. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Cultural Diversity and Citizenship and Public Ethics. prereq: dept consent

**FOST 1460. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Not published in catalog. prereq: dept consent

**FOST 1470. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Cultural Diversity and International Perspectives. prereq: dept consent

**FOST 1480. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Citizenship and Public Ethics and The Environment. prereq: dept consent

**FOST 1490. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in The Environment and International Perspectives. prereq: dept consent

**FOST 1495. Study Abroad.** (1-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Not published in catalog. prereq: dept consent

**FOST 1500. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science with Lab. prereq: dept consent

**FOST 1505. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science without Lab. prereq: dept consent

**FOST 1510. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science with Lab. prereq: dept consent

**FOST 1520. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science without Lab. prereq: dept consent

**FOST 1530. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective. prereq: dept consent

**FOST 1540. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Literature. prereq: dept consent

**FOST 1550. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Mathematical Thinking. prereq: dept consent

**FOST 1560. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Philosophical Perspective. prereq: dept consent

**FOST 1570. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science with Lab. prereq: dept consent

**FOST 1580. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science without Lab. prereq: dept consent

**FOST 1590. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science. prereq: dept consent

**FOST 1600. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual and Performing Arts. prereq: dept consent

**FOST 1710. Study Abroad.** (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual and Performing Arts. prereq: dept consent
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in Cultural Diversity. prereq: dept consent

FOST 1720. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in Cultural Diversity. prereq: dept consent

FOST 1730. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Literature and Cultural Diversity. prereq: dept consent

FOST 1740. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and Cultural Diversity. prereq: dept consent

FOST 1750. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in International Perspectives. prereq: dept consent

FOST 1760. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual and Performing Arts. prereq: dept consent

FOST 1770. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 1780. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Philosophical Perspective and a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 1790. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and Citizenship and Public Ethics. prereq: dept consent

FOST 1800. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in The Environment. prereq: dept consent

FOST 1810. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science with a Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 1820. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science without a Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 1830. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in The Environment. prereq: dept consent

FOST 1840. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science without a Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 1850. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science with a Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 1860. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and a Designated Theme in The Environment. prereq: dept consent

FOST 1870. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in International Perspectives. prereq: dept consent

FOST 1880. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall & Spring)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in International Perspectives. prereq: dept consent

FOST 1890. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall & Spring)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Literature and a Designated Theme in International Perspectives. prereq: dept consent

FOST 1900. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and a Designated Theme in International Perspectives. prereq: dept consent

FOST 1910. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual and Performing Arts and a Designated Theme in International Perspectives. prereq: dept consent

FOST 1920. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual and Performing Arts and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3000. Study Abroad: Outside Program. (0-20 cr. [max 200 cr.]; S-N only; Every Fall, Spring & Summer)
Study abroad outside program placeholder course. prereq: dept consent

FOST 3010. Directed Study Abroad. (0-18 cr. [max 180 cr.]; S-N only; Every Fall, Spring & Summer)
N/A prereq: dept consent

FOST 3020. Exchange Study Abroad. (0-18 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer)
N/A prereq: dept consent

FOST 3021. Study Abroad: Bilateral Exchange Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3022. Study Abroad: China Center Exchange Program. (0-20 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer)
Study abroad course

FOST 3023. Study Abroad: CSE Exchange Program. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course

FOST 3024. Study Abroad: Collegiate Exchange Programs. (0-20 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer) Study abroad course

FOST 3025. Study Abroad: Scholarship / IRSEP Exchange Program. (0-20 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer) Study abroad course

FOST 3026. Study Abroad: ISEP Exchange Program. (0-20 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer) Study abroad course

FOST 3027. Study Abroad: Departmental Affiliated Program. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad placeholder course

FOST 3028. Study Abroad: AC China Flagship Capstone Year Program. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

FOST 3040. Study Abroad. (1-32 cr.; A-F only; Every Fall, Spring & Summer) Course used to grant credit for a new study abroad course or program that, by the time recruiting begins, has not had time to go through the normal approval process. prereq: dept consent

FOST 3050. Study Abroad Through UMN System. (0-32 cr.; Student Option; Every Fall, Spring & Summer) Study abroad through program sponsored by Duluth/Morris, or Crookston campus. prereq: dept consent

FOST 3060. Global Seminar. (3 cr. [max 9 cr.]; A-F only; Every Spring & Summer) Short term study abroad program during May Session or winter break.

FOST 3110. HECU-Affiliated Study Abroad Programs. (1-20 cr. [max 80 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad through Higher Education Consortium for Urban Affairs. prereq: dept consent

FOST 3111. Study Abroad: International Chinese Language Program. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad placeholder course for new affiliate program, ICLP.

FOST 3115. Study Abroad: Alliance Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad course

FOST 3120. AESOP/CIC-Study Abroad Programs. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad through Committee on Institutional Cooperation. prereq: dept consent

FOST 3125. Study Abroad: USIT Irish Studies Summer School Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad course

FOST 3130. IES-Study Abroad Program. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad through Institute for the International Education of Students (IES). prereq: dept consent

FOST 3135. Study Abroad: CET Programs. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad course

FOST 3140. CIEE-Study Abroad Program. (1-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad through Council on International Educational Exchange. prereq: dept consent

FOST 3150. Butler/IFSA: Study Abroad Program. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad sponsored by Butler University/IFSA and cosponsored by the University of Minnesota. prereq: dept consent

FOST 3160. Arcadia/CEA: Study Abroad Program. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad sponsored by Arcadia College/CEA and cosponsored by the University of Minnesota. prereq: dept consent

FOST 3170. Study Abroad: Integrated Studies in Freiburg. (0-20 cr. [max 80 cr.]; A-F only; Every Fall & Spring) Study Abroad placeholder course for the Integrated Studies in Freiburg program.

FOST 3175. Study Abroad: AC China Flagship Capstone Year Program. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

FOST 3180. Bologna Cooperative Studies Program, Italy. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring) Study abroad through Bologna Cooperative Studies Program at the University of Bologna, Italy. prereq: dept consent

FOST 3201. Study Abroad. (1-32 cr.; Student Option; Every Fall, Spring & Summer) Course used to grant credit for a new study abroad course or program that, by the time recruiting begins, has not had time to go through the normal approval process. prereq: dept consent

FOST 3202. Study Abroad. (1-32 cr.; Student Option; Every Fall, Spring & Summer) Course used to grant credit for a new study abroad course or program that, by the time recruiting begins, has not had time to go through the normal approval process. prereq: dept consent

FOST 3203. Study Abroad. (1-32 cr. [max 1 cr.]; Student Option; Every Fall, Spring & Summer) Course used to grant credit for a new study abroad course or program that, by the time recruiting begins, has not had time to go through the normal approval process. prereq: dept consent
FOST 3220. Study Abroad: SIT Program. (1-20 cr. [max 60 cr.]; A-F only; Every Fall & Spring)

FOST 3225. Study Abroad: Language Immersion in China. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

FOST 3230. Study Abroad: School for Field Studies (SFS) Program. (1-20 cr. [max 60 cr.]; A-F only; Every Fall & Spring)

FOST 3235. Study Abroad: University Study in Ireland. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

FOST 3240. University Study in Norway. (1-20 cr. [max 60 cr.]; A-F only; Every Fall & Spring)

FOST 3245. Study Abroad: Arabic Language and Culture in Morocco Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3255. Study Abroad: Language and Culture in Buenos Aires Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3265. Study Abroad: Florence Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3270. Denmark's International Study Program. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad in Denmark or Iceland through Denmark's international study program. prereq: dept consent

FOST 3275. Study Abroad: Mexico Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3285. Study Abroad in Rome Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3290. University Study in New Zealand. (1-20 cr. [max 60 cr.]; A-F only; Every Fall & Spring)

FOST 3295. Study and Internships in Sydney Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3305. Study Abroad: Turkey. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

FOST 3306. Study Abroad: Study and Internships in Madrid. (0-20 cr. [max 60 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad placeholder course.

FOST 3310. Study Abroad in Montpellier. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Semester or year at Universit? Paul Val?ry, Montpellier, France, sponsored by Global Campus and the Department of French and Italian. Students take regular courses or special courses for foreigners. All courses taught entirely in French by Paul Val?ry faculty. Many disciplines available. prereq: dept consent

FOST 3315. Study Abroad: MSID Ecuador Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3316. Study Abroad: Health and Society in Ecuador. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad program for the new program, "Health and Society in Ecuador"

FOST 3320. International Program in Toledo, Spain. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer)
Study through International Program of Spanish, European, and Latin American Studies in Toledo, Spain. prereq: dept consent

FOST 3325. Study Abroad: MSID India. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3326. Study Abroad: MSID Thailand. (0-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

FOST 3330. Study Abroad in Venezuela. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer)
Semester or summer study in Venezuela through a University of Minnesota program administered by Learning Abroad Center and VENUSA. Spanish language, Venezuelan/Latin American studies. prereq: dept consent

FOST 3335. Study Abroad: MSID Kenya. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3340. Study Abroad in London. (1-20 cr. [max 120 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3345. Study Abroad: MSID Senegal. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3350. University Study in Australia. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Not listed in catalog.

FOST 3355. Study Abroad: University Study in Israel Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3360. University Study in the United Kingdom. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Not printed in catalog.

FOST 3365. Study Abroad: University Study in South Africa Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3370. Study Abroad Through InterStudy. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Study abroad program cosponsored by InterStudy and the University.

FOST 3375. Study Abroad: University Study in South Korea Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3380. Study Abroad: American University Cairo. (0-20 cr. [max 42 cr.]; A-F only; Every Fall, Spring & Summer)
Placeholder course for students studying at American University Cairo.

FOST 3385. Study Abroad in Tanzania Program. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course.

FOST 3390. Study Abroad: GlobaLinks, AustraLearn. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Study abroad program sponsored by AustraLearn and approved by University of Minnesota.

FOST 3391. Study Abroad: GlobaLinks, AsiaLearn. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Study abroad program sponsored by AsiaLearn and approved by University of Minnesota.

FOST 3392. Study Abroad: GlobaLinks, EuroLearn. (1-20 cr. [max 120 cr.]; A-F only; Every Fall & Spring)
Study abroad program sponsored by EuroLearn and approved by University of Minnesota.

FOST 3400. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Designated Theme in Cultural Diversity prereq: dept consent

FOST 3410. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 3420. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Designated Theme in International Perspectives. prereq: dept consent

FOST 3430. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Designated Theme in International Perspectives. prereq: dept consent

FOST 3440. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Cultural Diversity and Citizenship and Public Ethics. prereq: dept consent

FOST 3450. Study Abroad. (; 1-10 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: dept consent

FOST 3460. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Cultural Diversity and International Perspectives. prereq: dept consent

FOST 3470. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Citizenship and Public Ethics and The Environment. prereq: dept consent

FOST 3480. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in Citizenship and Public Ethics and International Perspectives. prereq: dept consent

FOST 3490. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as two Designated Themes, in The Environment and International Perspectives. prereq: dept consent

FOST 3495. Study Abroad Course. (; 1-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

FOST 3500. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities. prereq: dept consent

FOST 3510. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) N/A prereq: dept consent

FOST 3520. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science without Lab. prereq: dept consent

FOST 3530. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in Cultural Diversity. prereq: dept consent

FOST 3540. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Literature. prereq: dept consent

FOST 3550. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Mathematical Thinking. prereq: dept consent

FOST 3560. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Philosophical Perspective. prereq: dept consent

FOST 3570. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science with Lab. prereq: dept consent

FOST 3580. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science. prereq: dept consent

FOST 3590. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Cultural Science. prereq: dept consent

FOST 3600. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual or Performing Arts. prereq: dept consent

FOST 3710. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in meats and Humanities and a Designated Theme in Cultural Diversity. prereq: dept consent

FOST 3720. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and Citizenship and Public Ethics. prereq: dept consent

FOST 3730. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 3740. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and Citizenship and Public Ethics. prereq: dept consent

FOST 3750. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 3760. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science With Lab and a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 3770. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in Cultural Diversity. prereq: dept consent

FOST 3780. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Philosophy and a Designated Theme in Citizenship and Public Ethics. prereq: dept consent

FOST 3790. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and Citizenship and Public Ethics. prereq: dept consent

FOST 3800. Study Abroad. (; 1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer) Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in The Environment. prereq: dept consent

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
FOST 3810. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science with a Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 3820. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Biological Science without Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 3830. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in The Environment. prereq: dept consent

FOST 3840. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science with Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 3850. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Physical Science without Lab and a Designated Theme in The Environment. prereq: dept consent

FOST 3860. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and a Designated Theme in The Environment. prereq: dept consent

FOST 3870. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Arts and Humanities and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3880. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Historical Perspective and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3890. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Literature and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3900. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Philosophical Perspective and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3910. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Social Science and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3920. Study Abroad. (1-10 cr. [max 30 cr.]; Student Option; Every Fall, Spring & Summer)
Course taken through study abroad that counts toward the Liberal Education graduation requirements as a Diversified Core in Visual and Performing Arts and a Designated Theme in International Perspectives. prereq: dept consent

FOST 3991. Study Abroad: SOR London Semester & Quarter Programs. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3993. Study Abroad: SOR CAPA Sydney. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3994. Study Abroad: SOR CAPA Australian Catholic University. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3995. Study Abroad: SOR DIS. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3996. Study Abroad: SOR GlobalLinks. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3997. Study Abroad: SOR Rome. (0-20 cr. [max 40 cr.]; A-F only; Every Fall, Spring & Summer)
Study abroad course

FOST 3998. Study Abroad: SOR SFS. (0-20 cr. [max 60 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course

FOST 3999. Study Abroad. (1-20 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad for-credit internship course.

FOST 5000. Study Abroad. (0-18 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad registration. prereq: dept consent

FOST 5010. Study Abroad Directed Study placeholder course. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

FOST 5020. Global Experience Program. (0-6 cr. [max 18 cr.]; Student Option; Every Fall & Summer)
The course is used to award credit for work successfully completed on the Global Experience Program study abroad internship program. Evaluation standards and work load are determined by the graduate faculty member who signs the Global Experience Program learning contract required of each participant. Number of contact hours varies from location to location. prereq: Must have graduate student status

Foreign Study - SPAN (FSSP)

FSSP 5960. Preparatory Seminar for SPAN Overseas Research. (4 cr.; A-F or Audit; Every Summer)
Preparatory seminar for SPAN overseas research. prereq: dept consent

FSSP 5970W. Seminar for SPAN Overseas Research. (WI; 4 cr.; A-F or Audit; Every Summer)
Seminar for SPAN overseas research. prereq: dept consent

Forest and Natural Res. Mgmt. (FNRM)

FNMR 1001. Orientation and Information Systems. (1 cr.; A-F or Audit; Every Fall)
Forest resources, recreation resource management, urban forestry programs. Forestry and natural resource careers. Qualification requirements for government positions, competencies, internships, and experiences to compete for jobs in industry. Course planning, mentoring, alumni contacts. Leadership, organization, process. Lab equipment/software, GIS, the Internet, spreadsheets, Lumina, periodical indexes.

FNMR 1101. Dendrology: Identifying Forest Trees and Shrubs. (3 cr.; Student Option; Every Fall)
Identification nomenclature, classification, and distribution of common/important forest trees/shrubs. Use of keys. Field/lab methods of identification.

FNMR 2101. Identifying Forest Plants. (1 cr.; A-F or Audit; Every Summer)
Field identification of common northwoods trees, shrubs, and nonwoody vascular plants. Emphasizes concept of plant communities, soil site relationships, and wildlife values. Taught at Cloquet Forestry Center.

FNMR 2102. Northern Forests Field Ecology. (2 cr.; A-F or Audit; Every Summer)
Field examination of natural history of northern/boreal forests with respect to soils,
ecological characteristics of trees, community-environment relationships, stand development, succession, and regeneration ecology. Taught at the Cloquet Forestry Center; prereq: Biol 1001 or Biol 1009

FNRM 2104. Measuring Forest Resources. (; 1 cr.; A-F or Audit; Every Summer) Introduction to land survey, tree/forest stand measurement (mensuration), and forest sampling techniques. Taught at Cloquet Forestry Center.

FNRM 3101. Park and Protected Area Tourism. (; 3 cr.; A-F or Audit; Fall Odd Year) Tourism is a significant industry locally, nationally, and internationally. Park and protected area attractions are among the most visited but also the most vulnerable attractions. This course is designed to familiarize you with the basic concept of park and protected area tourism, including cultural and ecotourism, and then develop your expertise to plan and evaluate sustainable tourism development and operations. Accordingly, you will complete assignments that apply the knowledge gained to planning and evaluation activities. This course is offered partially on-line. COURSE OBJECTIVES By the end of the class you will be able to: 1. Differentiate and appreciate the complexities involved with defining and developing nature, eco, heritage, geo-, park and protected, cultural and "sustainable tourism." 2. Identify specific social, economic, and environmental impacts associated with park and protected area tourism, how to measure them, and methods to minimize the negative and maximize the positive impacts. 3. Analyze domestic and international case studies of park and protected area tourism. 4. Critically evaluate park and protected area tourism services and effective management and planning. 5. Create elements of a business plan for park and protected area tourism operations that emphasize sustainability.

FNRM 3104. Forest Ecology. (; 4 cr.; A-F or Audit; Every Fall) Form and function of forests as ecological systems. Characteristics and dynamics of species, populations, communities, landscapes, and ecosystem processes. Examples applying ecology to forest management. Weekly discussions focus on research topics in forest ecology, exercises applying course concepts, and current issues in forest resource management. Required weekend field trip. Prereq: Biol 1001, 1009 or equivalent introductory biology course; 1 semester college chemistry recommended.

FNRM 3114. Hydrology and Watershed Management. (; 3 cr.; Student Option; Every Fall) Hydrologic cycle and water processes in upland/riparian systems. Applications of hydrologic concepts to evaluate impacts of forest and land management activities on water yield, streamflow, groundwater erosion, sedimentation, and water quality. Concepts, principles, and applications of riparian/watershed management. Regional/ national/global examples. Forest ecosystems. Prereq: [BIOI 1001 or BIOI 1009], [CHEM 1015, CHEM 1017] or CHEM 1021, MATH 1151] or instr consent

FNRM 3131. Geographical Information Systems (GIS) for Natural Resources. (TS; 4 cr.; A-F only; Every Fall & Spring) Spatial data development/analysis in science/management of natural resources. Data structures/sources/collection/quality. Geodesy, map projections, spatial/tabular data analysis. Digital terrain analysis, cartographic modeling, modeling perspectives, limits of technology. Lab exercises. Both onsite and fully online options for course enrollment. Prereq: Soph or jr or sr or UHP Jr

FNRM 3201. Introduction to Travel and Tourism. (; 3 cr.; A-F only; Every Spring) Travel and tourism is called one of the largest industries in the world today. This course introduces students to the nature, structure, and complexity of the travel and tourism system. Specific focus is placed on understanding the tourism system and its impact globally on economies, environments, and people. Using a lens of sustainability, students will examine the functions and interconnectedness of the various sectors within the tourism system and the role of diverse and sometimes competing priorities of stakeholders in the creation, delivery, and integration of tourism. The course uses readings, case studies, discussion, and applied projects to develop students' understanding of tourism and how communities, businesses, and government can maximize benefits associated with the demand for tourism while protecting the natural and human resources upon which it depends.

FNRM 3203. Forest Fire and Disturbance Ecology. (3 cr.; A-F or Audit; Every Spring) Ecology, history, management, control of fire, wind, insect infestation, deer browsing, other disturbances in forests, including disturbance regimes of boreal, northern hardwood, savannas of North America. Influence of disturbance on wildlife habitat, urban/wildland interfaces, forest management, stand/landscape dynamics. Tree mortality in fires, successional patterns created by fires, interactions of life history traits of plants with disturbances.

FNRM 3204. Landscape Ecology and Management. (3 cr.; A-F or Audit; Every Fall) Introduction to landscape ecology at different scales in time/space. Development/implications of broad-scale patterns of ecological phenomena, role of disturbance in ecosystems, characteristic spatial/temporal scales of ecological events. Principles of landscape ecology as framework for landscape research, analysis, conservation, and management. Prereq: Ecology course

FNRM 3205. Productivity and Ecology of Forest Soils. (3 cr.; A-F only; Fall Even Year) Forest soils are fundamental to the development and function of forested ecosystems. This course will focus on soil-site factors affecting plant and wildlife communities, site quality estimation, site modification and enhancement, and the effects of forest management and other human-related disturbances on forest soil functions. Prior coursework in soils, hydrology, and forest management will enhance student learning, but are not required for successful completion of the course.

FNRM 3206. Park and Protected Area Management Field Studies. (2 cr. [max 3 cr.]; A-F only; Every Summer) Directed field study of park/protected areas. Recreation planning/visitor management, cultural/natural resource management, resource interpretation. Communication across local, state, federal, tribal park, protected areas in northern Minnesota, prereq: Sophomore status or higher.

FNRM 3218. Measuring and Modeling Forests. (3 cr.; A-F or Audit; Every Spring) Sampling design, survey techniques to assess resource conditions. Applying metrics/sampling methods to forest vegetation. Calculating tree/stand volume. Modeling approaches. Case studies of modeling to project future growth. Landscape processes, characterization, modeling. Prereq: [ESPM 3012 or STAT 3011], MATH 1151

FNRM 3262. Remote Sensing and Geospatial Analysis of Natural Resources and Environment. (3 cr.; Student Option; Every Fall) Introductory principles and techniques of remote sensing and geospatial analysis applied to mapping and monitoring land and water resources from local to global scales. Examples of applications include: Land cover mapping and change detection, forest and natural resource inventory, water quality monitoring, and global change analysis. The lab provides hands-on experience working with satellite, aircraft, and drone imagery, and image processing methods and software. Prior coursework in Geographic Information Systems and introductory Statistics is recommended. Prereq: None, but prior coursework in GIS and Statistics is recommended.

FNRM 3411. Managing Forest Ecosystems: Silviculture. (3 cr.; A-F only; Every Fall) Management of forest ecosystems for sustaining ecological integrity, soil productivity, water quality, wildlife habitat, biological diversity, commodity production in landscape context. Silvics, forest dynamics, disturbances, regeneration, restoration, silvicultural systems. Ramifications of management choices. Weekend field trip. FEMC track students should take FNRM 5413 concurrently prereq: FNRM 3104 or consent of instructor

FNRM 3431. Timber Harvesting and Road Planning. (2 cr.; Student Option; Every Spring) Introduction to forest operations. Terminology, basic engineering, equipment and harvesting system options, productivity/costs. Relationship to forest management and silviculture. Road planning, forest management guidelines, approaches for mitigating potential impacts to soil/water resources. Environmental
implications of method/equipment choices. Selling timber. Sale design, layout, and administration. Two all-day field trips, prereq: FNRM 3411 or instr consent

FNRM 3471. Forest Management Planning. (; 3 cr.; A-F or Audit; Every Fall) Management science as applied to forest decision-making to help develop better forest management plans. Helps students develop a basic understanding of common-analytical tools from operations research and how they are applied to forestry problems to help explore many potential solutions. Also reviews traditional approaches based on simulation. Emphasizes trade-off information, interpretation of model results, and linkages between stand-level economic analysis and forest-wide planning. Reviews recent modeling efforts in Minnesota. Includes synthesis of information from multiple natural resource disciplines. Guest speakers demonstrate value of analyses in planning. Emphasizes homework assignments with some group work. An individual project requires an informal class presentation. prereq: recommended ESPM 3261 and [3218 or 3411]

FNRM 3501. Arboriculture: Selection and Maintenance of Trees. (; 3 cr.; Student Option; Every Spring) Selection, growth, propagation, and maintenance of trees for urban spaces. Tree selection, site preparation, plant health care management. Prevention, diagnosis, and remediation of urban tree risks such as insects, pathogens, pollution, development, and climate change.

FNRM 4232W. Managing Recreational Lands. ([W] 4 cr.; A-F or Audit; Every Spring) Most of us participate in some form of outdoor recreation: hiking, hunting, riding all-terrain vehicles, or simply enjoying nature. Managing for outdoor recreation on public lands is mandated by federal law and an integral part of natural resource management. In this class, we'll learn why and how agencies manage recreation at the federal level, the management frameworks that guide this work, and apply management principles to an actual federal property in Minnesota. This course is designed to provide students with an understanding of the principles and practices of outdoor recreation management. Specific objectives are to: 1) compare and contrast federal recreation land management policies & organizations, 2) develop and demonstrate an understanding of conceptual frameworks for recreation resource and visitor use management, 3) evaluate visitor-caused impacts to resources and to visitor experiences, 4) understand and apply management tools designed to reduce recreation-related impacts (conflicts), and 5) demonstrate an understanding of course material through exams & applied assignments.

FNRM 4293. Directed Study. (; 1-5 cr.; [max 15 cr.]; Student Option; Every Fall, Spring & Summer) Study/project on topic of personal interest in consultation with faculty member. Initial proposal, reports of accomplishments. prereq: instr consent

FNRM 4501. Urban Forest Management: Managing Greenspaces for People. (; 3 cr.; Student Option; Every Spring) Management concepts for green infrastructure of cities, towns, and communities. Urban forest as a social/biological resource. Emphasizes management of urban forest ecosystem to maximize benefits to people. Tree selection, risk assessment, cost-benefit analysis, landscape planning, values, perceptions. How urban forestry can be a tool to improve community infrastructure.

FNRM 4511. Field Silviculture. (; 2 cr.; A-F only; Every Summer) Collection of field data to prepare/write silvicultural prescriptions for regeneration, thinning, and harvesting in context of landscape, watershed, and wildlife habitat issues. Field exercises in forest entomology, pathology, tree improvement, and non-timber forest products. Tree planting. Marking stands for harvest. Taught at the Cloquet Forestry Center. Field trips to forests managed by state/industry. prereq: FNRM 3411

FNRM 4515. Field Remote Sensing and Resource Survey. (; 2 cr.; Student Option; Every Summer) Field applications of remote sensing, sampling/measurement methods for inventory/mapping of forest and other natural resources. Offered at the Cloquet Forestry Center.


FNRM 5101. Park and Protected Area Tourism. (; 3 cr.; A-F or Audit; Fall Odd Year) Tourism is a significant industry locally, nationally, and internationally. Park and protected area attractions are among the most visited but also the most vulnerable attractions. This course is designed to familiarize you with the basic concept of park and protected area tourism, including cultural and ecotourism, and then develop your expertise to plan and evaluate sustainable tourism development and operations. Accordingly, you will complete assignments that apply the knowledge gained to planning and evaluation activities. This course is offered partially online. COURSE OBJECTIVES By the end of the class you will be able to: 1. Differentiate and appreciate the complexities involved with defining and developing nature, eco, heritage, geo-, park, and protected, cultural & "sustainable tourism." 2. Identify specific social, economic, and environmental impacts associated with park and protected area tourism, how to measure them, and methods to minimize the negative and maximize the positive impacts. 3. Analyze domestic and international case studies of park and protected area tourism. 4. Critically evaluate park and protected area tourism services and effective management and planning. 5. Create elements of a business plan for park and protected area tourism operations that emphasize sustainability.

FNRM 5104. Forest Ecology. (; 4 cr.; A-F or Audit; Every Fall) Form and function of forests as ecological systems. Characteristics and dynamics of species, populations, communities, landscapes, and ecosystem processes. Examples applying ecology to forest management. Weekly discussions on research topics, exercises, and current issues in forest resource management. Required weekend field trip. Introductory biology course recommended.

FNRM 5114. Hydrology and Watershed Management. (; 3 cr.; Student Option; Every Fall) Hydrologic cycle and water processes in upland/riparian systems. Applications of hydrological concepts to evaluate impacts of forest and land management activities on water yield, streamflow, groundwater erosion, sedimentation, and water quality. Concepts, principles, and applications of riparian/watershed management. Regional/national/global examples. Forest ecosystems.

FNRM 5131. Geographical Information Systems (GIS) for Natural Resources. (4 cr.; A-F or Audit; Every Fall) Geographic information systems (GIS), focusing on spatial data development and analysis in the science and management of natural resources. Basic data structures, sources, collection, and quality; geodesy and map projections; spatial and tabular data analyses; digital elevation data and terrain analyses; cartographic modeling and layout. Lab exercises provide practical experiences complementing theory covered in lecture. prereq: Grad student or instr consent

FNRM 5153. Forest Hydrology & Watershed Biogeochemistry. (3 cr.; Student Option; Spring Odd Year) This rigorous course examines hydrology and biogeochemical cycling in forested watersheds. Topics include role of forests in hydrologic processes (precipitation, runoff generation, and streamflow) and exports (sediment, carbon, and nitrogen). Readings from primary literature, active discussion participation, research/view review paper. prereq: [Basic hydrology course, one course in ecology, and one course in chemistry (upper div or grad student)] or instr consent

FNRM 5161. Northern Forest Field Course. (; 2 cr.; A-F or Audit; Every Summer) Field identification of common trees, shrubs, and nonwoody vascular plants. Plant communities, soil site relationships, wildlife values. Natural history of northern/boreal forests in terms of soils, ecological characteristics of trees, community-environment relationships, stand development, succession, and regeneration ecology. Land survey, tree/forest stand measurement, forest sampling techniques. Taught at the Cloquet Forestry Center.
FNRM 5201. Introduction to Travel and Tourism. (3 cr.; A-F only; Every Spring) Travel and tourism is called one of the largest industries in the world today. This course introduces students to the nature, structure, and complexity of the travel and tourism system. Specific focus is placed on understanding the tourism system and its impact globally on economics, environments, and people. Using a lens of sustainability, students will examine the functions and interconnectedness of the various sectors within the tourism system and the role of diverse and sometimes competing priorities of stakeholders in the creation, delivery, and integration of tourism. The course uses readings, case studies, discussion, and applied projects to develop students understanding of tourism and how communities, businesses, and government can maximize benefits associated with the demand for tourism while protecting the natural and human resources upon which it depends.

FNRM 5203. Forest Fire and Disturbance Ecology. (3 cr.; A-F or Audit; Every Spring) Ecology, history, management, control of fire, wind, insect infestation, deer browsing, other disturbances in forests, including disturbance regimes of boreal, northern hardwood, savannas of North America. Influence of disturbance on wildlife habitat, urban/wildland interfaces, forest management, stand/landscape dynamics. Tree mortality in fires, succession patterns created by fires, interactions of life history traits of plants with disturbances. prereq: Grad student or instr consent

FNRM 5204. Landscape Ecology and Management. (3 cr.; A-F or Audit; Every Fall) Introduction to landscape ecology at different scales in time/space. Development/implementations of broad-scale patterns of ecological phenomena, role of disturbance in ecosystems. Characterization of spatial, temporal scales of ecological events. Principles of landscape ecology as framework for landscape research, analysis, conservation, and management. prereq: Grad student or instr consent

FNRM 5205. Productivity and Ecology of Forest Soils. (3 cr.; A-F only; Fall Even Year) Forest soils are fundamental to the development and function of forested ecosystems. This course will focus on soil-site factors affecting plant and wildlife communities, site quality estimation, site modification and enhancement, and the effects of forest management and other human-related disturbances on forest soil functions. Prior coursework in introductory soils, silviculture, forest hydrology, biogeochemistry, and applied forest ecology are strongly recommended. prereq: grad student or instructor consent

FNRM 5206. Park and Protected Area Management Field Studies. (2 cr. (max 3 cr.); A-F only; Every Summer) Directed field study of park/protected areas. Recreation planning/visitor management, cultural/natural resource management, nature-based tourism management, resource interpretation/communication across local, state, federal tribal park/protected areas in northern Minnesota. prereq: Sophomore status or higher

FNRM 5216. Geodesy, Coordinate, and Surveying Calculations for GIS Professionals. (1 cr.; Student Option No Audit; Every Fall) Where exactly are we? How do we define and refine geographic locations such as a lumpy, spinning, unstable planet? On course completion students will understand concepts and practices that are at the very foundation of GIS: geodesy and geographic projections. They will have a working knowledge of geodetic datums and datum evolution, be able to make common geodetic and coordinate geometry calculations, and solve common problems that arise during datum and coordinate system conversions while engaged in the practice of GIS.


FNRM 5228. Advanced Topics in Assessment and Modeling of Forests. (3 cr.; A-F or Audit; Fall Even Year) Application of recently developed mathematics, computer science, and statistics methodologies to natural resource inventory, management, and use problems. Specific topics, software, and methodologies vary. prereq: 3218, Math 1272, Stat 5021

FNRM 5232. Managing Recreational Lands. (4 cr.; A-F or Audit; Every Spring) Most of us participate in some form of outdoor recreation: hiking, hunting, riding all-terrain vehicles, or simply enjoying nature. Managing for outdoor recreation on public lands is mandated by federal law and an integral part of natural resource management. In this class, we'll learn why and how agencies manage recreation at the federal level, the management frameworks that guide this work, and apply management principles to an actual federal property in Minnesota. This course is designed to provide students with an understanding of the principles and practices of outdoor recreation management. Specific objectives are to: 1) Compare and contrast federal recreation land management policies and organizations, 2) Develop and demonstrate an understanding of conceptual frameworks for recreation resource and visitor use management, 3) Evaluate visitor caused impacts to resources and to visitor experiences, 4) Understand and apply management tools designed to reduce recreation-related impacts and conflicts, and 5) Demonstrate an understanding of course material through exams and applied assignments. prereq: Grad student or instr consent

FNRM 5259. Visitor Behavior Analysis. (3 cr.; Student Option; Every Fall) Recreation, leisure, and tourism are significant parts of the world, national, and state economies. Understanding visitor behavior is important and has significant implications for organizations, agencies, and businesses related to parks, tourism destinations, and museums. In this class, you will learn to apply both social science theory and methods to understand consumers, with an emphasis on visitors to parks and protected areas. You will immediately apply your learning of survey development, interviewing, observation and content analysis to real-world situations in class projects. This is an online course.

FNRM 5262. Remote Sensing and Geospatial Analysis of Natural Resources and Environment. (3 cr.; Student Option; Every Fall) Introductory principles and techniques of remote sensing and geospatial analysis applied to mapping and monitoring land and water resources from local to global scales. Examples of applications include: Land cover mapping and change detection, forest and natural resource inventory, water quality monitoring, and global change analysis. The lab provides hands-on experience working with satellite, aircraft, and drone imagery, and image processing methods and software. Prior coursework in Geographic Information Systems and introductory Statistics is recommended. prereq: Grad student or instr consent

FNRM 5264. Advanced Forest Management Planning. (3 cr.; Student Option; Every Fall) Modeling tools for forest planning to better integrate forest resource conditions/uses and better understand trade-offs and potential management strategies. Analyzing facets of forest management that add complexity including multi-market interactions, temporal detail, spatial objectives, planning under uncertainty, and recourse strategies. Optimization models, decomposition and heuristic techniques detailed to capitalize on characteristics of forestry problems. Case studies involving recent or ongoing large-scale applications. Student projects with opportunity to tailor to student interests or expertise.

FNRM 5411. Managing Forest Ecosystems: Silviculture. (3 cr.; A-F only; Every Fall) Management of forest ecosystems for sustaining ecological integrity, soil productivity, water quality, wildlife habitat, biological diversity, commodity production in landscape context. Silvics, forest dynamics, disturbances, regeneration, restoration, silvicultural systems. Ramifications of management choices. Weekend field trip. FEMC track students should take FNRM 5413 concurrently. prereq: grad student

FNRM 5412. Advanced Remote Sensing and Geospatial Analysis. (3 cr.; Student Option; Every Spring) This course builds on the introductory remote sensing class, FNRM 3262/5262. It provides a detailed treatment of advanced remote sensing and geospatial theory and methods including biophysics of remote sensing, measurements and sensors, data transforms, data fusion, lidar processing and derivatives, advanced
classification algorithms (including Object-Based Image Analysis), multitemporal analysis, and empirical modeling. Independent lab activities will be used to apply the course topics to real-world problems. Prior coursework in Geographic Information Systems, remote sensing, and statistics is necessary. prereq: 3262 or grad student or instr consent

FNRM 5413. Managing Forest Ecosystems: Silviculture Lab. (1 cr. ; A-F only; Every Fall) Development of silvicultural prescriptions to achieve various landowner objectives. Timber cruise, growth/yield simulations, stand density management diagrams, thinning schedules, use of forest vegetation simulator. Field trips, computer labs, lectures. prereq: FNRM major or minor or grad student; FNRM-FEMC track students should take FNRM 3411/5411 concurrently or instructor consent

FNRM 5431. Timber Harvesting and Road Planning. ( ; 2 cr. ; Student Option; Every Spring) Forest operations. Terminology, engineering, equipment/harvesting system options, productivity/costs. Relationship to forest management and silviculture. Road planning, forest management guidelines. Mitigating potential impacts to soil/water resources. Environmental implications of method/equipment choices. Selling timber. Sale design, layout, and administration. Two all-day field trips.

FNRM 5471. Forest Management Planning. ( ; 3 cr. ; A-F or Audit; Every Fall) Management science as applied to forest decision-making to help develop better forest management plans. Helps students develop a basic understanding of common analytical tools from operations research and how they are applied to forestry problems to help explore many potential solutions. Also reviews traditional approaches based on simulation. Emphasizes trade-off information, interpretation of model results, and linkages between stand-level economic analysis and forest-wide planning. Reviews recent modeling efforts in Minnesota. Includes synthesis of information from multiple natural resource disciplines. Guest speakers demonstrate value of analyses in planning. Emphasizes homework assignments with some group work. An individual project requires an informal class presentation. prereq: Grad student

FNRM 5480. Topics in Natural Resources. ( ; 1-3 cr. ; Student Option; Periodic Fall & Spring) Lectures in special fields of natural resources given by visiting scholar or faculty member. Topics specified in Class Schedule.

FNRM 5501. Urban Forest Management: Managing Greenspaces for People. ( ; 3 cr. ; Student Option; Every Spring) Management concepts for green infrastructure of cities, towns, and communities. Urban forest as social/biological resource. Emphasizes management of urban forest ecosystem to maximize benefits. Tree selection, risk assessment, cost-benefit analysis, landscape planning, values, perceptions. How urban forestry can be a tool to improve community infrastructure.

FNRM 5611. Field Silviculture. ( ; 1 cr. ; A-F only; Every Summer) Collection of field data to prepare/write silvicultural prescriptions for regeneration, thinning, and harvesting in context of landscape, watershed, and wildlife habitat issues. Field exercises in forest entomology, pathology, tree improvement, and non-timber forest products. Tree planting. Marking stands for harvest. Taught at Cloquet Forestry Center. Field trips to forests managed by state/industry.

FNRM 5615. Field Remote Sensing and Resource Survey. ( ; 1 cr. ; Student Option; Every Summer) Field applications of remote sensing, sampling/measurement methods to inventory/mapping of forest and other natural resources. Offered at the Cloquet Forestry Center.

FNRM 5621. Field Timber Harvesting and Road Planning. ( ; 1 cr. ; Student Option; Every Summer) Design, layout, and administration of timber sales. Forest road planning and design. Protecting residual trees during harvesting operations. Timber appraisal, forest management guidelines. Road location and profiling. Planning/layout considerations. Field trips to visit timber harvesting and road planning sites with public and private organizations. Taught at the Cloquet Forestry Center.

FNRM 8101. Research Problems: Physiological Ecology. ( ; 1-5 cr. ; max 10 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance. prereq: instr consent

FNRM 8102. Research Problems: Forest-Tree Genetics. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8103. Research Problems: Forest Hydrology. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8104. Research Problems: Forest Ecology. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8105. Research Problems: Silviculture. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8106. Research Problems: Urban Forestry--Biology and Management. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8108. Research Problems: Forest Ecosystem Health. ( ; 1-5 cr. ; Student Option No Audit; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8201. Research Problems: Forest Economics. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8202. Research Problems: Forest Biometry and Measurements. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8203. Research Problems: Forest Recreation. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8204. Research Problems: Forest Policy. ( ; 1-5 cr. ; max 10 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8205. Research Problems: Spatial Data Analysis. ( ; 1-5 cr. ; max 10 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance. prereq: instr consent

FNRM 8206. Research Problems: Forest Management. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance.

FNRM 8207. Economic Analysis of Natural Resource Projects. ( ; 2 cr. ; A-F or Audit; Every Fall, Spring & Summer) Economics of public/private forestry/watershed management projects. Commercial profitability analysis, cost-benefit analysis, preparing feasibility studies. Case studies developed/presented. prereq: instr consent

FNRM 8208. Research Problems: Environmental Learning and Leadership. ( ; 1-5 cr. ; Student Option; Every Fall, Spring & Summer) Independent research under faculty guidance. prereq: instr consent

French (FREN)

FREN 100. Reading French in the Arts and Sciences. ( ; 0 cr. ; S-N only; Every Spring) Basic reading knowledge of French language. Intensive reading/translation of texts from a wide variety of disciplines. Students successfully completing the course obtain language certification in French.

FREN 1001. Beginning French I. ( ; 5 cr. ; Student Option; Every Fall, Spring & Summer) Bonjour! Join us in learning the global language of diplomacy, culture, cuisine, and commerce! French is spoken on five continents, in approximately 40 countries, and even in Maine and Louisiana. Studying French will deepen your understanding of world history and the relationships between different cultures around the globe and close to home. Studying the language of Les Misérables, Monet, and joie de vivre allows you to access some of the most amazing art, thought, and food on the planet! Beginning French (FREN 1001) is designed for students with little or no knowledge of the French language. It focuses on developing your intercultural, reading, listening, speaking, and writing skills. By the end of this course, you will be able to communicate about family, housing, and school. You will also gain familiarity with
French-speaking communities around the world. The course features preparatory and practice activities outside of class designed to encourage analysis of language structure so that class time can be primarily devoted to meaningful interaction in French.

FREN 1002. Beginning French II. (5 cr.; Student Option; Every Fall, Spring & Summer) Bienvenue en 1002! Ready to embark on a new journey to further develop your knowledge of the beautiful language of French? If you passed French 1001 or have taken the Entrance Proficiency Test (EPT) and were placed in 1002, this course is for you! While exploring topics such as French holidays and cultural celebrations and traditions, food, and ecology, you will further develop your listening, speaking, reading, and writing skills. You will also learn about the concept of laïcité, one of the pillars of French society, and the differences and similarities between the school systems in France and the U.S. Preparatory activities designed to encourage students to analyze grammar points need to be completed at home so that class time can be primarily devoted to meaningful interactions in French. Prereq: FREN 1001 or equivalent.

FREN 1003. Intermediate French I. (5 cr.; Student Option; Every Fall, Spring & Summer) Nous vous souhaitons la bienvenue dans le troisième semestre de françois. In this course, you will explore current issues such as the role technology plays in today's society and living a healthy lifestyle. Other themes include family, friends, and current social issues such as environment, energy, and immigration. Students will use film, excerpts from literature, and other authentic texts as part of the curriculum. Upon completion of the class, you will have more confidence in expressing past, future, and hypothetical events as well as your own opinions, feelings, and regrets. French 1003 is a five-credit course, so you should plan to spend an additional 10 hours a week on coursework outside the classroom. Upon successful completion of this course you will be able to communicate in French 1004, prerequisites: C- or better in FREN 1002 or 1022, or EPT (for students taking their first French course at the U)

FREN 1004. Intermediate French II. (5 cr.; Student Option; Every Fall, Spring & Summer) Vous êtes les bienvenus! Come join us in exploring some of the foundations of cultural identity. What does it mean to be "French?" What does it mean to be "American?" What are some things that people living within a particular culture have in common as a function of living in that culture? Where do personal and cultural identities intersect? We pay special attention to development of intercultural competence, comparing how food, child-rearing practices, elements of national identity, and diversity are treated in France and the US. We revisit many grammar concepts you have seen before, focusing on accuracy and extended language use. This course will allow you to be much more confident in using comparisons, narrating (past and present), linking ideas together into longer discourse, describing, etc. Upon successful completion of this course, you should be solidly in the Intermediate ranges of proficiency in French, able to travel and/or use French for your own goals. You will also be prepared for more advanced study in French here or abroad (FREN 3015 and 3014 are options after this course), prerequisite: C- or better in FREN 1003, or EPT/LPE (for students taking their first French course at the U)

FREN 1022. Accelerated Beginning French. (5 cr.; Student Option; Every Fall & Spring) Heureux de vous revoir! Because you have studied French before, you already know what a wonderful language it is. This course is designed to return you to studying the language of Les Misérables, Monet, and joie de vivre! French 1022 is an accelerated review of French 1001 followed by the material covered in French 1002. At the end of this course, you will be able to communicate about topics such as food, family, school, the environment, travel and much more. If you have had a gap of more than a year since your last French class, you need to take the EPT to place into French 1022.

FREN 1501. Gateways to French and Francophone Studies: English Only. (AH,GP; 3 cr.; A-F or Audit; Every Fall & Spring) What key moments in French and Francophone culture can help us understand our world today? What are French and Francophone Studies? This course taught in English answers these questions by letting you discover the cultures of France and French-speaking countries (such as Senegal, Canada or Belgium), and the ways we study them in the humanities. You will encounter texts, visual material, films, music, and historical events from various eras and learn how to make sense of them. Faculty from the French program will come and share with you what they research and why. A portion of the semester will be devoted to one of two role-playing simulations. During these weeks, you will delve deeply into the material, researching your historical character and working with other students whose goals converge with yours to sway the opinions of your other classmates. Along the way, you will enhance your skills in public speaking and writing. (1) The French Revolution. Where did the notion of the social contract and human rights come from? What dilemmas did the people of France face in this turbulent attempt to transition from monarchy to a new form of government? (2) The 1889 art exhibition in Paris, which was a focus of debates about art, esthetics and urbanism. Do you want to be a traditional painter, Van Gogh, an art critic, a woman patron, an anarchist, or a worker on the Eiffel Tower? French 1502 is taught in English, but it includes some readings in French. In some semesters, it may also include occasional discussions or small group activities in French. You can take French 1502 as a freestanding class or at the same time as a language class (FREN 3015-3016, depending on your level). The class is required for new majors and minors in French Studies, but you can take it simply to discover the fascinating cultures of French-speaking communities worldwide! Prerequisites: French 1504 (or equivalent through the LPE)

FREN 3014. French Phonetics. (3 cr.; Student Option; Every Fall & Spring) Survey of major institutions/components of modern French culture with special attention to the linguistic description of French sounds/transcription. Prereq: 1004

FREN 3015. Advanced French Grammar and Communication. (3 cr.; Student Option; Every Fall, Spring & Summer) Taught entirely in French. Prerequisite: French 1004 or LPE. Voil?, c'est fait: You have completed French 1004 or passed the LPE. You are certified as an intermediate speaker of French. Don't lose your momentum! French 3015 allows you to start working toward a new goal: advanced proficiency in speaking, listening, reading, and writing French. Along with this higher proficiency comes a deeper understanding of French and Francophone culture around the world. In this class, you will focus on grammar in context, reading
longer, more complex texts in the original language. You will write short compositions that include various genres such as the first-person narrative, the business letter, and the essay. You will learn how to use the correction software Antidote as a means of perfecting your writing skills. In class, you will participate in group work to boost your oral comprehension skills and in writing workshops to boost your writing skills. Listening activities include a film, an audiobook, a song, and videos related to readings. Written exercises include translation, grammar, and vocabulary building. Literary readings include excerpts from a medieval text (La l?gende de Tristan et Isolde), as well as four 20th-century texts (by Danielle Cadorette, Annie Ernaux, Albert Camus, and Pierre-Jakez H?lias). Journalists include Kamel Daoud (published in the Le Monde) and Fatym Layachi (published in the Moroccan newspaper Tel Quel). Based on these readings and discussions of the themes of friendship, family, education, work, technology, and bilingualism, you will explore notions of identity in the French and Francophone world.

FREN 3016. Advanced French Composition and Communication. (3 cr.; Student Option; Every Fall & Spring)
Taught entirely in French. In this class, you will continue the work you began in FREN 3015, keeping your eyes on the goal of advanced proficiency. You will continue to focus on grammar in context, reading challenging texts in the original language. You will write short compositions that include various genres: a summary of an online article of your own choosing, an argumentative essay, and a film or literary analysis. You will perfect your use of the correction software Antidote as you move toward advanced proficiency in writing. In class, you will participate in group work to boost your oral comprehension skills and in writing workshops to boost your writing skills. Listening activities include several films, a song, and videos related to readings. Written exercises include translation, grammar, and vocabulary building. This course explores identity in the French and Francophone world through the themes of youth, travel, immigration, and colonization. Literary readings include excerpts from the 18th century (Voltaire and Louis S?bastien Mercier), the 20th century (Ying Chen and Driss Chra?bi), and the 21st century (Tahar Ben Jelloun, Abdallah Ta?a, and Mina Oualdlhaj). Newspaper articles include the sociologist Edgar Morin (published in Le Monde) and the columnist R?da Allali (published in the Moroccan newspaper Tel Quel). But French 3016 adds new genres of writing as well. We will read selections from crime novels (Ren? Fr?gni and Michel de Roy), a graphic novel (Marjane Satrapi), and science-fiction (Pierre Boulle). This course is a good stepping-stone for an advanced course in French and Francophone film as we read about and view samples of Algerian, Canadian, and French films. Prerequisite: FREN 3015.

FREN 3017W. Advanced Writing in French: Genre, Style, Rhetoric. (WI; 3 cr.; A-F only; Every Fall)
Workshop in journalistic/literary prose writing in French. Theme of journalistic/literary readings varies. Article, editorial, review, essay, biography, tale, prose poem. Word order, sequence of tenses, indirect discourse, literary tenses. Overview of stylistics/use of rhetorical figures. preq: 3016

FREN 3018. French Oral Communication. (3 cr.; Student Option; Every Fall, Spring & Summer)
Intensive work in oral expression, listening comprehension. Incorporates wide variety of cultural topics. preq: 3014, 3015

FREN 3022. The Language and Culture of Business in France. (3 cr.; Student Option; Every Spring)
Examines French business language as well as business practices and culture in France. Includes cross-cultural analysis. preq: 3015; completion of 3016 recommended

FREN 3101W. Methods in French and Francophone Studies. (LITR; 3 cr. [max 4 cr.]; Student Option; Every Fall & Spring)
Taught entirely in French. In this course, you will delve deeply into original stories, lyrics, plays, and films in French, from around the world and across time. What verbal and visual codes carry meaning in a given culture? How do cultures create a space for the subject or the self? As you discuss these questions, you will become a faster and more independent reader, gain sensitivity to the sonorities and rhythms of the French language and the nuances of sense it makes possible, and learn to perceive implicit meaning in texts. Theoretical readings and lessons in developing thesis statements and organizing arguments will enhance your ability to understand and create complex arguments in French. Each individual section of this course addresses these questions with a different selection of readings and films grouped around a specific theme, so please consult the Class Info page to find out more! Nonfiction texts, cultural artifacts, and audio/visual media pertaining to France and Francophone communities across the centuries. preq: 3016 or equiv

FREN 3111. Medieval Stories. (3 cr.; Student Option; Periodic Fall)
Reading/discussion of major forms of medieval tale (comic, bawdy, moralizing, fantasy, historical) in modern French translation. Explores their relationship to development of French culture, especially urbanization, class relations, marriage, role of Church. preq: 3101

FREN 3115. Saints and Soldiers of Medieval France. (CIV; 3 cr.; A-F only; Fall Even Year)

FREN 3140. Topics in Medieval and Renaissance Literature. (3 cr. [max 9 cr.]; Student Option; Every Spring)
Different aspects of French literature/culture of medieval/Renaissance periods (11th-16th century). Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Readings may be literary, critical, cultural, historical, political, etc. Specific content posted in department and in Course Guide. preq: 3101

FREN 3240. Topics in Ancien Regime Literature. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Different aspects of French literature/culture from early modern period (17th/18th centuries). Content varies depending on instructor. Literary, historical, or social problems. Period, author, genre or topic of interest. Readings may be literary, critical, cultural, historical, political, etc. Specific content posted in department/Course Guide. preq: 3101

FREN 3260. Dramas of Culture: 20th-Century French and Francophone Theater. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Key movements, dramatists, and contexts of 20th-century French and Francophone theater. Areas of study include naturalist and symbolist legacies as well as existentialist, avant-garde, and contemporary performance and drama. preq: 3101

FREN 3310. Literature of Revolution and Uprheaval. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
A study of revolutionary movements in France seen through novels placed in historical context. Content may vary, but course will deal with radical historical, cultural and literary changes in France primarily in the modern period. preq: 3101

FREN 3333. The Idea of Paris: Writing and Viewing the City. (GP; 3 cr.; Student Option; Fall Odd Year)
Meanings that Paris acquired in modern French cultural imagination, particularly as protean metaphor, myth or allegory for effects of urban, national, global modernity. Literature, painting, photography, film, architecture, urban theory from Enlightenment to present. preq: 3101W

FREN 3340. Topics in Modern French Literature. (3 cr. [max 9 cr.]; Student Option; Periodic Spring)
Modern French literature/culture, defining modern period as that of post-Revolution France. Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Specific content posted in department/instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Specific content posted in department/Course Guide. preq: 3101

FREN 3350. Topics in Literature. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring)
Focuses on a problem, period, author, or topic of interest. Specific content posted in department and listed in Course Guide. preq: 3101

FREN 3410. Topics in Quebecois Literature. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Study writing produced in Quebec as a literature of its own, not simply as a part of
Canadian literature. Literature will be studied in relation to other North American literatures and to Francophone literature produced elsewhere in the world. prereq: 3101

**FREN 3431. Gender and Sexuality in Francophone Literature and Cinema.** (3 cr.; A-F only; Periodic Fall & Spring) This course will introduce students to colonial and postcolonial representations of gender and sexuality in Francophone contexts. Through literary and cinematic works from the Caribbean, Maghreb, West Africa, and Quebec, we will examine constructions and deconstructions of gender roles and sexual norms in relation to other identity categories such as race, class, nation and religion. We will consider topics such as erotic portrayals of the other, repressive and rebellious eroticism, and ambivalent or unruly affirmations of identity. Taught in French. prereq: 3101W. All courses counted toward a major/minor must be taken on an A-F basis.

**FREN 3451. North African Cinema.** (3 cr.; Student Option; Fall Odd Year) Cinemas of the Maghreb, the northern African nations of Morocco, Algeria, and Tunisia. Themes may include North African cities/communities; gender, class and ethnicity; and impact of globalization in migratory patterns. Films. Readings in philosophy, history, sociology, anthropology, and cultural critique. prereq: 3101

**FREN 3471. Topics in Francophone African Literature and Cultures.** (GP; 3 cr.; Student Option; Fall Odd Year) Issues relevant to cultures/societies of francophone Sub-Saharan Africa as reflected in literature, film, and cultural critique. prereq: 3101W

**FREN 3479. Francophone Writers of the African Diaspora.** (3 cr.; Student Option; Fall Even Year) Literature from Francophone North Africa, Africa, the Caribbean of the colonial and/or post-colonial eras, examined in its historical, cultural, or ideological contexts. Reading selections may include texts by immigrant or exiled writers in France. prereq: 3101

**FREN 3500. Linguistic Analysis of French.** (3 cr.; A-F only; Fall Even Year) Introduction to scientific study of French language. Concepts/terminology to describe nature/functioning of sounds, words, sentences/meaning, and variation. Taught in French. prereq: 3101

**FREN 3521. History of the French Language.** (3 cr.; Student Option; Fall Odd Year) Origins/development of French language from Latin to contemporary French. Selected texts. Present stage/development. prereq: 3015, 3500 or Ling 3001 or instr consent

**FREN 3531. Sociolinguistics of French.** (GP; 3 cr.; Student Option; Periodic Fall) Explores variation in the use of French associated with factors such as medium (oral-written), style (formal/informal), region, social and economic groups. Prerequisite: FREN 3015 or equivalent; strongly recommended: FREN 3500 or LING 3001.

**FREN 3541. Oral Discourse of French.** (3 cr.; Student Option; Periodic Fall & Spring) Contemporary French discourse. Spontaneous, multi-speaker discourse. Readings. Syntactic analysis. Phonological/lexical particularities. Macro level analyses. Discourse analysis/conversation analysis. prereq: 3015, [3500 or Ling 3001 or instr consent]

**FREN 3571. Old French in Action: Medieval French Language through Songs, Tales, and Plays.** (3 cr.; A-F only; Periodic Fall) This course introduces students to Old French grammar, vocabulary, and phonetics through language exercises and the reading and performance of original texts. Along the way, students will learn about the genres of medieval French literature, how these texts originally circulated, and how artists today work from medieval manuscripts to create new performances. Coursework will alternate between language lessons, oral and written exercises, the reading, translation, and discussion of Old French texts, and recitation and interpretive performance. This course is designed for undergraduates and will be based entirely on material available in modern editions or online in print-like format. It will also make use of audio recordings. Graduate students, honors undergraduates, and other high-achieving juniors and seniors should register for French 5571, which covers the same material and also how to read and edit texts from medieval manuscripts. prereq: 3016. Class is conducted in modern French. No prior experience of the medieval language is expected.

**FREN 3611. Speaking of Love in Medieval France: Stories, Songs, and Letters.** (GP, LITR; 3 cr.; Student Option; Fall Even Year) How did people talk about love in the Middle Ages? What songs did they sing about it? What stories did they tell? How did it define the self? In this course, we will study troubadour songs, short tales, romances, and letters composed in twelfth-century France and Anglo-Norman England. We will examine their historical context: the patronage of Eleanor of Aquitaine and her family, the broader context of medieval court life, and the erudite circles that formed during the rise of the Parisian schools. Because what people say is determined by the language, motifs, and forms that they have available to them, we will discuss the transmission of ideas about love and the interpretation of exemplary figures (Tristan and Iseut, Lancelot and Guinevere). We will also consider the literary form of these texts in relation to their meaning. But at the heart of our inquiry will be the notion of the self. How did "speaking of love" allow medieval writers to cultivate their own subjectivity or individuality? Texts will include troubadour songs, the Lais of Marie de France, the romances of Tristan and Iseut by Thomas of England and B?roul, Chr?tien de Troyes's Arthurian romances, and the letters of Abelard and Heloise. We will also study a film about Eleanor of Aquitaine and her family (The Lion in Winter, 1968) and a contemporary opera about a troubadour and his lady, Kaija Saariaho's L'Amour de loin (2000). FREN 3611 and 3711 meet together. Both FREN 3611 and 3711 are taught in English. Reading and writing assignments for FREN 3611 are in modern French. FREN 3611 may count towards the major or minor in French Studies. Reading and writing assignments for FREN 3711 are in English. FREN 3711 does not count towards the major or minor in French Studies. prereq: FREN 3015

**FREN 3612. Reading Libertinism.** (AH, CIV; 3 cr.; Student Option; Spring Even Year) Underground, subversive, philosophical countercultures that push society to limits. Why society has underground, how it shapes understanding of individual responsibility. Shifting notions of acceptable/moral behavior. Philosophizing/imagine in creating society/values. prereq: 3015, 3101 strongly recommended

**FREN 3650. Topics in French/Francophone Cultures.** (3 cr.; Student Option; Every Fall, Spring & Summer) French/romanfont cultures in various historical, social, political, geographical contexts. prereq: 3015

**FREN 3711. Speaking of Love in Medieval France: Stories, Songs, and Letters.** (GP, LITR; 3 cr.; Student Option; Fall Even Year) How did people talk about love in the Middle Ages? What songs did they sing about it? What stories did they tell? How did it define the self? In this course, we will study troubadour songs, short tales, romances, and letters composed in twelfth-century France and Anglo-Norman England. We will examine their historical context: the patronage of Eleanor of Aquitaine and her family, the broader context of medieval court life, and the erudite circles that formed during the rise of the Parisian schools. Because what people say is determined by the language, motifs, and forms that they have available to them, we will discuss the transmission of ideas about love and the interpretation of exemplary figures (Tristan and Iseut, Lancelot and Guinevere). We will also consider the literary form of these texts in relation to their meaning. But at the heart of our inquiry will be the notion of the self. How did “speaking of love” allow medieval writers to cultivate their own subjectivity or individuality? Texts will include troubadour songs, the Lais of Marie de France, the romances of Tristan and Iseut by Thomas of England and B?roul, Chr?tien de Troyes's Arthurian romances, and the letters of Abelard and Heloise. We will also study a film about Eleanor of Aquitaine and her family (The Lion in Winter, 1968) and a contemporary opera about a troubadour and his lady, Kaija Saariaho's L'Amour de loin (2000). FREN 3611 and 3711 meet together. Both FREN 3611 and 3711 are taught in English. Reading and writing assignments for FREN 3611 are in modern French. FREN 3611 may count towards the major or minor in French Studies. Reading and writing assignments for FREN 3711 are in English. FREN 3711 does not count towards the major or minor in French Studies. prereq: FREN 3015
FREN 3712. Reading Libertinism. (AH,CIV; 3 cr. ; Student Option; Spring Even Year) Undergraduate, subversive, philosophical countercultures. How it shapes understanding of individual responsibility. Shifting notions of acceptable/moral behavior. Groups that limits of what is imaginable. Role of philosophizing/imagining in creating society/values.

FREN 3733. The Idea of Paris. (GP; 3 cr. ; Student Option; Fall Odd Year) Meanings of Paris acquired in modern French cultural imagination, particularly as protein metaphor, myth or allegory for effects of urban, national, global modernity. Literature, painting, photography, film, architecture, urban theory from Enlightenment to present.

FREN 3750. Topics in French or Francophile Language and Culture. ( ; 3 cr. [max 9 cr. ; Student Option; Periodic Fall] Theme, problem, period, or topic of interest in French or Francophone language or culture. See Class Schedule. Taught in English. prereq: Non-French major; knowledge of French helpful

FREN 3896. Internship in a French-Speaking Milieu. (1-4 cr. ; A-F only; Every Fall, Spring & Summer) Volunteer or paid work in French-speaking milieu, undertaken at initiative of individual students. Work under direction of work supervisor/mentor chosen from among regular or adjunct faculty. Complete two-three written assignments designed to enhance language/field-specific learning. prereq: 3016, 3014 [3018 strongly recommended], [3022 strongly recommended for students undertaking internships in business, government, or law]

FREN 4001. Beginning French for Graduate Student Research I. ( ; 5 cr. ; Student Option; Every Fall, Spring & Summer) Bonjour! Join us in learning the global language of diplomacy, culture, cuisine, and commerce! French is spoken on five continents, in approximately 40 countries, and even in Maine and Louisiana. Studying French will deepen your understanding of world history and the relationships between different cultures around the globe and close to home. Studying the language of Les Misérables, Monet, and joie de vivre allows you to access some of the most amazing art, thought, and food on the planet! Beginning French (French 1001) is designed for students with little or no knowledge of the French language. It focuses on developing your intercultural, reading, listening, speaking, and writing skills. By the end of the course, you will be able to communicate about family, housing, and school. You will also gain familiarity with French-speaking communities around the world. The course features preparatory and practice activities outside of class designed to encourage analysis of language structure so that class time can be primarily devoted to meaningful interaction in French.

FREN 4002. Beginning French for Graduate Student Research II. (5 cr. ; Student Option; Every Fall, Spring & Summer) Bienvenue en 4002! Ready to embark on a new journey to further develop your knowledge of the beautiful language of French? If you passed French 1001/4001 or have taken the Entrance Proficiency Test (EPT) and were placed in 1002, this course is for you! While exploring topics such as French holidays and cultural celebrations and traditions, food, and ecology, you will further develop your listening, speaking, reading, and writing skills. You will also learn about the concept of laïcité, one of the pillars of French society, and the differences and similarities between the school systems in France and the US. Preparatory activities designed to encourage students to analyze grammar points need to be completed at home so that class time can be primarily devoted to meaningful interactions in French. prereq: FREN 1001/4001 or equivalent

FREN 4003. Int French for Grad Research I. ( ; 5 cr. ; Student Option; Every Fall, Spring & Summer) Nous vous souhaitons la bienvenue dans le troisième semestre de francôise. In this course, you will explore current issues such as the role technology plays in today’s society and living a healthy lifestyle. Other themes include family, friends, and current social issues such as environment, energy, and immigration. Students will use film, excerpts of literature, and other authentic texts as part of the curriculum. Upon completion of the class, you will have more confidence in expressing past, future, and hypothetical events as well as your own opinions, feelings, and regrets. French 4003 is a five-credit course, so you should plan to spend an additional 10 hours a week coursework outside the classroom. Upon successful completion of this course you will be able to enroll in French 4004. prereq: C- or better in FREN 1002/4002 or 1022/4022, or EPT (for students taking their first French course at the U)

FREN 4004. Intermediate French for Graduate Student Research II. ( ; 5 cr. ; Student Option; Every Fall, Spring & Summer) Vous êtes les bienvenus! Come join us in exploring some of the foundations of cultural identity. What does it mean to be *French*? What does it mean to be “American”? What are some things that people living within a particular culture have in common as a function of living in that culture? Where do personal and cultural identities intersect? We pay special attention to development of intercultural competence, comparing how food, child-rearing practices, elements of national identity, and diversity are treated in France and the US. We revisit many grammar concepts you have seen before, focusing on accuracy and extended language use. This course will allow you to be much more confident in using comparisons, narrating (past and present), linking ideas together into longer discourse, describing, etc. Upon successful completion of this course, you should be solidly in the intermediate ranges of proficiency in French, able to travel and/or use French for your own goals. You will also be prepared for more advanced study in French here or abroad. prereq: C- or better in FREN 1003/4003, or EPT/LPE (for students taking their first French course at the U)

FREN 4022. Accelerated Beginning French for Graduate Student Research. ( ; 5 cr. ; Student Option; Every Fall & Spring) Heureux de vous revoir! Because you have studied French before, you already know what a wonderful language it is. This course is designed to return you to studying the language of Les Misérables, Monet, and joie de vivre! French 1022 is an accelerated review of French 1001/4001 followed by the material covered in French 1002/4002. At the end of this course, you will be able to communicate about topics such as food, family, school, the environment, travel and much more. If you have had a gap of more than a year since your last French class, you need to take the EPT to place into French 1022. prereq: 1001/4001 or equivalent

FREN 4101V. Honors Capstone Seminar in French and Francophone Studies. (WI; 2 cr. ; max 3 cr. ; A-F only; Every Spring) Course for French and FRIT majors only, to be taken during the final semester. This is the capstone experience of the major in French and Francophone or FRIT Studies. Building on your prior coursework, your linguistic expertise in French, and your analytical skills, it gives you the opportunity to do independent, original work on a topic of particular interest to you. This project is designed to bridge two upper-division French courses: a 3-credit elective of your own choice in the areas of literature, culture, or linguistics (i.e., one of your required electives numbered 31xx-36xx) and the senior project course itself (4101W/V). The elective provides background in the general field of research, while French 4101W/V allows you to learn the basics of research and advanced academic writing while working with a faculty member and a group of peers involved in similar projects. prereq: French 3101W and at least three electives completed.

FREN 4101W. Capstone Seminar in French and Francophone Studies. (WI; 2 cr. ; max 3 cr. ; A-F only; Every Spring) Course for French and FRIT majors only, to be taken during the final semester. This is the capstone experience of the major in French and Francophone or FRIT Studies. Building on your prior coursework, your linguistic expertise in French, and your analytical skills, it gives you the opportunity to do independent, original work on a topic of particular interest to you. This project is designed to bridge two upper-division French courses: a 3-credit elective of your own choice in the areas of literature, culture, or linguistics (i.e., one of your required electives numbered 31xx-36xx) and the Senior Project Course itself (4101W/V). The elective provides background in the general field of research, while French 4101W/V allows you to learn the basics of research and advanced academic writing while working with a faculty member and a group of peers involved in similar projects. prereq: French 3101W and at least three electives completed.

FREN 4109W. Capstone Independent Study in French and Francophone Studies. (WI; 2 cr. ; A-F only; Every Fall & Spring) Completion of research paper based on paper written for previous course or expansion of
FREN 4110V. Honors Capstone Independent Study in French and Francophone Studies. (WI; 2-4 cr. [max 8 cr.]; A-F only; Every Fall & Spring) Directed study used to develop or complete honors thesis in French and Francophone studies. prereq: [Completion of most major coursework or permission of DUS], candidate for honors in French, instr consent

FREN 4970. Directed Readings. (; 1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Designed to meet unique requirements agreed upon by a faculty member and a student. Individual contracts are drawn up listing contact hours, number of credits, written and other work required. Each contract will vary. prereq: instr consent

FREN 5301. Critical Issues in French Studies. (; 3 cr.; Student Option; Spring Even Year) Introduces the methods of interpretation and critical debates that have shaped and continue to define the discipline of French studies. Provides a practical introduction to graduate-level literary research. prereq: Grad or instr consent

FREN 5350. Topics in Literature and Culture. (; 3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Problem, period, author, or topic of interest. See Class Schedule. prereq: 3101 or equiv

FREN 5470. Post/Colonial Francophone Literatures. (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall) Francophone literature from North Africa, Africa, and the Caribbean of the colonial and/or post-colonial eras in the light of relevant literary and cultural theories. prereq: 3111 or above

FREN 5531. Sociolinguistics of French. (; 3 cr.; Student Option; Periodic Fall) Explores variation in the use of French associated with factors such as medium (oral/written), style (formal/informal), region, social and economic groups. prereq: Graduate student status and advanced proficiency in French

FREN 5541. Oral Discourse of French. (; 3 cr.; Student Option; Periodic Fall) Nature of contemporary spoken French discourse. Focuses on spontaneous, multi-speaker discourse. Readings include examples of various linguistic approaches to such discourse. Emphasizes syntactic analysis, phonological/lexical particularities, 'Macro' level analyses such as discourse analysis and conversation analysis. prereq: 3015, grad student; Ling 5001 recommended

FREN 5571. Old French in Action: Medieval French Language through Songs, Tales, and Plays. (; 3 cr.; A-F or Audit; Periodic Fall) This course introduces students to Old French grammar, vocabulary, and phonetics through language exercises and the reading and performance of original texts. Along the way, students will learn about the genres of medieval French literature, how these texts originally circulated, and how artists today work from medieval manuscripts to create new performances. Coursework will alternate between language lessons, oral and written exercises, the reading, translation, and discussion of Old French texts, and recitation and interpretive performance. French 5571 is designed for graduate students, honors undergraduates, and other high-achieving juniors and seniors with particular interest in medieval language, literature, and culture. It covers the same material as French 3571 and also how to read and edit texts from medieval manuscripts. Class is conducted in modern French. No prior experience of the medieval language is expected. prereq: French 3016.

FREN 5995. Directed Teaching. (; 1 cr.; S-N or Audit; Every Fall) Directed teaching. prereq: instr consent

FREN 8110. Topics in Early Medieval French Literature. (; 3 cr. [max 9 cr.]; Student Option; Periodic Spring) Introduction to epic, romance, allegory, and theater in Old French readings (12th-13th centuries). Specific topics/texts studied vary. Taught in French.

FREN 8111. Introduction to Old French. (; 3 cr.; Student Option; Periodic Fall & Spring) Studies in medieval French; instruction in reading Old French, sources of bibliography, and topics in medieval studies (language and literature). Taught in French.

FREN 8114. Troubadour Lyric and Old Occitan Language. (; 3 cr.; Student Option; Periodic Fall & Spring) Language and literature of Old Occitan (Old Provençal), chiefly troubadours' songs. Some language instruction, reading of lyrics, consideration of social context, introduction to scholarly tradition. Knowledge of French, Spanish, Italian, or Latin desirable. Taught in English.

FREN 8120. Topics in Later Medieval French Literature. (; 3 cr. [max 9 cr.]; Student Option; Fall Odd Year) Problems presented by texts written in France ca. 1300-1500. Evolution of Middle French language. Specific topics/texts vary. Taught in French. prereq: 8110 or instr consent

FREN 8125. Short Narrative in the Middle Ages. (; 3 cr.; A-F only; Fall Odd Year) Short forms of medieval narrative. Examples from French literary production within context of socioeconomic history from ca. 1100 to ca. 1550. prereq: grad student

FREN 8190. Old French Workshop. (; 1 cr. [max 3 cr.]; A-F only; Periodic Fall) Workshop runs concurrently with seminars on Old French literature. Advanced practicum in reading Old French, with discussions of the particularities of seminar texts and formal, aesthetic, and hermeneutic issues directly related to the original language. Students read portions of texts in Old French and prepare an original translation. The workshop is not an introduction to Old French Students planning to make medieval French literature their research field should register for the workshop each time it is offered. prereq: French 5571 or other prior course on Old French language, concurrent registration in the related Ph.D. seminar.

FREN 8210. Narrative, History, and Memory: Topics. (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall) Significance of narrative paradigm in literature, history, and cultural memory. Specific topics/texts treated vary. Taught in French.

FREN 8220. Staging the Common. (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Developments in 20th-century drama/performance in relation to French theatrical tradition. Post-1945 avant-garde innovation, interculturalism in contemporary theater. Specific topics/texts vary. Taught in French.

FREN 8230. Critical Issues: Criticism and Thought. (; 3-9 cr. [max 27 cr.]; Student Option; Fall Odd Year) Critical issues relating to works in criticism/thought related to French/Francophone literature, philosophy or culture.

FREN 8240. Critical Issues: French and Francophone Cinema. (; 3-9 cr. [max 27 cr.]; A-F only; Fall Odd Year) Critical issues relating to French/Francophone cinema.

FREN 8250. Critical Issues: Poetry. (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Significant critical issues relating to poetic writing of selected authors or periods.

FREN 8260. Critical Issues: Theatre. (; 3 cr. [max 12 cr.]; Student Option; Periodic Spring) Significant critical issues relating to dramatic writing of selected authors or periods.

FREN 8270. Critical Issues: Prose. (; 3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Significant critical issues relating to prose writing of selected authors or periods.

FREN 8271. The Novel of the Ancien Regime. (; 3 cr.; Student Option; Periodic Fall & Spring) Considers major novels of the 17th and 18th centuries in connection with developments in such areas as esthetic theory, intellectual currents, social transformations, and reading practices.

FREN 8280. Ethics and Aesthetics in French and Francophone Writing. (; 3 cr.; A-F only; Periodic Spring) Explores the question of philosophy's engagement with literature in the twentieth century. Traces this from Greek Antiquity (Plato, Aristotle), especially the moment of differentiation between logos and mythos, rational speech and fiction. Focuses on the breakdown of the borders between these two regimes of discourse in modernity. Explores the limits of the porosity between the two disciplines, especially by examining, instead of philosophy's blind acquiescence to the discourse of fiction, its modalities of resistance to figurative language.
FREN 8290. Critical Issues: Perspectives on an Author. (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
In-depth study of major author's writing, critical tradition this writing has occasioned, and theoretical issues upon which this writing may be brought to bear.

FREN 8291. Jean Genet's Writings and French Institutions. (; 3 cr.; Student Option; Periodic Fall & Spring)
Jean Genet’s writings at the crossroads of several disciplines (politics, psychoanalysis, religion, and law). Genet’s novels, dramas, and political essays explore the power of institutional settings and strategies imagined by individuals to short-circuit their impact.

FREN 8333. FTE: Master’s. (; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

FREN 8371. The Rule of Reason, The Reign of Madness: Readings in Early Modern France. (; 3 cr.; Student Option; Periodic Fall & Spring)
Relation between construction of reason and madness in philosophy, legitimation of political rule, and the institution of literature in early modern France.

FREN 8410. Topics in Quebecois Literature. (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Quebecois in relation to other North American literatures and to Francophone literature produced elsewhere in the world. Specific topics/texts vary. Taught in French.

FREN 8420. Critical Issues: Francophone Literature. (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Critical issues relating to literature of Francophone world. Specific topics/texts vary. Taught in French.

FREN 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

FREN 8521. History of the French Language. (; 3 cr.; Student Option; Periodic Fall & Spring)
History of French from its origins in Latin to the present day. Aspects of diachronic phonology (sound change), morphology, syntax. Taught in French.

FREN 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

FREN 8777. Thesis Credits: Master’s. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Topic of interest in interrelations and cross-cultural exchanges that have contributed to Italian/French literature and culture, from Medieval to modern period. Topics vary with instructor. See Course Guide.

FRIT 5850. Topics in French and Italian Cinema. (; 3 cr.; Student Option; Periodic Fall)
Focuses on a theme, problem, period, filmmaker, or other topic of interest in French or Italian cinema. See Class Schedule. Taught in English. prereq: Knowledge of [French or Italian] helpful but not required

FRIT 5999. Teaching of French and Italian: Theory and Practice. (; 3 cr.; Student Option; Every Fall)
Theoretical and practical aspects of language learning and teaching applied to French and Italian. Includes history of foreign language teaching in 20th-century United States. Taught in English.

Gay, Lesbian, Bisexual, Transgender (GLBT)

GLBT 1001. Introduction to GLBT Studies. (DSJ, SOCS; 3 cr.; Student Option; Every Fall)
History of contemporary GLBT-identified communities. Terms of theoretical debates regarding sexual orientation, identity, and experience. Analyzes problems produced and insights gained by incorporating GLBT issues into specific academic, social, cultural, and political discourses.

GLBT 3211. History of Sexuality in Europe. (; 3 cr.; A-F or Audit; Periodic Fall & Spring)
History of sexuality in Europe, from ancient Greece to present. Plato’s philosophy of love, St. Augustine’s conception of sin, prostitution in 15th century, sexual science of Enlightenment. Industrial revolution and homosexual subcultures. Rape scares and imperialism. Eugenics and Nazi Germany.

GLBT 3212. Dissident Sexualities in U.S. History. (; 3 cr.; A-F or Audit; Every Fall)
History of sexuality in United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transgender, bisexuality, lesbian, gay identities/communities. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.

GLBT 3301. Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States. (; 3 cr.; Student Option; Every Spring)
Interdisciplinary course. Development of GLBT social movements using social movement theory/service learning.

GLBT 3305. Queer Cinema. (AH; 3 cr.; Student Option; Periodic Fall & Spring)
What "queer" and "queering" signify in relation to cinema. Directors, films, styles, genres of queer cinema. Ways in which traditional narrative codes are challenged/repackaged. Ideological dimensions. Impact of political climate. Readings, screenings, discussions, assignments.

GLBT 3309. LGBTQ Literature: Then and Now. (DSJ, LITR; 3 cr.; Student Option; Every Fall)
LGBTQIA life in the US has changed significantly over the past few decades. By examining a selection of poetry, prose, and film, our class will try to answer the questions: "How did we get to where we are today?" and "Where do we go next?" We will look at classic works in their historical contexts to see what was revolutionary about their publication; we will trace how they paved the way for all that followed. We will look at very new works to understand the concerns of twenty-first century LGBTQIA writers and readers. From the "lavender scare" to the Stonewall Riots to the AIDS pandemic to marriage equality to genderqueer and trans movements, we will explore how LGBTQIA authors and filmmakers have both responded to and shaped the ethos of our times.

GLBT 3404. Transnational Sexualities. (GP; 3 cr.; Student Option; Periodic Fall & Spring) Lesbian/gay lives throughout the world. Culturally-specific/transcultural aspects of lesbian/gay identity formation, political struggles, community involvement, and global networking. Lesbian/gay life in areas other than Europe and the United States.


GLBT 3456W. Sexuality and Culture. (DSJ,WJ; 3 cr.; Student Option; Periodic Fall & Spring) Historical/critical study of forms of modern sexuality (heterosexuality, homosexuality, romance, erotic domination, lynching). How discourses constitute/regulate sexuality. Scientific/scholarly literature, religious documents, fiction, personal narratives, films, advertisements.

GLBT 3502. Transgender Studies Now. (DSJ; 3-0 cr.; Student Option; Periodic Fall & Spring) Transgender studies transforms ideas about gender, sexuality, identity, and biology. We look at how knowledge is made about transgender life across disciplines and media: film, fiction, and the internet, as well as medicine, history, anthropology, and gender studies. This course also asks how transgender social practices and community politics are embedded in dynamics of race, class, sexuality, nationality, and ability.

GLBT 3610. Topics in GLBT Studies. (; 3 cr. [max 6 cr.]; Student Option; Every Spring) Topics specified in Class Schedule.

GLBT 3993. Directed Studies. (; 1-6 cr.; A-F or Audit; Periodic Fall & Spring) Guided individual study. GLBT topic not available through regular course offerings. Students work with faculty who share their research interests. Number of credits based on scope of project, student needs, and advising instructor's approval. prereq: GLBT studies minor, instr consent

GLBT 4101. Gender, Sexuality, and Politics in America. (DSJ,HIS; 3 cr.; Student Option; Every Fall) Ways public and private life intersect through the issues of gender, sexuality, family, politics, and public life: ways in which racial, ethnic, and class divisions have been manifest in the political ideologies affecting private life.

GLBT 4204. Sex, Love, & Disability. (3 cr.; Student Option; Periodic Fall & Spring) In America's cultural imagination, people with disabilities are figured either as childlike and asexual, or improperly hypersexual. For disabled people (or anyone perceived as disabled) this paradox has meant denial of sexual agency and gender expression, histories of forced sterilization and institutionalization, sociopolitical marginalization, and great risk of sexual violence (and even death). In this course, we'll examine this history to better understand our contemporary present. We'll analyze constructions of disability and sexuality as they are interwoven with gender, class, race, and citizenship. We will ask: What might it mean to desire disability? Is there a disability sexual culture? Do disabled people queer sex, or does sexuality queer disability? What is the relationship between GLBTO and disability rights and liberation movements? Drawing from feminist, queer, and disability studies, we'll answer these questions (and more) by examining how the imagined able-bodymind structures our understanding of gender/sexuality, and how disability sexual cultures resist these norms.

GLBT 4232. Chicana/o - Latina/o Gender and Sexuality Studies. (AH,DSJ; 3 cr.; Student Option; Fall Odd, Spring Even Year) Critical thinking of Chicana/os, Latinas/os around construction of gender. Politics of sexual identity. How self is gendered in relationship to sexual, racial, class, national identities under different social structural conditions.

GLBT 4403. Queering Theory. (3 cr.; Student Option; Periodic Fall & Spring) This course will give you a solid theoretical foundation in the field of queer studies in addition to explaining its relation to other scholarly traditions, including (but not limited to) feminist theory, GLBT studies, literary studies, psychoanalysis, and postmodernism. Over the course of the semester you will examine the historical forces that birthed queer politics and theory, become conversant in its conceptual basis, interrogate and analyze its various uses and applications, and finally apply it in your own arguments. prereq: Any GWSS or GLBT course

GLBT 4415. Transnational Body Politics. (GP; 3 cr.; A-F only; Periodic Fall & Spring) Our bodies are always already modified. How we shape our bodies can express our deepest feelings about who we are. Body modification can also represent cultural and subcultural identifications or expectations based on gender, race, class, and sexuality. But what we do with our bodies is never separate from the politics of cultural difference and fluctuating ideas of what is acceptable or unacceptable, civilized or uncivilized. These ideas are historically and culturally specific. This course looks at body modification on a transnational scale to ask how we come to know what differentiates "mutilation" from "correction." We ask how feminist, queer and critical race theories illuminate these debates, reading across historical, anthropological, medical, and literary texts. Weekly topics include gender, race, and cosmetic surgery; skin whitening technologies; transnational gender reassignment; surgical tourism; female genital cutting; piercing, tattooing and scarification; the cultural politics of hair; and body modification in the context of transnational feminized labor.

GLBT 4502. Gender and Public Policy. (3 cr.; Student Option; Periodic Fall & Spring) Public policy issues, processes, and histories as these affect women-, children-, and gender-related issues.

GLBT 5993. Directed Study. (; 1-12 cr.; Student Option; Every Fall & Spring) Directed Study

Gender, Women, & Sexuality Std (GWSS)

GWSS 1001. Gender, Power, and Everyday Life. (; 3 cr.; Student Option; Every Summer) U.S. multi-/cross-cultural studies of contemporary social, cultural, and personal conditions of women's lives.

GWSS 1002. Politics of Sex. (DSJ,SOCS; 3-4 cr.; Student Option; Every Spring) Introductory survey of historical, cultural, psychological, and sociopolitical dimensions of analyzing gender/sexuality. Norms/deviances pertaining to gender/sexuality as differently enacted/understood by social groups in different time/place-specific locations.

GWSS 1003W. Women Write the World. (GP,WL,LLTR; 3 cr.; Student Option; Every Fall) Concepts in literary studies. Poems, plays, short stories, novels, essays, letters by women from different parts of world. Focuses on lives, experiences, and literary expression of women, including basic concepts of women's studies.

GWSS 1004. Screening Sex: Visual and Popular Culture. (AH; 3 cr.; Student Option; Fall Even, Spring Odd Year) Film history and theory; feminist critique of popular culture.

GWSS 1005. Engaging Justice. (CIV; 3 cr.; Student Option; Fall Odd, Spring Even Year) U.S./cross-cultural studies of social movements/political organizing around justice/equality.

GWSS 1006. Skin, Sex, and Genes. (SOCS,TS; 3 cr.; Student Option; Fall Odd Year) Interdisciplinary course that explores the tense relationships between science, medicine, and gender and sexuality.
GWSS 1007. Introduction to GLBT Studies. (DSJ,SOCS; 3 cr.; Student Option; Every Fall) History of contemporary GLBT-identified communities. Terms of theoretical debates regarding sexual orientation, identity, and experience. Analyzes problems produced/insights gained by incorporating GLBT issues into specific academic, social, cultural, political discourses.

GWSS 1912. The Spell: A Black Feminist Oracle. (3 cr.; Student Option; Every Fall) This is an interactive semester long experience in Black feminist theory and praxis grounded in the theoretical interventions and poetic implications of the work of Hortense J. Spillers. Hortense J. Spillers has influenced generations of scholars with her foundational essays, collected in the volume Black, White and In Color: Essays on American Culture. Some of the questions that the class will come back to again and again include: What constitutes freedom? What am I escaping? How am I contained and constrained? Where and when am I overflowing? To whom am I accountable? What nourishes me? What feeds my community? Where do words fail? Does love prevail? What is the purpose and place of critique? What are the contours of collaboration? What is my role in this community? What am I learning and unlearning with and from my family of origin? This course is a Black feminist space of inquiry and is open to all students who are excited about and committed to engaging and prioritizing Black feminist modes of thinking, creating and collaborating.

GWSS 1917. Inequality and the American Dream. (3 cr.; A-F only; Periodic Fall) Increasing and intensifying inequality is perhaps the most pressing socio-economic problem of our time. A significant threat to democracy, the American dream, and national values of diversity and inclusion, wealth inequality today has not only surpassed that of the Great Depression but also grafted onto longstanding, intersectional cleavages of race, gender, indigeneity, class, and sexuality. The richest one percent have captured nearly 60 percent of all income gains from 1977 to 2000, and in 2010, the top 20 percent of households owned almost 90 percent of all privately held wealth in the United States, while the net worth of the bottom 40 percent was negative. Simultaneously, much of the current political polarization, cultures of resentment, and rise in scapegoating and racist anti-immigrant actions have also been attributed to the attendant consequences of rising inequality, anxiety, and insecurity. And yet, many social critics argue that instead of addressing the key causes of inequality and the crisis of the American dream, the powerful in society have seized on these conditions to mobilize an avalanche of discontent among sectors of the downwardly mobile in a way that often obscures the key reasons for their predicament and scapegoats those at the social margins. Given this context, it is imperative to better understand and analyze the histories, cultural assumptions, and hierarchies that have produced contemporary inequality. How did we get to this point? What are the consequences, and what might we expect in the future? This set of seminars asks these hard questions and engages in precisely this exploration. These four freshman seminars (AFRO 1917, ANTH 1917, GWSS 1917, HIST 1917) will occasionally meet together, and will bring together scholars across multiple disciplines (African American Studies, Anthropology, Feminist Studies, History, and beyond) who are substantively engaged with scholarship on class, race, indigeneity, gender, and sexuality. We believe that this cross-fertilization is critical because the fault-lines of inequality have precisely cohered to these structural formations and categories of analysis.

GWSS 3002V. Honors: Gender, Race and Class in the U.S. (WI,DSJ; 3 cr.; A-F only; Periodic Fall & Spring) Comparative study of women, gender, race, class, sexuality in two or more ethnic cultures in U.S. prereq: Honors

GWSS 3002W. Gender, Race, and Class in the U.S. (DSJ,WW; 3 cr.; A-F only; Every Fall & Spring) Comparative study of women, gender, race, class, sexuality in two or more ethnic cultures throughout U.S.

GWSS 3003. Gender and Global Politics. (GP,SOCS; 3 cr.; Student Option; Every Fall, Spring & Summer) Similarities/differences in women’s experiences throughout world, from cross-cultural/historical perspective. Uses range of reading materials/media (feminist scholarship, film, news media, oral history, autobiography).

GWSS 3004V. Honors: Point/Counterpoint: Contemporary Feminist Debates. (CIV,WW; 3 cr.; A-F only; Periodic Fall) Contemporary debates of concern to many women. Abortion, affirmative action, marriage rights, welfare rights, sex education, children’s rights, date rape. In-depth study of several issues. Debate pros/cons of relevant perspectives. Includes honors recitation. prereq: Honors


GWSS 3102V. Honors: Feminist Thought and Theory. (AH,WW,CIV; 3 cr.; A-F only; Every Fall) Course explores a range of feminist theoretical perspectives, asking how theory develops both in response to earlier theoretical traditions and in the context of diverse forms of practice, starting from the assumptions that theories emerge from (rather than just being applied to) practice, and that theory-making is itself a form of practice.

GWSS 3102W. Feminist Thought and Theory. (AH,WW,CIV; 3 cr.; A-F only; Every Fall)

GWSS 3203W. Blood, Bodies and Science. (SOCS,WTI,TS; 3 cr.; Student Option; Every Fall) Ways in which modern biology has been site of conflict about race/gender. Race/gender demographics of scientific professions.


GWSS 3208. Transgender Health. (2 cr.; A-F only; Every Spring & Summer) Transgender Health is an online course which prepares future health care and social services professionals to serve the diverse needs of transgender patients and clients. This course offers feminist perspectives on clinical transgender health care. Students will engage with literature from feminist and queer studies, public health, medicine, social work, legal studies, and public policy.

GWSS 3215. Bodies That Matter: Feminist Approaches to Disability Studies. (DSJ; 3 cr.; Student Option; Periodic Spring) Dis/ability is not a physical or mental defect but a form of social meaning making mapped to certain bodies in larger systems of power and privilege. Feminist approaches to dis/ability as vector of oppression intersecting and constituted through other oppression such as race, class, gender, sexuality and citizenship. Dis/ability must be understood through systems of power that construct, support, regulate, and determine the life choices of those who claim, or are claimed by disability. Deconstruct the complex ideologies of ableism and the material realities of such oppression, and work toward imagining and reconstructing a more just and equitable society.

GWSS 3218. Politics of Reproduction. (3 cr.; A-F only; Every Fall & Spring) We often think of reproduction solely in terms of physiological events like pregnancy, delivery, or menstruation that occur in (or to) individual female bodies. Additionally, physicians and demographers appear to be the primary professional experts when it comes to managing and quantifying such reproductive events. In contrast, this class grapples with reproduction as a social and biological set of meanings and processes through which racial, gender, sexual, and socio-economic inequalities have been amplified, reconfigured, and contested across time and space. We trace how control over reproduction has been critical to a variety of professional, economic
and political endeavors, including the rise and consolidation of disciplines like obstetrics-gynecology and demography; the maintenance of white privilege in colonial spaces and the metropolis; post-WW II techno-scientific projects of "development" in the global South; and the emergence of the welfare state. The course identifies inequalities along the lines of race, class, gender, sexuality, and nationality in reproductive experiences and outcomes in a wide range of countries, including Cameroon, China, Cuba, Sudan, Soviet Russia, Romania, Zimbabwe, India, Senegal, Burkina Faso, South Africa, Nigeria, and the US. We locate individually epistemologically repressed meanings and practices related to pregnancy, delivery, abortion, post-abortion care, contraception, sterilization, surrogacy, and child care in regional, national and global political economies. In other words, we investigate continuities and disruptions in reproductive politics between the individual body and the social body; the past, present and future; and local and global arenas. By exploring how reproductive production operates domestically and globally as a mechanism of governance and social and economic stratification, we also consider possibilities for reproductive justice.

GWSS 3290. Topics. (1-3 cr.; max 9 cr.; A-F only; Every Fall, Spring & Summer) Topics specified in Class Schedule.

GWSS 3301W. Women Writers. (LITR,WI; 3 cr.; Student Option; Every Spring) Complexities of women's roles and way women writers have used various genres of literature to articulate personal and social struggles. Fiction, poetry, drama, critical nonfiction texts. Fidelity/ betrayal within relationships and societal perceptions. What images of femininity do these writers convey? How do formal and stylistic devices transform meaning?

GWSS 3302. Women and the Arts. (AH,DSJ; 3 cr.; Student Option; Every Fall) Study of women in the arts, as represented and as participants (creators, audiences). Discussion of at least two different art forms and works from at least two different U.S. ethnic or cultural communities.

GWSS 3303W. Writing Differences: Literature by U.S. Women of Color. (DSJ,WI,LITR; 3 cr.; Student Option; Fall Odd Year) Interpret/analyze poetry, fiction, and drama of U.S. women minority writers. Relationship of writer's history, ethnicity, race, class, and gender to her writings.

GWSS 3304. Novels and Nations. (GP,LITR; 3 cr.; Student Option; Periodic Fall) Explore intricacies of web of fiction without losing sight of structures that hold it up.

GWSS 3305. Queer Cinema. (AH; 3 cr.; Student Option; Periodic Fall & Spring) What "queer" and "queering" signify in relation to cinema. Directors, films, styles, genres of queer cinema. Ways in which traditional narrative codes are challenged/repackaged. Ideological dimensions. Impact of political climate. Readings, screenings, discussions, assignments.

GWSS 3306. Pop Culture Women. (AH,DSJ; 3 cr.; Student Option; Every Fall & Spring) Contemporary U.S. feminism as political/intellectual movement. Ways in which movement has been represented in popular culture.

GWSS 3307. Feminist Film Studies. (AH,DSJ; 3 cr.; Student Option; Every Fall) Construction of different notions of gender in film, social uses of these portrayals. Lectures on film criticism, film viewings, class discussions.


GWSS 3404. Transnational Sexualities. (GP; 3 cr.; Student Option; Fall Odd, Spring Even Year) Lesbian/gay lives throughout world. Culturally-specific/transcultural aspects of lesbian/gay identity formation, political struggles, community involvement, and global networking. Lesbian/gay life in areas other than Europe and the United States.

GWSS 3406. Gender, Labor, and Politics. (GP,SOCS; 3 cr.; Student Option; Every Fall) Historical developments/contemporary manifestations of women's participation in labor force/global economy. Gender as condition for creation/maintenance of exploitable category of workers. How women's choices are shaped in various locations. Women's labor organizing.

GWSS 3406H. Honors: Gender, Work, Labor. (GP,SOCS; 3 cr.; A-F only; Every Fall) Historical developments/contemporary manifestations of women's participation in labor force/global economy. Gender as condition for creation/maintenance of exploitable category of workers. How women's choices are shaped in various locations. Women's labor organizing.

GWSS 3407. Women in Early and Victorian America: 1600-1890. (DSJ,HIS; 3 cr.; Student Option; Every Fall) Varied experiences of women in American history from European settlement in North America to the end of the 19th century.

GWSS 3408. Women in Modern America. (AH; 3 cr.; Student Option; Every Spring) History of women in the United States from 1890 to present. Women's changing roles in politics, in labor force, in family, and in popular culture. Work, family, sexuality, gender ideologies, women's right struggles. Different experiences of women based on race, class, religion, and region.

GWSS 3409W. Asian American Women's Cultural Production. (AH,WI,DSJ; 3 cr.; Student Option; Every Fall) Analysis of media, art, literature, performance, on artistic contributions. History, politics, culture of Asian American women. Interpret cultural production to better understand role of race, gender, nation within American society/citizenship.

GWSS 3410. Chicana Studies: La Chicana in Contemporary Society. (AH,DSJ; 3 cr.; Student Option; Every Fall & Spring) Scholarly/creative work of Chicanas or politically defined women of Mexican American community. Interdisciplinary. Historical context, cultural process, autoethnography.

GWSS 3413. Women and Gender in Latin American History. (GP,HIS; 3 cr.; Student Option; Periodic Spring) Changing gender norms in Latin America over time as compared with lives of women/men of diverse classes, ethnic groups. How women responded to their position in society, on continuum from accommodation to resistance.

GWSS 3415. Feminist Perspectives on Domestic Violence and Sexual Assault. (DSJ; 3 cr.; A-F only; Every Fall) History of and contemporary thinking about public policies and legal remedies directed toward domestic violence and sexual assault. How notions of public/private spheres and social constructions of gender roles, agency, and bodies contribute to attitudes/responses.


GWSS 3502. Transgender Studies Now. (DSJ; 3 cr.; Student Option; Periodic Fall & Spring) Transgender studies transforms ideas about gender, sexuality, identity, and biology. We look at knowledge is made about transgender life across disciplines and media: film, fiction, and the internet, as well as medicine, history, anthropology, and gender studies. Also asks how transgender social practices and community politics are embedded in dynamics of race, class, sexuality, nationality and ability.

GWSS 3503. Women and the Law. (; 3 cr.; Student Option; Periodic Fall & Spring) Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.

GWSS 3505V. Girls, Girlhood, and Resistance. (WI; 0-3 cr.; A-F only; Fall Odd Year) A critical engagement with what constitutes "girlhood" and "resistance" through comparative analyses of girls' resistance and activism across North America.

GWSS 3505W. Girls, Girlhood, and Resistance. (WI; 3 cr.; Student Option; Fall Odd Year) A critical engagement with what constitutes "girlhood" and "resistance" through comparative analyses of girls' resistance and activism across North America.
GWSS 3515. Comparative Indigenous Feminisms. (GP; 3 cr.; Student Option; Periodic Fall & Spring) The course will examine the relationship between Western feminism and indigenous feminism as well as the interconnections between women of color feminism and indigenous feminism. In addition to exploring how indigenous feminists have theorized from 'the flesh' of their embodied experience of colonialism, the course will also consider how indigenous women are articulating decolonization and the embodiment of autonomy through scholarship, cultural revitalization, and activism.

GWSS 3549. U.S. Women’s Legal History. (DSJ, HIS; 3 cr.; A-F or Audit; Fall Odd Year) Women’s legal status, from colonial era through 20th century. Women’s citizenship, civil rights. Marriage, divorce, and child custody. Reproductive/physical autonomy/integrity. Economic/educational equality. prereq: Soph or jr or sr

GWSS 3590. Topics: Social Change, Activism, Law, and Policy Studies. (3 cr. [max 6 cr.]; Student Option; Periodic Spring) Topics specified in Class Schedule.

GWSS 3626W. Witches, Seers and Saints: Women, Gender and Religion in the US. (WI; 3 cr.; Student Option; Periodic Fall & Spring) This course examines the development and ramifications of gender ideologies within several religious groups in North America from the colonial period to the present and explores women’s strategies that have contributed to and resisted these ideologies.

GWSS 3681. Gender and the Family in the Islamic World. (3 cr.; A-F only; Periodic Spring) Experiences of Muslim women/families from historical/comparative perspective. Gender/family power relations in colonial representations, sexual politics, family, education/health, paid work, human rights, Islamic feminism. prereq: At least soph

GWSS 3993. Directed Study. (1-12 cr.; Student Option; Every Fall, Spring & Summer) TBD Prereq instr consent, dept consent, college consent.

GWSS 3994. Directed Research. (1-12 cr.; Student Option; Every Fall & Spring) TBD Prereq instr consent, dept consent, college consent.

GWSS 4001. Nations, Empires, Feminisms. (3 cr.; A-F only; Spring Even Year) Feminist critiques of the nation-state and citizenship, political economy and development, globalization, and/or empire and colonialism. Overview of the broader literature and an interrogation of specific attendant questions (such as how do feminists theorize state violence; what are feminist and queer critiques of U.S. empire; and how do feminists theorize globalization from above and below).

GWSS 4002. Politics of Engagement and Social Justice. (CIV; 3 cr.; A-F only; Fall Odd Year) Ways in which feminist scholars have thought about and worked to complicate the opposition between theory and praxis. Diverse efforts by intellectuals situated within the Western academy to produce scholarship that is committed to deinstitutionalizing knowledge production and relevant to political struggles confronted by their own material and institutional inequalities.

GWSS 4003. Science, Bodies, Technologies. (3 cr.; Student Option; Spring Odd Year) Feminist approaches to scientific methods and practices. Relationship between scientific practices and social relations, emphasizing the larger social, political, and economic context in which scientific knowledge production takes place. How scientific knowledge structures relationships of power and inequality, and constructs understandings of bodies and identities. Ways in which science shapes meanings of sex, race, gender and sexuality.

GWSS 4004. Queering Desire. (3 cr.; Student Option; Fall Even, Spring Odd Year) Core perspectives of queer theory. Recent extensions and manifestations.

GWSS 4103. Transnational Feminist Theories. (GP; 3 cr.; Student Option; Periodic Fall & Spring) Western/non-Western feminist theories in conversation. Historical, cultural, political context. Relation of theory to activism.

GWSS 4108. Senior Seminar: Writing. (1 cr.; A-F only; Every Spring) Capstone course. Conduct independent research/writing in conjunction with 3xxx-, 4xxx-, or 5xxx-level GWSS class. prereq: GWSS major [jr or sr]

GWSS 4204. Sex, Love, & Disability. (3 cr.; Student Option; Periodic Fall & Spring) In America's cultural imagination, people with disabilities are figured either as childlike and asexual, or improperly hypersexual. For disabled people (or anyone perceived as disabled) this paradox has meant denial of sexual agency and gender expression, histories of forced sterilization and institutionalization, sociopolitical marginalization, and great risk of sexual violence (and even death). In this course, we'll examine this history to better understand our contemporary present. We'll analyze constructions of disability and sexuality as they are interwoven with gender, class, race, and citizenship. We will ask: What might it mean to desire disability? Is there a disability sexual culture? Do disabled people desire sex, or does sexuality queer disability? What is the relationship between GLBTQ and disability rights and liberation movements? Drawing from feminist, queer, and disability studies, we'll answer these questions (and more) by examining how the imagined able-bodymind structures our understanding of gender/sexuality, and how disability sexual cultures resist these norms.

GWSS 4303W. Writing Differences: Literature by U.S. Women of Color. (DSJ, WI, LITR; 3 cr.; Student Option; Fall Odd Year) Interpret/analyze poetry, fiction, drama of U.S. women minority writers. Relationship of writer's history, ethnicity, race, class, gender to writings.

GWSS 4390. Topics: Visual, Cultural, and Literary Studies. (3 cr.; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule, prereq: Sr or grad student or instr consent

GWSS 4401. Chicana/Latina Cultural Studies. (AH, DSJ; 3 cr.; Student Option; Fall Even Year) Readings in Chicana/Latina cultural studies. TV, film, art, music, dance, theatre, literature. Identity/sexuality. Production of culture/theory.

GWSS 4403. Queering Theory. (3 cr.; Student Option; Periodic Fall & Spring) This course will give you a solid theoretical foundation in the field of queer studies in addition to explaining its relation to other scholarly traditions, including (but not limited to) feminist theory, GLBT studies, literary studies, psychoanalysis, and postmodernism. Over the course of the semester you will examine the historical forces that birthed queer politics and theory, become conversant in its conceptual basis, interrogate and analyze its various uses and applications, and finally apply it in your own arguments. prereq: Any GWSS or GLBT course

GWSS 4406. Black Feminist Thought in the American and African Diasporas. (3 cr.; Student Option; Periodic Spring) Critically examine spatiality of African descendant women in Americas/larger black diaspora. Readings from black feminist/queer geographies, history, contemporary cultural criticism. Recent black feminist theorizing.

GWSS 4415. Transnational Body Politics. (GP; 3 cr.; A-F only; Periodic Fall & Spring) Our bodies are always already modified. How we shape our bodies can express our deepest feelings about who we are. Body modification can also represent cultural and subcultural identifications or expectations based on gender, race, class, and sexuality. But what do we do with our bodies is never separate from the politics of cultural difference and fluctuating ideas of what is acceptable or unacceptable, civilized or uncivilized. These ideas are historically and culturally specific. This course looks at body modification on a transnational scale to ask how we come to know what differentiates "mutilation" from "correction." We ask how feminist, queer, and critical race theories illuminate these debates, reading across historical, anthropological, medical and literary texts. Weekly topics include gender, race and cosmetic surgery; skin whitening technologies; transnational gender reassignment; surgical tourism; female genital cutting; piercing, tattooing and scarification; the cultural politics of hair; and body modification in the context of transnational feminized labor.

GWSS 4502. Gender and Public Policy. (3 cr.; Student Option; Periodic Fall & Spring) Public policy issues, processes, and histories as these affect women-, children-, and gender-related issues.
GWSS 4980. Directed Instruction. (1-8 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Guided individual reading or study.

GWSS 4993. Directed Study. (; 1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
TBD prereq: Filled out student/faculty contract, instr consent, dept consent, college consent

GWSS 4994. Directed Research. (1-8 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Guided individual reading or study.

GWSS 5104. Transnational Feminist Theory. (; 3 cr.; Student Option; Fall Odd Year)
Third World and transnational feminisms. Interrogating the categories of "women," "feminism," and "Third World." Varieties of power/oppression that women have endured/resisted, including colonization, nativism, globalization, and capitalism. Concentrates on postcolonial context.

GWSS 5190. Topics: Theory, Knowledge, and Power. (; 3 cr.; Student Option; Fall Odd, Spring Even Year)
Topics specified in Class Schedule.

GWSS 5290. Topics: Biology, Health, and Environmental Studies. (; 3 cr.; Student Option; Periodic Fall & Spring)
Topics specified in class schedule.

GWSS 5390. Topics: Visual, Cultural, and Literary Studies. (; 3 cr.; [max 6 cr.]; Student Option; Periodic Fall & Spring)
Topics specified in Class Schedule.

GWSS 5406. Black Feminist Thought in the American and African Diasporas. (; 3 cr.; Student Option; Periodic Spring)
Critically examines spatiality of African descendant women in Americas/larger black diaspora. Writings from black feminist/queer geographies, history, contemporary cultural criticism. Recent black feminist theorizing.

GWSS 5490. Topics: Political Economy and Global Studies. (; 3 cr.; [max 12 cr.]; Student Option; Periodic Fall & Spring)
Topics specified in Class Schedule.

GWSS 5502. Gender and Public Policy. (3 cr.; Student Option; Periodic Fall & Spring)
Public policy issues, processes, and histories as they affect women-, children-, and gender-related issues.

GWSS 5593. Directed Study. (; 1-12 cr.; Student Option; Every Fall, Spring & Summer)
TBD

GWSS 5594. Directed Instruction. (; 1-12 cr. [max 36 cr.]; Student Option; Every Fall, Spring & Summer)
TBD

GWSS 5595. Directed Research. (; 1-8 cr. [max 36 cr.]; Student Option; Every Fall & Spring)
TBD

GWSS 8101. Intellectual History of Feminism. (; 3 cr.; Student Option; Periodic Fall & Spring)
Major trends in feminist intellectual history from 14th century to the present, especially in the United States and Europe.

GWSS 8102. Advanced Studies in Sexuality. (; 3 cr.; Student Option; Fall Odd Year)
Contemporary theoretical scholarship/research on selected issues related to sexuality, gender, and the body. prereq: Priority given to feminist studies grad students

GWSS 8103. Feminist Theories of Knowledge. (; 3 cr.; Student Option; Periodic Fall)
Interdisciplinary seminar. Feminist approaches to knowledge and to criticism of paradigms of knowledge operative in the disciplines. Feminist use of concepts of subjectivity, objectivity, and intersubjectivity. Feminist empiricism, standpoint theory, and contextualism. Postmodern and postcolonial theorizing.

GWSS 8107. Feminist Pedagogies. (; 3 cr.; Student Option; Spring Odd Year)
Explore feminist theories/critical approaches to pedagogy. Develop teaching philosophy statement, design syllabus, practice teach/learn problem-solving strategies for classroom. prereq: Feminist Studies grad student [Maj or Minor] or instr consent

GWSS 8108. Genealogies of Feminist Theory. (3 cr.; Student Option; Every Fall)
Two-semester seminar. First term: debates in gender theory; intersections of gender theory with critical race theory, post-colonial theory, sexuality theory, social class analysis. Second term: inter-/multi-disciplinary feminist research methodologies from humanities/social sciences. prereq: Feminist studies PhD or grad minor student or instr consent

GWSS 8109. Feminist Knowledge Production. (3 cr.; Student Option; Every Spring)
Two-semester interdisciplinary seminar. First term: debates in gender theory; gender theory, critical race theory, post-colonial theory, sexuality theory, social class analysis. Second term: inter-/multi-disciplinary feminist research methods from humanities/social sciences. prereq: Feminist studies PhD or grad minor student or instr consent

GWSS 8201. Feminist Theory and Methods in the Social Sciences. (; 3 cr.; Student Option; Periodic Fall & Spring)
Seminar on recent theories, including feminist versions of positivist, interpretivist, critical theoretical, and postmodernist models of social science knowledge. Methodologies congenial to feminist practices of inquiry, including use of narrative in theory, feminist ethnography, discourse analysis, and comparative methods in history.

GWSS 8210. Seminar: Feminist Theory & Praxis. (; 3 cr. [max 9 cr.]; Student Option; Every Fall & Spring)
Topics in feminist theory.

GWSS 8220. Seminar: Science, Technology & Environmental Justice. (; 3 cr. [max 6 cr.]; Student Option; Periodic Spring)
Topics related to science, technology, environmental justice.

GWSS 8230. Seminar: Cultural Criticism and Media Studies. (; 3 cr. [max 6 cr.]; Student Option; Periodic Spring)
Topics in literature, film, art.

GWSS 8250. Seminar: Nation, State, and Citizenship. (; 1-3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
Topics related to nation, state, citizenship.

GWSS 8260. Seminar: Race, Representation and Resistance. (; 3 cr. [max 6 cr.]; Student Option; Every Spring)
Race, racialization, racial justice as related to representation/struggles for social/economic justice. Intersectional analysis of power, politics, ideology/identity. Queer of color critique, women of color feminisms, critical sex/body positive approaches. prereq: Grad student

GWSS 8270. Seminar: Theories of Body. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
How body is configured in many social arenas. Legal decisions, public policy, medical research, cultural customs. Examine how attitudes toward male/female bodies influence social myths/discourses about social policy/ change.

GWSS 8301. Feminist Literary Criticism. (; 3 cr.; Student Option; Periodic Fall & Spring)
Recent developments and major issues in feminist studies of literature. Introduction to array of scholars and scholarship in field of feminist literary theory and criticism, emphasizing broad range of feminist textual analysis taking place in various University departments.

GWSS 8333. FTE: Master's. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

GWSS 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

GWSS 8490. Seminar: Transnational, Postcolonial, Diaspora. (; 3 cr.; [max 6 cr.]; Student Option; Every Fall & Spring)
Graduate topics in comparative/global studies.

GWSS 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr.; [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

GWSS 8888. Thesis Credit: Doctoral. (; 1-24 cr.; No Grade Associated; Every Fall, Spring & Summer)
General Dentistry (GEND)

GEND 5151. Advanced General Dentistry Seminar I. (1-5 cr.; S-N or Audit; Every Fall & Summer)
Clinical seminars with emphasis on treatment planning, case presentation, techniques and materials, comprehensive oral healthcare and maintenance, and issues in practice management. Correlated with concurrent clinical experiences.

GEND 5152. Advanced General Dentistry Seminar II. (1-5 cr.; S-N or Audit; Every Fall)
Clinical seminars with emphasis on treatment planning, case presentation, techniques and materials, comprehensive oral healthcare and maintenance, and issues in practice management. Correlated with concurrent clinical experiences.

GEND 5153. Advanced General Dentistry Seminar III. (2-10 cr.; S-N or Audit; Every Fall & Spring)
Clinical seminars with emphasis on treatment planning, case presentation, techniques and materials, comprehensive oral healthcare and maintenance, and issues in practice management. Correlated with concurrent clinical experiences.

GEND 5154. Advanced General Dentistry Clinic I. (5-15 cr.; S-N or Audit; Every Fall & Summer)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5155. Advanced General Dentistry Clinic II. (5-15 cr.; S-N or Audit; Every Fall)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5156. Advanced General Dentistry Clinic III. (5-15 cr.; S-N or Audit; Every Fall & Spring)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5157. Advanced General Dentistry Clinic IV. (1-10 cr.; S-N or Audit; Every Fall & Spring)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 6151. General Practice Seminar I. (5-10 cr.; S-N or Audit; Every Fall & Summer)
A sequence of lectures, discussions, and seminars on topics related to current dental practice. Correlated with clinical experiences.

GEND 6152. General Practice Seminar II. (5-10 cr.; S-N or Audit; Every Fall & Summer)
A sequence of lectures, discussions, and seminars on topics related to current dental practice. Correlated with clinical experiences.

GEND 6153. General Practice Seminar III. (1-10 cr.; S-N or Audit; Every Fall & Spring)
A sequence of lectures, discussions, and seminars on topics related to current dental practice. Correlated with clinical experiences.

GEND 6154. General Practice Seminar IV. (1-10 cr.; S-N or Audit; Every Fall & Spring)
A sequence of lectures, discussions, and seminars on topics related to current dental practice. Correlated with clinical experiences.

Genetics, Cell Biol/Developmnt (GCD)

GCD 2002W. Ethical and Social Challenges in Genetics. (TS,WI; 3 cr.; A-F only; Every Fall)
For nonscientists. Advances in genetics and their application to society. Ethical and social issues of advancements in genomics and genetics in our everyday lives. Prereq: BIOL 1009 or equiv
primary papers in molecular genetic and genomics.

GCD 4111. Histology: Cell and Tissue Organization. (4 cr.; Student Option; Every Spring)
Structure/function of vertebrate tissues/organs. Electron microscopy, light microscopy, physiologic, cell biology of higher animals. Light microscopy of mammalian tissues. prereq: 3033 or Biol 4004 or instr consent

GCD 4134. Endocrinology. (3 cr.; Student Option; Every Spring)
Survey of structure and function of invertebrate and vertebrate endocrine systems. prereq: BIOL 3211 or BIOL 3021 or BIOL 3022 or BIOL 4331 or instr consent

GCD 4143. Human Genetics. (3 cr.; Student Option; Every Spring)
Principles of human genetics at the molecular, cellular, individual, and populations levels. Chromosomal and biochemical disorders; gene mapping; mutation and natural selection; variation in intelligence and behavior; genetic screening, counseling and therapy. prereq: 3022 or Biol 4003 or instr consent

GCD 4161. Developmental Biology. (3 cr.; Student Option; Every Fall)
Mechanisms that govern development from gametogenesis through fertilization. Embryogenesis/postembryonic development. Mechanisms of morphogenesis/differentiation. Classical/molecular approaches in various model organisms. Genetic models such as bacteriophage, yeast, Drosophila, C. elegans, Arabidopsis, zebrafish, and the mouse. prereq: Biol 4003; concurrent registration is required (or allowed) in Biol 4004 recommended

GCD 4171. Stem Cells in Biology and Medicine. (3 cr.; A-F only; Every Spring)
Contemporary stem cell biology with emphasis on mechanisms/applications. Embryonic, tissue-specific, and induced pluripotent stem cells and potential uses in human disease. prereq: BIOL 4003, [BIOL 4004 or concurrent registration is required (or allowed) in BIOL 404 or instr consent]

GCD 4793W. Directed Studies: Writing Intensive. (WI; 1-7 cr.; S-N or Audit; Every Fall & Summer)
Individual study on selected topics or problems. Emphasizes selected readings and use of scientific literature. Written report. prereq: instr consent, dept consent

GCD 4794W. Directed Research: Writing Intensive. (WI; 1-6 cr. [max 42 cr.]; S-N or Audit; Every Fall & Summer)
Laboratory or field investigation of selected areas of research including written report. prereq: instr consent, dept consent

GCD 4993. Directed Studies. (1-7 cr.; S-N or Audit; Every Fall, Spring & Summer)
Individual study on selected topics or problems. Emphasizes selected readings and use of scientific literature. prereq: instr consent, dept consent

GCD 4994. Directed Research. (1-6 cr. [max 42 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Laboratory or field investigation of selected areas of research. prereq: instr consent, dept consent

GCD 5005. Cell Biology-Writing Intensive. (WI; 4 cr.; A-F only; Every Spring)

GCD 4003. Molecular Genetics and Genomics. (3 cr.; Student Option; Every Spring)
Molecular genetics and genomics of eukaryotes. Course emphasizes mechanisms of gene regulation and how these are studied. Current strategies used to study the activity and function of genes and genomes, including the role of chromatin, will be covered. Techniques will include gene knockouts/knockdown, genome engineering, genome-wide analysis of RNA and protein expression and function, as well as genome-wide protein binding and chromatin interaction mapping. Technologies covered will include next-generations and third-generation sequencing and CRISPR-based strategies for gene modification and precision gene regulation. Students will analyze and present recent
will be expected to attend clinic and under the supervision of a board certified genetic counselor or medical geneticist, students are expected to log a minimum case load as defined by the Accreditation Council for Genetic Counseling (ACGC), the American Board of Genetic Counseling and the graduate program in genetic counseling at the University of Minnesota. The actual days and hours of the assigned clinic will be set by the clinical supervisor on site.

GCD 8002. Genetic Counseling Clinical Internship II. (5 cr. [max 10 cr.] ; A-F only; Every Fall)
This is a 15-week clinical internship course in genetic counseling practice. Students in this course will be assigned two appropriate clinics affiliated with the graduate program of study in genetic counseling. Students must be enrolled in the program in order to take this course. Students will be expected to attend clinic and will provide genetic counseling services under the supervision of a board certified genetic counselor or medical geneticist. Students are expected to log a minimum caseload that meets the criteria for clinical training by the Accreditation Council for Genetic Counseling (ACGC), the American Board of Genetic Counseling and the graduate program in genetic counseling at the University of Minnesota. The actual days and hours of the assigned clinics will be set by the clinical supervisor on site.

GCD 8003. Genetic Counseling Clinical Internship III. (5 cr. [max 10 cr.] ; A-F only; Every Spring)
This is a 15-week clinical internship course in genetic counseling practice. Students in this course will be assigned two appropriate clinics affiliated with the graduate program of study in genetic counseling. Students must be enrolled in the program in order to take this course. Students will be expected to attend clinic and will provide genetic counseling services under the supervision of a board certified genetic counselor or medical geneticist. Students are expected to log a minimum caseload that meets the criteria for clinical training by the Accreditation Council for Genetic Counseling (ACGC), the American Board of Genetic Counseling and the graduate program in genetic counseling at the University of Minnesota. The actual days and hours of the assigned clinics will be set by the clinical supervisor on site.

GCC 8008. Mammalian Gene Transfer and Genome Engineering. (2 cr. ; A-F or Audit; Every Spring)
Current gene transfer and genome engineering technology. Applications of genetic modifications in animals, particularly transgenic animals and human gene therapy. prereq: instr consent

GCC 8014. Small RNA Biology. (2 cr. ; A-F or Audit; Every Spring)
Small RNAs as major regulators of gene and protein expression. MicroRNAs and their potential use in diagnosis and prognosis of various disease conditions including cancers. Biology of small RNAs and their role in health and disease. prereq: MICA 8004 or BIOL 8002 or equiv or instr consent

GCD 8073. Genetics & Genomics in Human Health. (3 cr. ; Student Option; Every Spring) Application of molecular, biochemical, chromosomal, and population genetics to human variation and disease. Abnormal chromosome number and structure; abnormal enzyme, structural protein, receptor, and transport; analysis of inheritance patterns; behavioral genetics; genetic basis of common disease. Current research articles in human genomics. prereq: 8131 or BIOL 4003 or instr consent

GCD 8103. Human Histology. (; 5 cr.; Student Option; Every Fall) Light/electron microscopic anatomy of tissues and their organization into human organs. Emphasizes integrating structure, its relationship to function at levels from molecules to organs. Lecture, lab, prereq: Undergraduate biology, chemistry, math, and physics course; instr consent

GCD 8131. Advanced Molecular Genetics and Genomics. (3 cr.; Student Option; Every Fall & Spring) Literature-based course in modern molecular genetic and genomic analysis. Students will gain a deep understanding of the fundamental molecular mechanisms controlling inheritance in biological systems. Students will gain a facility in thinking critically and creatively about how genes work at cellular, organismal, and transgenerational levels. Course instruction emphasizes active-learning approaches, student presentations, and group projects. prereq: [3022 or BIOL 4003], [BIOL 3021 or BIOL 4331] or instr consent

GCD 8151. Cellular Biochemistry and Cell Biology. (; 2-4 cr.; A-F only; Every Fall) This course introduces graduate students to fundamental concepts of Biochemical Unity (Part 1) and Cell Theory (Part 2). For Part 1, we will discuss matter of life, equilibrium, entropy & law of mass action, two state systems, random walks & diffusion, rate equations of chemical reactions, and explore how they relate to regulation of biological networks (gene regulation and signal transduction). For Part 2 we will focus on properties of biological membranes, membrane trafficking, protein import & degradation, nuclear structures and their function, as well as molecular motors, cytoskeletal dynamics, and mitosis. The course assumes students have had previous undergraduate courses in cell biology, biochemistry and genetics. prereq: [4034 or 8121 or BioC 8002], BIOL 4004) or MBMB or MCDBG or grad student or instr consent

GCD 8161. Advanced Cell Biology and Development. (3 cr.; A-F only; Every Spring) The advanced cell and developmental biology of embryos, taught through in-depth, comparative analysis of historical and current primary research articles that illustrate developmental mechanisms and experimental approaches in invertebrate and vertebrate model organisms. prereq: MBMB or MCDBG or grad student) or [GCC 4161, [GCC 8131 or Biol 4003], Biol 4004, and GCD 4034] or instr consent

GCD 8171. Literature Analysis. (; 1-2 cr.; A-F only; Every Fall) Critical reading and evaluation of current literature. May include evaluation of both excellent and flawed papers. Intensive and in-depth discussions of selected papers in molecular biology, genetics, cell biology, and developmental biology. prereq: Grad MCDBG or MBMB major

GCD 8900. Seminar. (; 1-2 cr. [max 8 cr.] ; S-N or Audit; Every Fall & Spring) Current scientific research. prereq: Grad MCDG major or instr consent

GCD 8911. Introduction to Genetic Counseling Skills and Practice. (3 cr.; A-F only; Every Fall) Course focuses on basic concepts used in clinical genetic counseling practice. Students learn the necessary skills to prepare for and implement a genetic counseling session. The class will cover a variety of areas in the genetic counseling sub-specialty of perinatal genetics as well as newborn screening. Students will practice communicating genetics and medical information in a patient-friendly manner. At the end of the semester, students will be equipped with tools to assess medical and family histories, present genetic cases, and role play genetic counseling sessions. prereq: This class is intended for Molecular, Cellular, Biology and Genetics M.S. students with genetic counseling specialization.

GCD 8912. Genetic Counseling in Practice. (; 4 cr.; A-F or Audit; Every Spring) Practical genetic counseling, communicating genetics and medical information to the family, helping families with decision making. prereq: MCDG MS student with genetic counseling specialization or instr consent

GCD 8913. Psychosocial Issues in Genetic Counseling I. (; 3 cr.; A-F only; Every Fall) This course is designed to introduce students to the psychosocial issues that commonly arise in genetic counseling, as well as develop their individual counseling skills to assist them in effectively counseling patients. prereq: MCDG MS student with genetic counseling specialization or instr consent

GCD 8914. Ethical and Legal Issues in Genetic Counseling. (; 3 cr.; A-F or Audit; Every Spring) Professional ethics; ethical and legal concerns with new genetic technologies. prereq: MCDG MS student with genetic counseling specialization or instr consent

GCD 8915. Psychosocial Issues in Genetic Counseling II. (3 cr. [max 5 cr.]; A-F only; Every Spring) This course is designed to introduce Genetic Counseling Masters students to the psychosocial issues that commonly arise in genetic counseling, as well as develop their individual counseling skills to assist them in effectively counseling patients.
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

GCD 8920. Special Topics. (1-4 cr.; Student Option; Every Fall & Spring) Special topic shell

GCD 8993. Directed Studies. (1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) tbd prereq: MCDG MS student with genetic counseling specialization or instr consent

GCD 8994. Research. (1-5 cr. [max 20 cr.]; S-N or Audit; Every Fall, Spring & Summer) Independent research determined by student's interests, in consultation with faculty mentor. prereq: MCDG MS student with genetic counseling specialization or instr consent

Geographic Information Science (GIS)

GIS 5530. GIS Internship. (1-3 cr. [max 6 cr.]; S-N only; Every Fall & Spring) Practical hands-on experience using GIS to solve problems in a real-world work environment. prereq: instr consent, strong GIS/mapping skills

GIS 5555. Basic Spatial Analysis. (3 cr.; Student Option; Every Fall) How to use spatial data to answer questions on a wide array of social, natural, and information science issues. Exploratory data analysis/visualization. Spatial autocorrelation analysis/ regression. prereq: [STAT 3001 or equiv, MGIS student] or instr consent

GIS 5571. ArcGIS I. (3 cr.; Student Option; Every Fall) First of a two-course series focusing on ArcGIS Desktop. Overview of ArcGIS system and its use for spatial data processing. Data capture, editing, geographic transformations, map projections, topology, Python scripting, and map production. prereq: [GEOG 5561 or equiv, status in MGIS program, familiarity with computer operating systems] or instr consent

GIS 5572. ArcGIS II. (3 cr.; Student Option; Every Spring) Continues GIS 5571. Raster analysis, dynamic segmentation, geometric networks, geocoding, Python scripting, and data interoperability. Substantial projects include map and poster design and production. prereq: [GIS 5571, GEOG 5561 or equiv, in MGIS program] or instr consent

GIS 5573. Introduction to Digital Mapping: ArcGIS Basics. (2 cr.; A-F only; Every Fall) Desktop mapping functions using ArcGIS software. Application of systems to display, analysis of geographical data. prereq: [GEOG 5561 or equiv, in MGIS program] or instr consent

GIS 5574. Web GIS and Services. (3 cr.; Student Option; Every Fall) Plan, design, develop, publish web-based GIS solution. Build websites, prepare data for web, Commercial software, Open Source software, volunteer geographic information, open GIS standards/developing web GIS application. Hands-on experience with variety of web GIS technologies/software. prereq: [GEOG 5561 or equiv, in MGIS program] or instr consent

GIS 5575. Practical Surveying for GIS. (2 cr.; Student Option; Every Spring) Surveying techniques/relationship of GPS to GIS professionals. Geodesy, data adjustment, datums, ellipsoids, coordinate systems, transformations; prereq: GEOG 5561 or equiv in MGIS program or instr consent

GIS 5576. Spatial Digital Humanities. (3 cr.; Student Option; Every Spring) Introduction to Spatial Digital Humanities GIS 5576 is a basic overview of desktop GIS (both Esri and open source), as well as an introduction to a number of other mapping techniques (such as Esri Maps for Office, ArcGIS Online, web mapping basics, georeferencing historical maps, etc) in addition to digital scholarship techniques. Course objectives include: understanding the basics of mapping and geospatial information using GIS; documenting and managing spatial data using coherent/standardized methods; understanding several spatial analysis methods that are relevant to student research area; and applying spatial analysis methods to student research.

GIS 5577. Spatial Database Design and Administration. (3 cr.; Student Option; Every Spring) Spatial database design, development planning/management, maintenance, security, access/distribution, and documentation. prereq: instr consent

GIS 5578. GIS Programming. (3 cr.; Student Option; Every Spring) Programming techniques using Python and other languages specifically relating to GIS technologies. prereq: instr consent

GIS 5590. Special Topics in GIS. (3 cr. [max 6 cr.]; A-F or Audit; Every Fall, Spring & Summer) Topics vary according to curricular needs, technological developments in field.

GIS 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall & Spring) (No description) prereq: Master's student, adviser and DGS consent

GIS 8501. GIS Project Management and Professional Development. (3 cr.; A-F only; Every Fall) Project management/professional development. Portfolio creation, career exploration, degree program planning, GIS project management through lectures, class exercises, guest speakers. prereq: MGIS student or instr consent

GIS 8990. Research Problems in GIS. (1-6 cr.; A-F only; Every Fall, Spring & Summer) Project of sufficient scope/complexity to document student's ability to apply spatial analysis and visualization techniques to real-world problems. Supervised by faculty member. prereq: MGIS student, instr consent

Introduction to geographical understandings of globalization and of connections/differences between places.


GEOG 1403. Biogeography of the Global Garden. (BIOL,ENV; 4 cr.; Student Option; Every Fall & Spring) The geography of biodiversity and productivity, from conspicuous species to those that cause human disease and economic hardship. The roles played by evolution and extinction, fluxes of energy, water, biochemicals, and dispersal. Experiments demonstrating interactions of managed and unmanaged biotic with the hydrologic cycle, energy budgets, nutrient cycles, the carbon budget, and soil processes.

GEOG 1403H. Honors: Biogeography of the Global Garden. (BIOL,ENV; 4 cr.; A-F only; Every Fall & Spring) The geography of biodiversity and productivity, from conspicuous species to those that cause human disease and economic hardship. The roles played by evolution and extinction, fluxes of energy, water, biochemicals, and dispersal. Experiments demonstrating interactions of managed and unmanaged biotic with the hydrologic cycle, energy budgets, nutrient cycles, the carbon budget, and soil processes. prereq: Honors

GEOG 1425. Introduction to Weather and Climate. (ENV,PHYS; 4 cr.; Student Option; Every Fall & Spring) A pre-calculus introduction to the nature of the atmosphere and its behavior. Topics covered include atmospheric composition, structure, stability, and motion; precipitation processes, air masses, fronts, cyclones, and anticyclones; general weather patterns; meteorological instruments and observation; weather map analysis; and weather forecasting.

GEOG 1502. Mapping Our World. (SOCS,TS; 3 cr.; Student Option; Every Fall & Spring) Learn how maps and other spatial technologies like phones, drones, and GPS work. Use web-based tools to make maps for class, jobs, and fun. Explore how mapping is a useful lens through which to view interactions between technology and society, and see how mapping technology saves lives, rids elections, and spies on people.

GEOG 1911. Digital Earth. (3 cr.; Student Option No Audit; Periodic Fall & Spring) In today's digital and data-intensive era, geospatial technologies have become an integral part of everyday life. Searching for business locations and driving directions using web and mobile maps, or using location-based services offered with smart phones (e.g. Uber) has become routine. Geospatial technologies enable us to capture, store, process, and display a vast amount of
geographic information about the Earth and the environment. The term Digital Earth is a visionary concept that was coined by former United States Vice President Al Gore, for creating a digital, multi-resolution, three-dimensional representation of the Earth, storing and managing access to geospatial data and everything that is known about the planet. This course primarily aims to familiarize students with the basic concepts of geospatial technologies and datasets used to create a Digital Earth. Students will develop skills needed to locate, gather, manipulate, process, visualize, and use geospatial data.

GEOG 1973. Geography of the Twin Cities. (SOCS; 3 cr.; Student Option; Every Fall & Spring) Social and physical characteristics of the Twin Cities. Their place in the urban network of the United States.

GEOG 3311. Geography of Minnesota. (; 3 cr.; Student Option; Every Spring & Summer) The evolution of Minnesota and its current geographical characteristics. The state is a unique political entity that possesses similarities with other states because of the homogenizing influence of the federal government.


GEOG 3161. Europe: A Geographic Perspective. (GP; 3 cr.; Student Option; Fall Even Year) Comparative analysis and explanation of Europe's physical, demographic, ethnic/cultural, economic, political, and urban landscapes. European integration—the European Union. Transformation of Eastern Europe.

GEOG 3211. East Asia. (; 3 cr.; Student Option; Periodic Fall, Spring & Summer) Physical and human geography of Japan, mainland China and Taiwan, North and South Korea; population pressure, economic and urban development, and international relations.


GEOG 3331. Geography of the World Economy. (GP,SOCS; 3 cr.; Student Option; Every Fall) Geographical distribution of resources affecting development; location of agriculture, industry, services; geography of communications; agglomeration of economic activities, urbanization, regional growth; international trade; changing global development inequalities; impact of globalization production and finance on the welfare of nations, regions, and cities.

GEOG 3361W. Geography and Public Policy. (WI; 3 cr.; Student Option; Every Fall) Nature/effects of federal policy in the United States. How documents produced as policy are crafted/implemented. Policies relating to food/agriculture, forestry, wildlife, and transportation.

GEOG 3374W. The City in Film. (AH,WI; 4 cr.; Student Option; Every Spring) Cinematic portrayal of changes in 20th-century cities worldwide including social and cultural conflict, political and economic processes, changing gender relationships, rural versus urban areas, and population and development issues (especially as they affect women/children). Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor. prereq: honors

GEOG 3376. Political Ecology of North America. (ENV; 3 cr.; Student Option; Every Fall) Social production of nature in North America related to questions of social/environmental justice. Economic, political, cultural, ecological relations that shape specific urban/rural environments, social movements that have arisen in response to environmental change. Importance of culture/identity in struggles over resources/environments.

GEOG 3377. Music in the City. (AH,DSJ; 3 cr.; A-F or Audit; Every Spring) Geographical conceptions of place, space, embodiment, identity. Case studies of music.


GEOG 3381W. Population in an Interacting World. (GP,SOCS; 3 cr.; Student Option; Every Fall, Spring & Summer) Comparative analysis and explanation of trends in fertility, mortality, internal and international migration in different parts of the world; world population problems; population policies; theories of population growth; impact of population growth on food supply and the environment.

GEOG 3388. Going Places: Geographies of Travel and Tourism. (CIV; 3 cr.; A-F only; Every Spring) Global flows of tourism from perspective of debates about consumption, development, identity, and the environment. Close reading, field trips, discussion of films, research paper.

GEOG 3401. Geography of Environmental Sustainability and Global Change. (ENV; 4 cr.; A-F or Audit; Every Spring) Geographic patterns, dynamics, and interactions of atmospheric, hydroscopic, geomorphic, pedologic, and biologic systems as context for human population, development, and resource use patterns.

GEOG 3411W. Geography of Health and Health Care. (WI; 3 cr. [max 4 cr.]; Student Option; Every Fall) Application of human ecology, spatial analysis, political economy, and other geographical approaches to analyze problems of health and
health care. Topics include distribution and diffusion of disease; impact of environmental, demographic, and social change on health; distribution, accessibility, and utilization of health practitioners and facilities.

**GEOG 3423. Urban Climatology.** (3 cr.; A-F only; Every Spring)

Urban climatology focuses on how cities modify the local environment. Initial focus is on urban energy balance as the basis of most urban-climate research. The course also explores how atmospheric composition, urban hydrology, and urban ecosystems affect the urban climate, and how urban climates are linked to regional and global climate change.

**GEOG 3431. Plant and Animal Geography.** (; 3 cr.; Student Option; Periodic Fall & Spring) Introduction to biogeography. Focuses on patterns of plant/animal distributions at different scales over time/space. Evolutionary, ecological, and applied biogeography. Paleoecology, vegetation-environment relationships, vegetation dynamics/disturbance ecology, human impact on plants/animals, nature conservation. Discussions, group/individual projects, local field trips.

**GEOG 3511. Principles of Cartography.** (; 4 cr.; Student Option; Every Spring) History and development of US academic cartography, coordinate systems and map projections, data classification and map generalization, methods of thematic symbolization, and cartographic design. A series of computer-based lab exercises will apply conceptual lecture material to the creation of thematic maps. prereq: 3 cr in geog or instr consent

**GEOG 3521. Digital Planet: Understanding Your World in the Information Age.** (TS; 3 cr.; Student Option; Every Fall) Mobile geospatial information technologies--from cell phone tracking/vehicle navigation to virtual globe mapping. Potential, limits, and concerns about their use and ongoing developments. Use GPS and video to produce a GeoDiary. Surveillance, cyberspace, and more common geospatial applications, especially those relying on mobile devices.


**GEOG 3531. Numerical Spatial Analysis.** (; 4 cr.; Student Option; Every Fall & Summer) Introduction to theoretical and applied aspects of geographical quantitative methods with a focus on spatial analysis. Emphasis placed on the analysis of geographical data for spatial problem solving in both the human and physical areas of the discipline.

**GEOG 3541. Principles of Geocomputing.** (3 cr.; Student Option; Every Spring) The availability of computing infrastructures such as high-performance and cloud computing, high-speed networks, and rich data has led to a new scientific paradigm using computational approaches termed computational science. Geocomputation is the "application of a computational science paradigm to study a wide range of problems in geographical and earth systems (the geo) contexts" (Openshaw, 2014). This course will introduce students to geocomputation as well as related areas including big spatial data, and cyberinfrastructure. Students will engage in hands-on exercises learning principles and best-practices in geocomputing. The ability to program is an essential skill for GIScientists. Learning to program takes time and a lot of practice, and in this course students will learn how to develop programs in the Python programming language to solve geospatial problems.

**GEOG 3561. Principles of Geographic Information Science.** (; 4 cr.; Student Option; Every Fall & Spring) Introduction to study of geographic information systems (GIS) for geography and non-geography students. Topics include GIS application domains, data models and sources, analysis methods and output techniques. Lectures, readings and hands-on experience with GIS software. prereq: Jr or sr

**GEOG 3573. Introduction to Digital Mapping: ArcGIS Basics.** (2 cr.; A-F only; Every Fall) Desktop mapping functions using ArcGIS software. Application of systems to display/analysis of geographical data.

**GEOG 3605. Geographic Perspectives on Planning.** (3 cr. [max 4 cr.]; Student Option; Every Fall) The purpose of this course is to introduce the students to the discipline of urban planning, and to the various challenges planning has aimed to respond during its history. How and why did cities come into being before the invention of modern urban planning? What were the challenges that modern urban planning arose to encounter in the late 20th century? How have the planning challenges changed since then, and how have planning tools and planning systems evolved since the early 21st century in different countries? During the course, we will also discuss the role of planning in contemporary society, asking who needs planning and why. How does planning respond to political struggles and conflicts of interests in cities today? Furthermore, we will reflect on the academic status of urban planning and ask: to what extent can planning be based on knowledge and theory? To answer these questions, we will study history of planning, get acquainted with the basics of planning theory, and look at various international examples of planning systems and planning practice drawn from a variety of international settings, the main focus being on US, UK, and mainland Europe.

**GEOG 3839. Introduction to Dendrochronology.** (3 cr.; Student Option; Every Fall) Historical development, operational techniques, biological background, and principles of tree ring analysis. Applications of tree-ring data to investigate environmental change and past cultures. prereq: [1403, [BIOL 1001 or BIOL 1009 or equiv]] or instr consent

**GEOG 3900. Topics in Geography.** (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Special topics/regions covered by visiting professors in their research fields.

**GEOG 3973. Geography of the Twin Cities.** (SOCS; 3 cr.; Student Option; Every Fall & Spring) Social/physical characteristics of Twin Cities. Their place in U.S. urban network.

**GEOG 3985V. Honors Senior Project Seminar.** (WI; 4 cr.; Student Option; Every Fall & Spring) Completion of research/writing of senior project. prereq: Honors, instr consent

**GEOG 3985W. Senior Project Seminar.** (WI; 4 cr.; Student Option; Every Fall, Spring & Summer) Complete the research/writing of senior project. prereq: [jr or sr], instr consent

**GEOG 3992. Directed Reading.** (1-8 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Guided individual reading. Prereq-instr consent, dept consent, college consent.

**GEOG 3993. Directed Studies.** (1-8 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual study. Prereq-instr consent, dept consent, college consent.

**GEOG 3993H. Honors: Directed Studies.** (; 1-8 cr. [max 12 cr.]; Student Option; Every Spring) Guided individual study. Prereq honors, instr consent, dept consent, college consent.

**GEOG 3994. Directed Research.** (1-8 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Individual guided research. Prereq instr consent, dept consent, college consent.

**GEOG 3994H. Honors: Directed Research.** (; 1-8 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Individual guided research. Prereq honors, instr consent, dept consent, college consent.

**GEOG 3996. Senior Project Directed Research.** (3-4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) Individual guided research course taken in fulfillment of the senior project requirement. Prereq instr consent, dept consent, college consent.

**GEOG 3996H. Honors: Senior Project Directed Research.** (3-4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) Individual guided research course taken in fulfillment of the senior project requirement. Prereq instr consent, dept consent, college consent.

**GEOG 3997. Senior Project.** (2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer) Senior Project add-on credit. Must be taken concurrently with required or elective course
related to area of specialization. Prereq instr consent, dept consent, college consent.

**GEOG 3997H. Honors: Senior Project.** (\(2 \text{ cr.} \ [\max 4 \text{ cr.}] \); A-F only; Every Fall, Spring & Summer) Senior Project add-on credit. Must be taken concurrently with required or elective course related to area of specialization. Prereq instr consent, dept consent, college consent.

**GEOG 4001. Modes of Geographic Inquiry.** (; \(4 \text{ cr.} \); Student Option; Every Fall, Spring & Summer) Examination of competing approaches to the study of geography. Environmental determinism; regional tradition; scientific revolution; behavioral geography; modeling and quantitative geography; radical geography; interpretive and qualitative approaches; feminist and postmodern geography; ecological thinking and complexity; geographic ethics.

**GEOG 4002W. Environmental Thought and Practice.** (WI; 3 cr. ; Student Option; Periodic Spring) Changing conceptions of nature, culture, and environment in Western social/political thought. How our understanding of humans/nonhumans has been transformed by scientific and technological practices. Interdisciplinary, reading intensive. prereq: Jr or sr

**GEOG 5361. Geography and Real Estate.** (; 4 cr. ; Student Option; Every Spring) Origins and evolution of land ownership in the United States.

**GEOG 5374. The City in Film.** (WI; 4 cr. ; Student Option; Every Spring) Cinematic portrayal of changes in 20th-century cities worldwide. Social/cultural conflict, political/economic processes, changing gender relationships, rural versus urban areas, population/development issues (especially as they affect women/children). Meets concurrently with 3374. Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor. prereq: grad student or instr consent

**GEOG 5385. Globalization and Development: Political Economy.** (; 4 cr. ; Student Option; Periodic Fall & Spring) Nature/scope of modern world system (capitalism), its impact on regional development processes. Roles of state and of international financial institutions. prereq: Sr or grad or instr consent

**GEOG 5393. Rural Landscapes and Environments.** (; 4 cr. ; Student Option; Every Spring) Analysis of three principal components of rural landscape (form of land surface, plant life that cloaks it, structures that people have placed upon it). Structures associated with agriculture, including mining, forestry, resort areas, and small towns.

**GEOG 5401. Geography of Environmental Systems and Global Change.** (; 4 cr. ; Student Option; Periodic Fall) Processes that create/change the spatial patterns of climate, vegetation, and soils. Potential of humans to alter climate, vegetation, and soil processes. Possible impacts of human-altered environmental conditions. prereq: grad student or instr consent

**GEOG 5426. Climatic Variations.** (\(3 \text{ cr.} \); Student Option; Periodic Fall) Theories of climatic fluctuations and change at decadal to centuries time scales; analysis of temporal and spatial fluctuations especially during the period of instrumental record. prereq: 1425 or 3401 or instr consent

**GEOG 5431. Plant and Animal Geography.** (\(3 \text{ cr.} \); Student Option; Periodic Fall) Introduction to biogeography. Focuses on patterns of plant/animal distributions at different scales over time/space. Evolutionary, ecological, and applied biogeography. Paleobiogeography, vegetation-environment relationships, vegetation dynamics/disturbance ecology, human impact on plants/animals, nature conservation. Discussions, group/individual projects, local field trips.


**GEOG 5520. Cartography Internship.** (\(2-7 \text{ cr.} \); [max 10 cr.] ; S-N or Audit; Every Fall & Spring) Provides intensive hands-on experience in contemporary map production and design, ranging from GIS applications to digital prepress. Strong computer skills essential. prereq: instr consent

**GEOG 5531. Numerical Spatial Analysis.** (\(4 \text{ cr.} \); Student Option; Every Fall) Applied/theoretical aspects of geographical quantitative methods for spatial analysis. Emphasizes analysis of geographical data for spatial problem solving in human/physical areas.

**GEOG 5541. Principles of Geocomputing.** (\(3 \text{ cr.} \); A-F or Audit; Every Spring) The availability of computing infrastructures such as high-performance and cloud computing, high-speed networks, and rich data has led to a new scientific paradigm using computational science. Geocomputation is the "application of a computational science paradigm to study a wide range of problems in geographical and earth systems (the geo) contexts" (Openshaw, 2014). This course will delve into advanced topics in geocomputation as well as related areas ranging from geographic information and spatial big data to cyberinfrastructure and parallel computation. Students will engage in hands-on exercises learning principles and best practices in geocomputing while using cutting-edge computational infrastructures.

**GEOG 5561. Principles of Geographic Information Science.** (\(4 \text{ cr.} \); Student Option; Every Fall & Spring) Introduction to the study of geographic information systems (GIS) for geography and non-geography students. Topics include GIS application domains, data models and sources, analysis methods and output techniques. Lectures, reading, and hands-on experience with GIS software. prereq: grad

**GEOG 5562. GIS Development Practicum.** (\(3 \text{ cr.} \); Student Option; Periodic Fall) Algorithms/data structures for digital cartographic data, topological relationships, surface modeling, and interpolation. Map projections, geometric transformations, numerical generalization, raster/vector processing. Hands-on experience with software packages. prereq: GIS 5571 or instr consent

**GEOG 5563. Advanced Geographic Information Science.** (\(3 \text{ cr.} \); Student Option; Every Fall & Spring) Advanced study of geographic information systems (GIS). Topics include spatial data models, topology, data encoding, data quality, database management, spatial analysis tools and visualization techniques. Hands-on experience using an advanced vector GIS package. prereq: B or better in 5561 or 5561 or instr consent

**GEOG 5564. Urban Geographic Information Science and Analysis.** (\(3 \text{ cr.} \); Student Option; Periodic Fall) Core concepts in urban geographic information science including sources for urban geographical and attribute data (including census data), urban data structures (focusing on the TIGER data structure), urban spatial analyses (including location-allocation models), geodemographic analysis, network analysis, and the display of urban data. prereq: 3561 or 5561

**GEOG 5588. Advanced Geovisualization.** (\(3 \text{ cr.} \); Student Option; Every Fall) The generation and use of geographic information has become an integral part of our daily life, science, and technology. This has led to increasing interest in the design and development of interactive maps and dynamic
geographic visualizations in 2D, 3D, and Web environments. The Advanced GeoVisualization course intends to equip students with the knowledge and advanced technical skills needed to design and implement effective maps and create dynamic and interactive visualizations using geospatial data sets.

**GEOG 5839. Introduction to Dendrochronology.** (3 cr.; Student Option; Every Fall) Historical development, operational techniques, biological background, and principles of tree ring analysis. Applications of tree-ring data to investigate environmental change and past cultures. prereq: [1403, [BIOL 1001 or BIOL 1009 or equiv)] or instr consent

**GEOG 5900. Topics in Geography.** (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Special topics and regions. Course offered by visiting professors in their research fields.

**GEOG 8001. Problems in Geographic Thought.** (3 cr.; A-F or Audit; Periodic Fall) Currents of geographic thought in biophysical, GIS, human, cultural, and human-environment subfields. Focuses on concepts/paradigms through which geographers have attempted to unify/codify the discipline, around which which debate has flourished, and about which interdisciplinary histories can be traced.

**GEOG 8002. Research Methods in Geography.** (3 cr.; Student Option; Every Spring) Seminar. Overview of research designs/methods in geography. Relationships between different research paradigms (modes of inquiry), research designs, and methods. Critical readings. Analyses of research projects.

**GEOG 8005. Proseminar: Population Geography.** (3 cr.; Student Option; Periodic Fall & Spring) Conceptual literature and empirical studies on fertility, mortality, and migrations in different parts of the world. prereq: instr consent

**GEOG 8006. Proseminar: Research Methods in Geography.** (3 cr.; Student Option; Periodic Fall & Spring) Introduction to research design, strategies, methods of data collection, analysis, interpretation, and representation in contemporary geographic research. prereq: instr consent

**GEOG 8007. Proseminar: Theories of Development and Change.** (3 cr.; Student Option; Periodic Fall & Spring) Recent research themes and questions in geography and related social sciences on Third World development; development theories, conceptually grounded case studies, and grassroots-based research. prereq: instr consent

**GEOG 8020. Research Seminar: Economic Geography.** (3 cr.; Student Option; Periodic Fall & Spring) Contemporary research. Advanced topics, which vary with interests of faculty offering course. prereq: instr consent

**GEOG 8012. Agriculture.** (3 cr.; Student Option; Periodic Fall & Spring) Trees and forest management. prereq: instr consent

**GEOG 8013. East Asia and China.** (3 cr.; Student Option; Periodic Fall & Spring) Contemporary research, advanced topics. Topics vary with interests of faculty offering course. prereq: instr consent

**GEOG 8014. South Asia.** (3 cr.; Student Option) Advanced topics. Topics vary with interests of faculty offering course.

**GEOG 8020. Agrarian Change and Rural Development.** (3 cr.; A-F or Audit; Periodic Fall & Spring) Advanced topics. Topics vary with interests of faculty offering course. Contemporary theoretical/philosophical themes transcending subdisciplines of human/physical geography. prereq: instr consent

**GEOG 8021. Federal Policy Research.** (3 cr.; Student Option; Periodic Fall & Spring) U.S. environmental policies at federal/state level. Policy formulation, implementation, and evaluation. This seminar provides students with the necessary information to carry out independent research into public policy and will add unfamiliar sources to their research bibliographies. Descriptive and analytical rather than theoretical, and illustrative rather than comprehensive, it gives both social scientists and biophysical scientists additional perspective to their personal research and adds an important dimension to their analysis. It will allow them to find, describe, critically review, and communicate those aspects of federal policy of concern. Students are encouraged to choose areas of policy coinciding with their areas of research. prereq: instr consent

**GEOG 8212. Africa.** (3 cr.; Student Option; Periodic Fall & Spring) Advanced topics. Topics vary with interests of faculty offering course. prereq: instr consent

**GEOG 8214. South Asia.** (3 cr.; Student Option) Advanced topics. Topics vary with interests of faculty offering course.

**GEOG 8220. Agrarian Change and Rural Development.** (3 cr.; A-F or Audit; Periodic Fall & Spring) Topics vary with interests of faculty offering course. Contemporary theoretical/philosophical themes transcending subdisciplines of human/physical geography. prereq: instr consent

**GEOG 8230. Theoretical Geology.** (3 cr.; Student Option; Periodic Fall & Spring) Topics vary with interests of faculty offering course. Contemporary theoretical/philosophical themes transcending subdisciplines of human/physical geography. prereq: instr consent

**GEOG 8240. Medical Geography.** (3 cr.; Student Option; Periodic Spring) Geographic inquiry concerning selected problems of health and health care. prereq: instr consent

**GEOG 8241. Biogeography.** (3 cr.; Student Option; Periodic Spring) Forest dynamics, dendochronology, tree rings and climate, environmental disturbance, paleobiogeography, field/lab methods in biogeography. prereq: instr consent
GEOG 8290. Seminar in GIS and Cartography. (3 cr.; Student Option; Periodic Fall & Spring)
Selected concepts/methods. Topics, which vary yearly, include spatial analysis methods in GIS; advanced visualization methods; data quality and error propagation in GIS; generalization methods in GIS and cartography; role of time in GIS; interactive/animated cartography; incorporation of uncertainty. prereq: instr consent

GEOG 8291. Seminar in GIS, Technology, and Society. (3 cr.; Student Option; Periodic Fall & Spring)

GEOG 8292. Seminar in GIS: Spatial Analysis and Modeling. (3 cr.; Student Option; Spring Even Year)
Overview of Geographic Information Systems (GIS) and spatial analysis/modeling of human/environmental systems. Spatial statistics, modeling spatiotemporal processes, simulation techniques, visualization, complex systems/complexity. Guidance in thesis/dissertation research, prereq: 3511 [or equiv statistics course], [3561 or 5561 or equiv intro GIS course] or instr consent

GEOG 8293. CyberGIS. (3 cr.; Student Option; Every Spring)
Just as physical infrastructure provides services such as electricity, plumbing, and road networks to communities across the world, cyberinfrastructure has emerged to provide computational services and capabilities to scientific communities. Cyberinfrastructure integrates high-performance computing, digital sensors, virtual organizations, and software tools and services to facilitate computationally-intensive and collaborative scientific research. CyberGIS, broadly defined as cyberinfrastructure-based geographic information systems, integrates cyberinfrastructure, geographic information systems (GIS), and spatial analysis to enable collaborative geographic problem solving. This course will delve into advanced topics within the context of cyberGIS and related technologies. Particular emphasis will be placed on raster data processing including a broad introduction to raster data, cartographic modeling, and raster data manipulation. We will situate raster data processing in the broader context of geographic information science and cyberGIS focusing on the how synthesizing computational thinking and spatial thinking influence methodological approaches. Students will be expected to draw on their own experiences and backgrounds to enhance discussions, labs, and research projects. Students will gain hands-on experience developing methods to analyze and manipulate raster data.

GEOG 8294. Spatiotemporal Modeling and Simulation. (3 cr.; Student Option; Periodic Spring)
Many geographic, societal, and environmental phenomena as well as biological and ecological systems involve dynamic processes that are changing in space and time. Examples include hurricanes, animal migrations, spread of diseases, human mobility and population dynamics. Movement is a key to understanding the underlying mechanisms of these dynamic processes. Today, the availability of an unprecedented amount of movement observations at ne spatial and temporal granularities has resulted in substantial advances in GISciences approaches for the analysis, modeling, and simulation of movement and its patterns. Spatiotemporal models and simulation techniques are often used to analyze and better understand the patterns of spatiotemporal processes, and to assess their behavioral responses in varying environmental conditions. This seminar introduces students to the concepts of spatiotemporal processes and patterns. We review existing methods for modeling and simulation of spatiotemporal phenomena, especially movement. Students will develop computational skills to model a phenomena of their choice and create simulations.

GEOG 8301. Advanced Qualitative Methods. (3 cr.; A-F or Audit; Periodic Fall & Spring)

GEOG 8302. Research Development. (3 cr.; S-N or Audit; Periodic Fall)
Students in geography and related social sciences are guided in key steps to effective research proposal writing. prereq: instr consent

GEOG 8333. FTE: Masters. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

GEOG 8336. Development Theory and the State. (3 cr.; A-F or Audit; Every Spring)
Why certain interventionist states in third world countries have been able to guide their economies to overcome legacy of underdevelopment while most have failed to induce development. Internal/external conditions that facilitated such departure from underdevelopment. Comparative national/provincial case studies: Taiwan, South Korea, Botswana, Brazil, India. Applying theoretical approaches to policy issues.

GEOG 8350. Seminar: World Population. (3 cr.; Student Option; Periodic Fall & Spring)
Contemporary research in world population development and problems. Topics vary with interests of faculty offering course. prereq: instr consent

GEOG 8405. Seminar: Graduate Student Professional Development. (1 cr. [max 2 cr.]; S-N or Audit; Periodic Fall & Spring)
Strategies for success in graduate program. Preparation for a career as a geographer. Completing/defending the dissertation.

GEOG 8420. Teaching Practicum. (1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Teaching methodologies, learning objectives, course content, classroom techniques, student/course evaluation. Specific application to instruction in Geography. prereq: [Geog or MGIS] grad student or instr consent

GEOG 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

GEOG 8777. Thesis Credits: Master's. (1-18 cr.; [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

GEOG 8800. Seminar: Development of Geographic Thought. (3 cr.; Student Option; Periodic Fall & Spring)
Topics vary with interests of faculty offering course. prereq: instr consent

GEOG 8888. Thesis Credit: Doctoral. (1-24 cr.; [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

GEOG 8970. Directed Readings. (1-5 cr.; [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
tbd prereq: dept consent

GEOG 8980. Topics in Geography. (1-3 cr.; [max 30 cr.]; Student Option; Every Fall & Spring)
Seminar offered by visiting or regular faculty. Topics vary with interests of faculty. prereq: instr consent

GEOG 8990. Research Problems in Geography. (1-5 cr.; [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Individual research projects. prereq: dept consent

Geriatrics (GERI)

GERI 7100. Oral Health Services for Older Adults Seminar. (2 cr.; Student Option; Every Fall & Spring)
A seminar for graduate students on a broad variety of topics related to aging, oral health of older adults, and delivery of oral health services to older adults. Students present articles, complex clinical cases, and ongoing research projects for group discussion.
GERI 7200. Advanced Clinical Geriatric Dentistry. (1-10 cr.; A-F or Audit; Every Fall, Spring & Summer)

Practical clinical experience in examination, diagnosis, treatment planning, and treatment of older adult patients in the dental clinic at the Amherst H. Wilder Senior Health Center.

GERI 7210. Geriatric Hospital Dentistry. (1-6 cr.; Student Option; Every Fall, Spring & Summer)

Rotations at University of Minnesota Hospital Dental Clinic and/or Minneapolis V.A. Medical Center Dental Clinic. Management of elderly patients in acute care settings. Dental management of patients compromised by medical therapies such as radiation treatment or chemotherapy, as well as those with acute illnesses.

**German (GER)**

**GER 222. Reading German.** (0 cr.; A-F or Audit; Every Fall & Summer)

Teaches only a reading knowledge of German. Enables graduate students to satisfy departmental requirements for an advanced degree. Intensive reading of German scholarly texts. Emphasizes reading, grammar, some listening, discipline-specific vocabulary.

**GER 1001. Beginning German.** (5 cr.; Student Option; Every Fall, Spring & Summer)

Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

**GER 1002. Beginning German.** (5 cr.; Student Option; Every Fall, Spring & Summer)

Listening, reading, speaking, writing. Emphasizes proficiency. Topics include free-time activities, careers, and culture of German-speaking areas. cr. 1001

**GER 1003. Intermediate German.** (5 cr.; Student Option; Every Fall, Spring & Summer)

Contextualized grammar/vocabulary. Authentic readings. Essay assignments. cr. 1002 or Entrance Proficiency Test

**GER 1004. Intermediate German.** (5 cr.; Student Option; Every Fall, Spring & Summer)

Listening, reading, speaking, writing. Emphasizes proficiency. Topics include free-time activities, careers, and culture of German-speaking areas. cr. 1001

**GER 1005. Advanced Intermediate German.** (5 cr.; Student Option; Every Fall, Spring & Summer)

Contextualized grammar/vocabulary. Authentic readings. Essay assignments. cr. 1003 or completion of Entrance Proficiency Test at 1004 level

**GER 1006. Beginning German Review.** (5 cr.; Student Option; Every Fall & Spring)

Intended for students with previous experience in German, primarily those who have studied German in high school or at community colleges, or who are transfer students. Intensive review of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis to prepare for German 1003.

**GER 1601. Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood.** (AH; 3 cr.; Student Option; Fall Odd Year)

German/American films by famous directors who left Europe in Nazi period. Analysis of films by Fritz Lang, Max Ophuls, Robert Siodmak, Otto Preminger, Billy Wilder, Douglas Sirk, and others. Films as art works and as cultural products of particular social, political, and historical moments.

**GER 1911W. Art & Memory: Post-Holocaust Berlin.** (GP,WI; 3 cr.; Student Option No Audit; Periodic Spring)

Explore Berlin and its history while studying German visual culture in this freshman seminar abroad. Spend spring break in Berlin, the vibrant cultural, political, and film capital of Germany. Learn about the complex layers of historical and cultural memory in Berlin through exploring a number of important film and visual art projects. While in Berlin, explore the Olympic Stadium, the Film Museum of Berlin, the Monument to the Murdered Jews of Europe, remnants of the Berlin Wall, and public art projects that reflect on histories of trauma. At home and abroad, you will discuss how German visual culture has been intertwined with German history and politics, and how that role has evolved over time.

**GER 3011W. Conversation and Composition.** (WI; 4 cr.; Student Option; Every Fall & Spring)

Achieving proficiency in professional or academic German. Refinedment of oral/written expression. Review of important communicative modes of language. Wide range of topics to develop advanced level of proficiency. cr. 1004

**GER 3012W. Conversation and Composition.** (WI; 3 cr.; Student Option; Periodic Fall & Spring)

Prepares students for upper-level language and content courses in German. Continues the same focus and approach as 3011 with the addition of a larger reading component. cr. 3011

**GER 3014. German Media.** (3 cr.; Student Option; Every Spring)

Introduction to German language media. German language newspaper/magazine articles. The Internet. Radio/TV broadcasts. Structure/style of journalistic prose. cr. 3011

**GER 3021. Business German.** (3 cr.; Student Option; Periodic Fall & Spring)

German economy, business culture. Practice of language used in business. Reading/discussion of German business documents. Preparation of formal letters and reports. cr. 3011 or equiv

**GER 3104W. Reading and Analysis of German Literature.** (GP,LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year)

Intensive exploration of specific authors, literary genres, or literary topics not covered in period courses.

**GER 3501. Contemporary Germany.** (3 cr.; Student Option; Periodic Fall & Spring)

Social, political, and cultural developments in Germany, from 1945 to present. cr. 3011

**GER 3510. Topics in German Studies.** (3 cr.; max 9 cr.; Student Option; Every Spring)

One topic in depth dealing with culture or civilization of German-speaking countries. cr. 3011

**GER 3601. German Medieval Literature.** (GP,LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year)

Literary investigation of the greatest works of medieval German poetry. Readings in English. Majors will be required to write a paper with use of secondary sources in English and German. cr. 3011

**GER 3604W. Introduction to German Cinema.** (AH,WI,GP; 3 cr.; Student Option; Fall Even, Spring Odd Year)

An introduction to the study of German cinema, with a focus on the relation between German film and German history, literature, culture, and politics.

**GER 3610. German Literature in Translation.** (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring)

In-depth study of authors or topics from various periods in German literature. cr. 3011 or knowledge of German required

**GER 3631. Jewish Writers and Rebels in German, Austrian, and American Culture.** (3 cr.; Student Option; Periodic Fall & Spring)

Literary/cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English. cr. 3011

Reading/discussion of literary/philosophical works, aesthetic criticism. cr. 3011

**GER 3431. 19th-Century Literature.** (3 cr.; Student Option; Periodic Fall)

Literary/cultural exploration of 19th-century German literature through an investigation of romanticism, realism, and naturalism. Reading/discussion of literary/critical texts. cr. 3011

**GER 3441. 20th-/21st-Century Literature.** (3 cr.; Student Option; Periodic Fall)

German literature from 1890 to present, in historical, political, social, and cultural context. cr. 3011

**GER 3490. Topics in German Literature.** (3 cr.; max 9 cr.; Student Option; Every Fall & Spring)

Intensive exploration of specific authors, literary genres, or literary topics not covered in period courses.

**GER 3501. Contemporary Germany.** (3 cr.; Student Option; Periodic Fall & Spring)

Social, political, and cultural developments in Germany, from 1945 to present. cr. 3011

**GER 3510. Topics in German Studies.** (3 cr.; max 9 cr.; Student Option; Every Spring)

One topic in depth dealing with culture or civilization of German-speaking countries. cr. 3011

**GER 3601. German Medieval Literature.** (GP,LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year)

Literary investigation of the greatest works of medieval German poetry. Readings in English. Majors will be required to write a paper with use of secondary sources in English and German. cr. 3011

**GER 3604W. Introduction to German Cinema.** (AH,WI,GP; 3 cr.; Student Option; Fall Even, Spring Odd Year)

An introduction to the study of German cinema, with a focus on the relation between German film and German history, literature, culture, and politics.

**GER 3610. German Literature in Translation.** (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring)

In-depth study of authors or topics from various periods in German literature. cr. 3011 or knowledge of German required; cr toward major or minor requires reading in German

**GER 3631. Jewish Writers and Rebels in German, Austrian, and American Culture.** (3 cr.; Student Option; Periodic Fall & Spring)

Literary/cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English. cr. 3011

Reading/discussion of literary/philosophical works, aesthetic criticism. cr. 3011
required; Extra work in German must be done in order to count this course toward a German minor or a German, Scandinavian, Dutch major.

GER 3633. The Holocaust: Memory, Narrative, History. (GP,HIS; 3 cr.; Student Option; Periodic Fall & Spring) Seventy years after the end of the second world war, the Holocaust continues to play a formative role in public discourse about the past in Germany and Austria. As the event itself recedes into the past, our knowledge about the Holocaust has become increasingly shaped by literary and filmic representations of it. This course has several objectives: first, to deepen students' historical knowledge of the events and experiences of the Holocaust, and at the same time to introduce critical models for examining the relationship between personal experience, historical events, and forms of representation. This class will introduce students to the debates about the politics of memory and the artistic representation of the Holocaust, with special focus on public debates about the complex ways in which Holocaust memory surfaces in contemporary Germany and Austria, and by the accrual of layers of text and discourse about the Holocaust. Additional topics will include Holocaust testimony; Holocaust memoirs, and 2nd and 3rd generation Holocaust literature, the Historians' Debate of the 1980s.

GER 3641. German Folklore. (GP,LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year) Literary and cultural investigation of the main folkloric genres: charms, legends, folktales, and ballads; their composition, origin, and role in society with a strong emphasis on their international character. Readings in English. Majors required to write a paper with use of secondary sources in English and German. prerequisite: No knowledge of German required; cr for major or minor by arrangement with instructor.

GER 3642. The Grimm's Fairy Tales, Then & Now. (3 cr.; Student Option; Periodic Spring) Exploration and cultural background of the Grimms' fairy tales and investigation of how various folktales types developed and became classical models for children and adults. The genre of the literary fairy tale in Germany, Europe, and North America. Comparisons of original literary versions with contemporary tales. All readings in English.

GER 3651. Thinking Environment: Green Culture, German Literature and Global Debates. (ENV,LITR; 3 cr.; Student Option; Fall Odd, Spring Even Year) How environmental thinking became social-political force through German literature/culture, with comparisons to global or U.S. developments. Authors include Goethe, Christa Wolf, Enzensberger.

GER 3655. Cultures of Control and Surveillance in Germany and the US. (IV,HIS; 3 cr.; Student Option; Fall Odd Year) Discourses and practices of social control and surveillance in comparative/historical perspective. Explores the central conceptual condition for modern ethics: the relationship between individual and society. Paintings, manuals, scholarly and philosophical essays, and literary texts including writings by Franz Kafka.

GER 3701. History of the German Language. (3 cr.; Student Option; Periodic Fall) Change in grammar and lexicon, 750 A.D. to present. prerequisite: 1004

GER 3702. Beginning Middle High German. (3 cr.; Student Option; Periodic Fall) Middle High German grammar. Selected literary texts. prerequisite: 1004

GER 3993. Directed Studies. (1-4 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prerequisite consent, dept consent, college consent.

GER 4001. Beginning German for Graduate Research. (5 cr.; Student Option; Every Fall, Spring & Summer) Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.). Meets concurrently with 1001. prerequisite: Grad student

GER 4002. Beginning German for Graduate Research. (5 cr.; Student Option; Every Fall, Spring & Summer) Listening, reading, speaking, writing. Emphasizes proficiency. Topics include free-time activities, careers, and culture of German-speaking areas. Meets concurrently with 1002. prerequisite: Grad student

GER 4003. Intermediate German for Graduate Research. (5 cr.; Student Option; Every Fall, Spring & Summer) Listening, reading, speaking, writing. Contextualized grammar/vocabulary. Authentic readings. Essay assignments. Meets concurrently with 1003. prerequisite: Grad student

GER 4004. Intermediate German for Graduate Research. (5 cr.; Student Option; Every Fall, Spring & Summer) Listening, reading, speaking, writing. Contextualized grammar/vocabulary. Authentic readings. Essay assignments. Meets concurrently with 1004. prerequisite: Grad student

GER 4040. German Play: Oral Interpretation and Performance of German. (1-3 cr.; Student Option; Periodic Fall & Spring) Dramatic reading of German play for pronunciation; preparation and rehearsal for production and performance of German play.

GER 5011. Advanced Conversation and Composition. (3 cr.; Student Option; Fall Odd Year) Achieving high proficiency in writing/speaking professional/academic German. prerequisite: 3012, [grad student or adv undergrad]

GER 5410. Topics in German Literature. (3 cr.; Student Option; Periodic Fall & Spring)

GER 5610. German Literature in Translation. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Study in depth of authors or topics from various periods in German literature. Requires no knowledge of German. prerequisite: No knowledge of German required; cr toward major or minor requires reading in German

GER 5630. Topics in German Cinema. (3 cr.; max 9 cr.; Student Option; Periodic Spring) Topics chosen may focus on specific directors, genres, film production or reception, and/or other formal, theoretical, historical, or political issues. prerequisite: 3xxx film course or instr consent

GER 5651. Thinking Environment: Green Culture, German Literature and Global Debates. (ENV,LITR; 3 cr.; Student Option; Fall Odd, Spring Even Year) How environmental thinking became social-political force through German literature/culture, with comparisons to global or U.S. developments. Authors include Goethe, Christa Wolf, Enzensberger.

GER 5711. History of the German Language I. (3 cr.; Student Option; Fall Even Year) Historical development of German, from beginnings to 1450. prerequisite: 5011

GER 5712. History of the German Language II. (3 cr.; Student Option; Spring Odd Year) Historical development of German from 1450 to 2000. prerequisite: 5711

GER 5721. Introduction to Middle High German. (3 cr.; Student Option; Fall Odd Year) Introduction to Middle High German language and literature. Study of grammar through formal description of Middle High German phonology, morphology, and syntax. Normalized MHG texts read.

GER 5722. Middle High German: Advanced Readings. (3 cr.; Student Option; Spring Even Year) Acquisition of fluency in reading Middle High German normalized as well as non-normalized texts, both poetry and prose. prerequisite: 5721

GER 5734. Old Saxon. (3 cr.; Student Option; Periodic Fall) Study of the poetry of Old Saxon. Detailed investigation of Old Saxon in comparison with the other Old Germanic languages.

GER 5740. Topics in Germanic Medieval Studies. (3 cr.; max 9 cr.; Student Option; Periodic Spring) Topics specified in Class Schedule.

GER 5993. Directed Studies. (1-4 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prerequisite consent, dept consent, college consent.

GER 8010. Current Debates in Literary and Cultural Theory. (3 cr.; max 12 cr.; Student Option; Every Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

GER 8020. Problems in Literary and Cultural History. (3 cr.; max 12 cr.; Student Option; Every Spring) Historiographic texts as literature and literary or illocutionary texts as historical documents. Homogenizing/constructive elements in historiography. Strategies of writing historical syntheses.

GER 8200. Seminar in Medieval German Literature and Culture. (3 cr.; max 9 cr.; Student Option; Spring Even Year) Topics on specific author, group of authors, genre, or subject matter in German literature, ca. 800-1450. prereq: 5721

GER 8210. Seminar in Early Modern German Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Topics on specific author, group of authors, genre, or subject matter in German literature, 1450-1750.

GER 8220. Seminar in 18th-Century German Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Literary, philosophical, and aesthetic texts emerging from major 18th-century literary trends, 1720-1810. Cultural and historical contexts of Enlightenment and Weimar Classicism.

GER 8230. Seminar in 19th-Century German Literature and Culture. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Examination of an author, issue, or movement, using a variety of critical approaches.

GER 8240. Seminar in 20th-Century German Literature and Culture. (3 cr.; max 9 cr.; A-F or Audit; Periodic Fall & Spring) Topics on literature, film, or other forms of "high" and popular culture.

GER 8300. Topics in Literature and Cultural Theory. (3 cr.; max 18 cr.; Student Option; Periodic Fall & Spring) Authors, themes, movements, and social issues from 1700 to present. Focus varies each semester.

GER 851. Gothic and Methods of Comparative Reconstruction I. (3 cr.; Student Option) The oldest extant Germanic language and the prehistory of Germanic group of languages.

GER 852. Gothic and Methods of Comparative Reconstruction II. (3 cr.; Student Option; Periodic Fall) Continuation of study of the oldest extant Germanic language and the prehistory of Germanic group of languages. prereq: 8741

GER 851. Paleography: Medieval Manuscript Readings. (3 cr.; A-F or Audit; Periodic Spring) Introduction to techniques of reading and transcribing medieval German and Latin manuscripts.

GER 8752. Medieval Text Editing. (3 cr.; Student Option; Periodic Spring) Introduction to techniques of historical text-critical editing of medieval Germanic and Latin manuscripts.

GER 8820. Seminar: Advanced Theory. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Topic in critical thought, e.g., the Frankfurt School, hermeneutics, reception theory.

GER 8994. Directed Research. (1-3 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Tbd prereq: instr consent, dept consent; may be taken as tutorial with instr consent

GSD 3451V. Honors Major Project Seminar. (WI; 3 cr.; A-F or Audit; Every Fall) Major project under supervision of faculty member. Oral exam based on project. prereq: Honors student

GSD 3451W. Major Project Seminar. (WI; 3 cr.; A-F or Audit; Every Fall) Students prepare major project under supervision of faculty member.

GSD 3511W. Vikings, Knights, and Reformers: German and European Culture and Controversies to 1700. (WI; 3 cr.; Student Option; Every Fall) Survey of representative cultural-historical events in Europe (German-speaking countries, Scandinavian, the Netherlands) from early Germanic times to 1700.

GSD 3512W. Imagined Communities: German and European, Culture and Controversies, 1700 to Present. (WI; 3 cr.; Student Option; Every Spring) Survey of representative cultural-historical events in Europe (German-speaking countries, Scandinavian, the Netherlands) from 1700 to present.

GSD 5103. Teaching of Germanic Languages. (3 cr.; Student Option; Every Fall) Second language acquisition theory, methods, testing, and technology applicable to teaching of modern Germanic languages.

GSD 8001. Approaches to Textual Analysis. (3 cr.; Student Option; Every Fall) Theoretical approaches to textual analysis that shape disciplinary discussions in Germanic studies.

GSD 8002. Interdisciplinary Approaches to Textual Analysis. (3 cr.; Student Option; Spring Odd Year) Theoretical approaches in textual studies that challenge conventional notions of boundaries between disciplines and between national literatures/cultures.

GSD 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall & Spring) TBD prereq: Master's student, adviser and DGS consent

GSD 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student, adviser and DGS consent

GSD 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr.; dept consent for 3rd/4th registrations, up to 24 combined cr.; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

GSD 8801. Dissertation Seminar. (3 cr.; S-N or Audit; Periodic Fall & Spring) For doctoral students in German and Scandinavian studies who are beginning to establish topics and do research for their dissertations. Discussion of a variety of topics related to this process as well as presentation of some written work.


GSD 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall, Spring & Summer) (no description) prereq: Max 18 cr per semester or summer; 24 cr required

GER 5100. Topics in Gerontology. (0.5-4 cr.; max 10 cr.; Student Option; Periodic Fall, Spring & Summer) Timely topics related to the biology, sociology, and psychology of aging and applied aging services.

GER 5102. Hot Topics in the Biology of Aging. (1 cr.; S-N only; Fall Even Year) The goals of the course include providing the students with an essential understanding of the contemporary issues in biogerontology, including analysis of ethics issues in the field. This course is open to graduate students and post-doctoral fellows involved in the NIA training grant Functional Proteomics of Aging. others may enroll with instr permission.

GER 5103. Aging and Society. (2 cr.; Student Option; Every Fall) An examination of the broad range of topics and issues related to aging. Consideration of how the processes of aging affect individuals, groups, cohorts, and societies by drawing from research in sociology, psychology, gerontology, and health sciences. Comparisons are made of the processes of aging in US and other countries.

GER 5111. Studying Aging and Chronic Illness. (2 cr.; Student Option; Every Fall)
Methodological issues unique to studies of older populations. Focuses on measurement of epidemiological characteristics. Health conditions/disorders of older Americans. preq: Introductory course in epidemiology or instr consent

GERO 5125. Gerontology Service Learning. (3 cr.; Student Option; Every Fall, Spring & Summer) At least 100 hours of service to seniors or organizations serving seniors required. Longitudinal one-on-one relationship with at least two seniors. Service activities may include: friendly visiting, escorting seniors to medical appointments, chore services, teaching health education to groups of seniors and staff, participating in social or recreational activities with seniors, assisting with immunization and screening programs, assisting seniors with selection of healthcare plans, or providing volunteer home health aide or nursing assistant services or emergency non-medical response under the supervision of a nurse. Students may use up to 25 percent of their service time for project that benefits the campus as a whole. Reading, monthly class discussions, a term paper and weekly self-reflection

GERO 5191. Independent Study: Gerontology. (1-4 cr.; max 16 cr.; Student Option No Audit; Periodic Fall, Spring & Summer) Independent study; gerontology. preq: Approval of [adviser, DGS] for gerontology minor

GERO 8020. Seminar in Gerontology. (2 cr.; Student Option: Every Fall & Spring) Meets weekly. Students present and discuss new or completed research projects on aging; conduct formal reviews using NIH formats; critique published papers using formal review criteria employed by gerontologic journals; become familiar with large database in aging and describe how that database has been used in research for secondary analyses. preq: instr consent

GERO 8021. Application of Proteomics to Aging. (1 cr.; Student Option; Fall Odd Year) Proteomic technology in aging research. Faculty/student led discussions on topics relevant proteomic research. Overview of special techniques/analytical approaches complementary to proteomics, hands-on experience with data analysis, discussion of literature, preq: [Grad students, post-doctoral fellows involved in National Institutes on Aging training grant Functional Proteomics of Aging] or grad students or post-doctoral fellows with instr consent

GERO 8022. Fostering a Career in Aging Research. (1 cr.; Student Option; Spring Odd Year) Prepare pre-doctoral students/post-doctoral fellows for next step in academic career. Student/faculty led discussions on preparing for job interviews, including composing CV/cover letter, preparing grant applications/manuscripts, developing course syllabus based on biology of aging. preq: Grad students/post-doctoral fellows involved in National Institutes on Aging training grant Functional Proteomics of Aging or grad students or post-doctoral fellows with instr consent

GDBA 7102. Exploration of Tsinghua University. (2 cr.; A-F only; Every Fall, Spring & Summer) The course stems from the research, thinking in the distinctive context of these times. The course is devoted to providing a relatively complete view for executives of enterprises, who want to take control of their organizations, realize strategies and accomplish missions, to help them rethink, review and improve their leadership of self and of their organizations. The course will be delivered through a combination of theoretical analyses, cases study and review of practice, through which students will be better able to understand multiple dimensions of human nature; they will also practice and strengthen critical thinking (to get at the truth), creative thinking (for divergence), situational thinking (for effectiveness), and ethical thinking (for fairness). All of these are necessary for leaders? daily decision-making, and help leaders realize their full potential to lead their organizations by overcoming internal and external challenges in the face of uncertainty, and help them cultivate outstanding leaders and create great companies.

GDBA 7103. Financial Market and Investment Decision Making. (2 cr.; A-F only; Every Fall, Spring & Summer) The course starts with the basic theory of financial markets to examine the analytical framework of China's financial market theory, in light of the financial market system and interest rate policies of the United States and Europe. The course focuses on introducing the evolution of China's credit market, bond market, stock market, derivatives market, and securities investment funds market, through analysis of cases. It also emphasizes hot issues in the capital market, such as interest rate liberalization, multi-level capital market construction and structured finance. The course also introduces the financial derivatives market and its application to corporate risk management. Discussions in the class will include cases on Chinese and foreign financial markets, and the latest research results of the academic community. Students will become familiar with the mechanism of China's financial market, and thoroughly understand the operation of capital markets through this course.

GDBA 7104. International Environment and National Strategy. (2 cr.; A-F only; Every Fall, Spring & Summer) The course focuses on and explores the roots of global economic and political situations. International development trends. China's overall diplomacy, domestic and international views and disputes will be addressed. The course will mainly elaborate on the relationship between China and other major powers in the world such as the United States, Russia, and Japan, and the impact of the development of these relationships on economic behaviors and interactions between these markets.

GDBA 7105. Management Psychology. (2 cr.; A-F only; Every Fall, Spring & Summer) This course lays stress on analyzing factors that have influence on the organization's performance from three levels of the individual psychology, group psychology and organizational leadership psychology. It reveals the essence of human psychology and behaviors to improve all executives' ability to predict, coordinate and control people's behaviors, so as to stimulate people's enthusiasm in work and realize their potential to full extent for the purpose of achieving the organizational goals. The course will reach its goal of teaching through the analysis of real cases to lead students into the field of psychology and inform them of the psychological problems in practice of management: how to perform leadership
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
technology changes, and expanding global services combine to create new challenges. To succeed, business executives must have the skills to lead their service managers to allocate resources, design effective processes, analyze and improve operating practices, and apply new technologies. This course examines these opportunities.

**GDBA 7210. Fundamental Data Analysis.** (1 cr.; A-F only; Every Fall, Spring & Summer)
The course begins with an overview of descriptive statistics, which includes both graphical and numerical methods for summarizing data. Then we provide a review of essential steps of inferential statistics, which include random variables, estimation, and hypothesis testing. The second half of the course is devoted to predictive analytics, including simple linear regression, multiple linear regression, and a brief introduction of experimental design. Throughout, we focus on basic concepts and the practical use of these methods in management environments. This course provides the background in statistical methods that is required for conducting research in a doctoral program in business.

**GDBA 7211. Global Branding.** (2 cr.; A-F only; Every Fall, Spring & Summer)
This course will combine critical current perspectives from information economics, psychology, sociology, behavioral decision theory and neuro-science to inform students about how brand information is acquired, processed and employed in decision-making, across segments and cultures. Students are expected to be familiar with basic marketing concepts to allow for a discussion of strategic issues related to global branding. The course will involve multiple pedagogies including lecture, case discussion and class exercises.

**GDBA 7212. Global Talent Management.** (2 cr.; A-F only; Every Fall, Spring & Summer)
Global talent challenges are increasingly prevalent as organizations increasingly compete on a worldwide stage. Global talent management reflects an individual?s and/or organizations capacity to influence others and work with people from other countries and manage international operations and to the use of human resource practices designed to ensure needed access to talent for multinational enterprises competing in a global environment. In this course, we will put particular attention on the development of global competencies and a global mindset in individuals and organizations. We will also explore how to effectively manage talent in the context of increasing globalization. In the course, we will focus upon identifying best practices for recruiting, developing and retaining global talent and managing high performance global work systems. More specifically, we will consider how one should organize the processes and systems of hiring, rewarding, evaluating, developing, and motivating talent in today?s global context.

**GDBA 7888. Thesis.** (12 cr. [max 24 cr.]; S-N only; Every Fall, Spring & Summer)
Students have to complete and defend a thesis in order to be granted with the DBA degree.
GLOS 3215. Supercapitalism: Labor, Consumption & the Environment in the New Global Economy. (3 cr.; A-F only; Every Spring) Far-reaching transformations of the global economy over the last seventy years in the realms of labor, consumption and the environment. The movement away from regulated national economies to a more fully integrated global economy; changing patterns and organization of production, employment, consumption, and waste disposal; rise of supercapitalism: a new culture of market rule over society and nature.


GLOS 3401W. International Human Rights Law. (GP, WI; 3 cr.; A-F or Audit; Every Fall) Issues, procedures, advocacy strategies regarding promotion/protection of international human rights. Students analyze recent case studies of human rights violations in light of evolving laws, enforcement mechanisms. prereq: [3145, 3144] or instr consent


GLOS 3412. What is Equality?. (CIV; 3 cr.; A-F only; Every Spring) Course explores debates about equality. Equality has many dimensions—e.g.: economic, social, political. These forms cannot be reconciled. Liberal democracies affirm the principle of political equality but defend, even in principle, social and economic inequalities. Animal rights add another wrinkle: very few of those who fight for these rights would claim political equality for animals.


GLOS 3422. 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-91. (; 3 cr.; Student Option; Every Fall, Spring & Summer) Social, economic, political, and cultural impacts of WWII. Division of Europe, communist regimes in Eastern Europe, cooperation in Western Europe, impacts of modernization. End of Cold War.


GLOS 3550V. Honors Course: Supervised Research Paper. (WI; 4 cr.; A-F only; Every Fall & Spring) Supervised research paper. prereq: dept consent

GLOS 3602. Other Worlds: Globalization and Culture. (; 3 cr.; A-F or Audit; Every Fall & Spring) Globalization produces complex, sometimes volatile, local responses. Course explores interconnectedness of the world, considering not one world, but many. Topics include colonialism, consumption, diasporic conditions, global media, nationalism, supranational governance. Examines how globality is experienced and contested locally and specifically. prereq: [3101, 3144] or instr consent

GLOS 3609. Novels and Nations. (GP, LITR; 3 cr.; Student Option; Periodic Fall) Relation between nation/literature produced within it. How emerging nations enlist literature in claims for nationhood. How institution of literature underpin Empire. How gender, as organizing principle of identity, inflects literary representations of nation.

GLOS 3613V. Honors: Stuffed and Starved: The Politics of Eating. (GP, WI, SOCS; 3 cr.; A-F only; Periodic Fall & Spring) The course takes a cross-cultural, historical, and transnational perspective to the study of the global food system. Themes explored include: different cultural and social meanings attached to food; social class and consumption; the global food economy; global food chains; work in the food sector; the alternative food movement; food justice; environmental consequences of food production. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Examples of additional requirements may include: - Sign up and prepare 3-4 discussion questions in advance of at least one class session. - Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). - Write two brief (1-page) reflection papers on current news or a two-page critique of a class reading - Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. - Interview a current Sociology/Global Studies graduate student and present briefly in class or write a reflective piece, not more than 2 pages in length, to be submitted to the Professor.

GLOS 3613W. Stuffed and Starved: The Politics of Eating. (GP, WI, SOCS; 3 cr.; A-F or Audit; Periodic Fall & Spring) This course takes a cross-cultural, historical, and transnational perspective to the study of the global food system. Themes explored include: different cultural and social meanings attached to food; social class and consumption; the global food economy; global food chains; work in the food sector; the alternative food movement; food justice; environmental consequences of food production.

GLOS 3634. Chicana and Chicano History: 1821-1945. (DSJ, HIS; 3 cr.; Student Option; Every Fall) Experiences of people of Mexican descent in the United States. Important eras in histories of Mexico, the United States, and Mexican Americans. Central role of Chicana/os in U.S. history, culture, and politics.

GLOS 3637W. Modern Indian Literature. (GP, WI, LITR; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Survey of 20th century literature from South Asian countries, including India, Pakistan, and Sri Lanka. All readings in English. Focuses on colonialism, post-colonialism, power, and representation.

**Course: GLOS 3643, Islam and the West.**
- **Offered:** Every Fall
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3645, Islamic World.**
- **Offered:** Every Fall
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3681, Gender and the Family in the Islamic World.**
- **Offered:** Every Spring
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3701W, Population in an Interacting World.**
- **Offered:** Every Fall, Spring & Summer
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3705, Migrations: People in Motion.**
- **Offered:** Every Fall, Spring & Summer
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3900, Topics in Global Studies.**
- **Offered:** Every Fall & Spring
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3911, Contemporary Chinese Society: Culture, Networks, & Inequality in China.**
- **Offered:** Every Fall
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3921, Europe: A geographic Perspective.**
- **Offered:** Every Fall & Spring
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3934, Women and Gender in Latin American History.**
- **Offered:** Every Spring
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3942, History of Modern Israel/Palestine: Society, Culture, and Politics.**
- **Offered:** Every Spring
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3961, Culture and Society of India.**
- **Offered:** Every Fall & Spring
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3969, 20th Century India.**
- **Offered:** Every Fall
- **Instructor:** E. A. F.; Department consent required.

**Course: GLOS 3978, Contemporary Sub-Saharan African Popular Art forms.**
- **Offered:** Every Fall
- **Instructor:** E. A. F.; Department consent required.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
students will be expected to interview a current Sociology graduate student working on an LCD topic. Following this, each student will individually be expected to do an in-class power point presentation explaining how the interviewees' research relates to themes presented in the course. Students will also be expected to meet as a group and individually with the professor four times during the course semester. ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). ? Write two brief (1-page) reflection papers on current news or two-page critique of a class reading? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. prereq: At least one 3xxx SOC or GLOS course recommended

GLOS 4221. Globalize This! Understanding Globalization Through Sociology. (GP; 3 cr. ; A-F or Audit; Periodic Fall) Globalization of organizations, political relations, and culture. Dependency, world systems theories. Growth of international nongovernmental organizations, their impact on state policies and civil society. Expansion of international norms. Globalization of popular culture.

GLOS 4305. Environment & Society: An Enduring Conflict. (ENV; 3 cr. ; A-F or Audit; Every Fall) Examines how natural/built environments influence human behavior/social organization. Focuses on microenvironments/their influence on individuals. Impact of macroenvironments on societal organization. Environmental movements. prereq: SOC 1001 or environmental course or instr consent

GLOS 4311. Power, Justice & the Environment. (DSJ; 3 cr. ; A-F only; Every Spring) Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations.

GLOS 4315. Never Again! Memory & Politics after Genocide. (GP; 3 cr. ; A-F or Audit; Spring Odd Year) Course focuses on the social repercussions and political consequences of large-scale political violence, such as genocide, war crimes and crimes against humanity. Students learn how communities and states balance the demands for justice and memory with the need for peace and reconciliation and addresses cases from around the globe and different historical settings. prereq: SOC 1001 or 1011V recommended, A-F required for Majors/Minors.

GLOS 4344. Europe and its Margins. (; 3 cr. ; A-F only; Every Fall) Europe and its margins, an anthropological/ ethnohistorical perspective. Key topics in the study of Europe and European Societies. Ethnography, fiction, film, prereq: One course in [ANTH or GLOS]

GLOS 4406. Sociology of International Law: Trafficking, Human Rights, & Business Regulation. (GP; 3 cr. ; A-F or Audit; Periodic Fall & Spring) Cultural values and practices in a globalized world. Role of international law. Immigration, terrorism, Americanization, and structure of international legal system. prereq: SOC 1001 or SOC 3101 or SOC 3102 or instr consent

GLOS 4910. Topics in Global Studies. (; 1-4 cr. ; max 12 cr.) ; Student Option; Every Fall & Spring) Topics vary every semester. See Class Schedule.

GLOS 5104. Crime and Human Rights. (3 cr. ; A-F or Audit; Periodic Fall & Spring) This course addresses serious violations of humanitarian and human rights law, efforts to criminalize those violations (laws and institutions), and consequences of these efforts. Special attention will be paid to the impact interventions have on representations and memories of atrocities on responses and the future of cycles of violence. Case studies on Holocaust, Balkan wars, Darfur, My Lai massacre, etc. Criminal justice, truth commissions, vetting, compensation programs. prereq: at least one 3xxx SOC or GLOS course recommended

GLOS 5152. Global Avant-Gardes: Theatre, Music, Modernity. (HIS; 3 cr. ; Student Option; Every Spring) What does it mean to be an avant-garde artist in the Global South? In postcolonial Africa and Asia, where arts were linked to national modernization projects, artists have played a key role in shaping citizens’ identity, alongside schools and universities. While participating in modernizing projects, avant-garde artists maintained independence from state institutions and voiced criticism of dictators. This course examines avant-garde performance in several locations of the Global South, analyzing dramas of national identity, alongside schools and universities. You will apply select methods in your final research paper, which centers on an avant-gardist cultural phenomenon in the contemporary Global South.

GLOS 5170. Sociology of International Law: Human Rights, Trafficking, and Business Regulation. (GP; 3 cr. ; A-F or Audit; Periodic Fall & Spring) Cultural values and practices in a globalized world. Role of international law. Immigration, terrorism, Americanization, and structure of international legal system

GLOS 5315. Never Again! Memory & Politics after Genocide. (GP; 3 cr. ; A-F or Audit; Spring Odd Year) Course focuses on the social repercussions and political consequences of large-scale political violence, such as genocide, war crimes and crimes against humanity. Students learn
GRAD 5105. Practicum in University Teaching for Nonnative English Speakers. (1-2 cr.; S-N or Audit; Every Fall & Spring) Theory, advanced practice in teaching in higher education for non-native speakers of English. Emphasizes interactive teaching strategies, awareness of cross-cultural classroom issues, oral classroom presentation skills, and legal/policy issues. prereq: 5102 or English Language Proficiency Rating of 2; Contact instructor for permission number.

GRAD 8101. Teaching in Higher Education. (3 cr.; Student Option No Audit; Every Fall, Spring & Summer) Teaching methods/techniques. Active learning, critical thinking, practice teaching, and preparing a portfolio to document/reflect upon teaching. Readings, discussion, peer teaching, e-mail dialog, reflective writing, co-facilitation of course, prereq: Non-Degree Students: contact pfcollege@consentum.edu with questions about registration. If adding a section after first class meeting, contact your instructor as soon as you enroll.

GRAD 8102. Practicum for Future Faculty. (3 cr.; Student Option No Audit; Every Fall & Spring) Collegial support for teaching, faculty mentorship at regional college or university. Faculty role at various institutions. Classroom observation/feedback, preparation for academic job search, prereq: [8101 or equiv.], [native English speaker or iBT TOEFL score of 27-30] or [ELP score of 1 from CTL].

GRAD 8200. Teaching and Learning Topics in Higher Education. (.1 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Create course materials for context/discipline. Assess student learning. Write action plan. Topics may include active learning in sciences, teaching with technology, multicultural education, teaching in clinical settings, learning-community course design.

GRAD 8400. Interdisciplinary Dissertation Writing Seminar. (.1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Led by graduate faculty. For course description, see sponsoring program(s), prereq: PhD student, instr consent

GRAD 8401. Dissertation Proposal Development Seminar. (3 cr.; S-N only; Every Fall) This seminar is the culminating component of intensive work on dissertation proposal development. The program involves a five-day spring workshop, independent summer research, a five-day fall workshop, and opportunities for on-going interactions with the cohort and with faculty instructors. The work is designed to help participants develop cogent and fundable dissertation research proposals. The main goal of the spring workshop is to help clarify students’ research questions and scope as well as to better prepare them for a productive pre-dissertation summer research experience. The fall workshop is intended to help students build on their spring workshop efforts and summer research experiences to prepare full dissertation research proposals. These proposals are intended to serve as the foundation for department prospectus requirements and for internal and external dissertation research and completion grants. All components of the program are required through registration and are only for the fall seminar. Admission will be based on application in the prior year and requires a commitment to participate in all components of the program. A grade of Satisfactory will be based on attendance at and satisfactory performance in all of the spring and fall workshops, demonstrated completion of independent research over the summer, and the submission of a dissertation research proposal as part of the fall workshop. Students must be enrolled in a doctoral degree program, must be pre-ABD (may not have passed the prelim oral exam), and have advisor approval. prereq: PhD student who has not passed prelim oral exams

Graduate Summer Research (GRD)

GRD 4999. Graduate Summer Research. (; 0 cr.; No Grade Associated; Every Summer) Graduate Summer Research

Grand Challenge Curriculum (GCC)

GCC 3001. Can We Feed the World Without Destroying It?. (ENV; 3 cr.; A-F only; Periodic Fall) In this course, we will seek solutions to the challenge of achieving global food security and sustainability. Together, we will work to answer the question, “Can we feed the world without destroying it?” The course begins with lectures and skills workshops, followed by a series of interactive panels with guest experts. We will also prepare group projects that are focused on finding innovative solutions to this grand challenge. We will learn about the fundamental changes occurring in the global food system, the environment, and our civilization as a whole. We will explore how to approach inherently interdisciplinary problems, how to identify solutions that are truly sustainable in the long term, and how science and technology can inform decision-making.

GCC 3003. Seeking Solutions to Global Health Issues. (GP; 3 cr.; A-F only; Periodic Fall) Complex global health problems can often only be addressed through approaches that go beyond traditional health science disciplines. Whether responding to emerging pandemics, food insecurity, maternal mortality, or civil society collapse during conflict, solutions often lie at the interface of animal, environmental, and human health. In this course, students will examine the fundamental challenges to addressing complex global health problems in the world’s poorest countries. Together, we will seek practical solutions at the nexus of human, animal, and ecological health. While there isn’t a single “right” solution to grand challenges, progress can be made through an interdisciplinary perspective with emphasis on ethical and cultural sensitivity, and on understanding their complexities. This exploration will help students propose realistic actions that could be taken to resolve these issues. This course will help students gain the understanding and skills necessary for beginning to develop solutions to this grand challenge.

GCC 3004. The Fracking Boom: Promises and Challenges of the Hydrocarbon Renaissance. (ENV; 3 cr.; A-F only; Periodic Fall) This course will explore the energy revolution that has been ignited by recent technological advances (primarily hydro-fracturing or “fracking”) and its many far-reaching consequences. Students will engage in understanding the economic, political, geological, environmental, and social aspects of this multi-faceted issue. After establishing the historical framework, we will discuss how the “fracking boom” has drastically altered this landscape. With a solid understanding of the role of hydrocarbons in the modern world, we will explore the promises and perils of the fracking boom. While we will discuss all the major fracking areas, the Bakken Shale will receive special attention both because of its geographical proximity to Minnesota and because of the dramatic transformation it has spurred in North Dakota. We will explore economic and social repercussions of the Bakken boom from the interpersonal to the international, as well as issues related to environmental degradation and other potential hazards. prereq: sophomore, junior, senior

GCC 3005. Global Venture Design: What Impact Will You Make?. (GP; 3 cr.; A-F only; Periodic Fall) Students will work in teams developing sustainable business and technical solutions to address an environmental or social challenge in India. Teams may address a challenge related to water supply, energy availability, food/agriculture production, waste management, public health or a topic mutually agreed upon by the instructor and student teams. During the semester, a product or service must be designed, and a sustainable business model must be created around it. Technical and business development professionals based in the US and India will act as mentors to provide advice to each team. Each team will have one US-based mentor and one India-based mentor. The teams are expected to use a discovery process, design thinking, ideation and input from field research in solving the challenge. A primary focus of the course is up-front work to identify the “right” problem to solve. The model should be built around the customers’ needs and wants, as they will need to pay for the product or service to achieve a scalable model.

GCC 3007. Toward Conquest of Disease. (ENV; 3 cr.; A-F only; Every Spring) Since the rise of civilization, the large predators of humans have been subdued and the most dangerous predators remaining are those unseen—vastly smaller than our bodies. They are the microbial predators that cause disease. Infectious disease has devastated human populations and even caused global population declines. Subduing and managing disease

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is one of the grand challenges of our time. Through an enormous global effort, we have driven smallpox in humans and Rinderpest in livestock extinct from the natural world, and guinea worm is expected to follow. Other infectious diseases are in continual decline. In this course we will combine ecological thought and ecological models with historical and future perspectives to understand the fundamental dynamics of our miniscule predators, and relate this to similar minuscule predators of wild and domestic animals, to crops, and to other plants. 

GCC 3009. Rivers and Cities: Meeting Future Demands on Urban Water Systems. (ENV; 3 cr.; A-F only; Periodic Spring) Ensuring access to sufficient and safe water is one of the grand challenges of the 21st century. As the world’s population urbanizes, cities are at the leading edge of conflicts over water. We will evaluate changing demands on urban rivers, tracing this evolution as a hallmark of global urbanization, and challenge students to articulate their understanding of water management to local citizens and devise creative visions for better management of water. “Rivers and Cities” will examine urban water challenges by exploring four critical ways cities engage their river systems. This exploration will trace the evolution of urban water systems as they have been engineered to deliver drinking water, to provide power and transportation, to protect people living nearby, and to ensure a steady supply of food. Student learning will be interdisciplinary, place-based, and will engage with the community. Students will learn how and why managing water is a necessity and how the struggle between Minnesota, the US, and the world. prereq: sophomore, junior, senior

GCC 3010. Grand Challenge: The Global Climate Challenge ? Creating an Empowered Movement for Change. (CIV; 3 cr.; A-F only; Periodic Spring) Students will explore ecological and human health consequences of climate change, the psychology of climate inaction, and will be invited to join us in the radical work of discovering not only their own leadership potential but that of others. We will unpack the old story of domination and hierarchy and invite the class to become part of a vibrant new story of human partnership that will not only help humanity deal with the physical threat of climate change but will help us create a world where we have the necessary skills and attitudes to engage the many other grand challenges facing us. Using a strategy of grassroots empowerment, the course will be organized to help us connect to the heart of what we really value; to understand the threat of climate change; to examine how we feel in the light of that threat; and to take powerful action together. Students will work in groups throughout the course to assess the global ecological threat posed by climate change, and they will be part of designing and executing an activity where they empower a community to take action. prereq:soph,jr, sr

GCC 3011. Pathways to Renewable Energy. (TS; 3 cr.; A-F only; Periodic Spring) This interdisciplinary course will examine obstacles to energy transitions at different scales. It will explore the role of energy in society, the physics of energy, how energy systems were created and how they function, and how the markets, policies, and regulatory frameworks for energy systems in the US developed. The course will closely examine the Realpolitik of energy and the technical, legal, regulatory, and policy underpinnings of renewable energy in the US and Minnesota. Students will learn the drivers that can lead global systems to change despite powerful constraints and how local and institutional action enables broader reform. Students will put their learning into action by developing proposals for addressing a particular challenge: What would it take to get the University of Minnesota to invest significantly in solar energy? prereq: sophomore, junior, senior

GCC 3012. Structural Violence & The Medication Experience. (DSJ; 3 cr.; A-F only; Periodic Spring) The course will use a social justice framework for learning and communicating about structural violence and the intersection of culture, the medication experience, and community health. Utilizing principles of community engagement, we will focus on examining how broader community health and the individual medication experience are impacted by the overcoming of structural violence experienced by communities locally as well as globally. Using critical race theory and social ecological frameworks, we will come to a more complex understanding of our own social locations and the interplay of power and privilege while exploring the root causes of health disparities and the development of solutions that address inequities in health, education, housing, employment, and access to respectful health care. Students will learn to critically analyze these lived experiences while developing interactive storytelling, digital documentaries, digital essays and narratives to advance knowledge on health inequities in our community. prereq: sophomore, junior, senior

GCC 3013. Making Sense of Climate Change - Science, Art, and Agency. (CIV; 3 cr.; A-F only; Periodic Spring) The overarching theme of the course is the role of artistic/humanistic ways of knowing as tools for making sense and meaning in the face of “grand challenges.” Our culture tends to privilege science, and to isolate it from the “purposive” disciplines—arts and humanities—that help humanity ask and answer difficult questions about what should be done about our grand challenges. In this course, we will examine climate change science, with a particular focus on how climate change is expected to affect key ecological systems such as forests and farms and resources for vital biodiversity such as pollinators. We will study the work of artists who have responded to climate change science through their artistic practice to make sense and meaning of climate change. Finally, students create collaborative public art projects that will become part of local community festivals/events late in the semester.

GCC 3014. The Future of Work and Life in the 21st Century. (TS; 3 cr.; A-F only; Periodic Fall) This course seeks solutions to the technological, demographic, and economic forces that challenge taken-for-granted mindsets and existing policies around work, careers, and life. Students will consider positive and negative impacts of the forces that render the conventional education/work/retirement lockstep obsolete. What do these changes mean for men and women of different ages and backgrounds? What are alternative, sustainable ways of working and living in the 21st century? These questions reflect global challenges that touch the lives of people everywhere. Students will work in teams to begin to address these realities and formulate innovative solutions to better transform learning, working, caring, and community-building in the 21st century.

GCC 3015. Bioinspired Approaches to Sustainability - Greening Technologies and Lives. (TS; 3 cr.; A-F only; Periodic Spring) How can we build a sustainable society? From designing cities and technologies that use green energy, to health care and agriculture that can sustain billions, the sustainability challenges that face us today are immense. The field of biomimicry seeks solutions to such problems by looking to the diverse ways in which organisms have adapted to varied and sometimes extreme environments. With over 1.3 million described species (and likely over 8 million in existence), chances are a species out there has evolved some solution to a particular problem. But how do we go about figuring out which species this might be? And which trait holds the adaptation in which we are interested? What might be some limitations associated with copying this adaptation—how might we build on it instead? This course teaches bio-inspired approaches to sustainability solutions. Throughout the course, students work in teams of complementary expertise to identify a sustainability problem, research a relevant biological system, and build a prototype bio-inspired solution to their focal problem.

GCC 3016. Grand Challenge: Science and Society: Working Together to Avoid the Antibiotic Resistance Apocalypse. (TS; 3 cr.; A-F only; Periodic Spring) Before the discovery of antibiotics, even a simple wound could lead to life threatening infection. Antibiotics are truly miracle drugs, making most bacterial infections relatively easy to cure. However, this landscape is rapidly changing with the advent of microbes that are resistant to antibiotics. This course will provide an overview of how antibiotic use invoked antibiotic resistance, including in depth discussions of antibiotic resistant microbial organisms and the impact of globalization on this exploding problem. Societal and ethical implications associated with antibiotic use and restriction in humans and animals will be discussed, along with global issues of antibiotic regulation and population surveillance. The class will conclude with discussions of alternative therapeutic approaches that are
essential to avoid "antibiotic apocalypse."
The course will include lectures by world-renowned experts in various topics, and students will leverage this knowledge with their own presentations on important topics related to issues of personal freedom versus societal needs.

GCC 3017. World Food Problems: Agronomics, Economics and Hunger. (GP: 3 cr.; A-F only; Periodic Fall)
This course provides a multi-disciplinary look at problems (and some of the possible solutions) affecting food production, distribution and requirements for the seven plus billion inhabitants of this planet. It is co-taught by an agronomist (Porter) and an economist (Runge) who together have worked on international food production and policy issues for the past 40 years. Historical context, the present situation and future scenarios related to the human population and food production are examined. Presentations and discussions cover sometimes conflicting views from multiple perspectives on population growth, use of technology, as well as the ethical and cultural values of people in various parts of the world. The global challenge is reflected in attention to issues of poverty, inequality, gender, the legacy of colonialism, and racial and ethnic prejudice. Emphasis is placed on the need for governments, international assistance agencies, international research and extension centers, as well as the private sector to assist in solving the complex problems associated with malnutrition, undernourishment, obesity and sustainable food production. Through a better understanding of world food problems, this course enables students to reflect on the shared sense of responsibility by nations, the international community and ourselves to build and maintain a stronger sense of our roles as historical agents. Throughout the semester students are exposed to issues related to world food problems through the lenses of two instructors from different disciplinary backgrounds.

GCC 3018. What American Dream? Children of the Social Class Divide. (DSJ; 3 cr.; A-F only; Periodic Fall)
As a result of the increasing and widening social class divide present in the early 21st century, American families and their children are facing more challenges than ever before. Academic underachievement, a school-to-prison pipeline, and the opioid epidemic are just a few examples. In this course, students will identify and confront the barriers to opportunities created by the divide and seek solutions that can be pursued with families, schools, and communities, and public policy to redress these inequities. Because of the complexity of this grand challenge, an interdisciplinary approach to intervention and policy is required. From course instructors' respective vantage points in prevention science, developmental and educational psychology, and family social science, and with the perspectives provided by faculty contributors from economics, law, and pediatrics, students engage with diverse modes of inquiry, epistemologies, and critical lenses by which possible solutions can be generated and implemented.

GCC 3020. Ecosystem Health: Challenges at the interface of humans, animals and the environment. (ENV; 3 cr.; A-F only; Every Fall)
What are the effects of climate change, disease emergence, food and water security, gender, conflict and poverty, and sustainability of ecosystem services on health? Unfortunately, these large-scale problems often become overwhelming, making single solution-based progress seem daunting and difficult to implement in policy. Fortunately, the emerging discipline of ecosystem health provides an approach to these problems grounded in trans-disciplinary science. Ecosystem health recognizes the interdependence of human, animal and environmental health, and merges theories and methods of ecological, health and political sciences. It poses that health threats can be prevented, monitored and controlled via a variety of approaches and technologies that guide management action as well as policy. Thus, balancing human and animal health with management of our ecosystems. In this class, we will focus on the emerging discipline of ecosystem health, and how these theories, methods and computational technologies set the stage for solutions to grand challenges of health at the interface of humans, animals and the environment. We will focus not only on the creation and evaluation of solutions, but on their feasibility and implementation in the real world through policy and real time decision making. This will be taught in the active learning style classroom, requiring pre class readings to support didactic theory and case-based learning in class. Participation and both individual and group projects (written and oral presentation) will comprise most of the student evaluation. These projects may reflect innovative solutions, discoveries about unknowns, or development of methods useful for ecosystem health challenges. We envision that some of them will lead to peer-review publications, technical reports or other forms of publication.

GCC 3021. The Achievement Gap: Who is to Blame?. (DSJ; 3 cr.; A-F only; Periodic Spring)
Students in GCC 3021 will start the semester with a review of what unequal schooling looks like in the United States. The course uses the history of Detroit to examine how underinvestment and discrimination positioned minoritized communities to receive inadequate education. School structures— including resources, climate and discipline, academic tracks, and community engagement— will be explored. Students will consider what it means to say that there are "achievement gaps" in our society's schools. Mainstream assumptions and meanings will be questioned and criticized, and alternatives, such as the notion of an "education debt," will be explored.

GCC 3024. 11 Billion People: How long can the planet sustain humanity?. (ENV; 3 cr.; A-F only; Periodic Fall)
As an evolved animal, humanity has always interacted with its environment, both through the ecology of its food web and through its modification of its geological surroundings. Yet the human ecological niche, and the breadth of its impact on the environment, has changed enormously through the biological and cultural evolution of our lineage, from our first two-legged ancestor; to the appearance of our own species, Homo sapiens; to the diversification of the hunter-gatherer adaptation at the end of the Pleistocene; to the invention of agriculture and animal husbandry in the Holocene; to the rise of craft specialization, social inequalities, and urbanism with the first state-level societies; and now the globalization of our food, diseases, and culture. Students in this course will explore how the cumulative effects of our biocultural evolution are putting the sustainability of our current population, now approaching 11 billion, at risk, mostly due to the unprecedented scale of humanity's impact on the Earth's ecosystems. This course investigates the origins, development, and predictions for humanity's ecological niche on the planet through a novel interdisciplinary fusion of the social and environmental sciences to give students i) the ability to see the environmental context of the present in an evolutionary light, as well as ii) the tools to evaluate possible remediation and sustainability approaches to control these problems at the local and global scale. The course provides an interdisciplinary immersion in these issues through combined instruction by anthropologists, archaeologists, historians, environmental scientists, ecologists, toxicologists, and sociologists. By focusing on multiple vectors of inquiry (i.e., society, economy, technology, environment) which can be considered at different scales (i.e., from past to present, local to global, individual to societal, temporary to long term), students' progress through the course will give them powerful tools to confront the Grand Challenges of our age, the Anthropocene.

GCC 3025. Living the Good Life at the End of the World: Sustainability in the Anthropocene. (CIV; 3 cr.; A-F only; Every Fall)
What does it mean to live "the good life" in a time of rapid climate changes, mass extinction of plant and animal species, and the increasing pollution of our oceans, atmosphere, and soils? Is it possible to live sustainably, as individuals and societies, in what scientists are calling the Anthropocene, or this new epoch of human influence over the planet? Will sustainability require that we sacrifice the gains humanity has made in our quality of life? Or can we find a way to create a good Anthropocene? This course will attempt to answer these questions in four ways: 1. By providing an overview of sustainability science, both what it says about human and natural systems and how it comes to make these claims 2. By examining various conceptions of the good life, both individual and social, and how they intersect with the findings of sustainability science 3. By exploring the conflicts that exist within and
between differing visions of sustainability and the good life through case studies in energy, water, and food. By pursuing collaborative research projects that will help students apply their knowledge and skills to current problems in sustainability studies, we will read widely in the sciences, social sciences, and humanities to understand a range of historical and contemporary perspectives on these questions, and in doing so will put abstract ethical principles into conversation with a diversity of specific cultures and environments. By the end of the course, students will have examined their own assumptions about personal and professional happiness, considered how these align with and diverge from societal visions and values, and explored innovative solutions to help sustain our productive economy and our planet.

GCC 3026. Stepping into the gap: Understanding the challenges of supporting diversity in STEM. (DSJ; 3 cr.; A-F only; Periodic Fall)
The goals of this class are (1) to understand the cognitive, social, and emotional factors that have led to the underrepresentation of many groups in STEM fields (Science, Technology, Engineering, and Mathematics) and (2) understand what each citizen in a science community must do to push back against this trend. In addition to studying research on the psychology of learning and diversity, we will survey literature about scientific communication and learn about the impact of disparities in educational opportunities. This class builds on a partnership between the University of Minnesota and a local middle school. The overarching goal is to support students from groups typically underrepresented in science as they participate in an advanced science learning opportunity: the science fair. Our engagement with the school science fair process should result in an experience that motivates future participation in STEM opportunities. There are two phases to the class. First, we prepare to lead the program. September readings, discussions, and weekly reflection assignments focus on what is known about inclusive and supportive learning environments. Then, for October, November, and December, the class meets at a local middle school (easily accessible by public transportation). University students take turns leading science demos, stage a science fair so the middle school students have a chance to play judge, and then partner with the middle school students as they invent, execute and present their own science fair projects.

Class participants will learn about theories and research that explains the crisis being experienced across America and in particular, in the Twin Cities. They will design evidence-based curriculum materials to address key issues and have hands-on experiences as peer mentor-teachers. Overall, this class will provide experiences that are likely to be transformative in relation to students’ views of education, opportunity, and the power of their involvement.

GCC 5001. Can We Feed the World Without Destroying It?. (ENV; 3 cr.; A-F only; Periodic Fall)
In this course, we will seek solutions to the challenge of achieving global food security and sustainability. Together, we will work to answer the question, “Can we feed the world without destroying it?” The course begins with lectures and skills workshops, followed by a series of interactive panels with guest experts. We will also prepare group projects that are focused on finding innovative solutions to this grand challenge. We will learn about the fundamental changes occurring in the global food system, the environment, and our civilization as a whole. We will explore how to approach inherently interdisciplinary problems, how to consider how we frame truly sustainable in the long term, and how science and technology can inform decision-making.

GCC 5003. Seeking Solutions to Global Health Issues. (GP; 3 cr.; A-F only; Periodic Fall)
Complex global health problems can often only be addressed through approaches that go beyond traditional health science disciplines. Whether responding to emerging pandemics, food insecurity, maternal mortality, or civil society collapse during conflict, solutions often lie at the interface of animal, environmental, and human health. In this course, students will examine the fundamental challenges to addressing complex global health problems in the world’s poorest countries. Together, we will seek practical solutions at the nexus of human, animal, and ecological health. While there isn’t a single “right” solution to grand challenges, progress can be made through an interdisciplinary perspective with emphasis on ethical and cultural sensitivity, and on understanding their complexities. This exploration will help students propose realistic actions that could be taken to resolve these issues. This course will help students gain the understanding and skills necessary for beginning to develop solutions to this grand challenge.

GCC 5005. Global Venture Design: What Impact Will You Make?. (GP; 3 cr.; A-F only; Periodic Fall)
Students will work in teams developing sustainable business and technical solutions to address an environmental or social challenge in India. Teams may address a challenge related to water supply, energy availability, food/agriculture production, waste management, public health or a topic mutually agreed upon by the instructor and student teams. During the semester, a product or service must be designed, and a sustainable business model must be created around it. Technical and business development professionals based in the US and India will act as mentors to provide advice to each team. Each team will have one US-based mentor and one India-based mentor. The goal is expected to use a discovery process, design thinking, ideation and input from field research in solving the challenge. A primary focus of the course is up-front work to identify the “right” problem to solve. The model should be built around the customer’s needs and wants, as they will need to pay for the product or service to achieve a scalable model. Prereq: sophomore, junior, senior, graduate student

GCC 5007. Toward Conquest of Disease. (ENV; 3 cr.; A-F only; Every Spring)
Since the rise of civilization, the large predators of humans have been subdued and the most dangerous predators remaining are those unseen—vastly smaller than our bodies. They are the microbial predators that cause disease. Infectious disease has devastated human populations and even caused global population declines. Subduing and managing disease is one of the grand challenges of our time. Through an enormous global effort, we have driven smallpox in humans and Rinderpest in livestock extinct from the natural world, and guinea worm is expected to follow. Other infectious diseases are in continual decline. In this course, we will combine ecological thought and ecological models with historical and future perspectives to understand the fundamental dynamics of our miniscule predators, and relate this to similar miniscule predators of wild and domestic animals, to crops, and to other plants. Prereq: sophomore, junior, senior, graduate student

GCC 5008. Policy and Science of Global Environmental Change. (ENV; 3 cr.; A-F only; Periodic Fall)
Through readings, lectures, discussions, written assignments, and presentations, this course introduces the critical issues underpinning global change and its environmental and social implications. The course examines current literature in exploring evidence for human-induced global change and its potential effects on a wide range of biological processes and examines the social, economic, and environmental consequences, and political processes at local, national, and international scales related to global change.

GCC 5010. Grand Challenge: The Global Climate Challenge: Creating an Empowered Movement for Change. (CIV; 3 cr.; A-F only; Periodic Spring)
Students will explore ecological and human health consequences of climate change, the psychology of climate inaction, and will be invited to join us in the radical work of discovering not only their own leadership potential but that of others. We will unpack the old story of domination and hierarchy and invite the class to become part of a vibrant story of human partnership that will not only help humanity deal with the physical threat of climate change but will help us create a world where we have the necessary skills and attitudes to engage the many other grand challenges facing us. Using a strategy of grassroots empowerment, the course will be organized to help us connect to the heart of what we really value: to understand the threat of climate change; to experience how we feel in the light of that threat; and to take powerful action together. Students will work in groups throughout the course to assess the global ecological threat posed by climate change, and they will be part of designing and executing an activity where they empower a community to take action.
(TS; 3 cr.; A-F only; Periodic Spring)  
This interdisciplinary course will examine obstacles to energy transitions at different scales. It will explore the role of energy in society, the physics of energy, how energy systems were created and how they function, and how the markets, policies, and regulatory frameworks for energy systems in the US developed. The course will closely examine the Realpolitik of energy and the technical, legal, regulatory, and policy underpinnings of renewable energy in the US and Minnesota. Students will learn the drivers that can lead global systems to change despite powerful constraints and how local and institutional action enables broader reform. Students will put their learning into action by developing proposals for addressing a particular challenge: What would it take to get the University of Minnesota to invest significantly in solar energy?

GCC 5012. Structural Violence & The Medication Experience.  
(DSU; 3 cr.; A-F only; Periodic Fall)  
The course will use a social justice framework for learning and communicating about structural violence and the intersection of culture, the medication experience, and community health. Utilizing principles of community engagement, we will focus on examining how broader Community Health and the individual Medication Experience are impacted by the overcoming of structural violence experienced by communities locally as well as globally. Using Critical Race Theory and Social Ecological frameworks, we will come to a more complex understanding of our own social locations and the interplay of power and privilege while exploring the root causes of health disparities and the development of solutions that address inequities in health, education, housing, employment, and access to respectful health care. Students will learn to critically analyze these lived experiences while developing interactive storytelling, digital documentaries, digital essays and narratives to advance knowledge on health inequities in our community.

GCC 5013. Making Sense of Climate Change - Science, Art, and Agency.  
(CIV; 3 cr.; A-F only; Periodic Fall & Spring)  
The overarching theme of the course is the role of artistic/humanistic ways of knowing as tools for making sense and meaning in the face of “grand challenges.” Our culture tends to privilege science, and to isolate it from the “purposeful” disciplines--arts and humanities--that help humanity ask and answer difficult questions about what should be done about our grand challenges. In this course, we will examine climate change science, with a particular focus on how climate change is expected to affect key ecological systems such as forests and farms and resources for vital biodiversity such as pollinators. We will study the work of artists who have responded to climate change science through their artistic practice to make sense and meaning of climate change. Finally, students create collaborative public art projects that will become part of local community festivals/events late in the semester.

(TS; 3 cr.; A-F only; Periodic Fall)  
This course seeks solutions to the technological, demographic, and economic forces that challenge taken-for-granted mindsets and existing policies around work, careers, and life. Students will consider positive and negative impacts of the forces that render the conventional education/work/retirement lockstep obsolete. What do these changes mean for men and women of different ages and backgrounds? What are alternative, sustainable ways of working and living in the 21st century? These questions reflect global challenges that touch the lives of people everywhere. Students will work in teams to begin to address these realities and formulate innovative solutions to better transform learning, working, caring, and community-building in the 21st century.

(TS; 3 cr.; A-F only; Periodic Spring)  
How can we build a sustainable society? From designing cities and technologies that use green energy, to health care and agriculture that can sustain billions, the sustainability challenges that face us today are immense. The field of biomimicry seeks solutions to such problems by looking to the diverse ways in which organisms have adapted to varied and sometimes extreme environments. With over 1.3 million described species (and likely over 8 million in existence), chances are a species out there has evolved some solution to a particular problem. But how do we go about figuring out which species this might be? And which trait holds the adaptation in which we are interested? What might be some limitations associated with copying this adaptation? How might we build it on instead? This course teaches bioinspired approaches to sustainability solutions. Throughout the course, students work in teams of complementary expertise to identify a sustainability problem, research a relevant biological system, and build a prototype bio-inspired solution to their focal problem.

(TS; 3 cr.; A-F only; Periodic Spring)  
Before the discovery of antibiotics, even a simple thorn prick could lead to life threatening infection. Antibiotics are truly miracle drugs, making most bacterial infections relatively easy to cure. However, this landscape is rapidly changing with the advent of microbes that are resistant to antibiotics. This course will provide an overview of how antibiotic use invoked antibiotic resistance, including in depth discussions of antibiotic resistant microorganisms and the impact of globalization on this exploding problem. Societal and ethical implications associated with antibiotic use and restriction in humans and animals will be discussed, along with global issues of antibiotic regulation and population surveillance. The class will conclude with discussions of alternative therapeutic approaches that are essential to avoid “antibiotic apocalypse.” The course will include lectures by world-renowned experts in various topics, and students will leverage this knowledge with their own presentations on important topics related to issues of personal freedom versus societal needs.

(GP; 3 cr.; A-F only; Periodic Fall)  
This course provides a multi-disciplinary look at problems (and some of the possible solutions) affecting food production, distribution and requirements for the seven plus billion inhabitants of this planet. It is co-taught by an agronomist (Porter) and an economist (Runge) who together have worked on international food production and policy issues for the past 40 years. Historical context, the present situation and future scenarios related to the human population and food production are examined. Presentations and discussions cover sometimes conflicting views from multiple perspectives on population growth, use of technology, as well as the ethical and cultural values of people in various parts of the world. The global challenge perspective is reflected in attention to issues of poverty, inequality, gender, the legacy of colonialism, and racial and ethnic prejudice. Emphasis is placed on the need for governments, international assistance agencies, international research and extension centers, as well as the private sector to assist in solving the complex problems associated with malnutrition, undernutrition, obesity and sustainable food production. Through a better understanding of world food problems, this course enables students to reflect on the shared sense of responsibility by nations, the international community and ourselves to build and maintain a stronger sense of our roles as historical agents. Throughout the semester students are exposed to issues related to world food problems through the lenses of two instructors from different disciplines.

The core issues of malnutrition and food production are approached simultaneously from a production perspective as well as an economic and policy perspective throughout the semester.

GCC 5020. Ecosystem Health: Challenges at the interface of humans, animals and the environment.  
(ENV; 3 cr.; A-F only; Periodic Spring)  
What are the effects of climate change, disease emergence, food and water security, gender, conflict and poverty, and sustainability of ecosystem services on health? Unfortunately, these large-scale problems often become overwhelming, making single solution-based progress seem daunting and difficult to implement in policy. Fortunately, the emerging discipline of ecosystem health provides an approach to these problems grounded in trans-disciplinary science. Ecosystem health recognizes the interdependence of human, animal and environmental health, and merges
 GCC 5023. Grand Challenge: Leading Across Sectors to Address Grand Challenges. (CIV; 3 cr.; A-F only; Periodic Spring)

"The critical challenges society faces, such as water scarcity, access to education, and the rising cost of healthcare, increasingly require the business, government and nonprofit sectors to work together to create lasting solutions." -- Nick Lovegrove and Matthew Thomas, "Why the World Needs Cross-Sector Leaders," Harvard Business Review, February 13, 2013 Numerous universities, including the University of Minnesota; business leaders; non-profit organizations and policy makers have increasingly emphasized the value and necessity of multisector leadership to address complex and critical challenges. Such collaborative initiatives take place in broader social contexts: have key individual and organizational inputs; and can take many forms, from community task forces to organized collective impact initiatives to social enterprise organizations that blend private-sector incentives with public-service goals. Because they involve a conscious focus on us versus me, and operate largely apart from well-established processes or mission statements, they force us to examine civic life through a new lens to consider ethical questions related to it. This course explores multisector leadership from a variety of perspectives and provides an opportunity for students to work together to apply what they are learning individually and in teams through in-class exercises, peer coaching, and a final team grant proposal project. After an introductory session where students analyze and present answers related to specific case studies, we begin with an overview of relevant shared leadership theories and practice fields --- including collective, participatory and integrative leadership and an overview of relevant ethical questions and themes. We then consider relevant individual inputs into multisector leadership, including through having students assess their own leadership strengths, what they bring to the collaborative table, and contract with assigned interdisciplinary teams for peer coaching throughout the semester. The lens of the course moves to the collaboration itself after this focus on the individual, looking at techniques and qualities of successful teams, including those composed of diverse individuals or organizations. Finally, we move to considering different contexts, forms and specific examples of multisector leadership before concluding with presentations to an external panel of each student team’s grant proposal for a particular multisector initiative of their choosing that they believe will enable transformative action to tackle a significant societal issue and achieve lasting change. Throughout the course, we consider the ethical questions that arise from focusing on multisector leadership. These questions relate, for example, to the role of trust and truth-telling in individual efforts to lead and collaborate; how and when it is appropriate to engage with others to address challenges that extend beyond the communities to which we belong; who defines priority problems to be addressed, and why; the role and potential of business to contribute to broader efforts to achieve public good; how equity and justice relate to collective leadership; and whether and how society is better off from the joining of organizational efforts across sectors.

 GCC 5024. 11 Billion People: How long can the planet sustain humanity?. (ENV; 3 cr.; A-F only; Every Fall)

As an evolved animal, humanity has always interacted with its environment, both through the ecology of its food web and through its modification of its geological surroundings. Yet the human ecological niche, and the breadth of its impact on the environment, has changed enormously through the biological and cultural evolution of our lineage, from our first two-legged ancestor; to the appearance of our own species, Homo sapiens; to the diversification of the hunter-gatherer adaptation at the end of the Pleistocene; to the invention of agriculture and animal husbandry in the Holocene; to the rise of craft specialization, social inequalities, and urbanization with the first state-level societies; and now the globalization of our food, diseases, and culture. Students in this course will explore how the cumulative effects of our biocultural evolution are putting the sustainability of our current population, now approaching 11 billion, at risk, mostly due to the unprecedented scale of humanity’s impact on the Earth’s ecosystems. This course investigates the origins, development, and predictions for humanity’s ecological niche on the planet through a novel interdisciplinary fusion of the social and environmental sciences to give students i) the ability to see the environmental context of the present in an evolutionary light, as well as ii) the tools to evaluate possible remediation and sustainability approaches to control these problems at the local and global scales. The course provides an interdisciplinary immersion in these issues through combined instruction by anthropologists, archaeologists, historians, environmental scientists, ecologists, toxicologists, and sociologists. By focusing on multiple vectors of inquiry (i.e., society, economy, technology, environment) which can be considered at different scales (i.e., from past to present, local to global, individual to societal, temporary to long term), students’ progress through the course will give them powerful tools to confront the Grand Challenges of our age, the Anthropocene.

 GCC 5501. Knowledge to Impact: Creating Action with Your Grand Challenge Project Idea. (3 cr.; A-F only; Periodic Spring)

Do you want to learn how to design viable solutions to address a complex social or environmental challenge? Are you interested in taking a course with other motivated students from across the university who care about being changemakers and being mentored by 15 UMN faculty who will be supporting
the students in the course? This hands-on course will help you learn the skills to develop solutions to a specific problem that you have worked on in a previous GCC course or a similar project-based class. By the end of the course, you will work with a team of students to create a design and implementation plan for a solution that could take many forms, depending on student interest and the nature of the problem (business or nonprofit plans, policy and advocacy plans, media and awareness campaigns and activism plans are all possible). Resources (funding, training and mentors) will be available for students who wish to pursue their idea and take the classroom into implementation. Learn more at gcc.umn.edu. Students should enter the class with a problem statement identifying the challenge they aim to address, a target location or community, and a proposed solution or intervention that they wish to develop. Student teams working on a project are welcomed to enroll in this class together. Student solutions should address a problem that is about a broadly defined Grand Challenge; examples of applicable areas include water, immigration and refugees, energy, housing, achievement gap, public health, food and sustainable agriculture. While it is important to have a project or theme idea to be placed into the appropriate COP, the first part of the class is an examination of student ideas and possible modification of ideas and possible student teams. By the end of class, students will create a plausible design and implementation plan for a solution that addresses their self-created Grand Challenge problem statement. This solution or intervention could take many forms, depending on student interest and problem statement. Business or non-profit plans, policy and advocacy plans, media and awareness, activism plans are all possible. Determining the correct path(s) is part of the learning objectives for the course. prereq: Prior completion of a GCC course

Graphic Design (GDES)

GDES 1311. Foundations: Drawing and Design in Two and Three Dimensions. (4 cr. ; A-F or Audit; Every Fall & Spring) Design elements and principles in context of observational drawing. Integrative approach to two-dimensional design, three-dimensional design, and drawing. Broad conceptual framework for design exploration. Emphasizes perceptual aspects of visual forms.

GDES 1312. Foundations: Color and Design in Two and Three Dimensions. (4 cr. ; A-F or Audit; Every Fall & Spring) Color theory, its application in two- and three-dimensional design. Emphasizes effective use of color by studying traditional color systems, perception, and interaction. Lectures, demonstrations, extensive studio work, and critiques.

GDES 1315. Foundations: The Graphic Studio. (4 cr. ; A-F or Audit; Every Fall & Spring) Graphic design process of problem-solving. Visual communication of ideas and information. Use of design software to compose with words, images, and forms. prereq: Graphic design premajor design minor or instr consent

GDES 2196. Work Experience in Graphic Design. (1-4 cr. [max 8 cr.]; S-N only; Every Fall, Spring & Summer) Supervised work experience in business, industry, or government, related to student’s area of study. Integrative paper or project. prereq: Plan submitted/approved by [adviser, internship supervisor], written approval of supervisor, instr consent

GDES 2342. Web Design. (3 cr. ; A-F only; Every Fall & Spring) Graphic design elements/principles applied to website design. HTML, CSS. Working with interactive media and file formats.

GDES 2345. Typography. (4 cr. ; A-F only; Every Fall & Spring) History of typographic forms, principles of composition, expressive potential of type. Design process from problem-solving through exploration, experimentation, selection, critique, and refinement. Readings, research, exercises, design production.

GDES 2361. Design Process: Photography. (3 cr. ; A-F only; Every Fall & Spring) Photography for graphic designers: digital/film photographic developing/image manipulation, printing.

GDES 2399V. Honors Design and its Discontents: Design, Society, Economy, and Culture. (WI; 3 cr. ; A-F only; Every Fall) Secret history of modern, postmodern, and contemporary design. Principles and practices of designers who operate outside of mainstream. Innovators, activists, cultural gadflies whose work challenges, provokes, and inspires. Context of economy, society, culture, and politics. Lecture, research, studio production. Written project proposals/reflections/blogging.


GDES 3170. Topics in Graphic Design. (1-4 cr. [max 32 cr.]; A-F or Audit; Every Fall, Spring & Summer) In-depth investigation of specific topic.

GDES 3311. Illustration. (3 cr. ; A-F only; Every Spring) Two aspects of illustration for contemporary graphic designer. Image making, by hand or digitally, for use in design projects. Design development. Mapping ideas/expressing thoughts visually. Not observational drawing course. prereq: GDES 1311 or ArtS 1101 or PDES 3702 or LA 1301 or Arch 3250 or Arch 2301 or instructor permission

GDES 3312. Color and Form in Surface Design. (4 cr. ; A-F only; Every Fall & Spring) Use of color/form representation in two-dimensional surface applications. Historical use of color and of spatial representation in visual communication.

GDES 3351. Text and Image. (3 cr. ; A-F or Audit; Every Fall & Spring) Composition of visual information using grid structures to integrate text/image. Informational/expressive aspects of graphic design, hierarchical relationships of visual elements. Methods of text layout that enhance communication. prereq: [2345 or DHA 2345], graphic design major, pass portfolio review

GDES 3352. Identity and Symbols. (3 cr. ; A-F only; Every Fall & Spring) Representation of abstract ideas through symbols. Development of visual identity systems. prereq: pass portfolio review, graphic design major

GDES 3352H. Honors: Identity and Symbols. (3 cr. ; A-F only; Every Fall & Spring) Representation of abstract ideas through symbols. Development of visual identity systems.

GDES 3353. Packaging and Display. (3 cr. ; A-F only; Every Fall & Spring) Application of graphic design principles to three-dimensional projects. Principles of three-dimensional design/space applied to labeling, packaging, and display.

GDES 4131W. History of Graphic Design. (WI; 4 cr. ; A-F or Audit; Every Fall & Spring) Historical analysis of visual communication. Technological, cultural, and aesthetic developments. How historical events are communicated/perceived through graphic presentation/imagery. prereq: Intro history or art history course

GDES 4160H. Honors Capstone Project. (2 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Individualizes honors experience by connecting aspects of major program with special academic interests. prereq: Graphic design honors

GDES 4193. Directed Study in Graphic Design. (1-4 cr. [max 8 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Independent study in Graphic Design under tutorial guidance. prereq: Undergrad, instr consent

GDES 4196. Internship in Graphic Design. (3 cr. ; S-N or Audit; Every Fall, Spring & Summer) Supervised work experience relating activity in business, industry, or government to the student’s area of study. Integrative paper or project may be required. prereq: Completion of at least one-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, instr consent

GDES 4312. Advanced Graphic Design Print Projects. (3 cr. ; A-F or Audit; Every Fall) Advanced Graphic Design Print Projects offers an opportunity for students to propose, design, and produce printed graphic design products while expanding upon their experience in surface design and printing. Students will
explore graphic design communication through group and individualized projects in a cohort, and under the supervision of graphic design faculty.

GDES 4330. Surface Fabric Design Workshop. (4 cr. [max 8 cr.]; A-F or Audit; Every Spring) Studio experience in the development and production of surface design. Screen printing, batik, resist dying, shibori, cyanotypes, and dye transfers are included.

GDES 4345. Advanced Typography. (4 cr.; A-F or Audit; Every Fall, Spring & Summer) Expressive visual communication of words. Fundamental legibility of "invisible art," overt expression through type. Students complete extended typographic project. prereq: [2334 or DHA 2345], 3351, graphic design major or design grad student or instr consent

GDES 4350. Advanced Design Material Topics. (3 cr.; max 6 cr.); A-F or Audit; Every Spring) Letterpress, screen, and relief printing, or bookmaking. Defined but varying range of media expression. Graphic design communication through group/individualized projects in a cohort, under supervision of faculty.

GDES 4361V. Honors Thesis Studio and Writing. (WI; 3 cr.; A-F only; Every Fall & Spring) Research/design of comprehensive graphic design thesis project. prereq: [Graphic design major, 2399W, 3352, 3353] or instr consent

GDES 4361W. Thesis Studio and Writing. (WI; 3 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Research/design of comprehensive graphic design thesis project. prereq: [Graphic design major, 2399W, 3352, 3353] or instr consent

GDES 4362. Senior Thesis and Exhibition. (3 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Design, production, and exhibition of comprehensive graphic design thesis project.

GDES 4362H. Senior Thesis and Exhibition. (3 cr.; A-F only; Every Fall & Spring) Design, production, and exhibition of comprehensive graphic design thesis project.

GDES 4363. Graphic Design Portfolio. (3 cr.; S-N only; Every Fall & Spring) Preparation of professional portfolio. Graphic design thesis exhibition. Professional issues.

GDES 4371. Data Visualization Studio. (3 cr.; A-F only; Every Fall) Visual articulation of data. Expansive research, meticulous gathering of data, analysis. Develop cohesive graphical narratives/build solid foundation in craft of presenting data. prereq: 2345, [Design minors required to take 2345], or graduate student, or instructor's consent

GDES 5193. Directed Study in Graphic Design. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent study in graphic design under tutorial guidance. prereq: Jr or sr or grad student

GDES 5311. Illustration. (3 cr.; A-F only; Every Spring) Image making by hand or digitally for use in design projects. Design development. Mapping out ideas/expressing thoughts visually. Not observational drawing course, prereq: 1311 or ArtS 1101 or PDes 3702 or LA 1301 or Arch 3250 or Arch 2301 or instr consent

GDES 5341. Interactive Design. (3 cr.; A-F or Audit; Every Fall & Spring) Design of interactive multimedia projects. Interactive presentations and electronic publishing. Software includes hypermedia, scripting, digital output. prereq: [2334 or 2342], design minor or graphic design major or grad student or instr consent

GDES 5342. Advanced Web Design. (3 cr.; A-F or Audit; Every Spring) Internet-based design. Static web pages, embedded media, cascading style sheets. Design and usability of interface between humans and technology. Evaluation of visual elements that control and organize dealings with computers to direct work. Students develop designs, do usability testing. prereq: [2334 or 2342], design minor or graphic design major or grad student or instr consent

GDES 5371. Data Visualization Studio. (3 cr.; A-F only; Every Fall) Visual articulation of data. Expansive research, meticulous gathering of data, analysis. Develop cohesive graphical narratives/build solid foundation in craft of presenting data.

GDES 5372. Data Visualization for Interactive Platforms. (3 cr.; A-F only; Every Spring) Skills/tools necessary to process large quantities of information/present them through interactive mediums. Create data visualizations for web utilizing Javascript libraries. Linear/non-linear data-driven narratives.

GDES 5383. Digital Illustration and Animation. (3 cr.; A-F or Audit; Periodic Fall & Spring) Advanced computer design. Integration of design knowledge with Macintosh computer applications. Students use software to create digital illustration and animations. Adobe Illustrator, After Effects, Flash. prereq: [2334 or 2342], design minor, [graphic design major or [grad student, experience with computer illustration]] or instr consent

GDES 5386. Fundamentals of Game Design. (3 cr.; A-F or Audit; Periodic Fall & Spring) Games of all kinds. Theoretical/practical aspects of making games. Investigation of design process. Rules, strategies, methodologies. Interactivity, choice, action, outcome, rules in game design. Social interaction, story telling, meaning/ideology, semiotics. Signs, cultural meaning, prereq: [2334 or 2342], design minor or [4384 or DHA 4384 or 5341 or DHA 5341], [graphic design major or sr or grad student] or instr consent

GDES 5388. Graphic Design Research. (3 cr.; A-F or Audit; Periodic Spring) Experience in Graphic Design research strategies and methods. Applied, theoretical, and human-centered aspects directed at project development. Design prototyping, testing, analysis. prereq: Graphic design major or grad student or instr consent

GDES 8170. Topics in Graphic Design. (1-3 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) In-depth investigation of topic, announced in advance.

GDES 8180. Professional Seminar. (1-2 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring) Professional development issues/trends.

GDES 8192. Readings in Graphic Design. (1-3 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent study, review of books/periodicals under tutorial guidance. prereq: instr consent

GDES 8193. Directed Study. (1-3 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer) Directed study in graphic design. prereq: instr consent

GDES 8222. Plan B Master's Project. (3 cr.; S-N or Audit; Every Fall & Spring) Plan B master's project. prereq: [Design or DHA master's student], instr consent

GDES 8361. Color, Design, and Human Perception. (3 cr.; A-F or Audit; Periodic Fall & Spring) Perceptual and psychological aspects of color and design. Human factors of color variables and design strategies that can enhance human experience of, and interaction with, color. prereq: Basic color theory course or instr consent

GDES 8382. The Nature of Representation in Visual Communication. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theories of representation and studio production (digital, non-digital) centered around representation in culture.

GDES 8990. MFA Creative Thesis. (6 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer) MFA project. prereq: Completed coursework requirements for MFA in DHA w/multimedia emphasis, instr consent

Greek (GRK)

GRK 1001. Beginning Classical Greek I. (5 cr. [Student Option; Every Fall]) Introduction to grammar/vocabulary of classical Greek as written in Athens in 5th/4th centuries BCE. Forms/simple constructions. Some reading of simple, heavily adapted passages from ancient texts.

GRK 1002. Beginning Classical Greek II. (5 cr. : Student Option; Every Spring) Continuation of Greek 1001. More complex constructions, including participles, clauses, indirect discourse. Some reading of adapted passages from ancient texts. prereq: Grade of at least C- or S in 1001 or dept consent

GRK 3003. Intermediate Greek Prose. (4 cr. : Student Option; Every Fall) Introduction to Athenian prose authors of 5th/4th centuries BCE. Readings of continuous
passages of unadapted Greek texts (history, speeches). Review of grammar/vocabulary. Some discussion of major themes/issues in Greek culture as illustrated by texts. prereq: Grade of at least C- or S in 1002 or 5001 or instr consent

**GRK 3004. Intermediate Greek Poetry.** (4 cr.; Student Option; Every Spring)
Introduction to Greek epic poetry. Readings of selections from Homer's Iliad and Odyssey. Quantitative meter and poetic devices. Discussion of major themes and issues as developed in Homer's poetry. prereq: dept consent

**GRK 3993. Directed Studies.** (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. prereq: instr consent

**GRK 4951W. Major Project.** (WI; 4 cr.; A-F only; Every Fall & Spring)
Research project using documents/other sources from ancient world. Students select project in consultation with faculty member, who directs the research/writing. prereq: Greek major, three 3xxx Greek courses, instr consent, dept consent

**GRK 5003. Intermediate Greek Prose for Graduate Student Research.** (4 cr.; Student Option; Every Fall)
Introduction to Athenian prose authors of 5th/4th centuries BCE. Readings of continuous passages of unadapted Greek texts (history, speeches). Review of grammar/vocabulary. Some discussion of major themes/issues in Greek culture as illustrated by texts. prereq: Grade of at least C- or S in [1002 or 5001] or [instr consent, grad student]

**GRK 5004. Intermediate Greek Poetry for Graduate Student Research.** (4 cr.; Student Option; Every Spring)
Introduction to Greek epic poetry. Readings of selections from Homer's Iliad and Odyssey. Quantitative meter and poetic devices. Discussion of major themes and issues as developed in Homer's poetry. prereq: dept consent

**GRK 5100. Advanced Reading.** (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading in Greek texts/authors. Texts/authors vary. prereq: [GRK 3004 or equiv], at least two yrs of college level Greek. Must contact Classical and Near Eastern Studies department for permission to register.

**GRK 5200. Biblical Greek.** (3 cr. [max 6 cr.]; Student Option; Fall Even Year)
Readings from Gospels, epistles of Paul, related literature. Emphasizes proficiency in reading Greek New Testament. Selections vary. prereq: [GRK 3004 or equiv], at least two yrs of college level Greek. Must contact Classical and Near Eastern Studies department for permission to register.

**GRK 5701. Prose Composition.** (3 cr.; Student Option; Spring Odd Year)
Moving step by step through Ancient Greek grammar, starting with simple sentences and progressing to complex ones. Course ends with students translating short passages of modern English prose into Greek. prereq: Grad student or instr consent

**GRK 5705. Introduction to the Historical-Comparative Grammar of Greek and Latin.** (3 cr.; Student Option; Periodic Fall & Spring)
Historical/comparative grammar of Greek and Latin from their Proto-Indo-European origins to classical norms.

**GRK 5800. Sight Reading for Graduate Students.** (1 cr. [max 6 cr.]; S-N only; Every Fall & Spring)
Practice in reading Greek texts at sight. prereq: Enrollment in a grad program in Department of Classical/Near Eastern Studies

**GRK 5993. Directed Studies.** (1-4 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. Prereq Grad student or instr consent.

**GRK 5994. Directed Research.** (1-12 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Supervised original research on topic chosen by student. Prereq Grad student or instr consent.

**GRK 5996. Directed Instruction.** (1-12 cr. [max 20 cr.]; Student Option; Every Fall & Spring)
Supervised teaching internship. Prereq Grad student or instr consent.

**GRK 6100. Readings in Greek Prose.** (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading and discussion of ancient Greek prose texts. prereq: Advanced grad student

**GRK 6120. Greek Text Course.** (3 cr. [max 15 cr.]; Student Option; Every Fall & Spring)
Students attend 3xxx Greek courses. Supplementary work at discretion of instructor. prereq: 3111 or dept consent; not for students in dept of Classical and Near East Studies

**GRK 8200. Readings in Greek Verse.** (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading/discussion of ancient Greek poetic texts. prereq: Advanced grad student

**GRK 8261. Survey of Greek Literature I.** (3 cr.; Student Option;)
Extensive selections from all genres of Greek literature of archaic and early classical periods.

**GRK 8262. Survey of Greek Literature II.** (3 cr.; Student Option;)
Extensive selections from Greek authors of the classical and Hellenistic eras.

**GRK 8300. Readings in Greek Texts.** (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading/discussion of literary or documentary texts from Greek antiquity. Topics may include subjects that draw on various of sources, genres, or methods. prereq: Advanced grad student

**GRK 8400. Readings in Patristic Greek.** (3 cr. [max 6 cr.]; Student Option; Fall Odd Year)
Reading/discussion of early Christian texts in Greek. prereq: Advanced grad student

**GRK 8910. Seminar.** (3 cr. [max 30 cr.]; Student Option; Periodic Fall & Spring)
Various topics in Greek literature examined in depth with emphasis on current scholarship and original student research.

**Health Informatics (HINF)***

**HINF 5115. Interprofessional Healthcare Informatics.** (3 cr.; Student Option; Every Fall, Spring & Summer)
Implications of informatics for practice, including nursing, public health, and healthcare in general. Electronic health record issues. Relates ethical, legislative and political issues informatics. Global and future informatics issues. prereq: Grad student or professional student or instr consent

**HINF 5430. Foundations of Health Informatics I.** (3 cr.; A-F or Audit; Every Fall)
An introductory survey of health informatics, focusing on foundational concepts. Topics covered include: conceptualizations of data, information, and knowledge; current terminologies, coding, and classification systems for medical information; ethics, privacy, and security; systems analysis, process and data modeling; human-computer interaction and data visualization. Lectures, readings, and exercises highlight the intersections of these topics with electronic health record systems and other health information technology. prereq: Junior, senior, grad student, professional student, or instr consent

**HINF 5431. Foundations of Health Informatics II.** (3 cr.; Student Option; Every Spring)
An introductory survey of health informatics, focusing on applications of informatics concepts and technologies. Topics covered include: health informatics research, literature, and evaluation; precision medicine; decision models; computerized decision support systems; data mining, natural language processing, social media, rule-based system, and other emerging technologies for supporting ‘Big Data’ applications; security for health care information handling. Lectures, readings, and exercises highlight the intersections of these topics with current information technology for clinical care and research. prereq: Junior, senior, grad student, professional student, or instr consent

**HINF 5436. AHC Informatics Grand Rounds.** (1 cr. [max 10 cr.]; S-N or Audit; Every Fall & Spring)
Presentation/discussion of research problems, current literature/topics of interest in Health Informatics.

**HINF 5440. Foundations of Translational Bioinformatics.** (3 cr.; A-F or Audit; Every Fall)
Translational bioinformatics deals with the assaying, computational analysis and knowledge-based interpretation of complex molecular data to better understand, prevent, diagnose and treat disease. This course emphasizes deep DNA sequencing methods that have persistent impact on research related to disease diagnosis and treatment.
The course covers sequence analysis, applications to genome sequences, and sequence-function analysis, analysis of modern genomic data, sequence analysis for gene expression, functional genomics analysis, and gene mapping/applied population genetics. Prerequisites: MS, PhD, or MD/PhD student interested in translational bioinformatics

HINF 5450. Foundations of Precision Medicine Informatics. (3 cr.; Student Option; Every Fall)
The course will provide an introduction into the fundamental concepts of Precision Medicine with a focus on informatics-focused applications for clinical data representation, acquisition, decision making and outcomes evaluation. The student will gain an appreciation of fundamental biomedical data representation and its application to genomic, clinical, and population problems.

HINF 5454. Topics in Health Informatics. (3 cr. max 9 cr.; Student Option; Periodic Fall & Spring)
Topics in health informatics. prereq: Professional student or grad student or instr consent

HINF 5496. Internship in Health Informatics. (1-6 cr. max 18 cr.; S-N or Audit; Every Fall, Spring & Summer)
Practical industrial experience not directly related to student's normal academic experience. prereq: HINF student or instr consent

HINF 5499. Capstone Project for the Masters of Health Informatics. (3 cr.; A-F only; Every Fall, Spring & Summer)
Final opportunity to apply newly acquired knowledge/skills to project involving practical problem in health informatics. Submit written project report in lieu of final examination. prereq: second semester MHI student or instr consent

HINF 5501. US Health Care System: Information Challenges in Clinical Care. (1 cr.; S-N or Audit; Every Fall & Spring)
Health care system/its unique interaction between key health system stakeholders. Relationship between patients, providers, payers, regulatory bodies. Role of information management/functions in information standardization/exchange. prereq: Junior or senior or professional student or grad student or instr consent

HINF 5502. Python Programming Essentials for the Health Sciences. (1 cr.; S-N or Audit; Every Fall & Spring)
Computer programming essentials for health sciences/health care applications using Python 3. Intended for students with limited programming background, or students wishing to obtain proficiency in Python programming language. prereq: Junior or senior or grad student or professional student or instr consent

HINF 5510. Applied Health Care Databases: Database Principles and Data Evaluation. (3 cr.; A-F or Audit; Every Fall)
Principles of database theory, modeling, design, and manipulation of databases will be introduced, taught with a healthcare applications emphasis. Students will gain experience using a relational database management system (RDBMS), and database manipulation will be explored using Structured Query Language (SQL) to compose and execute queries. Students will be able to critically evaluate database query methods and results, and understand their implications for health care. prereq: Junior or senior or grad student or professional student or instr consent

HINF 5520. Informatics Methods for Health Care Quality, Outcomes, and Patient Safety. (2 cr.; A-F or Audit; Every Fall & Spring)
Application/operation of clinical information systems, electronic health records, decision support/application in health care system. Use of clinical information systems/association with health care delivery, payment, quality, outcomes. prereq: Junior or senior or grad student or professional student or instr consent

HINF 5530. Health Care Software Management. (2 cr.; A-F or Audit; Every Spring)
Health care software and unique interaction between key stakeholders in health care software development and implementation. Systems analysis, software development, and software life cycle management for health care applications. prereq: HINF student or instr consent

HINF 5531. Health Data Analytics and Data Science. (3 cr.; A-F or Audit; Every Spring)
Data science methods and techniques for the extraction, preparation, and use of health data in decision making, prereq: Junior or senior or professional student or grad student or instr consent

HINF 5540. Advanced Translational Bioinformatics Methods. (3 cr.; A-F or Audit; Every Spring)
This course is designed to introduce the high throughput platforms to students who are interested in the genomics research and genomics data analysis in the basic and clinical medical science field. The course covers history of the genomics platforms, its revolution and the specifics of the data generated by all existing different platforms. The course will also introduce all existing sequencing platforms and applications to biological science, as well as the changes in this field.

HINF 5550. Clinical Data Mining. (3 cr.; A-F or Audit; Every Fall)
This is a hands-on introductory data mining course specifically focusing on health care applications. Analogously to the relationship between biostatistics and statistics, the data and computational challenges, the experimental design and the model performance requirements towards data mining in the clinical domain differ from those in general applications. This course aims to teach the students the most common data mining techniques and elaborate on the differences between general and clinical data mining. Specifically, the course will focus on (i) clinical data challenges and preprocessing; (ii) survey of the most common techniques in the clinical domain; (iii) clinical application touching up on experimental design and collaborations with physicians. The class will meet twice a week, one day dedicated to lectures and one day to a hands-on lab component, where students are expected to apply the techniques to health-related data. Some of the models will be evaluated with the involvement of a physician collaborator. Prerequisites: Basic linear algebra (matrix notation), basic optimization (gradient descent) Graduate level introductory statistics (e.g. STAT 5101-5102) or equivalent or instructor consent

HINF 5560. Integrative Genomics and Computational Methods. (3 cr.; A-F or Audit; Every Spring)
Genome-scale high throughput data sets are a central feature of modern biological research and translational clinical study. Experimental, computational biologists and clinical researchers who want to get the most from their data sets need to have a firm grasp and understanding of genomic data structure characteristics, analytical methodology and the intrinsic connection to integrate. This course is
designed to build competence in quantitative methods for the analysis of high-throughput genomic data and data integration.

HINF 8220. Computational Causal Analytics. (3 cr.; A-F or Audit; Every Fall) Identifying causal relationships and mechanisms is the ultimate goal of natural sciences. This course will introduce concepts and techniques underlying computational causal discovery and causal inference utilizing both observational and experimental data. Example applications of the above mentioned techniques in the domain of health sciences include reconstructing the molecular pathways underlying a particular disease, identifying the complex and interacting factors influencing a mental health disorder, and evaluating the potential impact of a public health policy. The course emphasizes both on the theoretical foundations and the practical aspects of causal discovery and causal inference. Students will gain hands-on experience with applying major causal discovery algorithms on simulated and real data.

HINF 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

HINF 8405. Advanced Topics in Health Informatics I. (1-4 cr.; Max 12 cr.) Student Option; Every Fall) Topics may include computer systems design for health sciences, small computer concepts/use, computers for clinical services, computer-aided medical decision making, biomedical image processing, pattern recognition, data mining. Case studies from health sciences. prereq: Professional student or grad student or instr consent

HINF 8406. Advanced Topics in Health Informatics II. (1-4 cr.; Max 12 cr.) Student Option; Every Spring) This is a topics course. Topics may include, computational causal discovery for health sciences, computer systems design for health sciences, small computer concepts and use, computers for clinical services, computer-aided medical decision making, biomedical image processing, and pattern recognition. Case studies from health sciences.

HINF 8430. Foundations of Health Informatics I Lab. (2 cr.; A-F or Audit; Every Fall) The PhD-level lab complement for an introductory survey of health informatics, focusing on applications of informatics concepts and technologies. Topics covered include: health information research, literature, and evaluation; precision medicine; decision models; computerized decision support systems; data mining, natural language processing, social media, rule-based system, and other emerging technologies for supporting ‘Big Data’ applications; security for health care information handling. Lectures, readings, and exercises highlight the intersections of these topics with current information technology for clinical care and research.

HINF 8434. Medical Decision Support Techniques. (3 cr.; A-F or Audit; Every Fall & Spring) Examines systems based on statistical and logical approaches to decision making that include statistical prediction, rule-based systems, case-based reasoning, quantitative reasoning, and neural networks, and issues related to their use. prereq: 5432 or instr consent

HINF 8440. Foundations of Translational Bioinformatics Lab. (2 cr.; A-F or Audit; Every Fall) Translational bioinformatics deals with the assaying, computational analysis and knowledge-based interpretation of complex molecular data to better understand, prevent, diagnose and treat disease. This course emphasizes deep DNA sequencing methods that have persistent impact on research related to disease diagnosis and treatment. The course covers sequence analysis, applications to genome sequences, and sequence-function analysis, analysis of modern genomic data, sequence analysis for gene expression/functional genomics analysis, and gene mapping/applied population genetics. Prerequisites: MS, PhD, or MD/PhD student interested in translational bioinformatics

HINF 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

HINF 8446. Professional Studies in Health Informatics. (1-2 cr.; A-F or Audit; Every Fall & Spring) Health informatics as a profession, including discipline, responsibilities, resources, and job opportunities. Directed experiences in consulting, teaching, writing, conducting research, and managing facilities. prereq: 5431, PUBH 5452 or instr consent, grad hith inf major

HINF 8492. Advanced Readings or Research in Health Informatics. (1-6 cr.; Max 24 cr.) Student Option No Audit; Every Fall, Spring & Summer) Directed readings or research in topics of current or theoretical interest in healthinformatics. prereq: HINF student or instr consent

HINF 8494. Research in Health Informatics. (1-6 cr.; A-F or Audit; Every Fall, Spring & Summer)

Directed research under faculty guidance. prereq: instr consent

HINF 8525. Health Informatics Teaching. (2 cr.; A-F only; Spring Even Year) Use selected teaching techniques to assist in the delivery of course content in health informatics curriculum. Work with a professor who is the course director. From evaluation and feedback on their teaching technique, students develop a teaching philosophy as a final course project. prereq: HINF student or instr consent

HINF 8535. Advanced Health Informatics Research Methods. (3 cr.; A-F only; Spring Even Year) Application of research methods, evaluation. Design, data collection, and data analysis in the context of health informatics, including computational and health data challenges. prereq: HINF student or instr consent

HINF 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; Max 12 cr.) No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

HINF 8770. Plan B Project. (4 cr.; No Grade Associated; Every Fall, Spring & Summer) Research project. Topic arranged between student/instructor. Written report required. prereq: Advanced plan B MS student

HINF 8777. Thesis Credits: Master's. (1-18 cr.; Max 50 cr.) No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

HINF 8888. Thesis Credit: Doctoral. (1-24 cr.; Max 100 cr.) No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: PhD candidate or department consent. Max 18 credits per semester; 24 credits required

Health Services Management (HSM)

HSM 3051. Career Skills in a Professional Health Services Environment. (2 cr.; A-F or Audit; Every Fall & Spring) This course is a requirement in the Bachelor of Applied Science major in Health Services Management. It can also be elective for HSM minor and certificate students, with adviser permission. Its overall goal is to enable students to apply concepts and skills gained in the Health Services Management program and contribute their knowledge of best practices to make a positive impact on the health services management workplace and industry. To successfully complete this class, students will create a career interest statement, resume, cover letter, and LinkedIn profile. They will also apply to at least one health services-related internship or work position, participate in

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu. 296
networking opportunities, and create an action plan to successfully obtain an HSM internship and enroll in HSM 4596. Prerequisites: HSM major or premajor; WRIT 1301 or 1401 or equivalent; HSM 5521; HSM 4561.

HSM 3521. Health Care Delivery Systems. (3 cr. ; A-F or Audit; Every Fall) Health care (HC) delivery systems, health economics, third-party/public reimbursement, current trends in HC organizations/management/administration. Regulations, standards, quality assurance, accreditation, current ethical issues. Implications for HC providers/professionals, patients/families, communities, international health. prereq: 30 cr

HSM 4043. Project and Program Management in Health Services Management. (3 cr. ; A-F or Audit; Every Fall) This is a hands-on course aimed at providing a practical, holistic perspective on the complexities of evidence-based project and program management within the health care organization. It describes the nature of health care projects, characteristics of project teams, and relevant trends in health care. You will familiarize with multiple project management tools, including Microsoft Project, as well as the necessary leadership, facilitation, and team skills. You will be exposed to case studies, examples, discussions, and readings on the disciplines and tools that professional health care project managers use. Upon completion of this course, you will have experienced the activities required to initiate, plan, execute, monitor, control, and close a successful health care project. Prerequisites: None

HSM 4065. Information Privacy and Security in Health Services Management. (TS; 3 cr. ; A-F or Audit; Every Fall & Spring) Developing and implementing a security and privacy program in a health care environment. Privacy and security from societal, health care operations, and regulatory perspectives. Final project uses resources in the public domain to design a security and privacy program that supports regulatory compliance requirements and that considers customer/patient concerns and experience, health care provider experience and workflows, operational workflows, and regulatory compliance. Topics include importance of security in health care; risk concepts and value of health information, usability, and security/privacy; federal and state regulations; impact of technology on security; health care operations; what can be learned from other industries; security certifications; and breach response.

HSM 4193. Directed Study. (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent project. Topic arranged with and supervised by Health Services Management faculty member. prereq: admitted to HSM major, minor, or certificate; department consent.

HSM 4301. Health Care Quality & Patient Safety Management. (3 cr. ; A-F or Audit; Every Spring) Principles of health care improvement, quality, and patient safety management from the role of the manager and project leadership in health services management. Overall the course is designed to provide an understanding of the concepts and principles of quality management and tools, patient safety, and related quality and safety management accreditation and regulatory requirements. The course will use an applied, real-world approach to ensure understanding of these important issues in health services management.

HSM 4531. Human Resources in Health Care Settings. (3 cr. ; A-F or Audit; Every Fall & Spring) Basic understanding of human resources issues within health care organizations—management of human capital to meet organizational objectives, and building and motivating an engaged workforce. Legal principles; labor supply and demand; sourcing, recruitment, selection and orientation; compensation; benefits; diversity; performance management. prereq: 45 cr

HSM 4541. Health Care Finance. (3 cr. ; A-F or Audit; Every Fall & Spring) General principles of financial management for the health care industry. Operational knowledge of financial management theory, esp., how hospitals and their departments develop/ balance operating/capital budget for business growth/development. Governmental procedures, and ethical issues controlling the health care industry. prereq: Basic accounting knowledge, a course such as ACCT 2050, and knowledge of Microsoft Excel are strongly recommended. HSM pre-majors should wait for major status to take this course.

HSM 4541W. Health Care Administration and Management. (WI; 3 cr. ; A-F or Audit; Every Fall & Spring) Knowledge and skills in the organizational and managerial aspects of health care. Applications of behavioral and organizational theory to health care settings. Topics will include organizational models, supervision, employee evaluation, problem solving, productivity management, group leadership, and case studies. As a Writing Intensive course, it will provide management-level communication skills to develop a thoughtful and reflective understanding of the writing (and rewriting) process.

HSM 4575. Innovation in Health Services. (3 cr. ; A-F or Audit; Every Fall) This interactive course will help you understand the theory and practical application of innovation to solve big challenges in the health care system. You will learn and apply multiple approaches and tools for innovation and human-centered design to reshape organizational culture, strategy, structures, and systems.

HSM 4582. Practicum in Long Term Care. (4 cr. ; A-F or Audit; Every Fall, Spring & Summer) The Practicum course is the final component of the long term care administrator's education. A broad range of performance parameters are affected by management practices (e.g., employee morale, clinical processes, financial performance, regulatory compliance, quality of life for residents, customer satisfaction, and community/public relations). The course is a transition between the classroom and this executive level of management. Students will undertake a formal practicum project that must be coordinated with 1) the practicum site, 2) a preceptor who is a licensed nursing home administrator at the sponsoring organization, and 3) the course instructor. The intern is expected to make positive contributions to the sponsoring organization. The preceptor functions as a mentor, coach, and tutor. The intern identifies learning objectives and opportunities to meet both short-range goals for gaining work experience and long-range goals for career development through the development of a learning agreement. prereqs: Most prelicensure courses completed—at a minimum, HSM 4580-LTC Organizational Management; HSM 4589-LTC Human Resource Management; HSM 4583-LTC Supports and Services; HSM 4590-LTC Gerontology for Health Care Managers.

HSM 4583. Long Term Care Supports and Services. (2 cr. ; A-F or Audit; Every Spring) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure to complete accredited postsecondary academic courses covering key competencies. This course covers the organization, operations, functions, services, and programs of long-term care and supports and services, including the following: governing and oversight bodies and their relationship to the administrator; administrative responsibilities and structures; operations and functions of each facility department; functions and roles of professional and nonprofessional staff and consulting personnel. Prerequisites: Some basic knowledge of the long-term care field. Students without this knowledge are encouraged to meet with the instructor to explore preparation strategies.

HSM 4584. Health Care and Medical Needs of the Elderly. (1 cr. ; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota's regulatory requirements for experience or certification) to complete accredited post-secondary academic courses covering key competencies. This course covers the medical and health needs of nursing facility residents and persons living in community-based settings. Topics include: How anatomic and physiologic changes associated with the aging process affect disease processes and clinical needs. Impact and management of common syndromes associated with aging, including vision/hearing impairment, nutrition/malnutrition, and balance and mobility impairment. Prevention and management of common conditions such as pressure ulcers and delirium. Common psychiatric and neurodegenerative disorders such as dementias (including Alzheimer's), depression, anxiety, psychotic disorders, and alcohol and drug abuse. Advance care planning and the
role of palliative care and end-of-life care. Basic medical and pharmacological terminology. Innovative medical trends and emergent technologies used in long-term care settings. Prerequisite: Basic knowledge of the long-term care field. Students who do not have this knowledge are encouraged to meet with the instructor to discuss strategies for obtaining it prior to registering for this course.

HSM 4585. Long Term Care Organizational Management. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited postsecondary academic courses covering key competencies. HSM 4585 covers the following basic management functions: planning and objective setting; organizing and delegating; and observing, monitoring, and evaluating outcomes. Prereq: Basic knowledge of the long-term care field. Students without this knowledge are encouraged to consult with the instructor prior to registering to explore preparatory strategies.

HSM 4587. Long Term Care Regulatory Management. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited postsecondary academic courses covering key competencies. This course is one of those areas. It covers regulatory and funding provisions and requirements governing operation of long-term care services and related health care programs. Topics include Resident rights, resident choice/resident risk and protection from maltreatment; Guardianship and conservatorship; Health and safety codes including OSHA and National Life Safety Code; Medicare and Medicaid, standards for managed care and sub-acute care, and third-party payer requirements and reimbursement; Federal and state nursing home survey and compliance regulations and processes; Requirements affecting the quality of care and life of residents; Resident acuity and assessment methodology; Quality assurance and performance improvement. Prereq: Basic knowledge of the long-term care field. Students without this knowledge are encouraged to meet with the instructor prior to registering to discuss options.

HSM 4588. Long Term Care Quality Management and Performance Improvement. (2 cr.; A-F or Audit; Every Fall) This course integrates competencies, knowledge from three interrelated areas to support evidence-based management decision making in long term care. These areas include 1) problem-solving skills, 2) quality management and quality improvement practices, and 3) data analytics. Classwork consists of preclass readings, online preclass discussion, face-to-face one-day seminar, one-day comprehensive Excel homework assignment, and homework assignments. Prerequisites: Basic knowledge of the long term care field. Students without this knowledge are encouraged to meet with the instructor prior to registering to discuss ways of acquiring it. Skill with Excel is strongly recommended.

HSM 4589. Long Term Care Human Resources Management. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited post-secondary academic courses covering key competencies. Human Resource Management covers the following areas: Workplace culture, accountability and ethics, and just & learning culture concepts. Employment law. Equal employment opportunity, affirmative action and workforce diversity. Staffing and workforce development. Compensation and benefits. Coaching and performance management. Organizational development and staff training and development. Labor relations, including union contract negotiation and administration. Prerequisites: Knowledge of the long-term care field. Students without this knowledge are encouraged to meet with the director of the LTC program prior to registering to discuss strategies for acquiring it.

HSM 4591. Health Care Law and Ethics. (3 cr.; A-F or Audit; Every Fall & Spring) Introduction to the major legal and ethical aspects and principles as applied in health services management. Topics include organization and governance of healthcare organizations; regulation; healthcare fraud and abuse; professional licensing and credentialing; compliance, quality and risk management; privacy and security of individually identifiable health information; healthcare decision-making; professional liability and malpractice. Other topics include legal and ethical issues surrounding healthcare technologies, medical research, and medical breakthroughs.

HSM 4592. Long Term Care Health Care Law. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited post-secondary academic courses covering key competencies. HSM 4592 covers legal and regulatory issues, ethical perspectives, public policy advocacy and professional reporting requirements related to the operation of long-term care service delivery organizations. The following topics are covered: Professional and biomedical ethics; Liability, negligence, and malpractice; Data confidentiality, privacy and practices; Professional licensing, certification and reporting for staff and consulting personnel; and Advocacy for public policies. Prerequisites: Knowledge of the long-term care field. Students who do not have this knowledge are encouraged to meet with the instructor prior to registering to discuss strategies for gaining this knowledge.

HSM 4593. Gerontology for Health Care Managers. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited post-secondary academic courses covering key competencies. This course covers the requirement related to Gerontology. HSM 4593 covers the following: Issues of cultural diversity and human relationships between and among employees and residents of nursing facilities and their family members. Physical, biological, social and psychological aspects of the aging process. Policies and programs designed to meet the needs of a rapidly aging population. Therapeutic programs for individuals with cognitive impairments. Services to support the needs of family caregivers. Prerequisites: Knowledge of the long-term care field. Students without this knowledge are encouraged to meet with the instructor prior to registering to discuss strategies for acquiring it.

HSM 4596. Health Services Management Internship. (3 cr. [max 9 cr.]; A-F only; Every Fall, Spring & Summer) Students will apply coursework and contribute knowledge of best practices through hands-on experience in a professional health services setting. Prereq: HSM major, minor, or cert student; dept. consent; HSM 3521, HSM 4531, HSM 4541, HSM 4561, HSM 4591 (and ABus 3301 and HINF 5430 for HSM technology internships)

HSM 4597. Long Term Care Organizational Management. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited post-secondary academic courses covering key competencies. This course is one of those areas. It covers regulatory and funding provisions and requirements governing operation of long-term care services and related health care programs. Topics include Resident rights, resident choice/resident risk and protection from maltreatment; Guardianship and conservatorship; Health and safety codes including OSHA and National Life Safety Code; Medicare and Medicaid, standards for managed care and sub-acute care, and third-party payer requirements and reimbursement; Federal and state nursing home survey and compliance regulations and processes; Requirements affecting the quality of care and life of residents; Resident acuity and assessment methodology; Quality assurance and performance improvement. Prereq: Basic knowledge of the long-term care field. Students without this knowledge are encouraged to meet with the instructor prior to registering to discuss options.

HSM 4598. Long Term Care Quality Management and Performance Improvement. (2 cr.; A-F or Audit; Every Fall) This course integrates competencies, knowledge from three interrelated areas to support evidence-based management decision making in long term care. These areas include 1) problem-solving skills, 2) quality management and quality improvement practices, and 3) data analytics. Classwork consists of preclass readings, online preclass discussion, face-to-face one-day seminar, one-day comprehensive Excel homework assignment, and homework assignments. Prerequisites: Basic knowledge of the long term care field. Students without this knowledge are encouraged to meet with the instructor prior to registering to discuss ways of acquiring it. Skill with Excel is strongly recommended.

HSM 4599. Gerontology for Health Care Managers. (1 cr.; A-F or Audit; Every Fall) The Minnesota Board of Examiners for Nursing Home Administrators (BENHA) requires applicants for initial licensure (and those who are licensed in other states but do not meet Minnesota’s regulatory requirements for experience or certification) to complete accredited post-secondary academic courses covering key competencies. This course covers the requirement related to Gerontology. HSM 4599 covers the following: Issues of cultural diversity and human relationships between and among employees and residents of nursing facilities and their family members. Physical, biological, social and psychological aspects of the aging process. Policies and programs designed to meet the needs of a rapidly aging population. Therapeutic programs for individuals with cognitive impairments. Services to support the needs of family caregivers. Prerequisites: Knowledge of the long-term care field. Students without this knowledge are encouraged to meet with the instructor prior to registering to discuss strategies for acquiring it.

HSM 4601. Leadership and Business Planning in Health Care: Capstone. (3 cr.; A-F only; Every Fall & Spring) The course is a core requirement in the HSM major and allows students to synthesize and integrate lessons from previous courses. It covers theory and practice of leadership skills needed for high-performing health care organizations in changing and turbulent times. It emphasizes a four-phase approach: environmental assessment, planning, strategy and innovation, and implementation/ measurement. Students will be prepared to embrace innovation and lead business plans through to successful implementation. They will learn to integrate a wide range of management tools through collaborative development of a strategic business plan. Prereq: HSM 3521, HSM 4531, HSM 4541, HSM 4561, HSM 4591 (and ABus 3301 and HINF 5430 for HSM technology internships)

Hebrew (HEBR)

HEBR 1001. Beginning Hebrew I. (5 cr.; Student Option; Every Fall) For beginners whose goal is biblical or post-biblical Jewish studies or modern Israeli Hebrew. Leads to speaking, listening
HEBR 1002. Beginning Biblical Hebrew I. (; 5 cr.; Student Option; Periodic Fall & Spring)
Basic grammar and syntax preparatory to reading simple narrative texts in the Bible. Presentation and discussion of multiple approaches to problems and issues in biblical scholarship.

HEBR 1002. Beginning Biblical Hebrew II. (; 5 cr.; Student Option; Spring Even Year)
Continuation of 1001. Leads to speaking, listening comprehension, reading, and writing Hebrew. Emphasizes communication proficiency. Cultural materials. prerequisites: Grade of at least [C- or S] in [1001 or 4001] or instr consent

HEBR 1101. Beginning Biblical Hebrew I. (; 5 cr.; Student Option; Periodic Fall & Spring)
Basic grammar and syntax preparatory to reading simple narrative texts in the Bible. Presentation and discussion of multiple approaches to problems and issues in biblical scholarship.

HEBR 1102. Beginning Biblical Hebrew II. (; 5 cr.; Student Option; Spring Even Year)
Continuation of 1001. Leads to speaking, listening comprehension, reading, and writing Hebrew. Emphasizes communication proficiency. Cultural materials. prerequisites: Grade of at least [C- or S] in [1001 or 4014] or instr consent

HEBR 3011. Intermediate Hebrew I. (; 5 cr.; Student Option; Every Fall)
Prepares students for CLA language requirement. Speaking, reading, writing, and comprehension of modern Hebrew. Students read/discuss prose, poetry, news, and film. Important features of biblical/classical Hebrew. Taught primarily in Hebrew. prerequisites: Grade of at least [C- or S] in [1002 or 4002] or instr consent

HEBR 3012. Intermediate Hebrew II. (; 5 cr.; Student Option; Every Spring)
Extensive reading of simplified modern Hebrew prose selections. Students discuss poetry, newspaper, film, and TV in Hebrew. Israeli cultural experiences. Hone composition, listening comprehension, and speaking skills to prepare for proficiency exams. Biblical prose, simple poetic texts. Taught in Hebrew. Meets with 4012. prerequisites: Grade of at least [C- or S] in 3011 or instr consent

HEBR 3090. Advanced Modern Hebrew. (; 3 cr. [max 18 cr.]; Student Option; Every Fall)
Preparation to read various kinds of authentic Hebrew texts and to develop higher levels of comprehension/speaking. Conducted entirely in Hebrew. Emphasizes Modern Israeli Hebrew. Introduction to earlier genres. Grammar, widening vocabulary. Contemporary short fiction, essays, articles on cultural topics, films, Hebrew Internet sites, TV. prerequisites: 3012 or instr consent

HEBR 3101. Intermediate Biblical Hebrew I. (; 4 cr.; Student Option; Fall Odd Year)
Text of Hebrew Bible. Basic research tools/ commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 4107. prerequisites: Grade of at least [C- or S] in 3101 or instr consent

HEBR 3102. Intermediate Biblical Hebrew II. (; 4 cr.; Student Option; Spring Odd Year)
Text of Hebrew Bible. Basic research tools and commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 4107. prerequisites: Grade of at least [C- or S] in 3101 or instr consent

HEBR 3951W. Major Project. (Wt; 4 cr.; Student Option; Every Fall & Spring)
Research project using primary and secondary sources. Students select project in consultation with a faculty member, who directs the research/writing, prerequisites: [Hebr major, three three Hebrew courses], instr consent, dept consent

HEBR 3960. Directed Instruction. (1-4 cr.; Student Option; Every Fall & Spring)
Guided individual research or study. prerequisites: instr consent

HEBR 4001. Beginning Hebrew I for Graduate Student Research. (; 5 cr.; Student Option; Every Fall)
For beginners whose goal is biblical or post-biblical Jewish studies or modern Israeli Hebrew. Leads to speaking, listening comprehension, and reading and writing Hebrew. Emphasizes communication proficiency. Cultural materials are incorporated. Meets concurrently with 1001. prerequisites: grad student

HEBR 4002. Beginning Hebrew II for Graduate Student Research. (; 5 cr.; Student Option; Every Fall)
Prepares students for CLA language requirement. Speaking, reading, writing, and comprehension of modern Hebrew. Students read/discuss prose, poetry, news, and film. Taught primarily in Hebrew. prerequisites: Grade of at least [C- or S] in [1001 or 4001] or instr consent

HEBR 4105. Beginning Biblical Hebrew II. (; 4 cr.; Student Option; Fall Even Year)
Multiple approaches to problems and issues in biblical scholarship. Meets with 1102. prerequisites: Grade of at least [C- or S] in [1101 or 4104] or instr consent

HEBR 4106. Intermediate Biblical Hebrew I. (; 3 cr.; Student Option; Every Fall)
Text of Hebrew Bible. Basic research tools/ commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 3101. prerequisites: Grade of at least [C- or S] in [1102 or 4105] or instr consent

HEBR 4107. Intermediate Biblical Hebrew II for Graduate Student Research. (; 4 cr.; Student Option; Spring Odd Year)
Text of Hebrew Bible. Basic research tools and commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 3102. prerequisites: Grade of at least [C- or S] in 3101 or instr consent

HEBR 5090. Advanced Modern Hebrew. (; 3 cr. [max 18 cr.]; Student Option; Every Fall)

HEBR 5200. Advanced Classical Hebrew. (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
In-depth reading, analysis, and discussion of classical Hebrew texts. Grammar, syntax. Introduction to text-criticism, history of scholarship, and scholarly tools. Format varies between survey of themes (e.g., law, wisdom, poetry) and extended concentration upon specific classical texts.

HEBR 5300. Post-Biblical Hebrew: Second Temple Period. (; 3 cr. [max 18 cr.]; Student Option; Periodic Spring)
Readings in late-/post-biblical Hebrew literature of Persian, Hellenistic, and early Roman periods (e.g., Chronicles, Ezra-Nehemiah, Ecclesiastes, Daniel, Dead Sea Scrolls, apocrypha, pseudopigrapha). Focuses on historical development of Hebrew language and literature in relation to earlier biblical sources. prerequisites: Grad student or instr consent

HEBR 5990. Topics in Hebrew Studies. (; 1-4 cr. [max 12 cr.]; Student Option; Periodic Fall)
Historical, linguistic, literary, religious, or humanistic study of Hebrew society/culture. Approach/method of study varies with topic. prerequisites: Grad student or instr consent

HEBR 5992. Directed Readings. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

Guided individual reading or study. Prereq instr consent, dept consent, college consent.

Heritage Studies & Public Hist (HSPH)

HSPH 8001. Who Owns the Past? Common Concerns and Big Questions in Heritage and Public History. (3 cr.; A-F or Audit; Every Fall) Course offers a survey through case studies of the common concerns, concepts and ethics of heritage and public history. Students will learn about the history and social contexts of heritage studies and public history, the stakes and stakeholders, and the conflicts and positive interventions that can be made through the work of these affiliated professions.

HSPH 8002. Core Practices in Heritage Studies and Public History. (3 cr.; A-F or Audit; Every Fall) Course is open to all Heritage Studies and Public History (HSPH) graduate students. DGS or Instructor permission required for others. Course offers a survey of how heritage and public history concern and ethics are embedded into practice. Through illustrated lectures, case studies, field trips, readings and class discussion, students will learn about the professional practice of heritage studies and public history, how approaches to practice are aligned to institutional mission, customization of programs for diverse audiences, and professional evaluation and management of financial resources.

HSPH 8003. Race and Indigeneity in Heritage Representation. (3 cr.; A-F or Audit; Every Spring) This seminar will explore the changes in how diversity has been represented in historical interpretations in the past, and how practice is changing in response to the contemporary and anticipated social context of the United States. “Diversity” has historically been assumed to derive from categories such as race or culture, concepts constructed in the discipline of anthropology but taken up as the foundation for typologies in other arenas such as art history, architectural history, museums, and public policy. What is problematic in such an approach? What happens to communities defined by shared history, political sovereignty, and disenfranchisement? What are the implications beyond museums for those communities? Finally, how can we think differently about diversity without re-inscribing harmful constructions of difference?

HSPH 8004. Capstone in Heritage Studies and Public History. (3 cr.; A-F or Audit; Every Spring) This course will operate as a workshop, drawing together a cohort of students, working individually or as part of a team, to craft independent heritage studies and public history research projects under the supervision of a faculty instructor. Projects may be based in archival research, public exhibitions, archaeology, material culture studies and preservation, architecture and preservation, or landscape studies. Consistent with the values of the program, projects shall have multidisciplinary perspectives, broadly consider aspects of diversity, and will be accountable to some stakeholder(s) identified by the students.

HSPH 8005. Leadership and Future of Historical Organizations. (1 cr. [max 5 cr.]; S-N only; Every Fall & Spring) This course will operate as a series of lectures and discussions in which leaders of historical organizations explain how they are navigating major changes and challenges associated with their professional practice. Speakers in this course will be invited and organized by the instructor in coordination with HSPH faculty and colleagues at the Minnesota Historical Society. Topics to be presented by speakers may include: making history accessible and meaningful to increasingly diverse audiences; interpreting difficult or traumatic histories; gathering, storing, and providing access to physical collections in a digital age; engaging the public in historical research and interpretation; the financial management and leadership of historical organizations. The course has several objectives: students will learn from, and have the opportunity to meet, leaders of historical organizations located throughout Minnesota and the United States; it will also be a cohort-building opportunity as students in the first and second years of the program meet regularly in this course to hear from professional practitioners and discuss presentations and readings.

HSPH 8006. Digital Methods for Heritage Studies & Public History. (3 cr.; Student Option; Every Fall) Digital technologies are significantly altering the speed and scale of the foundational methodologies of archeology, history, and preservation. Moreover, they are shifting the way the public engages with the past in cultural institutions and across the myriad screens that pervade their daily life. In this course, students will not only learn how emerging digital technologies can enhance their research, but also how those technologies are fundamentally transforming the possibilities for the public presentation of that research. This course privileges hands-on learning and balances deepening essential methodological skills with exposure to a breadth of field-altering technologies. It is structured around five core methodologies—excavation, documentation, reconstruction, interpretation, and exhibition. In each unit, students will be first be tasked with identifying the underlying principles of these methodological approaches. They will then use class time to explore technologies that extend those methods such as high-resolution imaging, relational databases, text mining programs, virtual environments, and content management systems for website building. Bookending the course is a focus on effective collaboration—the foundation of successful digital projects—and public engagement in an increasingly connected yet fractured society.

HSPH 8101. Internship. (3 cr. [max 6 cr.]; S-N only; Every Fall, Spring & Summer) Internships are an opportunity to apply your skills and deepen your understanding of careers in historical sites and museums, community heritage organizations, or preservation/oversight agencies. This experience is for both skill-building and general professional development. Internship placements will be determined through conversations with advisors regarding student areas of interest and career goals, and available professional opportunities within the Minnesota Historical Society or a partnering organization. MHSPH degree students are required to complete two internships, one within MNHS and one outside. There are small stipends paid to students for their internship work, and depending on the site/project there may be funds available for project materials.

Higher Ed Consortium Urban Aff (HECU)

HECU 3555W. Making Media & Change: Digital Technologies, Storytelling, and Activism From Concepts to Creators. (AH, WLT; 4 cr.; A-F only; Every Fall & Spring) Critical exploration of storytelling and media in social change efforts. Digital stories as lens to understand world. Media-based activist strategies in context of competing theoretical perspectives on media and society. Theory and field experiences. prereq: instr consent

HECU 3556. Making Media Making Change: Digital Technologies, Storytelling, & Activism Digital Laboratory. (4 cr.; A-F only; Every Fall & Spring) Development/production of compelling digital stories. Training by MTN staff in camera operations, aesthetics of video production, shot composition, audio, lighting, editing. Produce video suitable for public broadcast by semester's end. prereq: instr consent

HECU 3557. Making Media, Making Change: Digital Technologies, Storytelling, & Activism Digital Media Internship. (AH, WLT, TS; 4 cr.; A-F only; Every Fall & Spring) An optional Internship in Digital Media course is offered for students who have participated in Making Media, Making Change: Digital Technologies, Storytelling, and Activism. The internship allows students to put their passion to work at St. Paul Neighborhood Network (SPNN) and deepen their understanding of how the core issues in the program’s two linked courses (HECU 3555W and 3556) play out in this community media center and shape professional practice in digital media. Students typically take the Internship in the semester or summer immediately after the initial core courses, but may be eligible to take it concurrently or in fall semester after the Spring program, with instructor consent. Working at SPNN, students build networks in the diverse set of practitioners in the Twin Cities committed to using digital media for social change. Interns contribute to public access and nonprofit programming and create professional quality video for community organizations in the Twin Cities. Departmental Consent required. Successful completion or concurrent enrollment in HECU 3555W

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and 3556. Credit cannot be earned if already granted for HECU 3558.

HECU 3558. Making Media, Making Change: Digital Technologies, Storytelling, and Activism Digital Internship. (B; cr. : A-F only; Every Fall, Spring & Summer)
An optional internship in Digital Media course is offered for students who have participated in Making Media. Making Change. Digital Technologies, Storytelling, and Activism. The internship allows students to put their passion to work at St. Paul Neighborhood Network (SPNN) and deepen their understanding of how the core issues in the program's 2 linked courses (HECU 3555W and 3556) play out in this community media center and shape professional practice in digital media. Students typically take the internship in the semester or summer immediately after the initial core courses, but may be eligible to take it concurrently or in fall semester after the Spring program, with instructor consent. Working at SPNN, students build networks in the diverse set of practitioners in the Twin Cities committed to using digital media for social change. Interns contribute to public access and nonprofit programming and create professional quality video for community organizations in the Twin Cities. Departmental Consent required. Successful completion or concurrent enrollment in HECU 3555W and 3556. Credit cannot be earned if already granted for HECU 3557.

HECU 3571W. Inequality in America: A Political Economy Approach. (SOC SCI; 4 cr. : A-F only; Every Fall & Spring)
This seminar provides the theoretical foundations necessary for understanding the roots, dynamics, and reproduction of urban and regional economic, political, and social inequality and poverty. It will also equip students with the key theoretical tools for evaluating alternative policies and strategies for addressing various forms of poverty and inequality. Theory will be treated in an integrated fashion with students' field and internship work and will draw from numerous disciplines but with a particular focus on the field of political economy. Students examine a series of interrelated social systems relevant to the study of poverty and inequality such as the economy, the politics of economic policy, labor markets, geographic systems and housing, education and welfare systems. Theories of oppression help students understand how institutionalized racism, classism and gender discrimination factor in and among all of these systems. This course is one of three courses taken concurrently that make up the Inequality in America: Policy, Community, and the Politics of Empowerment program taught through our institutional partnership with HECUA. Students are also enrolled in HECU 3572 Political Sociology of Building Power, Change, and Equity and HECU 3573 Internship and Integration Seminar. prereq: departmental consent required.

HECU 3572. Inequality in America: Political Sociology of Building Power, Change, and Equity. (DSJ; 4 cr. : A-F only; Every Fall & Spring)
Roots and strategies for addressing urban inequality and poverty. Interdisciplinary field study, seminar work, internship, prereq: concurrent registration is required (or allowed) in 3571, 3573, dept consent

HECU 3573. Inequality in America: Internship and Integration Seminar. (CIV; 8 cr. : A-F only; Every Fall & Spring)
Roots and strategies for addressing urban inequality and poverty. Interdisciplinary field study, seminar work, internship, prereq: concurrent registration is required (or allowed) in 3571, concurrent registration is required (or allowed) in 3572, dept consent

HECU 3574. Race in America: Then and Now: "Post-Racial" Perspectives on the Civil Rights Movement. (DSJ; 4 cr. [max 6 cr.] : A-F only; Every Summer)
Based in Jackson, Mississippi, with travel to sites in Alabama, Tennessee, and Louisiana. Offered each June. This program explores struggles and movements for racial equality from the 1960s to the present, and dives into questions of racial justice in America today. Students meet with civil rights activists active in the 1960s, and those who are active now--activists, lawyers, politicians, educators and youth. Field experiences open up connections among issues such as education, incarceration, distribution of wealth, health care, housing, employment, and the environment. Students also delve into racial identity development theory, the philosophy of nonviolence, and the functioning of social movements. By the end of the month, students have a profound understanding of the Civil Rights Movement and its motivations, strategies, successes and failures. They have also developed ways to make meaningful contributions to their own communities. The program is based in Jackson, Mississippi, where students stay at Jackson State University, one of America's Historically Black Colleges and Universities. Mississippi typified the "Deep South" during the era of Jim Crow, and in many ways continues to be racially and politically divided. In and near Jackson and during trips to Alabama, Tennessee, and the Gulf Coast (including New Orleans), students also explore current issues related to health, education, culture, and community organizing.

HECU 3581. Art for Social Change: Art and Culture in Political, Social, and Historical Context. (AH; 4 cr. : A-F only; Every Spring)
Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship, prereq: concurrent registration is required (or allowed) in 3582, 3583, dept consent

HECU 3582. Art for Social Change: Arts Praxis - Social Justice Theory and Practice in the Field. (DSJ; 4 cr. : A-F only; Every Spring)
Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship, prereq: concurrent registration is required (or allowed) in 3581, 3583, dept consent

HECU 3583. Art for Social Change: Intersections of Art, Identity and Advocacy Internship & Integration Seminar. (CIV; 8 cr. : A-F only; Every Spring)
Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship, prereq: concurrent registration is required (or allowed) in 3581, concurrent registration is required (or allowed) in 3582

HECU 3591. Environmental Sustainability: Sci, Public Policy, & Cmty Action Environmental & Climate Justice. (ENV; 4 cr. : A-F only; Every Fall)
Examine ecological and physical processes that underlie environmental degradation and learn to set up ecological monitoring through in-depth case studies of adaptive management projects. prereq: concurrent registration is required (or allowed) in 3592, concurrent registration is required (or allowed) in 3593, concurrent registration is required (or allowed) in 3594, dept consent

HECU 3592. Environmental Sustainability: Ecology and Socio-ecological Systems Change. (SOC SCI; 4 cr. : A-F only; Every Fall)
How power dynamics and a global free market impact efforts to promote sustainability. The state's role in regulating resources and distributing environmental benefits. How social movements develop a collective future and mobilize actors to realize it. prereq: concurrent registration is required (or allowed) in 3591, concurrent registration is required (or allowed) in 3593, concurrent registration is required (or allowed) in 3594, dept consent

HECU 3593. Environmental Sustainability Sci, Public Policy, & Cmty Action Field Research Method & Investigation. (BIOL; 4 cr. : A-F only; Every Fall)
The Field Methods course provides students with practical skills to assess and improve ecosystems and decision-making in socio-ecological systems. We will use a text by Bill Mollison, a founder of permaculture, to learn how to work with nature to improve ecological, communal, and personal health simultaneously. This course is designed to help students develop the capacity for constant and consistent ecological thinking, in order to participate in wise and effective decision-making at the interface of the human and natural worlds. All field-based learning in the course takes place in partnership with community organizations and branches of government that are working actively as ecological stewards and promoting sustainability of human society and specific settlements with wise design. We will learn and apply conceptual, organizational, and technical skills to help our community and institutional partners in this process. This course engages Lily Springs Farm as a field-learning site. We work with a permaculture designer and farmer on-site to use a variety of techniques to assess the landscape and to design and implement ecologically restoration strategies for a lake; a wetland; a farm system, a pine plantation being slowly converted to an oak savanna mimic; and 30 acres of forest that has been largely undisturbed for the past thirty years. This course is one of four

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Courses which make up the Environmental Sustainability: Ecology, Policy, and Social Transformation Program taught by Study Away partner HECUA. Concurrent registration is required in 3591, in 3592, and in 3594, Fall semester program. Dept consent required.

HECU 3594. Environmental Sustainability Sci, Public Policy, & Cmty Action Internship. (CIV: 4 cr.; A-F only; Every Fall) Students work with an organization addressing issues such as how to manage infrastructure for a booming economy and population in the metropolitan area, how rural communities can maintain viable livelihoods, and how to avert environmental decline in threatened ecosystems. prereq: concurrent registration is required (or allowed) in 3591, concurrent registration is required (or allowed) in 3592, concurrent registration is required (or allowed) in 3593, dept consent

Hindi (HNDI)

HNDI 1011. Beginning Hindi I. (5 cr.; Student Option No Audit; Every Fall) Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.

HNDI 1015. Accelerated Beginning Hindi. (; 5 cr.; Student Option No Audit; Periodic Fall) Aspects of linguistic performance: speaking, reading, writing, listening. Cultural/linguistic literacy about South Asia and, in particular, India. Emphasizes individual learning styles/preferences for students to understand/retain information.

HNDI 3031. Advanced Hindi I. (4 cr.; Student Option No Audit; Every Fall) Continued emphasis on development of communication skills, ability to comprehend both written/spoken texts. Speak, read, write in Hindi beyond intermediate level. prereq: 3022 or instr consent

HNDI 4001. Beginning Hindi I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall) Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence. Meets with 1011.

HNDI 4003. Intermediate Hindi I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall) Development of reading, writing, speaking, and listening skills. Grammar review, some basic compositions and oral presentations.

HNDI 4015. Accelerated Beginning Hindi for Graduate Research. (5 cr.; Student Option No Audit; Periodic Fall) Aspects of linguistic performance: speaking, reading, writing, listening. Cultural/linguistic literacy about South Asia and, in particular, India. Emphasizes individual learning styles/preferences for students to understand/retain information.

Hindi-Urdu (HNUR)

HNUR 1005. Conversational Hindi-Urdu. (3 cr.; Student Option; Every Spring) Conversational Hindi-Urdu is targeted for students with different backgrounds and purposes. This specific course is designed for students who want to acquire only conversational skills without focusing on the Hindi/Urdu script and writing and reading components. English transliteration will be used instead.

HNUR 1011. Beginning Hindi-Urdu I. (5 cr.; Student Option No Audit; Every Fall) Listening, speaking, reading, writing. Development of communicative competence.

HNUR 1012. Beginning Hindi-Urdu II. (5 cr.; Student Option No Audit; Every Spring) Listening, speaking, reading, writing. Development of communicative competence. prereq: 1011 or instr consent

HNUR 1015. Accelerated Beginning Hindi-Urdu. (5 cr.; Student Option No Audit; Every Spring) This course is designed for students who already have good speaking skills (mainly heritage students) or those who studied Hindi/Urdu in the past and can review basic knowledge of the language at a faster pace than that of regular language classes. Course focuses on all four skills (plus cultural skills) and employs the communicative approach as a main teaching methodology. The Hindi/Urdu script will be introduced right from the beginning. By the end of semester, students will be equipped with linguistic and cultural competencies that will enable them to communicate successfully with people of the target country at a novice-high level, and have a good foundation on which to further build proficiency in the language. Students will learn materials that are normally covered in a full academic year.

HNUR 3021. Intermediate Hindi-Urdu I. (5 cr.; Student Option No Audit; Every Fall) Reading, writing, speaking, listening skills. Grammar review, basic compositions, oral presentations. prereq: 1012 or instr consent

HNUR 3032. Advanced Hindi-Urdu II. (4 cr.; Student Option No Audit; Every Spring) Continued emphasis on development of communication skills, ability to comprehend both written/spoken texts. Speak, read, write in Hindi/Urdu beyond intermediate level. prereq: 3031 or instr consent

HNUR 3032. Advanced Hindi-Urdu II. (4 cr.; Student Option No Audit; Every Spring) Continued emphasis on development of communication skills, ability to comprehend both written/spoken texts. Speak, read, write in Hindi/Urdu beyond intermediate level. prereq: 3031 or instr consent

HNUR 3044. Intermediate Hindi-Urdu II for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring) Listening, speaking, reading, writing. Development of communicative competence. prereq: 4001 or instr consent

HNUR 3045. Advanced Hindi-Urdu I for Graduate Student Research. (4 cr.; Student Option No Audit; Every Fall) Continued emphasis on development of communication skills, ability to comprehend both written/spoken texts. Speak, read, write in Hindi/Urdu beyond intermediate level. Meets with HNUR 3032. prereq: 4005 or instr consent

HNUR 3046. Advanced Hindi-Urdu II for Graduate Student Research. (4 cr.; Student Option No Audit; Every Spring) Continued emphasis on development of communication skills, ability to comprehend both written/spoken texts. Speak, read, write in Hindi/Urdu beyond intermediate level. Meets with HNUR 3032. prereq: 4005 or instr consent

HNUR 4015. Accelerated Beginning Hindi-Urdu for Graduate Research. (5 cr.; Student Option No Audit; Every Spring) This course is designed for students who already have good speaking skills (mainly heritage students) or those who studied Hindi/Urdu in the past and can review basic knowledge of the language at a faster pace than that of regular language classes. Course focuses on all four skills (plus cultural skills) and employs the communicative approach as a main teaching methodology. The Hindi/Urdu script will be introduced right from the beginning. By the end of semester, students will be equipped with linguistic and cultural competencies that will enable them to communicate successfully with people of the target country at a novice-high level, and have a good foundation on which to further build proficiency in the language. Students will learn materials that are normally covered in a full academic year.

HNUR 5040. Readings in Hindi Texts. (3 cr.; Student Option; Periodic Fall) Read authentic materials of various types to improve reading/speaking ability.

HNUR 5041. Hindi-Urdu Language Teaching Tutoring. (1 cr.; [max 2 cr.]; S-N only; Every Fall & Spring) Students tutor beginning students of Hindi-Urdu and are part of department's Hindi-Urdu language team. prereq: Grade of A in HNDI 4162

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cultural competencies that will enable them to communicate successfully with people of the target country at a novice-high level, and have a good foundation on which to further build proficiency in the language. Students will learn materials that are normally covered in a full academic year.

HNUR 5993. Directed Readings. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Guided individual reading or study of modern Hindi-Urdu texts. Prereq instr consent, dept consent, college consent.

History (HIST)

HIST 1000. New Topics in History. (; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Courses on new topics in history, historical topics related to current events, and other special subjects. Contact the History department for current listings.

HIST 1011W. Civilization and the Environment: World History to 1500. (ENV,WI,HIS; 4 cr.; Student Option; Every Fall, Spring & Summer) Sweep of history, from first prehistoric societies to dawn of modern world circa 1500. Forces that pushed humans to continually explore new environments and develop higher levels of social organization and cross-cultural interaction. prereq: Fr or soph or non-hist major.

HIST 1012W. The Age of Global Contact. (GP,WI,HIS; 4 cr.; Student Option; Every Fall, Spring & Summer) Five centuries of globalization. How the modern, interconnected world came into being. Changing material life (food, clothes, petroleum) and ideologies/beliefs. Analysis of primary documents to show how historical knowledge is produced. prereq: Fr or soph or non-hist major.

HIST 1015W. Globalization: Issues and Challenges. (GP,WI; 4 cr.; A-F or Audit; Every Fall & Spring) Increased global interconnections over past 50 years. Impact of information revolution on human rights, economic inequality, ecological challenges, and decolonization. Cases in Asia, Africa, Latin America, or Middle East. prereq: Fr or soph or non-hist major.

HIST 1031W. Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present. (GP,WI,HIS; 4 cr.; Student Option; Every Fall) Europe, from Hammurabi to Columbus. Heyday of ancient Near East, Late Middle Ages. Europe, from Hammurabi to Columbus. Heyday of ancient Near East, Late Middle Ages. Culture, European interactions with wider world through religion, conquest, and trade. Beginning of the age of discoveries. prereq: Fr or soph or non-hist major.

HIST 1032W. Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present. (GP,WI,HIS; 4 cr.; Student Option; Every Fall) Emergence of a Europe of nations/empires. Transformations through revolutions, wars, and encounters with world regions. prereq: Fr or soph or non-hist major.

HIST 1081. History of Christianity I: Martyrs, Monks, Crusaders. (3 cr.; Student Option; Fall Odd, Spring Even Year) This course surveys the history of Christianity from its status as a persecuted minority religion of the Roman Empire to its dominant role in medieval Europe and Byzantium. We study Christian conversions in Asia and Africa as well as Europe with special attention to the relationship between Christianity and culture in the ancient and medieval world.

HIST 1082. Jesus in History. (HIS; 3 cr.; Student Option; Every Spring) Who was Jesus? While there has been some basic consistency in the depictions of Jesus throughout history, there has also been lots of variety. We will explore a whole host of portraits of Jesus at different points in history to demonstrate not only the varying ways that Jesus has been thought of but also to understand the relationship between these portraits and the historical and cultural contexts in which they were created. We will look at the gospels of the New Testament and some from outside the New Testament. We will look at ancient and medieval art. And we will look at modern film. Although we might not get to the bottom of who Jesus was, we might understand more fully how communities throughout history have thought about him. Intended as a course of interest to undergraduates in all colleges of the TC campus. Students of any, all, or no religious background are welcome.

HIST 1102. Medieval Tales and their Modern Echoes. (GP,LITR; 3 cr.; Student Option; Every Spring) Knights of Round Table, dragon-slayers, magic djinn, pilgrims in Hell. How stories have been retold in modern fiction, film, arts. Texts from Europe/other regions of globe.

HIST 1301W. Authority and Rebellion: American History to 1865. (DSJ,WI,HIS; 4 cr.; Student Option; Every Fall) Conflict/change, from colonial era through Civil War. colonization/resistance, slavery, nation-building, westward expansion, gender roles, religion, reform, race/ethnicity, immigration, industrialization, class relations. Students use primary sources, historical scholarship. prereq: Fr or soph or non-hist major.


HIST 1361W. World War I: A Global History. (HIS,WI,TS; 3 cr.; A-F only; Every Fall) This class takes a global approach to the examination of World War One's causes and consequences. We will look at how the war unfolded in Europe, Africa, and the Middle East. We will also explore the war's impact on North America and Australasia, areas drawn into the conflict because of their unique relationships with Britain and France. We will consider the special role played by the U.S. in restoring world peace and analyze the lasting social and political legacies occasioned by the war. We will get at the heart of how the war was fought and how it is remembered for all of its triumphs and tragedies.

HIST 1362. Global History of World War II. (HIS; 3 cr.; Student Option; Every Spring) This course examines 1) how different countries remember WWII and how memories of the war have been shaped by domestic and international contexts of each country and 2) how WWII changed the world in areas of human rights, the government-society relationship, and ethical use of science and technology. Various faculty members with different geographical and thematic expertise come to the class as guest lecturers throughout the semester.

HIST 1411W. The Family from 10,000 BCE to the Present. (CIV,WI,HIS; 4 cr.; Student Option; Every Fall) How family life has played and continues to play a major role in world history. Lectures, labs, assignments. prereq: Fr or soph or fewer than 60 cr.

HIST 1534. Introduction to Jewish History and Cultures. (HIS; 3 cr.; Student Option; Every Fall) Jewish history, society, culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, artifacts of daily life. Emphasizes political, social, cultural contexts that shaped development of Jewish ideas, practices, and institutions.

HIST 1809. The Presidency: Power, Politics, and Policy in the United States. (3 cr.; Student Option; Fall Even Year) This course explores the emergence, meaning, and evolution of the American presidency. We will examine the nature of presidential power and ask how and why those powers have changed over time. We will explore the impact of politics and political parties on the American presidency. We will consider how presidents
HIST 1811. The Sixties: History & Memory. (3 cr.; Student Option; Every Fall) The Sixties was an incredibly dynamic decade in the United States and around the world. It was a decade of powerful social movements from the Civil Rights and Black, Brown, Yellow and Red Power movements to the countercultural, student/campus, anti-war, feminist, and environmental movements. It was also marked by the rise of a series of New Right movements from the rise of the Barry Goldwater to the election of Richard Nixon and the transformation of both the Democratic and Republican parties. Major immigration reform, transformations in the nation's educational and health care systems, along side new patterns of consumption and new forms of media were also products of the Sixties. From the Cold War to the Vietnam War, from anti-imperialism and anti-colonialism to third world revolutions, Americans transformed the world and the US was transformed by the world in the sixties. Fifty years removed from the sixties, the idea of the sixties remains alive in the American imagination. It remains alive and in tension with the new movements, like Black Lives Matters, and in political thought, as, for example, in Donald Trump's repeated invocation of the "silent majority." Students will explore a wealth of primary sources and be introduced to the dynamic historiography of the 1960s. As a class, we will also consider how the sixties continues to serve as a powerful trope that organizes political and social thought in the 21st century.

HIST 1842. The Digital Revolution: Computers in the Making of the Contemporary World. (3 cr.; Student Option; Periodic Fall & Spring) Historical examination of birth of computer. Global transformations after 1945. History of technology/how technology transforms cultural life. United States history integrated with global history to show how technology, capitalism, politics, culture, environment, conspired to make computer an agent of revolutionary change.

HIST 1914. Food, Wine, and Sport in the Creation of French Identity. (3 cr.; Student Option; Periodic Fall & Spring) This course will examine the specific way in which food, wine, and sport have helped to create the French cultural, social, and economic identity. The course is divided into three sections, each dealing with one of these topics. Throughout the course, we will explore what it is about French attitudes to these three essential elements of national identity that stamp them with "Frenchness." We will look beyond the national implications to consider the international ramifications of each element. The themes of gender and politics will also be introduced. Texts will include scholarly works of history as well as clips from films, with emphasis on understanding the concepts and methodologies of the scholarly works and discussing and analyzing the other material as sociological and historical sources.

HIST 1915. The Black Death: Plague in History. (3 cr.; Student Option; Periodic Fall & Spring) In 1348, the disease that would be called the Black Death (the second pandemic) swept west from Central Asia to Europe, where it quickly annihilated up to 60% of Europe's population in the years 1347-1352. This was neither the first nor the last occurrence of this dreaded disease in world history. The Justinianic Plague of the 6th century (the first pandemic) was devastating as well. Plague recurred again and again, with the third pandemic coming at the end of the 19th century. The effects on the social fabric of the societies with which it came into contact were considerable, but so were the psychic effects, and the religious, intellectual, medical, and artistic worlds felt compelled to attempt to understand what the plague was, as well as its grander philosophical and moral implications. This course will consider the modern scientific advances in understanding the disease and the medieval sources that document its devastation.

HIST 1916. Herders and History. (3 cr.; Student Option; Periodic Fall & Spring) This seminar explores herding societies found throughout the premodern and modern world, from the Andes to the Sahara to North America, the Middle East, and Inner Asia. In this course, students will learn the key approaches to thinking about herding peoples and their forms of subsistence as well as the ways in which they interacted with their natural environment and sedentary societies. By focusing on herders' adaptation strategies to different climatic and environmental conditions, the we will explore how these conditions determined the level of their interaction/relationship with domesticated and non-domesticated animals. We will also examine the cultural identities emerging as a result of interdependency between people and their animals.

HIST 1917. Inequality and the American Dream. (3 cr.; Student Option; Periodic Fall & Spring) Increasing and intensifying inequality is perhaps the most pressing socio-economic problem of our time. A significant threat to democracy, the American dream, and national values of diversity and inclusion, wealth inequality today has not only surpassed that of the Great Depression but also grafted onto longstanding, intersectional cleavages of race, gender, indigeneity, class, and sexuality. The richest one percent have captured nearly 60 percent of all income gains from 1977 to 2000, and in 2010, the top 20 percent of households owned almost 90 percent of all privately held wealth in the United States, while the net worth of the bottom 40 percent was negative. Simultaneously much of the current political polarization, cultures of resentment, and rise in scapegoating and racist anti-immigrant actions have also been attributed to the attendant consequences of rising inequality, anxiety, and insecurity. And yet, many social critics argue that instead of addressing the key causes of inequality and the crisis of the American dream, the powerful in society have seized on these conditions to mobilize an avalanche of discontent among sectors of the downwardly mobile in a way that often obscures the key reasons for their predicament and scapegoats those at the social margins. Given this context, it is imperative to better understand and analyze the histories, cultural assumptions, and hierarchies that have produced contemporary inequality. How did we get to this point? What are the consequences, and what might we expect in the future? This set of seminars asks these hard questions and engages in precisely this exploration. These four freshman seminars (AFRO 1917, ANTH 1917, GWSS 1917, HIST 1917) will occasionally meet together, and will bring together scholars across multiple disciplines (African American Studies, Anthropology, Feminist Studies, History, and beyond) who are substantively engaged with scholarship on class, race, indigeneity, gender, and sexuality. We believe that this cross-fertilization is critical because the fault-lines of inequality have precisely cohered to these structural formations and categories of analysis.

HIST 3000. New Topics in History. (His; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Courses on new topics in history, historical topics related to current events, and other special subjects. Contact the History department for current listings.

HIST 3001. Public History. (3 cr.; A-F or Audit; Periodic Fall & Spring) Interpretations of collective past as produced in public venues, including museum exhibits, films, theme parks, websites. Intellectual and political issues in history produced for public audiences. Career opportunities. prereq: instr consent

HIST 3011. Measuring the Past: Quantitative Methods for Historical Research. (Math; 4 cr.; Student Option; Periodic Fall & Spring) Basics of quantitative historical data collection, measurement, analysis.

HIST 3020. Hands-On History. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Tired of textbooks? Investigate the past directly and develop the ability to answer your own questions. Gain hands-on experience researching, analyzing, and presenting the past using archives, interviews, online research, visual and textual analysis, etc. Explore presentation through essays, websites, films, exhibits, and more.

HIST 3021. Hands-On History: Global Apartheid. (3 cr.; A-F only; Periodic Fall & Spring) The years 1989 and 1990 saw the fall of the Berlin Wall and the release of Nelson Mandela from prison, respectively. These events are emblematic of a changing world order which saw the dismantling of apartheid even as racialized separation, oppression, and exploitation went global. In a world increasingly characterized by separations and divisions (made visible in the proliferation of physical walls and the hardening of borders) between rich and poor, between the privileged and...
the disenfranchised, between those whose lives matter and those who are understood to be entirely expendable, this course asks students to think about historical constructions of difference (such as race and gender), and about the past and history in relationship to the challenges of the present and towards a future yet to come. This course will introduce history majors to the methods and practices of historical knowledge production and to the philosophy of history. While attending to the work of history, and historiography, this course will also ask what history is for and what the historian does in research (as the detective and the archivist writing (as the storyteller and the analyst), and in (critical) thought (as the teacher and the philosopher).

HIST 3022. Hands-On History: The 1960s: A Decade of Change. (3 cr.; A-F only; Periodic Fall & Spring)
The 1960s was a decade of hope, fear and incredible change. These years witnessed the rise of race, youth, gender, and anti-war movements in the wake of a hot Cold War and a series of anticollaborist revolutions. The course offers students a deep introduction to this fascinating decade in US history. This methods and skills course also fulfills a departmental requirement for all History majors. Through the study of the 1960s, students will be introduced to the methods and skills historians have used to write this history. This course also offers students an opportunity to think deeply about the purpose, meaning, significance, and work of history. Students will leave this course with a deeper understanding of a significant moment in US history and a fuller understanding of the exciting and powerful work of history.

HIST 3051. Ancient Civilization: Near East and Egypt. (HIS; 3-4 cr.; Student Option; Periodic Fall)
A broad survey of ancient Near Eastern and Egyptian history and culture from the prehistoric to the rise of Persia around 550 B.C.

HIST 3052. Ancient Civilization: Greece. (3 cr.; Student Option; Every Fall, Spring & Summer)
A broad survey of ancient Greek culture and history from the third millennium B.C. to the death of Alexander the Great in 323 B.C.

HIST 3053. Ancient Civilization: Rome. (HIS; 3 cr.; Student Option; Every Spring & Summer)
A broad survey of the culture and history of Rome from its origins to the decline and fall of the Roman Empire in the third and fourth centuries A.D.

HIST 3054. Egypt of the Pharaohs. (3 cr.; Student Option; Fall Even Year)
History/culture of ancient Egypt from prehistoric times to the conquest of Egypt by Persians in late 6th century B.C. Emphasizes Old/New Kingdom periods.

HIST 3061. "Bread and Circuses": Spectacles and Mass Culture in Antiquity. (CIV.HIS; 3 cr.; Student Option; Fall Odd, Spring Even Year)
Development of large-scale public entertainments in ancient Mediterranean world, from athletic contests of Olympia and dramatic festivals of Athens to chariot races and gladiatorial games of Roman Empire. Wider significance of these spectacles in their impact on political, social, and economic life of the societies that supported them.

HIST 3066. Prehistoric Pathways to World Civilization. (HIS; 3 cr.; Student Option; Every Spring)
How did complex urban societies first develop? This course addresses this question in ten regions of the world, including Maya Mesoamerica, Inca South America, Sumerian Near East, Shang Civilization in East Asia and early Greece and Rome.

HIST 3076W. Archaeology of Prehistoric Europe. (HIS; WI; 3 cr.; Student Option; Every Fall)
How archaeologists analyze/interpret artifacts to develop knowledge about formation of European society, from earliest evidence of human occupation to Roman period.

HIST 3081. History of Christianity I: Martyrs, Monks, Crusaders. (3 cr.; Student Option; Fall Odd, Spring Even Year)
This course surveys the history of Christianity from its status as a persecuted minority religion of the Roman Empire to its dominant role in medieval Europe and Byzantium. We study Christian traditions in Asia and Africa as well as Europe with special attention to the relationship between Christianity and culture in the ancient and medieval world.

HIST 3082. History of Christianity II: From the Middle Ages to the Enlightenment. (3 cr.; Student Option; Spring Odd Year)
The course examines the history of Christianity from the 13th century to the end of the 18th century. It begins with the Latin church at the height of its power before moving on to a consideration of the disastrous 14th century, the revolts of the 15th and the Reformations of the 16th centuries. The course closes by considering new challenges facing the church in an age of Enlightenment and Revolution.

HIST 3092. Jesus in History. (HIS; 3 cr.; Student Option; Every Spring)
Who was Jesus? While there has been some basic consistency in the depictions of Jesus throughout history, there has also been lots of variety. We will explore a whole host of portraits of Jesus at different points in history to demonstrate not only the varying ways that Jesus has been thought of but also to understand the relationship between these portraits and the historical and cultural contexts in which they were created. We will look at the gospels of the New Testament and some from outside the New Testament. We will look at ancient and medieval art. And we will look at modern film. Although we might not get to the bottom of who Jesus was, we might understand more fully how communities throughout history have thought about him. Intended as a course of interest to undergraduates in all colleges of the TC campus. Students of any, all, or no religious background are welcome.

HIST 3101. Introduction to Medieval History. (GP.HIS; 3 cr.; Student Option; Every Fall, Spring & Summer)
Europe from decline of Rome to early Renaissance. Politics, institutions, society, economy, and culture of Middle Ages.

HIST 3102. Medieval Tales and their Modern Echoes. (GP.LITR; 3 cr.; Student Option; Every Spring)
Knights of Round Table, dragon-slayers, magic djinn, pilgrims in Hell. How stories have been retold in modern fiction, film, arts. Texts from Europe/other regions of globe.

HIST 3151W. British History to the 17th Century. (GP.WI.HIS; 4 cr.; Student Option; Every Fall)
The making of the English nation: Anglo-Saxon and Normans; development of English law and Parliament; Reformation and constitutional crisis; early Wales, Scotland, and Ireland.

HIST 3152. British History From the Seventeenth Century. (GP.HIS; 3 cr.; Student Option; Every Spring)
Civil War, Revolution, and constitutional settlement. Industrialization and growth of democracy. Rise/decline of British Empire.

HIST 3211. History of Sexuality in Europe. (3 cr.; A-F or Audit; Periodic Fall & Spring)
History of sexuality in Europe, from ancient Greece to present. Plato’s philosophy of love, St. Augustine’s conception of sin, prostitution in 15th century, sexual science of Enlightenment. Industrial revolution and homosexual subcultures. Rape scares and imperialism. Eugenics and Nazi Germany.

HIST 3212. Dissident Sexualities in U.S. History. (GP.HIS; 3 cr.; Student Option; Spring Odd Year)
History of sexuality in United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transgender, bisexual, lesbian, gay identities/communities. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.

HIST 3244. History of Eastern Europe. (GP.HIS; 3 cr.; Student Option; Spring Odd Year)
History of the peoples of the region from their origins to modern times, culture and society in the Middle Ages; Golden Age of Eastern Europe; loss of independence; nationalism and formation of national states; fascism and World War II; Jews in Eastern Europe; communist and post-communist periods.

HIST 3264. Imperial Russia: Formation and Expansion of the Russian Empire in the 18th and 19th Centuries. (3 cr.; Student Option; Every Fall)

HIST 3265. 20th-Century Russia: The Collapse of Imperial Russia, the Revolutions, and the Soviet Regime. (3 cr.; Student Option; Every Spring)
HIST 3271. The Viking World: Story, History, and Archaeology. (3 cr.; Student Option; )
Viking society and expansion of Viking influence abroad. Viking impact on Western Europe; interactions with Slavic lands; settlement of North Atlantic islands; and Western Europe's impact on Scandinavian lands. Analyzes archaeological, historical, linguistic, and numismatic evidence.

HIST 3281. EuropeanIntellectual History: The Early Modern Period, Antiquity to 1750. (3 cr.; Student Option; Periodic Fall)
First of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/ scientific thought, its relation to thinking about the individual and the community. Readings from original sources.

HIST 3282. European Intellectual History: The Modern Period, 1750-Present. (3 cr.; Student Option; Periodic Spring)
Second of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/ scientific thought, its relation to thinking about the individual and the community. Readings are from original sources.

HIST 3283. Marx, Capital, and History: An Introduction to Marxist Theory and History. (3 cr.; Student Option; Spring Even Year)
Explore Marx's understanding of capitalism/its history. Marx's argument regarding historical specificity of capitalism as economic/social condition.

HIST 3284W. History through Memoir. (HIS, WI; 3 cr.; A-F only; Every Fall)
Memoirs--non-fictional life stories--offer an intriguing lens into the past. Memoirs vividly portray a person's experiences, but they also raise questions about the reliability of the narrator. What kinds of histories are memoirs? We will read memoirs about experiences of race, class, gender in America. Students write their own short memoir.

HIST 3285. Magic and Medicine. (3 cr.; Student Option; Spring Odd Year)
Course examines how the line between magic and medicine has changed over time. From accusations of witchcraft to proclamations of scientific breakthrough, we will examine the relationship between the supernatural and the natural from the early modern period to today. Specific topics include the practice of exorcism, the concept of the "four humors," the persecution of witches, the development of "voodoo," the effectiveness of placebos, and the profession of medicine. Throughout, we will ask how gender, class, and race have affected the construction of "magic" and "medicine."  

HIST 3286. Galileo and the Beginnings of Modern Science. (3 cr.; A-F or Audit; Periodic Fall)
The life and work of Galileo Galilei (1564-1642), often called the "founder of modern science." Topics: the Renaissance Italian context for Galileo's work; the arrangements of authoritative knowledge that prevailed in 16th-century Tuscany and Venice, the role that universities, the Catholic church, learned academies, and the state played in disciplining knowledge. We consider the episodes of Galileo's career and read his seminal texts with secondary commentaries upon them. Topics: his telescopic observations of 1609-10; his battles with Aristotelian natural philosophy; his experiments and arguments on behalf of experimental and mathematical physics; his defense of Copernican "heliocentric" cosmology and his trial and condemnation by the Roman Catholic Church for heresy; and his work in mathematics and mathematical physics that paved the way for Newton and Einstein. The goal will be to understand the achievements of Galileo in their specific historical and cultural context and to use these reflections for thinking about the nature of the modern science that he helped to initiate.

HIST 3347. Women in Early America: 1600-1890. (DSJ, HIS; 3 cr.; Student Option; Every Fall)
Varied experiences of American women 1600-1900. Topics include women's involvement in the dispossession of native peoples, westward expansion, slavery, industrialization, reform, revolution, transformations in family life/sexuality.

HIST 3348. Women in Modern America. (3-4 cr.; Student Option; Every Spring)
History of women in the United States from 1890 to the present. Explores women's changing roles in politics, the labor force, the family, and popular culture.

HIST 3349. U.S. Women's Legal History. (DSJ, HIS; 3 cr.; A-F or Audit; Fall Odd Year)
Women's legal status, from colonial era through 20th century. Women's citizenship, civil rights. Marriage, divorce, and child custody. Reproductive/physical autonomy/integrity. Economic/educational equality. Prereq: Soph or jr or sr

HIST 3361W. World War I: A Global History. (HIS, WI, TS; 3 cr.; A-F only; Every Fall)
This course takes a global approach to the examination of the causes and consequences of World War I. We will look at how the war unfolded in Europe, Africa, and the Middle East. We will also explore the war's impact on North America and Australasia, areas drawn into the conflict because of their unique relationships with Britain and France. We will consider the special role played by the U.S. in restoring world peace and analyze the lasting social and political cleavages occasioned by the war. We will get at the heart of how the war was fought and how it is remembered for all of its triumphs and tragedies.

HIST 3362. Global History of World War II. (HIS; 3 cr.; Student Option; Every Spring)
This course examines 1) how different countries remember World War II and how memories of the war have been shaped by domestic and international contexts of each country, and 2) how WWII changed the world in areas of human rights, the government-society relations, and ethical use of science and technology. Various faculty members with different geographical and thematic expertise come to the class as guest lecturers throughout the semester.

HIST 3363. Global History of the Cold War. (3 cr.; A-F or Audit; Fall Even Year)
This course examines the origins, unfolding, and end of the Cold War, with emphasis on both geopolitical conflict and its social and cultural expressions. It begins with an examination of the ideological tensions between the USSR and USA and then turns to the end of European hegemony and de-colonization across Asia and Africa. It examines the expansion of the American empire and the appearance of new communist nations in Asia, Africa, and Latin America. While we will spend time on wars, insurgencies, and alliances, we will also examine how compelling blocs and their members bound themselves through trade and economic interdependencies and how they represented themselves, their ideals, and the cold war itself in the sports, music, literature and film. The course ends with the collapse of the Soviet Union and a survey of Cold War traces in the fields of geopolitics and culture.

HIST 3401V. Honors Early Latin America to 1825. (GP, W, HIS; 4 cr.; A-F only; Every Fall & Spring)
Societies of America, Spain, and Portugal before contact. Interactions among Native Americans, African slaves, and Europeans, from colonization through independence. Religion, resistance, labor, gender, race. Primary sources, historical scholarship.

HIST 3401W. Early Latin America to 1825. (GP, W, HIS; 4 cr.; A-F or Audit; Every Fall & Spring)
Societies of America, Spain, and Portugal before contact. Interactions among Native Americans, African slaves, and Europeans, from colonization through independence. Religion, resistance, labor, gender, race. Primary sources, historical scholarship.

HIST 3402W. Modern Latin America 1825 to Present. (GP, W, HIS; 4 cr.; Student Option; Every Fall, Spring & Summer)
National and contemporary period 1825 to present, with emphasis on social, cultural, political, and economic change.

HIST 3411W. The Family from 10,000 BCE to the Present. (CIV, W, HIS; 4 cr.; Student Option; Every Fall)
How family life has played and continues to play a major role in world history. Lectures, labs, assignments. Prereq: Jr or sr or at least 60 cr

HIST 3412. Soccer: Around the World with the Beautiful Game. (CIV, HIS; 3 cr.; Student Option; Spring Odd Year)
Global history/exploration of relationship between football (soccer)/culture around world.

HIST 3413. War in History: Preparing and Making War in World History. (HIS; 3 cr.; Student Option; Every Fall)
War has been a standard tool for organizing societies, settling disputes, and securing resources. The means and meaning of war have changed in important ways over time and we see very different historical outcomes.
across different societies. This course examines differences in war making across many societies in Europe, Asia, the Americas, and Africa from 10,000 BC to now.

HIST 3414. Conquest and Conversion: Religion & Empire 1500-1900. (3 cr.; Student Option; Spring Odd Year)

Christian evangelism functioned as major justification for European expansion/imperialism. How interactions between missionaries/non-European "converts" wrought social, political, religious transformations in early modern world.

HIST 3415. Migrations in Modern Global History. (GP,HIS; 3 cr.; Student Option; Every Fall)

Today's debates about immigration in historical/comparative perspective. Major migrations into, within, and out of Americas over 500 years. Lives/identities of U.S. immigrants compared with foreigners living/working in Latin America, Europe, and Asia. Words/voices of migrants.

HIST 3416. Imperialism and its Critics: Ethical Issues, Literary Representations. (CIV,LITR; 3 cr.; A-F only; Fall Even Year)

Significant episodes of several imperial nations to underscore themes of ethics/literature.

HIST 3417. Food in History. (ENV,HIS; 3 cr.; Student Option; Fall Odd, Spring Even Year)

Significance of food in society, from earliest times to present. Why we eat what we eat. How foods have been "globalized." Dietary effects of industrial modernity. Material culture, social beliefs. Examples from around world.

HIST 3418. Drink in History. (HIS; 3 cr.; Student Option; Fall Even, Spring Odd Year)

Significance of alcohol and stimulating beverages. Interdisciplinary study of alcohol/prohibition regimes throughout history.

HIST 3419. History of Capitalism: Uneven Development Since 1500. (3 cr.; Student Option; Periodic Fall & Spring)


HIST 3423. Central American Revolutions. (3 cr.; Student Option; Periodic Fall)

Social, political and economic issues that have shaped Central American history for nearly two centuries. Focuses on influences of colonial histories, capitalist development, ethnic/racial conflict, foreign intervention, Catholic Church, civil war throughout region. Readings cover events in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama.

HIST 3424. Women and Gender in Latin American History. (GP,HIS; 3 cr.; Student Option; Spring Odd Year)

Changing gender norms in Latin America over time as compared with lives of women and men of diverse classes and ethnic groups. How women responded to their position in society, on a continuum from accommodation to resistance.

HIST 3425. History of Modern Mexico. (3 cr.; Student Option; Every Fall & Summer)

Mexico from independence to the present: struggles for land, liberty, and equality; ethnicity, gender, class; economic growth, nationalism, and globalization; urbanization, immigration, demographic transition.

HIST 3426. Piracy in the Mediterranean: The World of Merchants and Pirates. (3 cr.; Student Option; Spring Odd Year)

This course will use the vehicle of piracy and privateering in the Mediterranean world to explore issues of cross-cultural interaction, global connections, and identity from earliest times when people took to the sea in the Middle Ages through the early modern era, 500-1800. Wherever there was trade, wherever there was movement on the seas, there was piracy. Recent scholarship on the Mediterranean has focused on connectivities, micro-environments, the uniqueness of islands, and various climatic spheres in a geographic tradition that follows the path-breaking work of Fernand Braudel. This course will consider the urban and rural dimensions of the Mediterranean region as they relate to the history of merchants and pirates. Finally, the political and military aspects of Mediterranean history will be examined. There was a continuum from piracy to privateering to war. Students should gain a deeper understanding of a region that continues to fascinate us today.

HIST 3429. Latin American History in Film and Text. (AH,GP; 3 cr.; Student Option; Periodic Fall, Spring & Summer)

Cinematic representations of Latin America in context of other historical/literary narratives. Experiences of Latinos in Hollywood. U.S. films compared with those produced in Latin America. Themes vary (e.g., women, revolution, colonialism).

HIST 3431. Early Africa and Its Global Connections. (GP,HIS; 3 cr.; max 4 cr.; Student Option; Every Fall & Spring)

Survey of African history from earliest times to 1800. Focuses on socioeconomic, political, and cultural development in pre-colonial Africa from ancient Egypt through the era of the trans-Atlantic slave trade.

HIST 3432. Modern Africa in a Changing World. (GP,HIS; 3-4 cr.; Student Option; Every Fall, Spring & Summer)

Survey of modern African history from early 19th century to present. Focuses on socioeconomic, political, and cultural development in Africa, from abolition of trans-Atlantic slave trade through postcolonial era.

HIST 3435. History of South Africa from 1910. (3 cr.; Student Option; Periodic Fall)

History of South Africa from union to present. Focuses on issues such as African/Afrikaner nationalism, structures of apartheid, forced population removals, divestment/sanctions, and post-apartheid era.

HIST 3436. Contemporary African Conflicts: From Somalia to South Africa. (3 cr.; Student Option; Periodic Fall)

Historical contexts in which specific contemporary political conflicts developed.


HIST 3444. Chicana and Chicano History: 1821-1945. (DSJ,HIS; 3 cr.; Student Option; Every Fall)

Experiences of people of Mexican descent in the United States. Important eras in histories of Mexico, the United States, and Mexican Americans. Central role of Chicana/os in U.S. history, culture, and politics.

HIST 3446. Chicana/o History II: WWII, El Movimiento, and the New Millennium. (DSJ,HIS; 3 cr.; Student Option; Every Spring)

Experiences of people of Mexican descent in U.S. Notions of citizenship from WWII. Chicano civil rights movement. Impact of immigration patterns/legislation. Cultural wars, demographics. Social, economic, political changes. Meaning of racialized "Mexican" identity. How different groups of Mexicans have understood their relationships to other Americans/other Latino groups.

HIST 3454. West African History: Early Times to 1800. (GP; 3 cr.; Student Option; Every Fall)

West African history from late 18th century to establishment/histories of states. Relations with North African, Mediterranean, Asian, American worlds. Non-centralized political authority.

HIST 3455. West African History: 1800 to Present. (GP; 3 cr.; Student Option; Every Spring)

West African history from late-18th century to present. Themes include study of continuities with past. Profound changes including new 19th century state formation, European colonialism, post-colonial issues.

HIST 3456. Social and Intellectual Movements in the African Diaspora. (GP; 3 cr.; Student Option; Every Fall)


HIST 3461. Introduction to East Asia I: The Imperial Age. (3-4 cr.; Student Option; Every Fall)


HIST 3462. From Subjects to Citizens: The History of East Asia From 1500 to the Present. (GP; 3-4 cr.; Student Option; Every Spring)

How Asian states, societies, economies, and cultures linked with one another and with European powers. How period's historical effects still resonate. Covers India, China, Japan, Korea, and Indochina.
HIST 3462H. Honors: From Subjects to Citizens: The History of East Asia from 1500 to the Present. (GP,HIS; 3-4 cr.; A-F only; Every Spring) How Asian states, societies, economies, cultures linked with one another/European powers. Historical effects. Covers India, China, Japan, Korea, Indochina.

HIST 3466. Religion and Society in Imperial China. (3 cr.; Student Option; Periodic Fall & Spring) Varieties of religious experience in imperial China. Religion as lived practices. Textual traditions. Buddhism, Daoism, Confucianism, relations among them. Western missionary enterprise in China.


HIST 3476. War and Peace in Japan Through Popular Culture. (4 cr.; A-F or Audit; Periodic Fall & Spring) War-related issues in Japan. Animation films, comics from 1940s to 1990s. Mobilization of culture for WWII. Conflict between constitutional pacifism and national security. Japan's role in cold war and post-cold war worlds.

HIST 3477. Samurai, Geisha, and How They Became Japanese. (3 cr.; A-F or Audit; Periodic Spring) How samurai, geisha, and Zen Buddhism came to be considered as the quintessential Japanese tradition in 20th century. Modernity, nationalism, orientalism, international politics, globalization.


HIST 3479. History of Chinese Cities and Urban Life. (; 3-4 cr.; A-F or Audit; Periodic Fall & Spring) Introduction to traditional Chinese cities, their modern transformation. Ideal city plan in Confucian classics compared with physical layout of some major cities. Models about Chinese cities, influence of the models on our understanding of Chinese history/society.

HIST 3483. Hmong History Across the Globe. (; 3 cr.; Student Option; Fall Odd, Spring Even Year) Hmong interaction with lowland Southeast Asian states (Laos, Vietnam) and Western colonial powers (French, American) since 19th century. Changes to religious, social, political, and gender institutions. Aspirations for political autonomy.


HIST 3486. Hmong Refugees from the Secret War: Becoming Americans. (3 cr.; Student Option; Spring Odd Year) Socio-economic, political, gender, cultural/religious changes in Hmong American community during last three decades. How Hmong are racialized in American society. Impact to first/second generations.


HIST 3489. 20th Century India. (3 cr.; A-F or Audit; Fall 2013) India under British hegemony in 1914 through Mahatma Gandhi and his nationalistic movement; World War II; the British departure; creation of India and Pakistan; Nehru; Indira and Rajiv Gandhi.

HIST 3492. Hinduism. (3 cr.; Student Option; Periodic Fall & Spring) Development of Hinduism focusing on sectarian trends, modern religious practices, myths/rituals, pilgrimage patterns/religious festivals. Interrelationship between Indian social structure/Hinduism.

HIST 3493. Islam: Religion and Culture. (3 cr.; Student Option; Every Fall) This course is a brief survey of the religion and civilization of Islam. It introduces students to 1) Islamic history from its inception in the seventh century CE to the present, with emphasis on the life of the Prophet Muhammad and the early Caliphate; 2) The authoritative texts of Islam, i.e. the Quran and Prophetic traditions (Hadith); 3) The institutions and discourses characteristic of Islamic civilization; and 4) The transformation of Muslim life and thought in the modern period. By taking this course, students become familiar with the chief ideas, characters, narratives, rites, localities, and movements associated with Islam. prereq: Soph or jr or sr

HIST 3494W. Christ in Islamic Thought. (WI; 3 cr.; Student Option; Periodic Spring) Course examines the history of the figure of Christ in Islamic thought, from the beginnings of Islam in the Qur'an and the Hadith to the recent 2013 book by Reza Aslan, Zealot. The course is based on close reading of primary sources from regions extending from Spain to Iran, and in various languages (in translation): Arabic, Greek, French, Farsi, and Italian. Course demonstrates how much the interpretation of the figure of Christ in Islamic thought belonged to specific historical contexts. prereq: None

HIST 3502. Ancient Israel: From Conquest to Exile. (; 3 cr.; Student Option; Periodic Fall) Israelite history in context of what is known from Egyptian, Canaanite, and Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.

HIST 3503. Ancient Iran. (; 3 cr.; Student Option; Periodic Fall & Spring) Development of ancient Iranian culture under Achaeemian and Sassanian. Impact of Zoroastrian religion on Iranians, on Hellenism, and on domains such as Bactria. Iran's contribution to cultures of Silk Road.

HIST 3504. The Cultures of the Silk Road. (3 cr.; Student Option; Every Fall & Spring) Past/present state of the cultures that flourished in Central Asia (present-day CA republics, Iran, Afghanistan) after Alexander the Great and declined with opening of sea routes.


HIST 3506. Modern Iran: Nationalism, Religion, and the Struggle to Create Modern Iran. (3 cr.; Student Option; Spring Odd Year) Iranian history from the fall of the Sassanids (7th C. CE) to the present. Shi'I Islam in a world context. Iranian dynasties. Iran's entrance into modern world politics.

HIST 3507. History of Modern Egypt. (; 3 cr.; A-F only; Fall Odd, Spring Even Year) Main political events. Underlying social, economic, and intellectual issues. Impact of Egypt on region. Developments in Egypt compared with those of other leading Arab states.

HIST 3509. Approaches to the Study of the Middle East. (; 3 cr.; A-F or Audit; Periodic Fall & Spring) Intensive reading/discussion course. Ways in which historians/social scientists have studied
Middle East. Problems they have encountered. Paradigms, issues, and debates in Middle Eastern Studies.

HIST 3511. Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa since 1700. (GP,HIS; 3 cr.; Student Option; Fall Odd Year)
Diversity of social/cultural interactions between Muslims and Jews and between Islam and Judaism since 1700. What enabled the two religious communities to peacefully coexist? What were causes of conflict? Why is history of Muslim-Jewish relations such a contested issue?

HIST 3512. History of Modern Israel/Palestine: Society, Culture, and Politics. (GP; 3 cr.; Student Option; Fall Odd Year)

HIST 3513. North Africa since 1500: Islam, Colonialism, and Independence. (3 cr.; Student Option; Spring Odd Year)
History of Maghrib (Morocco, Algeria, Tunisia, Libya, disputed territories of Western Sahara) from time of Ottoman expansion/Sharifian dynasties (Sa'dian/A mushroom) in 16th/17th Centuries to end of 20th century. Focus on encounter of Islamic cultures/societies of Maghrib with Africa/Europe.

HIST 3534. Introduction to Jewish History and Cultures. (HIS; 3 cr.; Student Option; Every Fall)
Jewish history, society, culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, artifacts of daily life. Emphasizes political, social, cultural contexts that shaped development of Jewish ideas, practices, and institutions.

HIST 3546. Islam and the West. (3 cr.; Student Option; Periodic Fall & Spring)
Cultural/intellectual trends that have defined fundamental differences between Islam and the West. Development of historical, philosophical, and intellectual mindset of both spheres. Factors in tension, anxiety, and hatred between Muslim world and Europe and the United States.

HIST 3547. The Ottoman Empire. (GP,HIS; 3 cr.; Student Option; Every Fall & Spring)
Survey of Islam's most successful empire, from its founding circa 1300 to its demise in 1923. Lands, institutions, peoples, historical legacy.

HIST 3606. Christians, Muslims, and Jews in the Middle Ages. (GP,HIS; 3 cr.; Student Option; Fall Even, Spring Odd Year)
Violent dimensions of these relations: Muslim/Christian expansion, jihad/crusade, anti-Jewish violence/persecution. Peaceful dimensions: trade, intellectual exchange, religious dialogue.

HIST 3609. Military History of Medieval Western Europe. (3 cr.; Student Option; Periodic Fall & Spring)
Concept and conduct of war in Western Europe in the Middle Ages and the relation between the military and society.

HIST 3611. Medieval Cities of Europe: 500-1500. (GP,HIS; 3 cr.; Student Option; Every Fall & Spring)
Evolution of Western European cities from the late Roman town to the early Renaissance city-state.

HIST 3613. History of the Crusades. (GP,HIS; 3 cr.; Student Option; Every Fall, Spring & Summer)

HIST 3615W. Women in European History: 1500 to the Present. (GP,WI,HIS; 3 cr.; Student Option; Periodic Spring)
History of women in Western Europe from early modern period to present. Changes crucial to women's lives. Family/kinship structure, control over property, organization of work, religious ideas/practices, education, politics, beliefs/attitudes about female body.

HIST 3616. France in the Middle Ages. (3 cr.; Student Option; Periodic Fall)
Politics, society, and culture in medieval France from the end of the Carolingians to the end of the Hundred Years War.

HIST 3617. Pagans, Christians, Barbarians: The World of Late Antiquity. (3 cr.; A-F or Audit; Fall Odd Year)
Between classical and medieval, pagan and Christian, Roman and barbarian, the late antique world was a dynamic age. This course will focus on the Mediterranean region from the 2nd to the mid-7th century exploring such topics as the conversion of Constantine, the fall of Rome, barbarian invasions, the spread of Christianity, and the rise of Islam.

HIST 3618. The Dark Ages Illuminated: Medieval Europe to 1050. (3 cr.; Student Option; )
Origins of medieval Europe, Germanic and Viking invasions, feudalism, manorialism, Islam, the papacy, monarchies, intellectual developments.

HIST 3621. Creating the Modern World in Medieval Europe: The Renaissance, 1200-1600. (3 cr.; Student Option; Periodic Fall)
Political/cultural history of city-states of northern/central Italy, 1200-1550. Emphasizes Florence/Venice. Readings include Dante, Machiavelli, preter. Intro course in European history before 1500 recommended

HIST 3623W. The Age of Reformation. (WI; 3 cr.; Student Option; Fall Even Year)
This course will examine the great religious convulsion that gripped Europe in the sixteenth and seventeenth centuries. Chronologically, however, we will begin in the late medieval period as we consider important changes that were occurring in European culture and society culminating with Europe's first Reformation, not in Germany but in Bohemia. Geographically, we begin with Europe but our scope eventually widens out to consider developments also in Asia and the Americas. We conclude by considering the relaxation of religious tensions in the late seventeenth century and concurrent growth of toleration and skepticism. Throughout the course we will consider religion as a dynamic that has had a broad impact on society affecting not only personal belief but also the politics, social patterns, and intellectual and cultural production of the early modern world.

HIST 3626. Early Modern France: From Old Regime to Empire. (3 cr.; Student Option; Periodic Fall & Spring)
The evolution of French political culture and society in thematic context: Louis XIV's Old Regime, the Enlightenment, the French Revolution, the Republic, and Napoleon's Empire. Topics include urban and rural life, public opinion and polite culture, religious conflict, sex and gender, consumerism and material culture, and slavery and colonialism.

HIST 3632. History of Germany; Reformation to Unification: 1500-1871. (3 cr.; Student Option; Periodic Spring)
The Reformation era; warfare and demographic catastrophe of the early 1600s; life in town and country; absolutism; Baroque culture; family life and its transformation; economic crisis; Revolution of 1848; the military path to unification.

HIST 3637. Modern Russia: From Peter the Great to the Present. (3 cr.; Student Option; Every Fall)
Political, social, and cultural forces which have shaped modern Russia. Emphasis will be on modernization, attempts at reforms in the imperial and Soviet period, and the dissolution of empires.

HIST 3652. Early Modern Britain. (3 cr.; Student Option; Periodic Fall & Spring)
British society/culture during early modern era, especially 16th and 17th centuries. May include themes related to political developments, economy/social structure, gender, religion, literature, or interaction with other world regions.

HIST 3681. Irish History. (3 cr.; Student Option; Every Fall)
History of Ireland, primarily modern, with emphasis on politics and Anglo-Irish relations.

HIST 3691W. The British Empire. (WI; 3 cr.; A-F or Audit; )
Gain/loss of colonies in Ireland, America, India, Africa. Development of racism, multicultural composition of British society, debates about economic motives for empire, resistance of colonized peoples to conquest/dominion.

HIST 3704W. Daily Life in Europe: 1300-1800. (GP,WI,HIS; 3 cr.; Student Option; Fall Even, Spring Odd Year)
Living conditions and daily life in Europe before the Industrial Revolution. Topics include marriage and family, life at court, nobles, peasants, disease, farming, livestock-raising, urban life, the middle classes, manufacturing, trade, piracy, witchcraft, war, crime, and social deviance.
HIST 3706. Baroque Rome: Art and Politics in the Papal Capital. (HIS; 3 cr.; Student Option; Fall Even Year) Center of baroque culture--Rome--as city of spectacle and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

HIST 3708. The Age of Curiosity: Art and Knowledge in Europe, 1500-1800. (AH, TS; 3 cr.; Student Option; Every Fall & Spring) Diverse ways in which making of art and scientific knowledge intersected in early modern Europe. Connections between scientific curiosity and visual arts in major artists (e.g., da Vinci, Durer, Vermeer, Rembrandt). Artfulness of scientific imagery/diagrams, geographical maps, cabinets of curiosities, and new visual technologies, such as the telescope and microscope.


HIST 3721. Studies in 20th-Century Europe From the Turn of the Century to the End of World War II: 1900-45. (; 3 cr.; Student Option; Every Fall & Summer) Social, political, and cultural changes/conflicts. Background to WWI, its impact. Revolution, failure of interwar stability. Fascism. WWII, its consequences.

HIST 3722. Studies in 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-91. (; 3 cr.; Student Option; Every Fall, Spring & Summer) Social, economic, political, and cultural impacts of WWII upon Europe. Division of Europe. Communist regimes in Eastern Europe, cooperation in Western Europe. Impacts of modernization. End of Cold War.

HIST 3724. War & Revolution in 20th Century Europe: The Question of Gender. (; 3 cr.; Student Option; Periodic Fall) From WWI through break-up of Yugoslavia, involvement/reactions of European women to situations of war/revolution. Ways in which women contributed, resisted, or submitted. Impact of conflicts on women's lives. Gender, ideological gendering. Lecture, but emphasizes readings, presentations, and discussions.


HIST 3729. Nazi Germany and Hitler's Europe. (3 cr.; Student Option; Periodic Fall & Spring) Comprehensive exploration of Third Reich. Students will examine how the Nazis came to power, transformations of 1930s, imposition of racial politics against Jews/others, nature of total war. Students read historical accounts, memoirs, state documents, view films.

HIST 3731. Modern France and Its Empire: Identity, Citizenship and the State 1780 to the Present. (GP, HIS; 3 cr.; Student Option; Every Spring, Spring Odd Year) History of citizen/state in France from French Revolution to present.

HIST 3746. Game of Thrones: Emperors, Knights and Witches in Central Europe. (3 cr.; Student Option; Fall Odd, Spring Even Year) This course traces the rise and fortunes of the Habsburg family from their emergence in the late 13th century to the end of the Holy Roman Empire in 1806. We use the family to explore key themes of the period including the Black Death, Hussite wars and peasant revolts, the new print culture, developments of the Reformation, European expansion and Enlightenment culture. prereq: None

HIST 3767. Eastern Orthodoxy: History and Culture. (3 cr.; Student Option;) Development of the orthodox church in Byzantium, the Islamic Near East, the Slavic world and in the diaspora; impact of orthodoxy on political and cultural institutions, interaction with other Christian and non-Christian communities; orthodox spirituality and aesthetics.

HIST 3775. History of Jews in Europe and the Atlantic World, from 1700 to Present. (3 cr.; Student Option; Periodic Fall & Spring) Social, cultural, and political experience of Jews in Europe and the Americas. Emancipation, social/economic development, assimilation, migration, political anti-Semitism, Zionism, the holocaust, transformations after 1945.

HIST 3797. History of Population. (GP, SOCS; 3 cr.; Student Option; Every Spring) History of births, deaths, migration, population size, and population characteristics. Evidence from Europe, the United States, and Latin America with comparative material from Africa and Asia. Methods of historical population analysis and research of historical population data.


HIST 3811. Manifest Destiny, Slavery, and the Politics of Expansion: Jacksonian America. (3 cr.; Student Option; Spring Even Year) This course examines the history of the U.S. between the War of 1812 and the outbreak of the Civil War in 1861. We will examine the dramatic expansion in population and territory, onset of transportation, communications, and the industrial revolutions, forced removal of Native Americans, slavery, reform efforts of the 1830s and 1840s, growth and maturation of political parties, and coming of the Civil War.

HIST 3812. The Civil War and Reconstruction. (3 cr.; Student Option; Every Fall, Spring & Summer) United States from 1848 to 1877. Causes of sectional crisis; Southern secession; Lincoln and emancipation; military history; impact of war North and South; Reconstruction efforts to change the Southern life and transform the status of African Americans.

HIST 3821. United States in the 20th Century to 1945. (HIS; 3 cr.; Student Option; Every Fall, Spring & Summer) American politics and society in the progressive era, the 1920's, the Great Depression and World War II. Economic reform at home, the challenges of world war abroad, and social change affecting the status of women and racial minorities.

HIST 3822. Making America Modern: 1945 to Present. (3 cr.; Student Option; Every Fall, Spring & Summer) American politics and society in the postwar era, the diplomacy of the Cold War, the civil rights movement, the Vietnam War, cultural clashes in the 1960's, Watergate, the conservative resurgence, and the end of the Cold War.


HIST 3835. Law in American Life: 1865 to Present. (3 cr.; Student Option; )

**HIST 3837. Minnesota History.** (3 cr.; Student Option; Periodic Fall & Spring)
Topics in political/social history of Minnesota and its region in nineteenth/twentieth centuries.

**HIST 3838. Family History in America.** (3 cr.; Student Option; Every Spring)
How historians study families to explore race/ethnicity. Techniques for researching genealogy/family history. Research/write on history of family.

**HIST 3842. The Digital Revolution: Computers in the Making of the Contemporary World.** (3 cr.; A-F or Audit; Periodic Fall & Spring)
Historical examination of birth of computer. Global transformations after 1945. History of technology/how culture shapes technological change. United States history integrated with global history to show how technology, capitalism, politics, culture, environment conspired to make computer agent of revolutionary change.

**HIST 3852. Work and Workers in the United States.** (3 cr.; Student Option; Periodic Fall)
Why do Americans work, and what do we expect in exchange? This course explores how the answers to those questions have changed over time, from the colonial era to the present, and how the past shapes our approach to work today.

**HIST 3856. The Civil Rights and Black Power Movement, 1954-1984.** (3 cr.; Student Option; Every Fall)

**HIST 3862. American Immigration History.** (DSJ,HIS; 3 cr.; Student Option; Spring Odd Year)
Global migrations to U.S. from Europe, Asia, Latin America, and Africa, from early 19th century to present. Causes/cultures of migration. Migrant communities, work, and families. Xenophobia, assimilation/integration, citizenship, ethnicity, race relations. Debates over immigration. Place of immigration in America’s national identity.

**HIST 3864. African American History: 1619-1865.** (3 cr.; [max 4 cr.]; A-F or Audit; Periodic Fall & Spring)
Importance of dynamics of class, gender, region, and political ideology. Changing nature of race/racism.

**HIST 3865. African American History, 1865 to Present.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
History of African American men and women from the beginning of the 20th century to the present. Discussion of internal migrations, industrialization and unionization, The Great Depression, world wars, and large scale movements for social and political change.

**HIST 3868W. Race, War, and Race Wars in American History.** (CIV,WI; 3 cr.; A-F or Audit; Fall Odd Year)
Role that race has played in American war history. Impact that wars have had on race and race relations in the United States and the world. Literature, film.

**HIST 3871. American Indian History: Pre-Contact to 1830.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring)
Introduction to American Indian history from ancient native America to the removal era. Focuses on the social, cultural, political, and economic diversity of Native American peoples and Native American experiences with European colonialism.

**HIST 3872. American Indian History: 1830 to the Present.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring)
Focus on the impact of federal Indian policy on American Indian cultures and societies, and on American Indian culture change.

**HIST 3875W. Comparative Race and Ethnicity in US History.** (DSJ,WI,HIS; 3 cr.; max [4 cr.]; A-F or Audit; Periodic Fall & Spring)
This writing-intensive course examines the racial history of modern America to learn from and engage with what historians enmeshed in ethnic studies do. These historians examine the systematic and coordinated exercises of power called race in the American past and make legible how racially agrieved groups responded to this shaping power. Thus, throughout, we ask, "What did racial subjects do with what was done to them by the American system forged out of settler colonialism, slavery, racism, and other forms of injustice, exclusion, and violence?" This question issues an intellectual challenge to do all that needs to be done to capture community life, the politics of difference, and the dynamism of social identities in all their richness, fullness, and complexity. In other words, we study and write about the racial history of modern America, including its ugly past and arc of justice, to consider what it would take to transcend this racial past.

**HIST 3877. Asian American History, 1850-1941.** (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring)
Asian American history and contemporary issues, from 1850 to the present. Immigration, labor, anti-Asian movements, women/families, impact of World War Two, new immigrant/refugee communities, civil rights, Asian American identity/culture.

**HIST 3882. U.S. and the World.** (3 cr.; Student Option; Periodic Fall, Spring & Summer)
History of U.S. involvement in world affairs. Political, economic, social, cultural relations by individuals, groups, governmental, non-governmental agencies. Nation building, imperialism, hemispheric hegemony, cultural expansion, national security, wars.

**HIST 3899. How to Do History.** (3 cr.; A-F or Audit; Every Fall & Spring)
Skills/research experience to complete senior paper. How to answer questions such as, "What is history?" How to locate/use historical sources, develop a thesis, and turn rough idea into full research proposal. Prereq: History major or dept consent

**HIST 3960. Topics in History.** (1-4 cr. [max 16 cr.]; Student Option; Periodic Fall, Spring & Summer)
Selected history topics not covered in regular courses.

**HIST 3980W. Supplemental Writing in History.** (WI; 1 cr. [max 4 cr.]; Student Option; Every Fall & Spring)
May be attached, by agreement of instructor and students, to any 3xxx or 5xxx course to make a writing-intensive experience. Prereq: instr consent; must take a 3-cr 3xxx or 5xxx course taken concurrently

**HIST 3990. Historical Internship.** (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Internship with a historical society, government, or community historical organization. Arranged through and supervised by department. Prereq: instr consent

**HIST 3993. Directed Study.** (1-16 cr.; A-F or Audit; Every Fall, Spring & Summer)
Guided individual reading or study. Open to qualified students for one or more semesters. Prereq instr consent, dept consent, college consent.

**HIST 3994. Directed Research.** (1-16 cr.; A-F or Audit; Every Fall, Spring & Summer)
Guided individual tutorial basis. Prereq instr consent, dept consent, course consent, prereq; instr consent, dept consent, college consent

**HIST 4010V. Honors: Research Seminar.** (WI; 4 cr. [max 16 cr.]; A-F only; Every Fall & Spring)
Work closely with professors on in-depth investigations of historical topics. Guided instruction in issues, methods, sources. Topics vary. Prereq: Jr or Sr history major, honors, or instr consent

**HIST 4010W. Research Seminar.** (WI; 4 cr. [max 16 cr.]; A-F only; Every Fall & Spring)
Work closely with professors on in-depth investigations of historical topics. Guided instruction in issues, methods, sources. Topics vary. Prereq: Jr or Sr history major or instr consent

**HIST 4961V. Honors: Major Paper.** (WI; 4 cr.; A-F only; Every Fall, Spring & Summer)
Research paper on topic of student’s choice. Work largely with primary sources. Faculty guidance. Prereq: dept consent, instr consent; sign up in Undergraduate Studies Office two sem in advance
HIST 4961W. Major Paper. (WI; 4 cr. ; A-F or Audit; Every Fall & Spring) Research paper on topic of student's choice. Work largely with primary sources. Faculty guidance; prereq: dept consent, instr consent; sign up in Undergraduate Studies Office two sem in advance

HIST 4970. Historical Internship. (1-12 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer) Internship with a historical society, government, or community historical organization. Arranged through and supervised by department.

HIST 5011. Measuring the Past: Quantitative Methods for Historical Research. (4 cr.; Student Option; Periodic Fall & Spring) Basics of quantitative historical data collection, measurement, and analysis, prereq: Primarily for 1-st yr grad students

HIST 5053. Doing Roman History: Sources, Methods, and Trends. (3 cr.; Student Option; Fall Even, Spring Odd Year) Survey of major scholarship in field of Roman history since Mommsen. Political, cultural, social, military, and economic history. Focuses on methodological problems posed by evidence. Ways in which these issues shape research, prereq: Grad student or instr consent

HIST 5111. Proseminar in the History of Medieval Europe. (3 cr.; A-F or Audit; Periodic Fall & Spring) Examination of basic scholarly bibliography for medieval Western European history. Aim is to help students to prepare for M.A. and Ph.D. examinations. prereq: Advanced undergrads of exceptional ability or grads, instr consent

HIST 5115. Medieval Latin Historians. (3 cr.; Student Option; Periodic Fall & Spring) Writing of history in Western Europe during the Middle Ages. Focus on idea of history, philosophy of various historians, techniques of research by medieval historians and chroniclers, history as literature, and value of medieval histories to modern research scholars. Latin texts only, prereq: Reading knowledge of Latin

HIST 5264. Imperial Russia: Formation and Expansion of the Russian Empire in the 18th and 19th Centuries. (3 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Interaction with Europe and Asia; attempts at modernization and reform; emancipation of the serfs and rise of revolutionary movements.

HIST 5265. 20th-Century Russia: The Collapse of Imperial Russia, the Revolutions, and the Soviet Regime. (3 cr.; Student Option; Every Spring) Analysis of the factors that led to the collapse of the tsarist regime; discussion of the 1917 revolution, the evolution of the Soviet regime and the collapse of Soviet communism. Emphasis on the role of nationalities and the rise of the Commonwealth of independent states.

HIST 5271. The Viking World: Story, History, and Archaeology. (3 cr.; A-F or Audit; Periodic Fall & Spring) Viking society and expansion of Viking influence abroad. Viking impact on Western Europe, interactions with Slavic lands, settlement of North Atlantic islands, Western Europe's impact on Scandinavian lands. Analyzes archaeological, historical, linguistic, and numismatic evidence.

HIST 5281. European Intellectual History: The Early Modern Period, Antiquity to 1750. (3 cr.; A-F or Audit; Periodic Fall) First of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings from original sources. prereq: Grad student or instr consent

HIST 5282. European Intellectual History: The Modern Period,1750-Present. (3 cr.; A-F or Audit; Periodic Spring) Second of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings are from original sources. prereq: Grad student or instr consent

HIST 5283. Marx, Capital and History: An Introduction to Marxist Theory and History. (3 cr.; Student Option; Spring Even Year) Explore Marx's understanding of capitalism and its history. Marx's argument regarding historical specificity of capitalism as economic/social condition

HIST 5286. Galileo and the Beginnings of Modern Science. (3 cr.; A-F only; Periodic Fall) The life and work of Galileo Galilei (1564-1642), often called the ?founder of modern science.? Topics: the Renaissance Italian context for Galileo's work; the arrangements of authoritative knowledge that prevailed in 16th-century Tuscany and Venice; the role that universities, the Catholic church, learned academies, and the state played in disciplining knowledge. We consider the episodes of Galileo's career and read his seminal texts with secondary commentaries upon them. His telescopic observations of 1609-10; his battles with Aristotelian natural philosophy; his experiments and arguments on behalf of experimental and mathematical physics; his defense of Copernican ?heliocentric? cosmology and his trial and condemnation by the Roman Catholic Church for heresy; and his work in mathematics and mathematical physics that paved the way for Newton and Einstein. The goal will be to understand the achievements of Galileo in their specific historical and cultural context and to use these reflections for thinking about the nature of the modern science that he helped to initiate.

HIST 5295. Social History of Russia and the Ottoman World. (3 cr.; Student Option; Every Fall & Spring) Emphasis on the role of the peasantry, urban societies, and the court in the evolution of Russian society under the tsars. Discussion of the 1917 revolution and the role of the peasantry in the Russian Revolution. The role of the peasantry in the development of Soviet communism. Discussion of the impact of the revolution on the peasantry and the role of the peasantry in the development of Soviet communism.

HIST 5381. Minnesota History Workshop. (3-4 cr. [max 8 cr.]; Student Option; Periodic Fall & Spring) A case study and seminar approach to historical research and interpretation. It offers teachers and other scholars a chance to survey a particular topic in Minnesota history and to write their own historical narrative based on primary source research. prereq: 1301, 1302

HIST 5389. Environment and Society in Africa. (3 cr.; Student Option; Periodic Fall & Spring) Major historiographical, theoretical, and methodological debates concerning people-environment relations in Africa, from rise of human societies to present. Environment and the rise of civilizations. Demography, colonial environmental policies, conservation, disease, indigenous knowledge, water management, food, prereq: instr consent

HIST 5468. Social Change in Modern China. (3 cr.; Student Option; Every Fall) Opium War and opening of Treaty Ports in 19th century; missionary activity and cultural influence; changes in education system; women's movement; early industrialization; socialism and collectivization after 1949; industrialization of Taiwan; PRC's entry into the world trading system.

HIST 5469. Historiographies of China, 1000-1700. (3 cr.; A-F or Audit; Periodic Fall & Spring) Important recent English-language work on Chinese culture during the Song, Yuan, and Ming dynasties. Topics include religion, gender, family structures, ethnicity, commerce/ economics, and political structures/events. prereq: Grad student or instr consent

HIST 5478. Tigers and Dragons: The Rise of the East Asian Economies, 1930-Present. (3 cr.; Student Option; Spring Odd Year) Rise of East Asian Economies, 1930-Present. prereq: Grad student

HIST 5497. History of Chinese Cities and Urban Life. (3 cr.; A-F or Audit; Periodic Fall & Spring) Introduction to traditional Chinese cities, their modern transformation. Ideal city plan in Confucian classics compared with physical layout of some major cities. Models about Chinese cities, influence of the models on our understanding of Chinese history/society.

HIST 5513. North Africa since 1500: Islam, Colonialism, and Independence. (3 cr.; Student Option; Spring Odd Year) History of the Maghrib (Morocco, Algeria, Tunisia, Libya and disputed territories of Western Sahara from time of Ottoman expansion/Shari'ah dynasties
HIST 5540. Topics in Mediterranean Studies. (1-1 cr. [max 15 cr.]; A-F or Audit; Every Fall & Spring)
Mediterranean history, from Middle Ages to present. Taught as staffing permits. prereq; Grad student or advanced undergrad with instr consent

HIST 5547. Empire and Nations in the Middle East. (3 cr.; Student Option; Periodic Fall & Spring)
Modernity in non-Western imperial context. Identity, ideology, economy, environment, language. prereq; Grad student or instr consent

HIST 5611. New Directions in the Middle Ages, ca. 300-1100. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Basic scholarly bibliography for medieval Western European history during early Middle Ages. Foundation for teaching courses in medieval history, preparing for general doctoral exam. prereq; Grad student or instr consent

HIST 5612. New Directions in the Middle Ages, ca. 1100-1500. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Basic scholarly bibliography for medieval Western European history during central/late Middle Ages. Foundation for teaching courses in medieval history, preparing for general doctoral exam. prereq; [5611, grad student] or instr consent

HIST 5614. The Medieval Church. (3 cr.; Student Option; Periodic Fall & Spring)
Introduction to history of western church in Middle Ages. Emphasizes church teachings and institutional structures, beliefs/practices of lay people, medieval Christian encounter with non-Christian world. prereq; Grad student or instr consent

HIST 5633. Socio-Economic History of China. (3 cr.; A-F or Audit; Periodic Fall)
Nature of Chinese socio-political formations and economic development in Qing and Republican eras, 1644-1937. Establishment/ methods of state rule, merchants, agrarian social structure, domestic industry, demographic regimes, capitalism, and imperialism. Comparisons using theoretical and case studies of economic development. prereq; Grad student or [adv undergrad, instr consent]

HIST 5640. Topics in Legal History. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Comparative approaches to, methodologies of, and theoretical debates in legal history. Topics from ancient world to present, such as citizenship/statebuilding, religion and the law, women?sf legal history.

HIST 5642. U.S. Legal History. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Topics in history of American law, legal thought, legal institutions, and legal profession. Proceeds thematically. Primary/secondary sources.

HIST 5648. Development of the Western European Legal Tradition. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Evolution of and interaction among Roman and civil law, customary/feudal law, canon law, and English common law. Primary/secondary sources in English.

HIST 5715. Readings in European Women's History: 1450-1750. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Introduction to current historical research on European women's history, 1450-1750. Topics include gender roles and form of family structure, women's participation in religious movements, legal status of women.

HIST 5720. Society/Politics: Modern Europe. (3 cr.; A-F or Audit; Every Fall & Spring)
Introduction to literature in English on problems of modern European social, cultural, political history. Thematic/geographic focus varies year to year. Topics include historical approaches to class/gender relations, state formation as social/political process, family history, evolution of public life, popular culture.

HIST 5735. European Women's History: 1750 to the Present. (3 cr.; A-F or Audit; Periodic Fall & Spring)

HIST 5777. Proseminar in Habsburg Central Europe. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Central Europe under Habsburg rule from the reforms of Maria Theresa to imperial collapse. Continuity and change in society; economic and political modernization; the rise of national consciousness and anti-Semitism; politics and culture in the Fin de Siecle; the Empire and World War I. prereq; instr consent

HIST 5797. Methods of Population History. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Standard methods of population analysis. Focuses on methods widely used for historical population research.

HIST 5801. Seminar in Early American History. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Introduction to literature of early American history. Readings selected from some of best scholarship in field. Questions of colonial historians. Theories, methods, sources used in pursuit of those questions.

HIST 5802. Readings in American History, 1848-Present. (3 cr.; A-F or Audit; Every Fall & Spring)
Readings-intensive course. U.S. history from Mexican-American War to present.

HIST 5831. Cultural Fallout: The Cold War and Its Legacy: Readings. (3 cr.; A-F or Audit; Every Fall & Spring)
Culture of the Cold War, its legacy. How it affected/reflected domestic politics, public policies, civic life, gender expectations, sexuality, class relations, racial justice, and civil rights. Impact of domestic anti-communism and of American cultural politics abroad.

HIST 5871. Readings in U.S. Intellectual History: 19th-20th Centuries. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Definitions of American national identity from 1789 to the present as expressed in politics, religion, literature, painting, music, architecture, and history. prereq; instr consent

HIST 5881. American Foreign Relations to 1895. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Intensive readings in the historiography of American foreign relations with emphasis on American imperialism, domestic courses of foreign policy, and international political, economic, and cultural relations. prereq; instr consent

HIST 5890. Readings in American Indian and Indigenous History. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Students in this course will read recently published scholarship in American Indian and Indigenous history that takes up pressing research questions, promises to push inquiry in new directions, and that theorizes important interventions in our thinking to understand where the field is situated and moving. Reflecting the instinctively interdisciplinary nature of American Indian and Indigenous history, readings will be drawn not just from the discipline of history but across other disciplines such as Anthropology, American Studies, Geography, Literature, Political Science, and Legal Studies. As well, readings will include scholarship that reaches out to embrace the Global Indigenous studies turn. prereq: Advanced undergrad with instr consent or grad student

HIST 5900. Topics in European/Medieval History. (1-4 cr. [max 16 cr.]; A-F only; Every Fall & Spring)
Selected topics in European or medieval history not covered in regular courses; taught as staffing permits. prereq; Grad or [advanced undergrad with instr consent]

HIST 5901. Latin America Proseminar: Colonial. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Introduces beginning graduate and advanced undergraduate students to major historical writings on various Latin American themes. prereq; instr consent

HIST 5902. Latin America Proseminar: Modern. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Introduces beginning graduate and advanced undergraduate students to major historical writings on various Latin American themes. prereq; instr consent

HIST 5905. Topics in European Medieval History. (1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring)
Selected topics in Medieval European history, up to 1500ce. prereq; Grad or [advanced undergrad with instr consent]

HIST 5910. Topics in U.S. History. (1-4 cr. [max 20 cr.]; Student Option; Every Fall & Spring)
Selected topics in U.S. history not covered in regular courses. Taught as staffing permits. prereq: Grad or advanced undergrad student with instr consent

HIST 5920. Topics in African History. (; 3 cr.; max 16 cr. ; Student Option; Periodic Fall & Spring)
Topics not covered in regular courses.

HIST 5930. Topics in Ancient History. (; 1-4 cr.; max 16 cr. ; A-F or Audit; Periodic Fall & Spring)
Selected topics in ancient history not covered in regular courses. To be taught as staffing permits and as enrollment warrants. prereq: Grad or instr consent

HIST 5932. The Production of Knowledge, Negotiating the Past, and the Writing of African Histories. (3 cr. ; A-F or Audit; Periodic Fall & Spring)
Recent scholarship on social history of Africa. Focuses on new literature on daily lives of ordinary people in their workplaces, communities, households.

HIST 5940. Topics in Asian History. (; 1-4 cr.; max 16 cr. ; Student Option; Every Fall & Spring)
Topics not covered in regular courses. prereq: Grad student or [advanced undergrad, instr consent]

HIST 5941. Readings in Chinese Documents. (; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Readings in Chinese on a topic to be selected by the instructor. Depending on the topic and the time period, readings may involve a mixture of modern and classical Chinese or may be entirely in modern Chinese. Consult instructor for more information. prereq: Reading knowledge of Chinese

HIST 5950. Topics in Latin American History. (; 1-4 cr.; max 15 cr. ; A-F or Audit; Every Fall & Spring)
Selected topics in Latin American history not covered in regular courses. Taught as staffing permits. prereq: Grad or advanced undergrad with instr consent

HIST 5960. Topics in History. (; 1-4 cr.; max 16 cr. ; Student Option; Every Fall & Spring)
Selected topics in history not covered in regular courses. Taught as staffing permits. prereq: [advanced undergrad with instr consent]

HIST 5962. Bell Library Research Seminar in Comparative World History, ca. 1000-1800 CE. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Research proseminar on actions of Europeans in wider world, 1000-1800. Based on documents in James Ford Bell Library. prereq: Grad student, instr consent

HIST 5964. Comparative Economic History. (; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Theoretical approaches guide cross-cultural examinations of major issues in the economic history of East Asia, Europe, and the New World. Agrarian structures in economic development, markets, the state and economic development, and the industrial revolution. prereq: instr consent

HIST 5970. Advanced Research in Quantitative History. (; 4 cr.; max 16 cr.; A-F or Audit; Periodic Fall & Spring)
Students will carry out publishable-quality research on a quantitative historical topic.

HIST 5980. Topics in Comparative Women’s History. (; 3-4 cr.; max 20 cr. ; A-F or Audit; Periodic Fall & Spring)

HIST 5990. Readings in Comparative History. (; 3 cr.; max 9 cr.; A-F only; Spring Odd Year)
Students read/discuss historical works that focus on common theme or employ similar methods in different geographic areas. Issues of cross-area comparison. Topics vary (e.g., peasant societies, race/ethnicity, states/nationalism). prereq: instr consent

HIST 5993. Directed Study. (1-16 cr. ; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. Prereq [Grad student or sr], instr consent, dept consent, college consent.

HIST 5994. Directed Research. (1-16 cr. ; Student Option; Every Fall, Spring & Summer)
Work of a tutorial basis. Prereq [Grad student or sr], instr consent, dept consent, college consent.

HIST 8015. Scope and Methods of Historical Studies. (3 cr.; A-F or Audit; Every Fall)
Development of historical studies over time (especially in 19th and 20th centuries). Methodologies currently shaping historical research. Theoretical developments within the discipline during 19th and 20th centuries.

HIST 8016. Practicum in Historical Writing. (3 cr.; A-F only; Periodic Fall & Spring)
Facilitate transition from writing seminar papers to writing individual research projects part of dissertation. Practice of making historical arguments in common genres of academic profession, such as grant proposals, prospectus, dissertation chapters.

HIST 8021. History Research Seminar. (3 cr.; max 6 cr.; A-F or Audit; Every Spring)
The History Research Seminar will help History PhD students to conceptualize and articulate a significant research proposal and to become more effective writers. The course will prioritize the format and expectations of the dissertation prospectus, but with permission of the instructor students may develop a different research project (e.g. a seminar paper to become part of their portfolio, or a chapter of an MA thesis or dissertation). In either case, students will focus on the process of rigorously conceptualizing their research by writing a proposal using a format that is suggested by the Graduate School's Doctoral Dissertation Fellowship application's "Statement of Research" as a model.

HIST 8025. Politics of Historical Memory. (3 cr.; max 6 cr.; A-F or Audit; Periodic Fall & Spring)

HIST 8031. Digital Methods for Heritage Studies & Public History. (3 cr.; Student Option; Every Fall)
Digital technologies are significantly altering the speed and scale of the foundational methodologies of archeology, history, and preservation. Moreover, they are shifting the way the public engages with the past in cultural institutions and across the myriad screens that pervade their daily life. In this course, students will not only learn how emerging digital technologies can enhance their research, but also how those technologies are fundamentally transforming the possibilities for the public presentation of that research. This course privileges hands-on learning and balances deepening essential methodological skills with exposure to a breadth of field-altering technologies. It is structured around five core methodologies--excavation, documentation, reconstruction, interpretation, and exhibition. In each unit, students will be first be tasked with identifying the underlying principles of these methodological approaches. They will then use class time to explore technologies that extend those methods such as high-resolution imaging, relational databases, text mining programs, virtual environments, and content management systems for website building. Bookending the course is a focus on effective collaboration—the foundation of successful digital projects—and public engagement in an increasingly connected yet fractured society.

HIST 8110. Medieval History: Research Seminar. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Research in medieval European history, using primary source material. prereq: instr consent, good reading knowledge of Latin, French, one other European language

HIST 8122. Public Histories. (3 cr.; A-F or Audit; Every Fall)
This seminar examines the variety of ways that "public history" is produced both within and outside the academic institutions and explores how interdisciplinary approaches to the making and critical analysis of public histories. Students will discuss recent scholarship in public history as well as scholars and practitioners in allied fields. Through discussion and collaborative project work, the seminar will also provide a hands-on introduction to the theory, methods, practice and politics of public history.

HIST 8232. Cultural Fallout: The Cold War and Its Legacy: Research. (3 cr.; A-F or Audit; Every Fall & Spring)
Student produce research paper on history/culture of Cold War era as it developed in
United States after World War II. Research project builds upon readings from 8231.

**HIST 8239. Readings in Gender, Race, Class, and/or Ethnicity in the United States.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Dynamics of gender, racial, class, and ethnic relations in U.S. history; intersections of these forces. prereq: instr consent

**HIST 8240. Topics in Research in Gender, Race, Class, or Ethnicity in the United States.**
(3 cr. [max 6 cr.]; A-F or Audit; Periodic Fall & Spring)
Dynamics of gender, racial, class, and ethnic relations in U.S. history. Intersections of these forces. Topics vary by instructor. prereq: instr consent

**HIST 8245. Human Rights: A Global History.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
This course will focus on debates and social movements concerning human rights in the broadest sense, beginning with the seventeenth century and ending in the 1950s. Topics include colonization, slavery, torture, war crimes, rights to land, women's rights, sexual rights, and indigenous self-determination. The seminar will require a research or historiographical paper.

**HIST 8333. FTE: Master's.**
(1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

**HIST 8390. Research in American Indian History.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Research/writing skills in American Indian history. Identify research questions, locate sources, conduct original research, produce substantial research paper.

**HIST 8434. Health and Healing in African History.**
(3 cr.; Student Option; Periodic Fall & Spring)

**HIST 8444. FTE: Doctoral.**
(1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**HIST 8464. Research in Yuan, Ming, and Qing History.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Basic skills and resources for doing research in history of late imperial China. Bibliographic exercises; reading and translating primary documents. prereq: Good working knowledge of classical Chinese, background in history of late imperial China.

**HIST 8465. Research in Yuan, Ming, and Qing History.**
(3 cr.; Student Option; Periodic Fall & Spring)
Basic skills and resources for doing research in history of late imperial China. Students select, translate, and annotate texts appropriate to their research interests and write a research paper centering on these texts. prereq: Good working knowledge of classical Chinese, background in history of late imperial China.

**HIST 8540. Topics in Mediterranean Studies.**
(1-4 cr. [max 15 cr.]; A-F or Audit; Every Fall & Spring)
Mediterranean history from Middle Ages to present. Taught as staffing permits. prereq: Grad student or advanced undergrad with instr consent

**HIST 8630. Seminar in World History.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Critical examination of historical literature dealing with theoretical approaches to world history and teaching of world history. prereq: instr consent

**HIST 8640. Topics in Legal History Research.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Comparative, methodological, theoretical, and topical courses in legal historical research, from ancient world to present. Offerings rotate.

**HIST 8644. Legal History Workshop.**
(3 cr.; A-F or Audit; Every Fall & Spring)
Introduction to legal history and professional socialization. Work-in-progress of leading scholars working in field of legal history. Students can undertake original research. prereq: instr consent

**HIST 8645. American Legal History.**
(3 cr.; A-F only; Periodic Spring)
This course explores the interaction between law, politics, and culture in American society, concentrating on the period from the Revolution through the New Deal. Topics include: democracy and the rule of law; slavery; the public-private distinction; Civil War and Reconstruction; industrialization; expansion of the federal administrative state; law and the human sciences; crime and punishment; legal education and the role of the lawyer in the American polity. Readings will include primary legal sources, such as treatises, statutes, constitutions, and landmark cases, as well as contemporary religious, scientific, and literary works, which will help to situate the legal materials in broader cultural context. Several secondary sources will also be considered, both for insights into the topics covered, and to illustrate various approaches to legal-historical analysis. The course will encourage critical examination of these sources with the aim of clarifying how law has figured in the history and historiography of the United States. No previous background in American history is assumed.

**HIST 8666. Doctoral Pre-Thesis Credits.**
(1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**HIST 8709. Seminar: History of Sexuality.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Theories of sexuality (by, e.g., Foucault, Butler, deLauretis), their application in history. Topics may include: feminist critique of Foucault and the classics, psychoanalytic approaches to religious transformations such as the Reformation, varying forms of gender transgression, sexuality in colonial encounters, operation of sexual metaphors in political conflict, and AIDS and the writing of history.

**HIST 8715. Research on European Women's History, 1450-1750.**
(3 cr.; Student Option; Periodic Fall & Spring)
Research techniques for completing a major research paper based on primary sources. prereq: 5715

**HIST 8720. Research Seminar on Central European History.**
(1-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Broad research theme/problem: in most cases preparation for dissertation. Students identify primary/secondary sources, conduct research, write paper, and read/comment upon each other's drafts. Geographic focus varies with instructor, may include Germany or lands of former Habsburg Austrian empire.

**HIST 8777. Thesis Credits: Master's.**
(1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**HIST 8801. Seminar in Early American History.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Introduction to literature of early American history. Readings selected from some of best scholarship in field. Questions of colonial historians. Theories, methods, sources used in pursuit of those questions.

**HIST 8802. Readings in American History, 1848-Present.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Readings-intensive course. U.S. history from Mexican-American War to present.

**HIST 8832. Cultural Fallout: The Cold War and Its Legacy: Research.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Student produces research paper on history/culture of Cold War era in the United States after World War II. Research projects build upon readings from 5831. prereq: 5831

**HIST 8857. Seminar: Research in the History of American Women.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Students define a historical problem or area of research on a topic in American women's history they would like to pursue in depth, identify appropriate sources and accomplish research in primary and secondary sources, write a 25 to 35-page scholarly article, and read and comment upon each other's drafts. prereq: 5857, instr consent

**HIST 8858. Research in Early American History.**
(3 cr.; A-F or Audit; Periodic Fall & Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Research and writing skills. With instructor and other participants, students identify their research questions, locate the sources with which to answer these questions, conduct original research, and produce a substantial research paper. prereq: 5801 or instr consent

HIST 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 14 cr per semester or summer, 24 cr required

HIST 8900. Topics in European/Medieval History. (1-4 cr. [max 20 cr.]; A-F or Audit; Every Fall & Spring) Topics not covered in regular courses.

HIST 8905. Topics in European Medieval History. (1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Selected topics in Medieval European history, up to 1500ce.

HIST 8910. Topics in U.S. History. (1-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Topics not covered in regular courses.

HIST 8920. Topics in African History. (1-4 cr. [max 20 cr.]; A-F or Audit; Periodic Fall) Topics not covered in regular courses.

HIST 8930. Topics in Ancient History. (1-4 cr. [max 16 cr.]; A-F or Audit; Periodic Fall & Spring) Topics not covered in regular courses.

HIST 8940. Topics in Asian History. (1-4 cr. [max 16 cr.]; A-F or Audit; Periodic Fall & Spring) Topics not covered in regular courses.

HIST 8944. Research Seminar: New Directions in African Social History I. (3 cr.; A-F or Audit; Periodic Fall & Spring) First of two-part course. Radical transformation in field of African social history during past two decades. Students select major research topic and begin preliminary investigation. prereq: instr consent

HIST 8945. Research Seminar: New Directions in African Social History II. (3 cr.; S-N or Audit; Periodic Fall & Spring) Second of two-part course. Students conceptualize and write major research paper. prereq: 8944, instr consent

HIST 8950. Topics in Latin American History. (1-4 cr. [max 16 cr.]; A-F or Audit; Every Spring) Topics not covered in regular courses.

HIST 8960. Topics in History. (1-4 cr. [max 20 cr.]; A-F or Audit; Every Fall & Spring) Topics not covered in regular courses.

HIST 8961. Research Seminar: Intellectual History. (3 cr.; A-F or Audit; Periodic Fall & Spring) Approaches/methods. Readings on or exemplifying intellectual history. Intellectual history as something broader than history of philosophical thought: a set of approaches of broad cross-disciplinary applicability. Each student prepares a research paper on a topic of intellectual history and present it to class for critique.

HIST 8970. Advanced Research in Quantitative History. (3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Students carry out publishable-quality research on quantitative history topic. prereq: Grad student

HIST 8990. Topics in Comparative History-Research. (3 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Topics vary. Students read/discuss historical works from different geographic areas, develop proposals for comparative research, or pursue comparative research projects. prereq: instr consent

HIST 8993. Directed Study. (1-16 cr.; A-F or Audit; Every Fall, Spring & Summer) Students work on tutorial basis. Guided individual reading or study. prereq: Grad student, instr consent

HIST 8994. Directed Research. (1-16 cr.; A-F or Audit; Every Fall, Spring & Summer) Work on a tutorial basis. prereq: instr consent

History of Medicine (HMED)

HMED 3001W. Health, Disease, and Healing I. (HIS, W; 4 cr.; Student Option; Every Fall) Introduction to intellectual/social history of European/American medicine, health care from classical antiquity through 18th century.

HMED 3002W. Health Care in History II. (HIS, W; 4 cr.; Student Option; Every Spring) Introduction to intellectual/social history of European/American medicine, health care in 19th/20th centuries.

HMED 3040. Human Health, Disease, and the Environment in History. (HIS; 3 cr.; Student Option; Every Spring & Summer) Introduction to historical relationship of human health and the environment. How natural/human-induced environmental changes have, over time, altered our experiences with disease and our prospects for health.

HMED 3055. Women, Health, and History. (DSJ, HIS; 3 cr.; A-F only; Periodic Fall & Spring) Women's historical roles as healers, patients, research subjects, health activists. Biological determinism, reproduction, mental health, nursing, women physicians, public health reformers, alternative practitioners. Gender disparities in diagnosis, treatment, research, careers. Assignments allow students to explore individual interests.


HMED 3075. Technology and Medicine in Modern America. (HIS, TS; 3 cr.; Student Option; Every Fall & Spring) How technology came to medicine's center-stage. Impact on production of medical knowledge, professionalization, development of institutions/industry, health policy, and gender/race disparities in health care.

HMED 3993. Directed Study. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading or study.

HMED 4965W. Senior Research in Medical History. (WI; 3 cr.; A-F only; Every Fall & Spring) Seminar. Reading/discussion, individual directed research project with oral presentation. Students meet in peer groups and with instructor. prereq: Sr, instr consent

HMED 5075. Technology and Medicine in Modern America. (3 cr.; A-F or Audit; Fall Odd, Spring Even Year) How technology came to medicine's center-stage. Impact on medical practice, institutions, consumers, production of medical knowledge, professionalization, health policy, gender/race disparities in health care. prereq: instr consent

HMED 7500. Historical Research for Medical Students. (4 cr. [max 8 cr.]; H-N only; Every Fall, Spring & Summer) This course is designed to acquaint third and fourth year medical students with the sources and the methods of historical research in medical topics and to allow them to undertake a short research project on a topic which they help design.

HMED 8001. Foundations in the History of Early Medicine. (3 cr.; A-F only; Every Fall) History of Western medicine, from professionalization of healing in Greco-Egyptian antiquity to association of postmortem pathology with disease and clinical movement of early 19th-century Paris.

HMED 8002. Foundations in the History of Modern Medicine, 1800-present. (3 cr.; A-F only; Every Spring) History of Western medicine in Europe and America, from the Paris School and pathological anatomy in early 19c France through germ theories of disease, bacteriological revolution, reform of medical education, pharmaceutical revolution, growth of biomed research establishment, and comparative health care delivery systems.

HMED 8112. Historiography of Science, Technology, and Medicine. (3 cr.; A-F only; Every Fall) Models of practice, different schools. Work of representative historians of science, technology, and medicine. prereq: instr consent

HMED 8113. Research Methods in the History of Science, Technology, and Medicine. (3 cr.; A-F only; Every Spring) Introduction to sources, methods, and problems of research in history of science, technology, and medicine. Preparation of major research paper under faculty supervision. prereq: instr consent
HMED 8220. Seminar: Current Topics in the History of Medicine. (3 cr. [max 9 cr.]; A-F or Audit; Every Fall & Spring)
Topics vary. prereq: instr consent

HMED 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

HMED 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

HMED 8631. Directed Study. (1-6 cr. [max 12 cr.]; A-F or Audit; Every Fall)
tbd prereq: instr consent

HMED 8632. Directed Study. (1-6 cr. [max 12 cr.]; A-F or Audit; Every Spring)
tbd prereq: instr consent

HMED 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

HMED 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

HMED 8830. Topics in the History of Science, Technology, and Medicine. (3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Spring)
Historical literature of topics common to history of science, technology, and medicine. prereq: instr consent

HMED 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall & Spring)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

History of Science and Tech (HSCI)

HSCI 1011. Digital World. (HIS,T,S; 3 cr.; Student Option; Every Spring)
Essential knowledge and critical perspective to understand today’s Digital World. The history and social impact of the digital revolution, including security, surveillance, “virtual reality,” and the future of the Internet.

HSCI 1212. Life on Earth: Origins, Evolution & Ecology. (ENV,HIS; 4 cr.; Student Option; Every Spring)
How have people explained where life came from and how it has developed over time? We examine controversies over life’s origins, the Holocene extinction, human population growth, the Dust Bowl and soil conservation, DDT and falcon repatriation, and disease and responses to pandemics. Evolution, natural theology, Ecosystems.

HSCI 1555. Campus Obscura: A University of Minnesota Cabinet of Curiosities. (3 cr.; A-F only; Periodic Fall & Spring)
Exploring museums and special collections on campus, this course will analyze the importance of material objects—maps, rare books, artifacts, instruments, specimens, manuscripts—in writing history, producing public exhibits, and creating identities. The University of Minnesota provides a rich resource for such exploration of objects that, collectively, have and continue to shape its history. Among other places, students will visit the Wangensteen Historical Library of Biology and Medicine, the Goldstein Museum of Design, the University Archives, and the Conservatory on the Saint Paul campus where experts will guide them in examining specific specimens and artifacts. Students will write short response papers at each visit, often on an object of their choice. The final collaborative group project will be based on one particular object (or group of objects) studied in detail by each student that will then become part of a digital StoryMap of the campus.

HSCI 1714. Stone Tools to Steam Engines: Technology and History to 1750. (HIS,T; 3-4 cr.; Student Option; Every Fall & Spring)
Technology is an enormous force in our society, and has become so important that in many ways it seems to have a life of its own. This course uses historical case studies to demonstrate that technology is not autonomous, but a human activity, and that people and societies made choices about the technologies they developed and used. It asks how technological differences between nations influenced their different courses of development, and why some societies seemed to advance while others did not. We ask how technological choices can bring about consequences greater than people expected, and how we might use this knowledge in making our own technological choices. In particular, we explore the historical background, development, and character of the most widespread technological systems the world has known, from prehistoric stone tool societies, through Egypt and the pyramids, ancient Greece and Rome, the explosion of Islam, and the dynamic and often violent technologies of medieval Europe.

HSCI 1715. History of Modern Technology: Waterwheels to the Web. (HIS,T; 3-4 cr.; Student Option; Every Fall & Spring)
This course explores the many technological systems that have come to span our globe, alongside the widespread persistence of traditional technologies. We start with the earliest glimmerings of modernity and industrialization, and move on in time to the building of global technological networks. How have people changed their worlds through technologies like steam engines and electronics? Is it a paradox that many traditional agricultural and household technologies have persisted? How have technologies of war remade the global landscape? We ask how business and government have affected technological entrepreneurs, from railroads to technologies of global finance. We end by considering the tension between technologies that threaten our global environment and technologies that offer us hopes of a new world.

HSCI 1814. Revolutions in Science: The Babylonians to Newton. (GP,HIS; 3-4 cr.; Student Option; Every Fall & Spring)
Development and changing nature of sciences in their cultural context. Babylonian/Greek science. Decline/transmission of Greek science. Scientific Revolution (1500-1700) from Copernicus to Newton.

HSCI 1815. Making Modern Science: Atoms, Genes and Quanta. (GP,HIS; 3-4 cr.; Student Option; Periodic Fall, Spring & Summer)
How scientists like Darwin and Einstein taught us to think about nature; everything from space, time and matter to rocks, plants, and animals.

HSCI 1955. Einstein’s Universe. (3 cr.; A-F only; Periodic Fall & Spring)
In this seminar we examine the life and work of Albert Einstein (1879-1955). The use of mathematics will be kept to a minimum. You will need no more than some basic high school algebra and geometry. We begin by studying the special theory of relativity (1905) and some of its famous predictions such as time dilation, the twin paradox, and E=mc2. While working our way through this material, we will also look at elements of nineteenth-century physics that played a role in the development of special relativity. We continue to pursue a historical approach when we turn to the general theory of relativity (1915), the theory that makes gravity part of (curved) space-time. We trace the development of this theory from 1907 till about 1920. Einstein worked intensively on this theory living in Berlin during the first World War (1914-1918). For this period, we shall also take a close look at Einstein’s personal life and at his tentative first appearances on the political stage. Finally, we cover Einstein’s role in the development of quantum physics, building his early pioneering efforts in this field and his later opposition to quantum mechanics as formulated in the mid-20s. By the end of the course you should have a good understanding of some of Einstein’s most revolutionary ideas, of how he arrived at them, at what personal and cultural context.

HSCI 2333V. Honors Course: A Century of Science in Modern America. (CIV,W,HIS; 3 cr.; A-F only; Every Fall)
Science and technology influence nearly every aspect of our daily lives as well as the communities in which we live, both locally and globally. How did science and technology become such ubiquitous and powerful aspects of American industry, government policy, public life, and international negotiation? What are the responsibilities of scientists and engineers who play a critical role in creating and maintaining these elements? How can the broader public position itself to provide encouragement,
insight and critique of the research and applications of science and technology? This course is intended to examine these questions by exploring historical case studies that highlight ethical, political, and social issues that give meaning to, and in turn, are shaped by science and technology. Beginning with the role of scientists as professional experts in the Progressive era, we consider how ideals of scientific management impacted animal lives and workers = bodies. Ethical choices frame the application of expertise and require attention and specific decision-making. Using eugenics as an example, we will reflect upon the internal and external rhetoric that framed the often naïve understanding of heredity and public policy and continue discussion into the application of contemporary genetic testing. Ethics are framed in social and political settings, and we will follow sometimes surprisingly comparable developments in Russia and the United States, with particular attention to large-scale engineering projects in the 1920s and 1930s and the space race in the 1950s and 1960s in order to understand how these reflected, or failed to reflect, risk and human life. This course meets the Historical Perspectives, Civic Life and Ethics, and Writing Intensive requirements as defined by the Council on Liberal Education. Along with Student Learning Outcomes, these requirements will help you continue to build critical tools for your work at the university as well as ways to evaluate and create knowledge in and beyond your intended career area.

HSCI 3211. Biology and Culture in the 19th and 20th Centuries. (CIV,HIS; 3 cr.; Student Option; Every Fall & Spring)
Changing conceptions of life and aims and methods of biology; changing relationships between biology and the physical and social sciences; broader intellectual and cultural dimensions of developments in biology.

HSCI 3242. Navigating a Darwinian World. (HIS; 3 cr.; Student Option; Every Fall)
In this course we grapple with the impact of Darwin's theories of evolution in the scientific community and beyond. We'll examine and engage the controversies that have surrounded this theory from its inception in the 19th century through its applications in the 21st. What made Darwin a Victorian celebrity, a religious scourge, an economic sage and a scientific hero? We'll look closely at the early intellectual influences on theory development; study the changing and dynamic relationship between science and religion; and critically analyze the application of Darwin's theory to questions of human nature and behavior.

HSCI 3244. Nature's History: Science, Humans, and the Environment. (ENV,HIS; 3 cr.; Student Option; Every Fall)
We examine environmental ideas; sustainability, conservation history; critique of the human impact on nature; empire and power in the Anthropocene; how the science of ecology has developed; and modern environmental movements around the globe. Case studies include repatriation of endangered species; ecology and evolutionary theory; ecology of disease; and climate change.

HSCI 3246. History of (Un)Natural Disasters. (ENV,HIS; 3 cr.; Student Option; Periodic Spring)
Earthquakes, hurricanes, tsunamis, wildfires, epidemic disease, and technological failures? This course will examine large scale natural events in American and world history, the social, technological, and environmental conditions that underlie them, and their historical consequences. Human societies have long been embedded in physical landscapes where they are subject to specific environmental conditions and physical risks: eight thousand-year-old wall paintings in Turkey depict the eruption of Hasan Dag volcano over the city of Catal Huyuk, for example. But then and now, it takes a certain combination of social conditions and environmental events to create a natural disaster. In this course, we will use historical natural disasters to explore the interconnections between the structures and ideas of human society and environmental forces. Humans have not been simply the random victims of natural disasters; where and how they chose to live influenced the impact of any disastrous event. Examining these events in a historical context will help us see the social, technological, scientific, and environmental systems that have been constantly interacting, but which are normally taken for granted until they break down.

HSCI 3331. Technology and American Culture. (HIS; 3 cr.; Student Option; Every Fall & Spring)
American culture(s) and technology, pre-Columbian times to present. Artisanal, biological, chemical, communications, energy, environment, electronic, industrial, military, space and transportation technologies explained in terms of economic, social, political and scientific causes/effects.

HSCI 3332. Science in the Shaping of America. (DSJ,HIS; 3 cr.; Student Option; Periodic Spring)
Science played a central role in taking dispersed imperial colonies in North America to world power in just four centuries. This course investigates people, policies, and knowledge-making in a culture whose diversity was a critical part of its expanding capacities. It begins by examining the differences in ways of knowing as well as shared knowledge between Native Americans and Europeans and concludes by discussing how a powerful nation's science and technology shaped international relations. Class, race, ethnicity, and gender provided for a range of perspectives that contributed to science alongside social and economic developments. Online assignments, films and images, along with primary and secondary source readings provide the basis for class discussion.

HSCI 3401. Ethics in Science and Technology. (CIV,HIS; 3 cr.; Student Option; Periodic Fall & Spring)
In addition to examining the idea of ethics itself, this course will examine the ethical questions embodied in specific historical events, technological systems, and scientific enterprises. Commonly, technology is assumed to be the best engineered solution for a particular goal and (good) science is supposed to be objective; however, this is never truly the case, values and moral choices underlie all of our systems for understanding and interacting with the world around us. These values and choices are almost always contentious. Through a series of historical case studies we will grapple with the big issues of right and wrong and the role of morality in a technological world. Our goal will be to learn to question and think critically about the things we create, the tools we use, and the ideology and practice of science.

HSCI 3421. Engineering Ethics. (CIV,HIS; 3 cr.; Student Option; Every Fall & Spring)
Ethical issues in engineering research and engineers' public responsibility/practice, using historical cases; historical development of engineering as a vocation/profession; ethical implications of advanced engineering systems such as nuclear weaponry and networked communications.

HSCI 3611. Enlightenment, Revolution, and the Rise of Modern Science. (GP,HIS; 3 cr.; Student Option; Periodic Spring)
Understanding the origins of our own culture of Modern Science in the Enlightenment of the eighteenth century. Newton's ambiguous legacy; science as wonder and spectacle; automata and monsters; early theories of sex and gender; empire and scientific expeditions; reshaping the environment; inventing human sciences; Frankenstein and the limits of science and reason.

HSCI 3714. Stone Tools to Steam Engines: Technology and History to 1750. (HIS; 3-4 cr.; Student Option; Every Fall & Spring)
Technology is an enormous force in our society, and has become so important that in many ways it seems to have a life of its own. This course uses historical case studies to demonstrate that technology is not autonomous, but a human activity, and that people and societies made choices about the technologies they developed and used. It asks how technological differences between nations influenced their different courses of development, and why some societies seemed to advance while others did not. We ask how technological choices can bring about consequences greater than people expected, and how we might use this knowledge in making our own technological choices. In particular, we explore the historical background, development, and character of the most widespread technological systems the world has known, from prehistoric stone tool societies, through Egypt and the pyramids, ancient Greece and Rome, the explosion of Islam, and the dynamic and often violent technologies of medieval Europe.

HSCI 3715. History of Modern Technology: Waterwheels to the Web. (HIS; 3-4 cr.; Student Option; Every Fall & Spring)
This course explores the many technological systems that have come to span our globe,
alongside the widespread persistence of traditional technologies. We start with the earliest glimmers of modernity and industrialization, and move on in time to the building of global technological networks. How have people changed their worlds through technologies like steam engines and electronics? Is it a paradox that many traditional agricultural and household technologies have persisted? How have technologies of war remade the global landscape? We ask how business and government have affected technological entrepreneurs, from railroads to technologies of global finance. We end by considering the tension between technologies that threaten our global environment and technologies that offer us hope of a new world.

HSCI 3814. Revolutions in Science: The Babylonians to Newton. (GP,HIS; 3-4 cr.; Student Option; Every Fall & Spring) Development and changing nature of sciences in their cultural context. Babylonian/Greek science. Decline/transmission of Greek science. Scientific Revolution (1500-1700) from Copernicus to Newton.

HSCI 3815. Making Modern Science: Atoms, Genes and Quanta. (GP,HIS; 3-4 cr.; Student Option; Periodic Fall, Spring & Summer) How scientists like Darwin and Einstein taught us to think about nature; everything from space, time and matter to rocks, plants, and animals.

HSCI 4060. Special Topics in History of Technology. (3 cr.; Student Option; Periodic Spring) Topics specified in Class Schedule

HSCI 4121W. History of 20th-Century Physics. (WI; 3 cr.; Student Option; Periodic Spring) The transition from classical to modern physics (relativity, quantum) and its architects (from Planck and Einstein to Heisenberg and Schrödinger). The WWII bomb projects in the US and in Germany. Post-war developments (solid state, particle physics).

HSCI 4321. History of Computing. (HIS,TS; 3 cr.; Student Option; Fall Even, Spring Odd Year) Developments in the last 150 years; evolution of hardware and software; growth of computer and semiconductor industries and their relation to other business areas; changing relationships resulting from new data-gathering and analysis techniques; automation; social and ethical issues.

HSCI 4455. Women, Gender, and Science. (DSJ,HIS; 3 cr.; Student Option; Every Fall & Spring) Three intersecting themes analyzed from 1700s to the present: women in science, sexual and gendered concepts in modern sciences, and impact of science on conceptions of sexuality and gender in society.

HSCI 5211. Biology and Culture in the 19th and 20th Centuries. (CIV; 3 cr.; Student Option; Every Fall & Spring) Changing conceptions of life and aims and methods of biology; changing relationships between biology and the physical and social sciences; broader intellectual and cultural dimensions of developments in biology.

HSCI 5242. Navigating a Darwinian World. (3 cr.; Student Option; Every Spring) In this course we grapple with the impact of Darwin’s theory of evolution in the scientific community and beyond. We’ll examine and engage the controversies that have surrounded this theory from its inception in the 19th century through its applications in the 21st. What made Darwin a Victorian celebrity, a religious scourge, an economic saine and a scientific hero? We’ll look closely at the early intellectual influences on theory development; study the changing and dynamic relationship between science and religion; and critically analyze the application of Darwin’s theory to questions of human nature and behavior.

HSCI 5244. Nature’s History: Science, Humans, and the Environment. (3 cr.; Student Option; Every Fall) We examine environmental ideas, sustainability, conservation history; critique of the human impact on nature; empire and power in the Anthropocene; how the science of ecology has developed; and modern environmental movements around the globe. Case studies include repatriation of endangered species; ecology and evolutionary theory; ecology of disease; and climate change.

HSCI 5246. History of (Un)Natural Disasters. (3 cr.; Student Option; Periodic Spring) Earthquakes, hurricanes, tsunamis, wildfires, epidemic disease, and technological failures. This course will examine large scale natural events in American and world history, the social, technological, and environmental conditions that underlie them, and their historical consequences. Human societies have long been embedded in physical landscapes where they are subject to specific environmental conditions and physical risks: eight thousand-year-old wall paintings in Turkey depict the eruption of Hasan Dag volcano over the city of Catal Huyuk, for example. But then and now, it takes a certain combination of social conditions and environmental events to create a natural disaster. In this course, we will use historical natural disasters to explore the interconnections between the structures and ideas of human society and environmental forces. Humans have not been simply the random victims of natural disasters; where and how they chose to live influenced the impact of any disastrous event. Examining these events in a historical context will help us see the social, technological, scientific, and environmental systems that have been constantly interacting, but which are normally taken for granted until they break down.

HSCI 5331. Technology and American Culture. (3 cr.; Student Option; Periodic Fall & Spring) Development of American technology in its cultural/intellectual context from 1790 to present. Transfer of technology to America. Establishment of an infrastructure promoting economic growth. Social response to technological developments.

HSCI 5332. Science in the Shaping of America. (3 cr.; Student Option; Periodic Spring) The British colonies of North America were founded in precisely the same centuries as a revolution in European’s understanding of nature, transformed by the ideas of Galileo, Newton, and Linnaeus and by the technologies of the industrial revolution. Native Americans and African Americans had their own knowledge of nature, and their close understanding intersected with the increasingly scientific techniques brought with European settlers and enhanced the survival and intellectual capacities of the newcomers. By demonstrating the diversity of scientists in the ever changing demographics of an immigrant nation, the course argues that this diversity and the capacities of newcomers contributed to the national success in science and engineering. The engagement with science at points were used to try to limit access by women or African-Americans, but sciences was also used to discredit false theories through ever expanding emphasis on empiricism as well as attention to the social and economic consequences of innovation. The goal is to demonstrate those historical linkages in particular places and institutions as they influenced and reinforced specific scientific work, while, at the same time, being attentive to how scientific ideas and practices were shaped by American culture.

HSCI 5401. Ethics in Science and Technology. (3 cr.; Student Option; Periodic Fall & Spring) Historical issues involving ethics in science. Ethical problems posed by modern science/technology, including nuclear energy, chemical industry, and information technologies.

HSCI 5421. Engineering Ethics. (3 cr.; Student Option; Every Fall & Spring) Engineering ethics in historical context, including the rise of professional engineering societies; ethical problems in engineering research and engineers’ public responsibility; ethical implications of advanced engineering systems such as the production of nuclear weapons; development of codes of ethics in engineering.

HSCI 5611. Enlightenment, Revolution, and the Rise of Modern Science. (3 cr.; Student Option; Periodic Spring) Understanding the origins of our own culture of Modern Science in the Enlightenment of the eighteenth century. Newton’s ambiguous legacy; science as wonder and spectacle; automata and monsters; early theories of sex and gender; empire and scientific expeditions; reshaping the environment; inventing human sciences; Frankenstein and the limits of science and reason.

HSCI 5993. Directed Studies. (1-15 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. prereq: instr consent

HSCI 5994. Directed Research. (1-15 cr.; Student Option; Every Fall & Spring) TBD prereq: instr consent
HSCI 8112. Historiography of Science, Technology, and Medicine. (3 cr.; A-F only; Every Fall) Models of practice, different schools. Work of representative historians of science, technology, and medicine.

HSCI 8113. Research Methods in the History of Science, Technology, and Medicine. (3 cr.; A-F only; Every Spring) Introduction to sources, methods, and problems of research in history of science, technology, and medicine. Preparation of major research paper under faculty supervision.

HSCI 8124. Foundations for Research in Ancient Science. (3 cr.; A-F or Audit; Periodic Fall) Development of natural/mathematical science in ancient Near East and Classical Greece. prereq: Grad HSci major or minor or instr consent

HSCI 8125. Foundations for Research in the Scientific Revolution. (3 cr.; A-F or Audit; Fall Even, Spring Odd Year) Development of sciences/natural philosophy, 1500-1725. prereq: Grad HSci major or minor or instr consent

HSCI 8131. Industrial Revolutions. (3 cr.; A-F only; Spring Even Year) Development of industrial society, from 1700 through 1850. Emphasizes developments in mechanical/engineering sciences. Scientific, economic, political, and social dimensions of industrialization.

HSCI 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

HSCI 8421. Social and Cultural Studies of Science. (3 cr.; Student Option; Periodic Fall & Spring) Review of recent work; theoretical and methodological differences among practitioners; selected responses from historians and philosophers of science.

HSCI 8441. Women in Science: Historical Perspectives. (3 cr.; Student Option; Periodic Fall & Spring) Key literature dealing with patterns of participation in science and medicine since the 18th century. The ways in which modern science is perceived to be gendered, particularly in its practice and in ways that seem to influence theory and applications. prereq: instr consent

HSCI 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

HSCI 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

HSCI 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required (Plan A only)

HSCI 8830. Topics in the History of Science, Technology, and Medicine. (3 cr.; A-F or Audit; Periodic Fall & Spring) Historical literature of topics common to history of science, technology, and medicine. prereq: instr consent

HSCI 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

HSCI 8900. Seminar: History of Early Physical Science. (3 cr.; Student Option; Periodic Fall & Spring) For advanced graduate students; topics in development of natural and mathematical science before 1800. prereq: instr consent

HSCI 8910. Seminar: History of Modern Physical Sciences. (3 cr.; [max 6 cr.]; Student Option; Periodic Fall & Spring) For advanced graduate students; topics in development of physical sciences since 1800. prereq: instr consent

HSCI 8920. Seminar: History of Biological Sciences. (3 cr.; [max 6 cr.]; Student Option; Every Fall & Spring) For advanced graduate students; topics in development of natural, biological, and medical sciences from Aristotle to the present. prereq: instr consent

HSCI 8930. Seminar: History of Technology. (3 cr.; [max 6 cr.]; Student Option; Periodic Fall & Spring) For advanced graduate students; topics in development of technology from ancient times to the present. prereq: instr consent

HSCI 8940. Seminar: History of Science and Technology in the Americas. (3 cr.; Student Option; Every Fall & Spring) For advanced graduate students; topics in development of science and technology, emphasizing the United States and Canada. prereq: instr consent

HSCI 8950. Seminar: Science and Technology in Cultural Settings. (3 cr.; Student Option; Every Fall & Spring) For advanced graduate students; topics in development of science and technology in or across specific geographic regions or particular cultures. prereq: instr consent

HSCI 8993. Directed Studies. (1-15 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) TBD prereq: instr consent

HSCI 8994. Directed Research. (1-5 cr. [max 15 cr.]; Student Option; Every Fall & Spring) TBD


HMNG 1002. Introduction to Hmong Language II. (5 cr.; Student Option; Every Summer) Continuation of 1001. Foundations of learning Hmong. Speaking, reading, writing, listening. Communication/interaction, supplemented with grammatical details. Hmong community/culture. prereq: 1001 or 1011

HMNG 1011. Beginning Hmong I. (5 cr.; Student Option No Audit; Every Fall) Listening, speaking, reading, writing skills. Emphasizes development of communicative competence.

HMNG 1012. Beginning Hmong II. (5 cr.; Student Option No Audit; Every Spring) Continuation of 1011. Listening, speaking, reading, writing skills. Development of communicative competence. prereq: HMNG 1001 or 1011

HMNG 1015. Accelerated Beginning Hmong. (5 cr.; Student Option No Audit; Every Fall & Summer) Review of grammar/usage, practice in reading/ writing. Introduction to Hmong literature and formal writing. Topics in Hmong culture. prereq: Ability in basic spoken Hmong

HMNG 3016. Accelerated Intermediate Hmong. (5 cr.; Student Option No Audit; Every Spring) Review of grammar/usage, continued practice in reading/writing. Expanded introduction to Hmong literature/formal writing. Selected topics in Hmong culture. prereq: [1011 and 1012] or 1015 or instr consent

HMNG 3021. Intermediate Hmong I. (5 cr.; Student Option No Audit; Every Fall) Listening, speaking, reading, writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations. prereq: HMNG 1002 or Hmong 1012 or Hmong 1015

HMNG 3022. Intermediate Hmong II. (5 cr.; Student Option No Audit; Every Spring) Continuation of 3021. Listening, speaking, reading, writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations. prereq: HMNG 3021

HMNG 3031. Advanced Hmong I. (4 cr.; Student Option; Every Fall) Speaking, listening, reading, writing. Complex vocabularies, sentence structures from Hmong newspapers, magazine, folktales, folk songs, novels, poetry, proverbs, riddles. Concepts/terms from social/ritual settings. Idioms, slang, classifiers. prereq: 3022 or equiv or instr consent

HMNG 3032. Advanced Hmong II. (4 cr.; Student Option; Every Spring) Speaking, listening, reading, writing. Complex vocabularies, sentence structures from Hmong
newspapers, magazine, folktales, folk songs, novels, poetry, proverbs, riddles. Concepts/terms from social/ritual settings. Idioms, slang, classifiers. prereq: 4004 or equiv or instr consent

HMNG 4008. Advanced Hmong II for Graduate Student Research. (4 cr.; Student Option; Every Spring) Speaking, listening, reading, writing. Complex vocabularies, sentence structures from Hmong newspapers, magazine, folktales, folk songs, novels, poetry, proverbs, riddles. Concepts/terms from social/ritual settings. Idioms, slang, classifiers. prereq: 4007 or equiv or instr consent


Honors Colloquia (HCOL)

HCOL 3996H. Honors: Research Internship. (: 1-3 cr. [max 9 cr.]; A-F only; Every Fall, Spring & Summer) Supervised research-based internship with a University Honors Program community partner. prereq: Honors student

Honors Seminar (HSEM)

HSEM 2001H. Fragile Subjects: Portraits of Childhood in African World Literature. (AH,GP; 3 cr.; A-F only; Periodic Fall) This seminar will focus on how "coming-of-age" comes to represent something very different for boys and girls.

HSEM 2008H. Roots Music in America: Music, Movies, and Unsolved Mysteries. (: 3 cr.; A-F only; Periodic Fall) This seminar focuses on roots music, the early twentieth century southern vernacular music that has inspired virtually every genre of American popular music over the last seven decades. Everything from hip-hop to rock to jazz to bluegrass to American roots to folk to the singer-songwriter tradition and beyond has been profoundly shaped by the roots music we'll study this semester. The course is divided into three parts. In the first, we'll examine the contributions of the music that has made it and recorded it in the early decades of the twentieth century: African-American singers, blues musicians, and songsters who labored in the south under oppressive Jim Crow conditions and forged new musical traditions; and white Appalachian peoples who were moving from farm work to work in coal mines and textile mills and combining European musical traditions with those of African-Americans to create new sounds and new sonic landscapes. In the second part of the course, we'll examine what the music means to us, to contemporary audiences, by analyzing recent films in which roots music is featured and its story told. And in the third part of the course, we'll ask what the music has meant to scholars and analyze the ways in which, from the 1930s to the present, they've traversed the south with notepads and recording devices to preserve the music and to learn about the musicians. Here we'll dip into the vast repositories of primary source material now available online (field notes, recordings, photographs, interviews) and try to find new ways to understand and appreciate roots music for ourselves, and try to solve some of its mysteries through our own research.

HSEM 2009H. Contemporary Art and Politics: From Marcel Duchamp to Ai Weiwei. (GP; 3 cr.; A-F only; Periodic Fall) This course will discuss the subject matters and practices of major contemporary artists all over the world - including Marcel Duchamp, Joseph Beuys, Christo and Jeanne-Claude, Jeff Koons, Andy Warhol, Yoko Ono, Ilya Kabakov, Jasper Johns, Jean-Michel Basquiat, Ai Weiwei, Shirin Neshat, Marina Abramovic, Kara Walker, etc. - whose creative work frequently intertwines with contemporary politics. As a strategy of being, these contemporary artists seem to use art to engage their audiences in a dynamic dialogue concerning certain aspects of contemporary life. These and other artists want to interpret political reality in order to change it; that is, to bring about social and political transformation through aesthetic means. This course will provide an overview of the
ideas, strategies, and work of the artists as a critical lens for viewing the changing cultural and political landscape of an increasingly technological and globalized world. This course will take a critical and comparative studies approach to the development of contemporary art in its historical, its social and political contexts, the increasing influence of the Western art in Asia, Africa, and other parts of the world, and the cross-cultural communication customs and protocols of international art practice and art criticism. Methodologically, this course first aims at integrating four major disciplinary approaches in discussing art history to the present day: historical studies, sociological studies, psychoanalytic studies and cultural studies. Such an integrated approach will provide a framework and a reference point for us to describe and understand contemporary art in certain historical and political contexts.

HSEM 2018H. The American Quest for Security. (CIV,HIS; 3 cr.; A-F only; Periodic Spring) For more than half a century, Americans have been concerned about security--national security as well as personal security. What do Americans mean when they talk about security? What are they worried about, and how do they try to keep themselves safe and secure? The quest for national security has taken shape at the level of foreign policy and military engagement. At the same time, Americans have endeavored to achieve their own safety and security through political and personal efforts. This seminar examines the various ways that citizens have addressed the issue of security in their own lives, whether their fears have been justified, and whether their efforts have kept them safe. The goal is for students to understand the issue of security in a historical context, and to enable them to be effective citizens in a world that often feels dangerous.

HSEM 2037V. Under Fire: War on the Western Front: History, Literature, Ethics. (WI; 3 cr.; A-F only; Periodic Fall) The year 2014 was the centenary of the outbreak of the First World War, one of the two most devastating wars in European history. In the ensuing three years, there have been ongoing commemorations of the major battles and events that marked the war's trajectory. The importance of the war to the psyche and memory of some, the participants was illustrated when, in 2009 Harry Patch, the last surviving veteran of WWI, broke his ninety-year silence on his wartime experiences to declare that the war had been illegalized mass slaughter,. When he died shortly afterwards, he was given a funeral with full military honors, which was watched by millions on television. Why did this war happen when it did and why, nearly one hundred years later, did a veteran, about whom virtually nothing was known beyond his longevity, qualify for the honors that were usually afforded generals and statesmen? Three years earlier, in 2006, the 306 British soldiers shot for cowardice were pardoned. What does this tell us about the way mentalities about war have changed? This course will look at the history, literature, and ethics of the war that was known in French as the ?Dér de la Dér? (the last of the last) and which marked over three generations of Europeans creating a legacy that was incorporated into the national identity of those taking part.

HSEM 2039H. IAS Thursdays: Across the University & Beyond. (3 cr.; A-F only; Periodic Spring) In this seminar the best of the University's research and creative work is brought to you. Every Thursday afternoon, the Institute for Advanced Study offers a presentation, a lecture, discussion, and performances by leading scholars and artists from around the world and within the University. Seminar participants will attend the Thursdays at Four series and meet on Tuesdays to discuss the presentations, which will draw upon disciplines across the University. Students will do supplemental readings related to the presentations and talk with presenters as their schedules allow. This is the perfect seminar to introduce students to the rich variety of work done at the University.

HSEM 2043H. Finding the "Corporate Soul": Corporate advocacy, social responsibility, and community engagement. (3 cr.; A-F only; Periodic Fall) As the corporation has replaced government and the church as the dominant social institution in the industrialized world, the use of organizational advocacy as a means of persuasion has predictably increased. One reason for this increase is that stakeholders expect and demand corporations act in accordance with social and cultural norms. Advocacy messages provide organizations with a tool for promoting change, forming attitudes, and furthering dialogue about substantive issues. By engaging in advocacy, organizations enter into a public dialogue about issues that it views as significant in the realization of its goals and objectives. This seminar seeks to answer questions such as: What contribution does organizational advocacy make to public dialogue? How does corporate advocacy represent the goals and needs of the organization and society? What are the social implications of organizational advocacy? Our goal is to understand organizational advocacy beyond a single issue, campaign, or corporation. To achieve our goal, we will examine a variety of communication theories and international, national, and Minnesota-based campaigns.

HSEM 2046V. Linguistics and Biology. (WI; 3 cr.; A-F only; Periodic Spring) Connections between linguistics (the scientific study of human language) and biology (the scientific study of life and living forms) have a long history. Most contemporary linguists view language as part of human cognition, rooted in biologically determined predisposition to acquire language and constraints on the properties of what can be acquired. Before the Chomskyan revolution in the early 1960s, the connection was largely restricted to anatomical properties of the human vocal tract involved in articulation of speech sounds and the role of evolution of the vocal tract in making human language possible. Other connections included metaphorical borrowing of terms from biology, such as genetic relationships among related languages grouped into language families, whose members shared the same ancestor language. More recently, the focus has turned to the biological basis of human language, the existence of language genes and connections between evolution of language and evolution of the human brain. There has also been some influence of linguistic methodology on the field of biology, with researchers proposing similarities between generative models of linguistic codes (grammar) and genetic code. This course will examine the relationship between linguistics and biology, and how it reflects development of the field of linguistics and cross-disciplinary influences in general.

HSEM 2047H. All About Music: Its Meaning, Reality, Communication, and Embodiment. (TS; 3 cr.; A-F only; Periodic Fall) The great philosopher of life Friedrich Nietzsche rightly claims that “without music, life would be a mistake.” This does not mean that life is automatically perfect with music. This seminar deals with exactly this problem: What is music doing to us? Why do we listen to it? And how that? What is its meaning in our lives, why does it matter, which realities does it touch, how can it be communicated? In what way is it distributed between intellect and emotions? And why do we go to concerts, since electronic media and the internet provide such an easy access? The answers will be approached via intensive listening to all kinds of music from different cultures and epochs as well as through critical, very open discussions with the students. The instructor being highly sensitive to non-authoritarian music cultures, he may provide a thoroughly dynamic and flexible access to music.

HSEM 2053H. The Psychology of Paranormal Phenomena. (3 cr.; A-F only; Periodic Spring) Research has shown that most Americans hold one or more supernatural, paranoid, or pseudoscientific beliefs. These include beliefs in mind reading, fortune telling, psychokinesis, remote viewing, therapeutic touch, out-of-body experiences, alien abduction, and cryptozoology (Bigfoot, the Loch Ness Monster, etc.). This course has two goals: The first is to introduce students to critical thinking and behavioral research methods. The second is to critically evaluate the evidence for a variety of supernatural, paranoid and pseudoscientific claims. Students will design and carry out their own experimental tests of these claims. The course will also include a guest lecture and demonstration by a local psychic. Reading per week: 40 Pages. Three written papers (3-5 pages each), one group presentation, and 4 quizzes.

HSEM 2055V. Biology and Society: How Evolution Shapes Our Lives. (WI; 3 cr.; A-F only; Periodic Fall) Evolution is a contested idea in our society. However, in a very real sense, evolution shapes our lives. In order to understand both
the controversy surrounding evolution and its impact on individuals and society, this course explores a variety of themes at the intersection of biology and philosophy and is co-taught by a biologist and philosopher of biology. We will investigate various dimensions of human evolution and applications of different evolutionary ideas to understanding ourselves with a special focus on health and disease. Then we turn to how humans alter or control the evolutionary process through domestication, conservation of species, and climate change. Finally, we look at the intersection of evolution and religion in the public sphere. This combination of ideas about the human species (including questions about biological race realism), and how both culture and language evolve. We close the course by reflecting on what the future of human evolution might look like.

**HSEM 2061H. Statistics and Data Science for Everyone.** (MATH; 3 cr.; A-F only; Periodic Fall)
This is not a traditional statistics course. We concentrate on the important problems that can be addressed using data: learning about cause and effect, prediction, converting everyday information to learn about important problems, data visualization, and much more. Many of these topics and ideas are usually found only in more advanced courses. You will learn how to do statistical computing using the widely used and free R software, using the RStudio interface that encourages reproducible and defensible research and analysis. Most assignments will be done in groups, and oral and written communication of work is stressed. If you only plan to take one statistics course, this is it, as it covers methods and ideas needed for a literate and numerate person in the 21st century. The only prerequisite for this course is an open mind and comfort with using numerical information. Students with a prior statistics course, such as AP statistics in high school, are invited, as the overlap will be minimal. Most student work in this course will be in groups with oral and written presentations.

**HSEM 2091V. Roots Music in America: Music, Movies, and Mysteries.** (DSJ; 3 cr.; A-F only; Periodic Fall)
This seminar focuses on "roots music," the early twentieth century southern vernacular music that has inspired virtually every genre of American popular music over the last seven decades. Everything from hip-hop to rock to jazz to bluegrass to "Americana" to folk to the singer-songwriter tradition and beyond has been profoundly shaped by the roots music we'll study this semester. The course is divided into three parts. In the first, we'll examine the meanings the music had for the people who made it and recorded it in the early decades of the twentieth century: African-American singers, blues musicians, and "songsters" who labored in the south under oppressive Jim Crow conditions and forged new musical traditions; and white Appalachian peoples who were moving from farm work to work in coal mines and textile mills and combining European musical traditions with those of African-Americans to create new sounds and new sonic landscapes. In the second part of the course, we'll examine what the music means to us, to contemporary audiences, by analyzing recent films in which roots music is featured and its story told. And in the third part of the course, we'll ask what the music has meant to scholars and analyze the ways in which, from the 1930s to the present, they've traversed the south with notepads and recording devices to preserve the music and to learn about the musicians. Here we'll dip into the vast repositories of primary source material now available online (field notes, recordings, photographs), and we'll find new ways to understand and appreciate roots music for ourselves, and try to solve some of its mysteries.

**HSEM 2105H. Tropical Forests: Conservation, Carbon, and Conflict.** (; 2 cr.; A-F only; Periodic Fall)
Dr. Jennifer Powers is an associate professor in the Departments of Ecology, Evolution and Behavior and Plant and Microbial Biology at the University of Minnesota. She received her PhD in Biology from Duke University in 2001, and did postdoctoral work at SUNY-Stony Brook and the University of Minnesota. She is broadly trained in ecosystems ecology, biogeochemistry, and plant ecology, and has worked in tropical forests in Central and South America for over 22 years. The long-term goal of her research program is to understand how biophysical factors and human activities shape biodiversity and ecosystem functioning of tropical forests. Her current projects include a long-term study of how changes in land use such as deforestation and forest regeneration affect the balance of carbon on the land and in the atmosphere in Costa Rica, and a study of the effects of climate change on forest dynamics in Costa Rica, Colombia, Mexico, and Puerto Rico.

**HSEM 2200H. Housing Matters.** (DSJ; 3 cr.; A-F only; Periodic Spring)
Housing directly affects our physical and mental health, children's educational attainment, our economic opportunities, our transportation patterns and dependencies, and the environment. However, not all people are able to achieve the same levels of well-being because of disparities due to race, ethnicity, and class as they seek to obtain stable, secure, and affordable housing in supportive neighborhoods and communities. We will explore issues of power and privilege that contribute to those disparities. Public policy at the local and national levels will be examined as it both creates and minimizes social inequities in housing.

**HSEM 2207H. Visual and Critical Thinking.** (3 cr.; A-F only; Periodic Fall)
This course will examine two forms of thought processes: Visual Thinking and Critical Thinking, and integrate their use and development. Visual Thinking strategies focus on the use of evidentiary reasoning. Based on structured series of exercises of observation and fine art, it develops the ability to examine art, objects, and environments. Critical thinking will focus on the organization of the mind for critical thinking and examines the structures and assumptions we make in our everyday lives. The class will focus on practice, not on lecture.

**HSEM 2208H. Housing Matters.** (DSJ; 3 cr. [max 6 cr.]; A-F only; Periodic Spring)
Housing directly affects our physical and mental health, children's educational attainment, our economic opportunities, our transportation patterns and dependencies, and the environment. However, not all people are able to achieve the same levels of well-being because of disparities due to race, ethnicity, and class as they seek to obtain stable, secure, and affordable housing in supportive neighborhoods and communities. We will explore issues of power and privilege that contribute to those disparities. Public policy at the local and national levels will be examined as it both creates and minimizes social inequities in housing.

**HSEM 2209V. Roots Music in America: Music, Movies, and Mysteries.** (DSJ; 3 cr.; A-F only; Periodic Fall)
This seminar focuses on "roots music," the early twentieth century southern vernacular music that has inspired virtually every genre of American popular music over the last seven decades. Everything from hip-hop to rock to jazz to bluegrass to "Americana" to folk to the singer-songwriter tradition and beyond has been profoundly shaped by the roots music we'll study this semester. The course is divided into three parts. In the first, we'll examine the meanings the music had for the people who made it and recorded it in the early decades of the twentieth century: African-American singers, blues musicians, and "songsters" who labored in the south under oppressive Jim Crow conditions and forged new musical traditions; and white Appalachian peoples who were moving from farm work to work in coal mines and textile mills and combining European musical traditions with those of African-Americans to create new sounds and new sonic landscapes. In the second part of the course, we'll examine what the music means to us, to contemporary audiences, by analyzing recent films in which roots music is featured and its story told. And in the third part of the course, we'll ask what the music has meant to scholars and analyze the ways in which, from the 1930s to the present, they've traversed the south with notepads and recording devices to preserve the music and to learn about the musicians. Here we'll dip into the vast repositories of primary source material now available online (field notes, recordings, photographs), and we'll find new ways to understand and appreciate roots music for ourselves, and try to solve some of its mysteries.

**HSEM 2515H. Experiencing Local Environmental Solutions.** (2 cr.; A-F only; Periodic Fall)
This is a topical, field-trip-based course. This seminar will address some of the solutions to the environmental problems that affect our society by examining the science and by experiencing the solutions that are used on campus or in the neighboring community. Each week will focus on a solution to a different environmental issue (see schedule below). We will visit the places designed as environmental solutions, hear from the experts, and discuss the engineering and human aspects of these solutions. We will go to areas of campus that you would normally not visit or be able to visit. The field-trip destinations are accessible by campus bus, city bus, or train. The class will involve weekly reading and writing assignments. There will also be a semester-long, hands-on project to devise a realistic, potential solution to an environmental issue.

**HSEM 2516H. Slow Death by Rubber Duck: Chemicals We Use and Their Effects on the Environment and Us.** (2 cr. [max 3 cr.]; A-F only; Periodic Spring)
We use chemicals every day. We bathe in chemicals. We apply chemicals to our lawn. Chemicals are sprayed to control insects. While chemicals are an important part of modern life, these chemicals wind up in the environment and in our bodies. This seminar will examine how our use of chemicals drives our exposures and ultimately, where these chemicals wind up in the environment and what their impacts are. This seminar is designed for you to look at how you use chemicals in your daily life and how this influences your exposure to chemicals, environmental releases of chemicals, and the impact of chemicals on humans and the environment.

**HSEM 2520H. Visualization & Virtual Reality for Social Justice.** (TS; 3 cr.; A-F only; Periodic Fall)
From interactive web-based storytelling at the New York Times to analyzing climate change data in virtual reality, data visualization - computer-based visual depiction and analysis of data - is changing the way that we understand and communicate about the world we live in. This seminar encourages aspiring activists, artists, poets, journalists, engineers, doctors, scientists, and other
creative thinkers to come together to study: (1) How information is communicated visually; (2) how to use computers to create effective data visualizations; and (3) how to apply visualization to further social justice and to understand data related to social justice.

In this way, the course aims to provide a visually oriented introductory experience with computer science that is applied from day one to real-world problems of critical importance to today’s society. Students are expected to bring their own ideas, causes, and (optionally) datasets to the seminar. Students will study and have opportunities to create visualizations addressing gender and racial inequality, health equity, climate change, gun violence, gender identity, and more. Readings will cover a mix of current scholarly perspectives on these topics as well as technical information, such as computer programming techniques for using color, form, and metaphor to depict data using processing.org, a visual programming environment originally designed for artists.

Exciting current research on virtual reality will also be discussed, for example, recent studies on virtual embodiment that aim to foster empathy for people of diverse races and genders.

HSEM 2529H. “Elementary, Dr. Einstein:” Explanation and Evidence in Science. (3 cr.; A-F only; Periodic Fall)
Sherlock Holmes, in solving his cases, is relying on a pattern of reasoning called Inference to the BestExplanation (acronym:IBE; so named in 1965 by philosopher of science Gilbert Harman). Holmes’s explanation of how the crime was committed is so utterly convincing that it counts as evidence that the crime was actually committed in just that way. Although our use of it is hardly ever as clever as Sherlock Holmes’s, we rely on this same pattern of reasoning all the time in everyday life. When I run for my bus in the morning and see that there is still a group of people waiting at my stop, I take that as clear evidence that the bus has not shown up yet, because that is the best explanation for what I see. If I see a bunch of dejected Gopher fans filing out of TCF Bank Stadium, I take that as clear evidence that the Gophers just lost the game, because that is the best explanation for why their fans look so miserable. In science, this pattern of reasoning tends to be less reliable. Just because a theory explains a range of phenomena does not mean that the theory is true. In other words, we cannot simply take a theory’s explanatory power as evidence for it. Yet, scientists tend to put great emphasis on their theory’s explanatory power if they want to convince others of it. Which raises the question: What exactly is the relation between explanation and evidence in science? In this class, we will examine this relation, both in examples taken from everyday and not so everyday life (such as the cases investigated by Sherlock Holmes) and in examples taken from the history of science, such as Copernicus’s proposal that the earth orbits the sun, Newton’s proposal that the force that keeps the moon and planets in orbit is the same as the force that makes apples fall from trees, Darwin’s proposal that different species are descended from a common ancestor, or Einstein’s proposal that gravity and acceleration are two sides of the same coin. We will contrast the account of how we obtain evidence for some proposition or theory (i.e., increase our degree of belief in it) based on Inference to the Best Explanation (IBE) with an account based on probability theory known as Bayesianism (after the Reverend Thomas Bayes who in the 18th century came up with the formula in probability theory central to the account).

HSEM 2624H. “Reality 101” - A Survey of the Human Predicament. (4 cr.; A-F only; Periodic Fall)
How is the economy like a hurricane? Where does money come from? Will economic growth last forever? What is wealth? How many hours would it take you to generate the same amount of energy in a gallon of gasoline? Why are you so confident in your own beliefs? Why do you spend so much time on social media? Why do we want ‘more’ than our neighbors? What do all of these questions have to do with the environment? With your future? And what if our most popular societal beliefs about these issues turn out to be myths? Reality 101 will delve into these questions and unify them as they apply to the major challenges humanity faces this century, among them: slow economic growth, poverty, inequality, addiction, pollution, ocean acidification, biodiversity loss, and war. The course will provide students with a broad exposure to the foundational principles central to addressing these interrelated issues. The readings and lectures will cover literature in systems ecology, energy and natural resources, thermodynamics, history, anthropology, human behavior, neuroscience, environmental science, sociology, economics, globalization, trade, and finance/debt with an overarching goal to give students a general understanding of how our human ecosystem functions as a whole. Such a systems overview is necessary to view the opportunities and constraints relevant to our future from a realistic starting point. Though the hard science relating to sustainability will be surveyed, few answers will be forthcoming. However, it is hoped that creativity and group dialogue will lead to emergent ideas on how these big themes fit together. While the class material is daunting and intense (reflecting our world situation), the course itself will be enlightening and deeply informative, with an open, engaging, and entertaining class atmosphere.

HSEM 2707H. Battling the Bugs: Anthrax, Ebola, and Everyday Life - PUBH Strategies for Prevention & Control. (3 cr.; A-F only; Periodic Fall)
We share the planet with a myriad of living things. The smallest of those are the ones that may impact our lives the most. These creatures are in the news nearly every day: Ebola virus in Western Africa, measles outbreaks among visitors to Disneyland, foodborne outbreaks on cruise ships, Zika virus precautions for pregnant women. This course will focus on the importance of infectious disease prevention, control, and treatment to the health and well-being of the global community. Students will explore the many facets of public health response operations and decision-making which are often behind the scenes and not well understood by the general public.

HSEM 2716V. Social Justice and Health. (DSJ,WI; 3 cr.; A-F only; Periodic Spring)
This seminar explores matters of social justice related to health. Class sessions predominantly focus on discussion of specific practical issues such as the promotion of race-specific therapies as an approach to ameliorating health disparities, the inclusion of homeless persons in research providing free access to health care, and the allocation of HIV medications in impoverished developing countries. Readings from multiple disciplinary perspectives ground examination these social justice issues. Discussions incorporate consideration of these issues? institutional and broader social contexts.

HSEM 2719H. Mass Incarceration and Public Health: An American Crisis. (3 cr.; A-F only; Periodic Fall)
Mass incarceration is one of the major public health challenges facing the United States. Each year, millions of people cycle through the criminal justice system. Justice-involved experience far higher rates of chronic health problems, substance use, and mental illness than the general population. Further, our country’s prisons and jails are often ill-equipped to handle these complex health conditions, perpetuating health inequities. Mass incarceration contributes to powerful health disparities in the United States, affecting the health of entire communities and across generations. This course will examine the intersections of mass incarceration and public health. We will explore individual and community-level health impacts of incarceration, with a focus on the relationship between mass incarceration and health disparities, particularly in communities of color. This course will consider specific populations at particularly high risk, including detained youth, pregnant incarcerated women, and the elderly. Students will have an opportunity to tour local correctional facilities and hear directly from experts in the field, including formerly incarcerated people.

HSEM 2719V. Mass Incarceration and Public Health: An American Crisis. (WI; 3 cr.; A-F only; Periodic Fall)
Mass incarceration is one of the major public health challenges facing the United States. Each year, millions of people cycle through the criminal justice system. Justice-involved people experience far higher rates of chronic health problems, substance use, and mental illness than the general population. Further, our country’s prisons and jails are often ill-equipped to handle these complex health conditions, perpetuating health inequities. Mass incarceration contributes to powerful health disparities in the United States, affecting the health of entire communities and across generations. This course will examine the intersections of mass incarceration and public health. We will explore individual and community-level health impacts of
in incarceration, with a focus on the relationship between mass incarceration and health disparities, particularly in communities of color. This course will consider specific populations at particularly high risk, including detained youth, pregnant incarcerated women, and the elderly. Students will have an opportunity to tour local correctional facilities and hear directly from experts in the field, including formerly incarcerated people.

HSEM 2722H. Human Disease Influenced by Environmental Factors. (3 cr.; A-F only; Periodic Fall) This seminar aims at understanding whole organisms and cellular functions in response to various macro-environmental events, i.e. radiation, food carcinogens, global warming, pollution etc., that promote the disease process. Cells are consistently exposed to changing conditions, and they are programmed to effectively respond to diverse stimuli or insults under normal physiological conditions. However, when such conditions exceed cell’s inner capacity, cells can undergo apoptosis, or become senescent or in some cases, they can acquire pathological properties, which lead to the progression of various human diseases. In particular, environmental changes such as climate change caused by human activities can significantly affect human health and ecosystems, and there are growing concerns about emerging new diseases that are a threat to human health.

HSEM 2724H. The Sex Talk You Should Have Had: Controversies in Sexual Health. (CIV; 3 cr.; A-F only; Periodic Fall) Reproductive and sexual health is an increasingly important topic in community settings. Pharmacists can play a vital role in promoting safe and healthy practices that will improve the health of their communities and are an important source of reproductive and sexual health information and advice. This course is designed to expand and enhance community-based reproductive and sexual health knowledge and skills while preparing students to be informed and active participants in ethics driven debates surrounding reproductive and sexual health. The Sex Talk You Should Have Had covers three important sections in sexual health that interface in the community pharmacy setting. These topics include the HPV vaccine, contraception, and Sexually Transmitted Infection/Disease (STI/STD) testing and treatment options. Each of these sections is addressed in weekly modules that provide thorough introduction to the topic, an overview of how the treatments or medications work, and related contemporary topics of debate. This is a hybrid course with extensive online discussion with limited in-class meetings.

HSEM 2725H. Zombies and their Souls: Philosophy, Bioethics and the Undead. (3 cr.; A-F or Audit; Periodic Spring) We want money, love and fame. They want brains. Who is to say that our values are superior? This seminar will use zombie movies as a way of exploring fundamental issues in bioethics, the philosophy of mind and the philosophy of psychology. Are zombies conscious? Do they have free will? Should they have rights? If zombies could be safely controlled, would it be unethical to make them slaves or pets? What about experimenting on them, or using their organs for transplantation? If I were to become a zombie, would I still be me, or would I be something else?

HSEM 2801H. The Agile Mind: Cognitive & Brain Bases. (3 cr.; max 6 cr.; A-F only; Periodic Spring) This seminar course will examine recent research findings from psychology and cognitive neuroscience to arrive at a better understanding of the conditions that foster, or impede, flexible thinking or ‘mental agility.’ Two key questions will be examined throughout. First, what are the relative roles of predominantly controlled or deliberate modes of cognitive processing versus more automatic (or spontaneous) processes in enabling and sustaining creatively adaptive thinking? Second, how do mental representations at differing levels of specificity highly abstract versus highly specific contribute to flexible thinking? prereq: [Jr or sr] honors student
courses listed in this catalog are current as of 2018-08-23. for up-to-date information, visit www.catalogs.umn.edu.

hsem 3074h. development!: the power of an idea. (gp; 3 cr. ; a-f only; periodic fall)
the course critically analyzes and celebrates the poetic achievements of bob dylan, america's most important songwriter and musician and recent nobel prize winner in literature. we will study how his artistic evolution, from folk singer to rock icon and poet, comes from his immersion in american literature and lyrics that range from traditional songs to defiant, political protest. the results are timeless uses for poetry as dylan's music redefines how poetry influences and shapes popular culture. the main goal of the course is to come to an understanding of how his unique vision begins within the poetic traditions of the past and, as his songs redefine what poetry is, takes contemporary expression toward new definitions for literature. by the end of the course, the student of dylan's work should master a body of knowledge and a mode of inquiry in dylan studies and understand the role of creativity, innovation, discovery, and expression across various disciplines as american literature, folk and rock music, the history of political protest, and the popular artist in society.

hsem 3075h. humans and rights in historical perspective. (civ; 3 cr. ; a-f only; periodic fall)
in the second half of the twentieth century, in the wake of world war ii and decolonization, a language of human rights developed that emphasized rights as individual and universal. many of us now take this particular notion of human rights as a given. in this seminar, we will explore the complicated and multi-faceted history of how societies in different parts of the world have defined what it is to be human, the treatment owed to humans, and various kinds of rights. some of these philosophies are grounded in religion and others in secularism. some identify the nation-state as the adjudicator of rights, while others would empower international organizations or grassroots movements. for some, the individual is sacrosanct, while for others, persons are inextricably embedded in social webs. we will study how these concepts have changed over time as the globe has become increasingly interconnected and consider their relevance and application in our contemporary society. the semester will be divided into five mini units. in the first, we will explore concepts of the human and of rights in major faith traditions. in the second, we will examine the debates that emerged from european colonialism in the atlantic world. in the third, we will study the emergences of an explicit language of human rights after world war ii. in the fourth, we will look at human rights issues in the united states. and in the final unit, you will pursue your own research and collaborate in small groups to make presentations and facilitate discussion around common themes.

hsem 3073h. tradition and defiance: the literature of bob dylan. (; 3 cr. ; a-f only; periodic fall)
this course critically analyzes and celebrates the poetic achievements of bob dylan, america's most important songwriter and musician and recent nobel prize winner in literature. we will study how his artistic evolution, from folk singer to rock icon and poet, comes from his immersion in american literature and lyrics that range from traditional songs to defiant, political protest. the results are timeless uses for poetry as dylan's music redefines how poetry influences and shapes popular culture. the main goal of the course is to come to an understanding of how his unique vision begins within the poetic traditions of the past and, as his songs redefine what poetry is, takes contemporary expression toward new definitions for literature. by the end of the course, the student of dylan's work should master a body of knowledge and a mode of inquiry in dylan studies and understand the role of creativity, innovation, discovery, and expression across various disciplines as american literature, folk and rock music, the history of political protest, and the popular artist in society.

hsem 3076v. anthropology of place and displacement in the contemporary world. (gp,wi; 3 cr. ; a-f only; periodic fall)
this course asks questions about the meaning of place, the relationship of space to place, the relationship of identity to place, and the relationship of place to environmental change in the event of industrial pollution, development projects, natural disasters and climate change. theories of and ethnographic accounts of space and place in cultural anthropology and geography will be discussed. in addition to theoretical texts, we will also read contemporary accounts of non-western places.

hsem 3081v. anthropology of place and displacement in the contemporary world. (gp,wi; 3 cr. ; a-f only; periodic fall)
this course asks questions about the meaning of place, the relationship of space to place, the relationship of identity to place, and the relationship of place to environmental change in the event of industrial pollution, development projects, natural disasters and climate change. theories of and ethnographic accounts of space and place in cultural anthropology and geography will be discussed. in addition to theoretical texts, we will also read contemporary accounts of non-western places.

hsem 3080v. anthropology of place and displacement in the contemporary world. (gp,wi; 3 cr. ; a-f only; periodic fall)
this course asks questions about the meaning of place, the relationship of space to place, the relationship of identity to place, and the relationship of place to environmental change in the event of industrial pollution, development projects, natural disasters and climate change. theories of and ethnographic accounts of space and place in cultural anthropology and geography will be discussed. in addition to theoretical texts, we will also read contemporary accounts of non-western places.

hsem 3205h. a resilient, just, water future: living with the mississippi river. (3 cr. ; max 6 cr. ; a-f only; periodic fall)
located on the banks of one of the world's great rivers, the university of minnesota, through its teaching, research, and campus practices, is a model for developing future-oriented, resilient relationships between communities and water. water is essential to humanity's well-being, and is also threatened in myriad ways. working with communities of scholars and professionals on and off campus,
this seminar creates knowledge-sharing programs that increase interdisciplinary and cross-sector capacity to address the related issues of water and justice, two of society's greatest challenges. Working collectively, biological and physical scientists, planners, designers, advocates, and people involved in public interpretation and education must develop a "21st century" approach to living with the urban Mississippi, one that uses the river as a community, environmental, and economic asset without diminishing the river's key ecological functions upon which we depend.

**HSEM 3308V. Incarceration and the Family.** (WT; 3 cr.; A-F only; Periodic Spring) It is now estimated that more than 2.7 million children have a parent currently behind bars, and more than 5 million children have experienced a parent's incarceration in their lifetime. When parents are incarcerated, there are collateral consequences for children, families, communities, and society. Children of incarcerated parents are at risk for a number of adverse outcomes, including behavior problems, academic difficulties, substance abuse, and criminal activity. As a liberal education course with an explicit focus on Diversity and Social Justice in the United States, we will use an interdisciplinary perspective to explore the issue of mass incarceration, focusing on the impact of incarceration on children and families. This class will include opportunities to visit local correctional facilities and engage with community-based programs serving families impacted by incarceration. Topics will include parent-child contact during incarceration, intersections between incarceration and child welfare, systemic disparities by race and class, and intergenerational cycles of incarceration. 

**HSEM 3415H. Are corporations persons? Can they pray? Controversial Supreme Court Cases.** (CIV; 3 cr. [max 6 cr.]; A-F only; Periodic Fall) Alexis de Tocqueville noted in 1835 that "[s]carcely any political question arises in the United States that is not resolved, sooner or later, into a judicial question." Rightly or wrongly, in the US many highly-charged issues ultimately get resolved in the Supreme Court. This seminar uses the courts as a lens through which to examine the relationship between business and society. It employs recent Court opinions in business cases like Citizens United and MasterCard (ruling expected in summer 2018)—supplemented by transcripts of oral arguments, commentary in law reviews and legal blogs. The seminar should be of interest to pre-law students and all students who wish to gain a better understanding of the place of business in our society.

**HSEM 3511H. Science Court: Strengthening Democracy through Rational Discourse.** (; 3 cr.; A-F only; Periodic Fall) Science Court is a mock trial system designed to promote democratic norms by investigating controversial societal issues, based on facts and sound scientific research, in front of a judge and jury of citizens. Students work together in three teams (Science, Legal and Media) to plan, research, execute, and report a SciCourt case.

**HSEM 3619H. The Intersection of Food, Aging and Health.** (; 3 cr.; A-F only; Periodic Fall) This course aims to enhance students’ ability to critically think and problem-solve using innovative food systems approaches. We will work toward collective solutions relative to aging and health through food, the interdependence of economic and environmental factors, and collaboration with community partners. This course will focus on the interdependence of food environment and community sectors relative to their impacts on health, economy, and environment. Through this course, we will address the following question: How do we create a food environment that enhances public health in the aging population by aligning with non-profits, industry, academia, healthcare providers, communities, government, and advocacy groups?

**HSEM 3636H. On Vaccines and Vaccinations: Needless Needles?.** (; 3 cr.; A-F only; Periodic Spring) Human and animal health has been significantly advanced by the creation and application of vaccines to control infectious diseases. Nevertheless, there remain impactful diseases that cannot be controlled by vaccination for a variety of reasons, and global geopolitical factors often complicate public health initiatives. Further, vaccines have become controversial in some western societies, and debates have raged regarding potential negative aspects of routine vaccinations, scientific misconduct, and individual rights. This course will provide a scientific and historical background on immunity as a prelude to interdisciplinary discussion of vaccines and vaccinations. Seminars will combine didactic lectures with structured peer-to-peer interactions and debates. Students will consume both print and electronic media from multiple perspectives in order to reach their own conclusions regarding vaccines and vaccine safety. A final term paper will also inform peers as to various biological, public health, economic, regulatory, or cultural aspects of vaccines.

**HSEM 3701H. Exercise is Medicine.** (; 2 cr.; A-F only; Periodic Spring) Regular exercise is essential for good health and is important in the prevention and treatment of many diseases. The benefits of exercise and fitness, however, are frequently overlooked and under-emphasized in American health care delivery. Similar to other medical interventions, exercise has indications, contraindications, and potential complications and side effects. This seminar will explore these issues as well as related ones such as musculoskeletal concerns, nutrition, and sedentary physiology. Seminar format will include lectures, assigned readings, discussions, tests, and participant presentations. All seminar participants will research a different pre-approved aspect of exercise as medicine and present their findings at the seminar.

**HSEM 3715H. Doctors Behaving Badly: The Causes and Consequences of Medical Research Scandals.** (; 3 cr.; A-F only; Periodic Fall) This course will take students on a tour of the deadliest and most controversial research scandals in recent medical history. Some of these episodes are well-known, such as the exploitation of poor African American men with syphilis in Tuskegee, Alabama, and the injection of the hepatitis A virus into mentally disabled children at the Willowbrook State School in New York. But such well-known cases represent only a small fraction of ethically contentious medical research. In the 1980s, for example, at the world-renowned Allen Memorial Institute at McGill University, the CIA paid psychiatric researchers to use mentally ill subjects in "mind control" experiments involving LSD, intensive electroconvulsive therapy, and drug-induced comas for up to three months at a time. In 1996, during a meningitis epidemic in Nigeria, researchers for the pharmaceutical company Pfizer conducted a study of an unapproved antibiotic on children without the informed consent of their parents, resulting in eleven deaths. In 2013, two neurosurgeons at the University of California-Davis were forced to resign after authorities discovered that they had intentionally implanted bacteria in the brains of cancer patients. Today, the University of Minnesota itself is under investigation after the case of Dan Markingon, a mentally ill young man who nearly decapitated himself after allegedly being coerced into an AstraZeneca-funded psychiatric study. In this course, we will explore questions such as: What cultural and institutional forces allowed the scandals to occur? What were the best ethical arguments in favor of allowing the research to proceed? How were the scandals exposed? What was the role of investigative reporters, regulatory authorities, and whistleblowers? Should we have confidence that research abuse is not occurring today?

**HSEM 3801H. Modern China: Law, History, and Culture.** (GP; 3 cr.; A-F only; Periodic Fall) This course will provide a comprehensive overview of law, politics and culture in 20th- and 21st-century China, in their historical and cultural contexts. It will introduce undergraduate students to distinctive paradigms and discursive patterns of law and politics in China, with the intention of fostering comparative analysis and critical thinking. The course will focus on high profile legal cases and major political events in the People's Republic of China today. The course will conclude by examining current issues in Chinese law from both sides, and by looking into China's argument for the "Beijing Consensus," essentially a new type of capitalism, without Western-style rule of law. The classes will progress by way of interactive discussion and critical readings of historical documents and legal texts. This course is designed to
break through the traditional Chinese learning/ western learning dichotomy and interpret legal cases, political events, and cultural phenomena from a comparative perspective. It will bring to light the hidden rationales underlying historical and ideological narratives, and will explain how frequent misunderstandings can occur when comparing cultures. Students will be encouraged to use critical thinking to argue, to test whether the incommensurability of paradigms can be reconciled, and to explore how different political systems and cultures can communicate with each other and exchange ideas effectively.

HSEM 3803H. The Politics of Legal Policy. (3 cr.; A-F only; Periodic Fall)
The Politics of Legal Policy seminar will focus on several controversial issues involving courts and/or the types of issues they deal with. Class discussions will focus on five policy issues involving either the use and role of courts or areas in which the courts play a major role in policy administration: access to legal services, medical malpractice, scientific expert testimony, sexual predators, and judicial selection. Beyond these specific topics, students will select a specific policy issue to delve into on their own, and produce two papers: a short background memo on the nature of the issue and what is known about the facts that may make it an area in need of change, and a policy memo suggesting and advocating for possible changes. During the last three weeks, students will present their policy briefs to the seminar. The goal of the course is to understand the factual reality behind some major issues confronting the courts and the challenges of making policy changes to address these issues. Each of the five topics will be dealt with over two sessions of the seminar with the first session examining the issue from a policy perspective and the second session examining the issue from the perspective of differing political interests. Some of the sessions on policy change will involve students in the seminar debating the issue drawing upon the policy discussions from the previous week as well as their own research into the issue; other sessions may involve a guest speaker.

HSEM 3953H. History and Science of Eating. (3 cr.; A-F only; Periodic Fall)
Eating is both an everyday, mundane activity and a complex act that is linked to internal and external factors. Using the lenses of the humanities and sciences, we will explore topics from the full continuum of human eating. We move from hunger, starvation, and dieting to food choice and obesity, to eating? a relationship to contemporary politics, culture, and racial diversity. Overarching these topics are common themes of gender roles and changing cultural norms. We will investigate how and why diets vary as well as how food has emerged as a central political problem. Students will leave this class better able to judge evidence used in diet advice and with more understanding of their own beliefs about what they should eat.

Horticultural Science (HORT)

HORT 1001. Plant Propagation. (BIOL 4 cr.; Student Option; Every Fall & Spring)
Principles and techniques of propagating plants by seeds, cuttings, grafts, buds, layers, and division. Lectures on principles; labs on practice of various propagating techniques.

HORT 1003. Organic Gardening: From Balconies to Backyards. (3 cr.; A-F only; Every Spring)
This fully online course focuses on the principles and practices of growing fruits, vegetables, and herbs with an ecological approach. You'll explore basic botany, soils and compost, species and variety selection, planning and design, container gardening, pest management, season extension, and more so you can approach your gardening projects with confidence.

HORT 1013. Floral Design. (3 cr.; Student Option; Periodic Fall)

HORT 1014. Edible Landscape. (TS; 3 cr.; Student Option; Every Spring)
Tracing our relationship with edible landscapes traces to our hunting-gathering origins.

Technological/social changes that have distanced us from our food. Integrating food plants into pleasing, sustainable, and edible landscapes in yards, neighborhoods, and cities.

HORT 1015. Woody and Herbaceous Plants. (4 cr.; A-F only; Every Fall)
How to identify plants around the world. A few hundred of the most important cultivated plants for northern climates, their distinguishing features, common uses, cultural specificities, and notable cultivars.

HORT 1031. Vines and Wines: Introduction to Viticulture and Enology. (3 cr.; Student Option No Audit; Every Fall)
History of wine, principles of biology, culture of grapevine, fermentation, sensory evaluation of wine. prereq: 21 yrs of age by date of 1st class meeting.

HORT 1061. The Sustainable Lawn. (3 cr.; Student Option; Every Fall)
Common turfgrasses. How to manage a home lawn in sustainable way. Maintaining quality turf areas with reduced inputs.

HORT 1090. Directed Studies. (1-3 cr.; Student Option; Every Fall, Spring & Summer)
Approved field, lab, or greenhouse experiences in application of horticultural information/practices. prereq: instr consent or department permission.

HORT 1901. The Ten Plants that Changed Minnesota. (ENV 3 cr.; A-F only; Periodic Fall)
This course will focus on the impact of the ten plants that have made the most difference in Minnesota. These plants changed the history of the state and had a major impact on the economy, culture, health, food, arts, and the environment. The weekly class will include student-led environmental discussions, guest lectures, and independent and small-group research that will result in written communications and website information especially related to the ten plants and their environmental impact in Minnesota. Students will be provided with transportation for four or five classes from the Minneapolis campus to the Arboretum, which will leave at approximately 5:00 p.m. from the Minneapolis Student Center. A portion of the class at the Arboretum will be learning about the Arboretum and its role in public education and the university.

HORT 1902. Buzz: How Plants Enrich Our Lives. (2 cr.; A-F only; Every Fall)
In this course we will use Tom Standage’s book, The History of the World in Six Glasses, to think about how plants play a pivotal role in human history, past and current. We will highlight how plants make substances such as caffeine and the impact those compounds have had on human civilization. Coursework will include assigned readings, discovery of new information shared with the class through written reviews and oral summaries, and student-led discussions.

HORT 2100. Agricultural Biochemistry. (3 cr.; A-F only; Every Fall)
Chemical/biochemical foundation for agricultural disciplines. Concepts in organic,
analytical and biological chemistry. Chemistry, metabolism, and development of plants. 
prereq: CHEM 1015/1017 or CHEM 1061 instr consent
HORT 3090. Directed Studies. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Approved field, lab, or greenhouse experiences in application of horticultural information/ practices. prereq: Nonfr, instr consent
HORT 3131. Student Organic Farm Planning, Growing, and Marketing. (3 cr.; Student Option; Every Fall)
Organic fruit and vegetable production has been one of the fastest growing segments of the US economy for almost two decades, stimulating an overwhelming number of biological and ecological innovations to produce food using organic approaches. This course aims to increase student’s knowledge of ecological concepts as applied to managing organic systems, with an emphasis on soil nutrient cycles and plant-soil-microbe interactions that serve as the cornerstone of organic systems. Students in this course will learn tools needed to manage an organic diversified vegetable operation. The course consists of two components: a classroom session two times each week for 50 minutes, and a laboratory session that meets before class on Tuesdays for two hours. The classroom session is designed to help students think about concepts and principles that are useful in planning and managing production strategies on organic farms. We spend a significant amount of our time reviewing soil nutrient cycling and its critical importance for organic farms, including how to effectively use soil and organic nutrient inputs such as cover crops, manure and fertilizers, to provide vegetable crops with the nutrients they need to grow. We also learn about successful marketing strategies for organic produce. Finally, near the end of the semester we will discuss pest management, including both weeds and disease/insect pests, and compare different tillage options available to organic producers. What we learn is then applied to planning next year’s season of the UMN student organic farm. Throughout, we will use case studies, guest speakers, games, and active learning discussion approaches to move these classroom sessions “beyond the lecture” and allow students to engage with the material in a meaningful way. The lab is designed to allow a space to put into action some of the concepts students learn in lecture, including soil organic matter analysis, microgreen propagation, calculation of organic fertilizer rates, and operation of driven and walk-behind tractors.
HORT 3480. Topics in Sustainable Horticulture. (1-4 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer)
Various topics
HORT 4000. International Experiences in Horticultural Science. (3 cr. [max 6 cr.]; Student Option; Every Spring)
Perspectives in horticultural science/cultural diversity through various international settings. Preparation for international study tour of one to three weeks.
HORT 4015. Advanced Woody and Herbaceous Plant Topics. (1 cr. [max 7 cr.]; A-F only; Every Fall, Spring & Summer) Species, cultivars, identification, and use for each genus of one group of plants.
HORT 4061W. Turfgrass Management. (WI; 3 cr.; A-F only; Every Fall) Biology of turfgrasses, ecology of landscapes systems. Installation, management, and culture of turfgrass communities and landscape plant systems. Sod production, industrial grounds lawn care, park/recreation areas, athletic field/ business management. Case studies. prereq: 1001 or instr consent
HORT 4062. Turfgrass Weed and Disease Science. (3 cr.; A-F only; Fall Odd Year) Turfgrass weed/disease problems. How to deal with these problems using an integrated approach. Biology, identifying features, and management strategies for several turfgrass diseases/weeds. How to apply IPM principles to turfgrass weed/disease problems.
HORT 4063. Turfgrass Science. (3 cr.; A-F only; Every Spring) Ecology, physiology, and theory of turf population dynamics. Specialized management situations such as golf course, commercial sod production, and fine turf athletic settings. prereq: 4061
HORT 4071W. Applications of Biotechnology to Plant Improvement. (WI; 4 cr.; Student Option; Every Fall) Fundamentals of plant genetics, molecular biology, and plant biotechnology. Emphasizes their applications to plant propagation and crop improvement. Hands-on experience with crossing plants, analysis of phenotypes and segregation data, plant tissue culture/ transformation, gel electrophoresis, molecular cloning, use of genetically modified crops. Principles of ethics/citizenship to decision making in plant genetics and biotechnology. Debate, discussion, writing exercises. prereq: [Biol 1009 or equiv or grad student], instr consent
HORT 4096. Professional Experience Program: Internship. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Professional experience in horticulture firms or government agencies attained through supervised practical experience. Students evaluate reports and consult with faculty advisers and employers. prereq: CFANS undergrad, completed internship contract prior to employment
HORT 4096W. Professional Experience Program: Internship. (WI; 2 cr.; A-F only; Every Fall) Professional experience in horticultural businesses, government agencies, arboreta, and botanical gardens achieved through a supervised practical experience. Students produce a final publication focusing on writing for lay audiences. Project starts before the internship begins and ends approximately two months after the internship is complete. prereq: CFANS undergrad
HORT 4110. Spring Flowering Bulbs. (1 cr.; A-F only; Spring Odd Year) Geophytes are early harbingers of spring. In this course we will examine the variety of herbaceous perennial spring-flowering crops with underground storage organs (geophytes). As spring progresses, different genera and species predominate in the flowering landscape. In contrast, greenhouse production of potted plant and cut flower geophytic crops can be simultaneous rather than sequential. This course will consist of hands-on taxonomic identification of geophyte crops, their uses in landscape design, and production essentials. The laboratory will be hands-on, experiential learning with many visits of outdoor landscape, gardens, production greenhouses, and interiorscapes.
HORT 4111. Prairie Perennials and Grasses. (1 cr.; A-F only; Fall Odd Year) Students will learn to identify over 100 plants, predominately native fall perennials and grasses at the Minnesota Landscape Arboretum. Class meeting dates at the Arboretum are listed in the Class Detail under Class Search. prereq: HORT 1015
HORT 4112. Flowering Trees and Shrubs. (1 cr.; A-F only; Periodic Spring) Need an excuse to spend a few hours outside at the height of the spring flowering season? Want to spend more time amidst the expansive and beautiful University of Minnesota Landscape Arboretum plant collections? Do you want to be able to identify more woody landscape plants, in flower? Here’s your chance to expand your plant identification skills and learn the names and flowering characteristics for approximately 150 woody landscape plants. Flowering Trees and Shrubs is a practitioners course, designed to give you a hands-on opportunity to learn to identify woody landscape trees, shrubs, ground covers, and vines, including the common and scientific names for each. We will study the plants as family assemblages, noting features common to each family which will assist you in identifying unknown plants in Minnesota and other geographical locations in the future. In addition to identification; common landscape uses, cultural specifications, problems, and notable cultivars will be highlighted.
HORT 4113. Identifying Plants for the Home and Garden: Garden, Annual, and Potted Plants. (1 cr.; A-F only; Spring Even Year) There are many strange and unusual plants that are grown as horticulture crops, ornamentals, or collectable plants. Venus fly traps, bulbs, orchids, vines, cacti and succulents. Students will learn how to identify these crops, learn their common and scientific names, and how these plants have adapted physiologically to survive stressful conditions. At least 100 different crops will be covered during this course (approximately 20 per class). Students will be expected to be able to identify these plants from images, whole plants, and/or plant parts. Information will be presented and/or learned using lectures, field trips, exercises, and homework, and a course project. Students will also grow potted herbs/vegetables crops as part of this class.
HORT 4141W. Scheduling Crops for Protected Environments. (WI; 4 cr.; A-F only; Every Fall)
The purpose of this course is to acquaint students with the identification, scheduling, and cultural requirements of commercially produced potted plants, gain experience in growing them, and conduct experiments to understand current problems. The course builds on knowledge obtained in Hort 1001 or Hort 1015, by adding in additional factors of plant growth coupled with scheduling and growing of crops which commercial growers would experience. The role of ornamental plants in the human environment will be discussed, with special emphasis on future issues. Writing is an integral component of this course; one major paper is revised and expanded multiple times plus other course writing fulfill the writing intensive requirement. Through the use of interactive learning, field trips, written assignments, and in-class discussions students learn crop requirements and the interactions between the marketing distribution system of breeders, producers, distributors, growers, retailers, and consumers.

HORT 4461. Horticultural Marketing. (; 3 cr.; A-F only; Every Fall)
Major areas in horticultural marketing.

Difference between horticultural products and commercial commodities. Core marketing components that should be used by every small horticultural business. Approaches to consumer research.

HORT 4601. Aquaponics: Integrated fish and plant food systems. (4 cr.; A-F only; Every Spring)
Advanced training/experience at intersection of biology, engineering, economics, policy, culture, environment. Emphasis on experiential learning, i.e., system design/maintenance, community engagement. prereq: Biol 1001 or Biol 1009.

HORT 4850. Pollinator Protection in Managed Landscapes. (3 cr.; A-F or Audit; Fall Even Year)
Importance of pollinators in agricultural/other natural landscapes. Risks to pollinators. Ways risks can be reduced, minimized, or overcome. Ways public policy has impacted pollinators/how future policy decisions will affect pollinator protection efforts. prereq: [1001 or AGRO 1101 or BIOL 1009 or BIOL 1001 or ENT 1001 or PLPA 1005], 30 credits completed (non-freshman status)

HORT 5007. Advanced Plant Propagation. (3 cr.; Student Option; Spring Odd Year)
Control of growth/development in sexual/asexual reproduction of plants. Effects of environment, plant growth substances. Protocols on dormancy, origin, development of adventitious structures. Specialized propagation techniques. Lecture, lab, prereq: 1001 or BIOL 2022

HORT 5011. Common Medicinal Plants: Classification, Identification, and Application. (; 3 cr.; Student Option; Fall Odd Year)

HORT 5012. Common Medicinal Plants: Growing and Processing. (3 cr.; Student Option; Fall Even Year)
How to grow, process, store 40 common herbs/herbal products.

HORT 5023. Public Garden Management. (2 cr.; Student Option; Every Spring)

HORT 5031. Fruit Production and Viticulture for Local and Organic Markets. (3 cr.; A-F or Audit; Fall Odd Year)
Principles of fruit production. Temperature fruit crops. Integrated management of fruit cropping systems. Site selection, cultural management practices, taxonomic classification, physiologically/environmental control of plant development. Writing. prereq: [1001. 3005] or instc consent

HORT 5032. Organic Vegetable Production. (3 cr.; A-F or Audit; Spring Odd Year)
Integrated management of vegetable cropping. Site selection/environment, seed/stand establishment, cultural management, commodity use, handling. Types of vegetable cultivars. Breeding, physiological/environmental control.

HORT 5058. Plant Cytogenetics. (3 cr.; A-F or Audit; Spring Odd Year)
Hybrid science of plant cytology/genetics. History, concepts, current research, technological development in plant cytogenetics. Function, movement, number/structure of chromosomes. Methods/application of chromosome modification in plant improvement. prereq: [HORT/AGRO 4401, BIOL 4003] or instc consent

HORT 5059. Plant Cytogenetics Lab. (1 cr.; Student Option; Spring Odd Year)
Consolidate knowledge of plant cytogenetics by practicing series of microscopy/computational technologies. Examine number, movement, structure/structure modification of chromosomes. Application in plant improvement. prereq: [HORT/AGRO 4401, BIOL 4004] or instc consent

HORT 5061. Advanced Turfgrass Science. (2 cr.; Student Option; Every Spring)
For advanced students in turf with career objectives in professional turf management. Emphasis on ecology, physiology, theory of turf population dynamics and specialized management situations such as golf course, commercial sod production, and fine turf athletic settings. prereq: 4061

HORT 5071. Ecological Restoration. (4 cr.; Student Option; Every Fall)
Ecological/physiological concepts for revegetation of grasslands, wetlands, forests, and landscapes. Plant selection, stand establishment/evaluation. State/federal programs that administer restoration/reclamation. Field trips. prereq: [One college course in ecology, one college course in [plant science or botany]] or instc consent

HORT 5090. Directed Studies. (1-3 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer)
In-depth exploration of concepts, technology, materials, or programs in specific area to expand professional competency/self-confidence. Planning, organizing, implementing, and evaluating knowledge obtained from formal education and from experience. prereq: 8 cr upper div Hort courses, instc consent

HORT 5131. Student Organic Farm Planning, Growing, and Marketing. (; 3 cr.; Student Option; Every Spring)
Students plan/implement cropping/marketing strategies for organic produce/flowers from Student Organic Farm on St. Paul campus. prereq: 1001 or AGRO 1101 or AGRO 1103 or BIOL 1001 or BIOL 1009 or instc consent

HORT 6002. Problem Solving in Horticulture. (; 3 cr.; max 4 cr.; S-N only; Every Fall)
Collaborative problem-solving experience designed/completed by students with guidance from faculty instructor. prereq: Completion of 18 cr in master of agriculture in horticulture program or instc consent

HORT 6003. Masters of Professional Studies in Horticulture Professional Experience Program: Internship. (; 1-3 cr.; max 6 cr.; S-N only; Every Fall, Spring & Summer)
Professional experience in horticulture firms or government agencies attained through supervised practical experience. Students evaluate reports, consult with faculty advisers and with employers. prereq: Masters of professional studies in horticulture student, completed internship contract, instc consent

HORT 6011. Plant Propagation. (; 4 cr.; A-F only; Every Fall)
Principles/techniques of propagating plants by seeds, cuttings, grafts, buds, layers, and division. Lectures on principles, labs on practice of various propagating techniques. Reading/discussion of related primary literature. prereq: Master of Professional Studies or instc consent

HORT 8005. Supervised Classroom or Extension Teaching Experience. (; 2 cr.; S-N or Audit; Fall Even Year)
Classroom or extension teaching experience in one of the following departments: Agronomy and Plant Genetics; Biosystems and Agricultural Engineering; Horticultural Science; Plant Pathology; or Soil, Water, and Climate. Participation in discussions about effective teaching to strengthen skills and develop personal teaching philosophy. prereq: instc consent

HORT 8007. Extension Horticulture Practicum. (; 1-5 cr.; Student Option; Every Fall, Spring & Summer)
Selected activities that may include development of an extension fact sheet, assistance in Dial-U Clinic, or preparation of a
HSG 1461. Introduction to Housing. (3 cr.; A-F or Audit; Every Fall)
Physical, social, economic, and psychological aspects of housing. Housing as process/product for the individual, family, and community. Impacts of federal, state, and local governmental policies and economic trends.

HSG 3462. Housing and Community Development. (3 cr.; A-F or Audit; Every Fall)
Meaning/significance of neighborhood/community, residential neighborhood change, impact of housing on neighborhood conditions. Gentrification, displacement, racial segregation, suburbanization, community-based revitalization.

HSG 3482. Sustainable Housing: Community, Environment, and Technology. (TS; 3 cr.; A-F or Audit; Every Fall & Spring)
How sustainable housing practices build community. How community growth has impacted the environment and how natural events impact our communities. Science and technology required to build high performance houses.

HSG 4106H. Honors Capstone Project. (2 cr. [max 4 cr.]; A-F only; Every Fall & Spring)
Individualizes honors experience by connecting aspects of major program with special academic interests. prereq: Housing studies honors

HSG 4193. Directed Study in Housing Studies. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Independent study in Housing Studies under tutorial guidance. prereq: Undergrad, instr consent

HSG 4196. Internship in Housing Studies. (1-4 cr. [max 8 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Supervised work experience relating activity in business, industry, or government to the student’s area of study. Integrative paper or project may be required. prereq: Completion of at least one-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, instr consent

HSG 4461. Housing Development and Management. (4 cr.; A-F or Audit; Every Spring)
Housing development process/financing. Management of multifamily housing. Emphasizes housing for low-income families/specific populations (e.g., older residents).

HSG 4465. Housing in a Global Perspective. (3 cr.; A-F or Audit; Spring Odd Year)
Demographic changes, economic connections, and public policies for housing around the world. Sustainable development, rural-to-urban migration, land distribution, economic globalization, and civil conflict and war.

HSG 4467W. Housing and the Social Environment. (WI; 4 cr.; A-F or Audit; Every Fall)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.

HSG 5467. Housing and the Social Environment. (4 cr.; A-F or Audit; Every Fall)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.

HSG 5467. Housing and the Social Environment. (4 cr.; A-F or Audit; Every Fall)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.

HSG 5467. Housing and the Social Environment. (4 cr.; A-F or Audit; Every Fall)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.

HSG 5467. Housing and the Social Environment. (4 cr.; A-F or Audit; Every Fall)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.

HSG 5467. Housing and the Social Environment. (4 cr.; A-F or Audit; Every Fall)
Housing choices in context of social environment. Emphasizes special needs of elderly, disabled, minorities, large families, female-headed households, and low-income households. Students conduct a post-occupancy evaluation of housing.
HUMF 5001. Foundations of Human Factors/Ergonomics. (3 cr.; A-F or Audit; Periodic Fall) Variability in human performance influenced by interaction with designs of machines/tools, computers/software, complex technological systems, jobs/working conditions, organizations, sociotechnical institutions. Conceptual, empirical, practical aspects of human factors/ergonomics. prereq: Grad HumF major or minor or instr consent

HUMF 5193. Directed Study in Human Factors and Ergonomics. (1-4 cr.; A-F only; Every Fall, Spring & Summer) Independent study in human factors/ergonomics under tutorial guidance. prereq: Grad HumF major or minor or instr consent


HUMF 5874. Service Design: Designing complex systems to improve service delivery. (4 cr.; A-F only; Every Spring) Real world service delivery problems. Perceptual/cognitive strengths/weaknesses addressed when designing systems. prereq: Grad student or instr consent

HUMF 8001. Special Topics: Human Factors/Ergonomics. (2-3 cr.; Student Option; Every Fall & Spring) Survey course in human factors/ergonomics. Interaction of performance/behavior with design factors in performance environment. Concepts, methods, empirical findings, different systems applications, recent research. Topics vary. prereq: Grad HumanF major or minor or instr consent

HUMF 8002. Proseminar in Human Factors/Ergonomics. (1 cr.; max 2 cr.; A-F or Audit; Every Fall & Spring) Issues/concerns tailored to interests of faculty/students regarding human factors/ergonomics. Interdisciplinary science concerned with interaction of performance/behavior with design factors in performance environment. prereq: Grad HumF major or minor or instr consent

HUMF 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) FTE: master's. prereq: Master's student, adviser consent, DGS consent

HUMF 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) FTE: doctoral. prereq: Doctoral student, adviser consent, DGS consent

HUMF 8541. Decision Support Systems. (4 cr.; A-F or Audit; Every Fall & Spring) Students build a decision support system for a problem of their choice. How to identify appropriate problems. Styles of DSSs, evaluating their effectiveness. prereq: Undergrad-level computer programming course or instr consent; programming skills recommended

HUMF 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr

HUMF 8777. Thesis Credits: Master's. (1-18 cr.; [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credits: master's. prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

HUMF 8794. Human Factors Research. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Human factors research.

HUMF 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall, Spring & Summer) Thesis credit: doctoral. prereq: Max 18 cr per semester or summer; 24 cr required


HRIR 3032. Training and Development. (2 cr.; Student Option; Every Spring) Introduction to theory/research/practice of design/implementation/evaluation of employee training/development programs. Training as process for influencing individual/organizational outcomes.

HRIR 3041. The Individual in the Organization. (2 cr.; Student Option; Every Fall) Factors influencing individual work performance. Includes motivation, perceptual differences, career choice, psychological contracts, assumptions about workers' work, leadership/management, learning/skill development, openness to change. Examines evidence on current trends.

HRIR 3051. Compensation: Theory and Practice. (2 cr.; Student Option; Every Fall) Introduction to compensation/reward programs in employing organizations. Theories of organizational/employee behavior used in design/implementation of pay programs. Design, implementation, job evaluation, salary surveys, skill-based pay, merit-based pay, other compensation programs.


HRIR 3072. Collective Bargaining and Dispute Resolution. (2 cr.; Student Option; Every Spring) Collective bargaining, contract administration, grievance processing, interest/rights arbitration, strikes, related policies/practices of employers, workers, labor unions in private/public sectors. Impact/transfer of practices to non-union sector.

HRIR 4100W. HRIR Capstone: Personal and Organizational Leadership. (WI; 4 cr.; A-F only; Every Spring) Leadership as important competency for HR professionals. Reflection/growth of personal leadership skills. Techniques, strategies, philosophies to develop leadership acumen of individuals within organizations. Leadership research. prereq: 3021, 6 HRIR credits, [CSOM or HRD junior or senior or dept consent]
HRIR 5000. Topics in HRIR. (2 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Topics in human resources/industrial relations.

HRIR 5222. Managing Diversity. (2 cr.; Student Option; Every Fall & Spring)
How to manage diverse workforce. Human resource practices examined with respect to diversity. How to incorporate diversity into decision making to enhance organizational performance. prereq: HRIR MA student must register A-F, 3021, [CSOM or HRD junior or senior or dept consent]

HRIR 5252. Employment and Labor Law for the HRIR Professional. (2 cr.; Student Option; Every Fall & Spring)
Application of statutes/case law to work settings. Civil rights/equal opportunity. Discrimination/harassment. Compensation/benefits. Employee protection/privacy. Labor relations. Emphasizes application/ability to recognize legal aspects of HRIR issues. prereq: HRIR MA student must register A-F, 3021, [CSOM or HRD junior or senior or dept consent]

HRIR 5442. Employee Performance Management: Strategies, Systems, and Skills. (2 cr.; Student Option; Every Fall)
Performance management strategies. Components of effective performance management systems. Alignment with HR strategy. Integration with HR practices. Measurement/appraisal. Feedback, coaching. Legal issues. prereq: HRIR MA student must register A-F, 3021, [CSOM or HRD junior or senior or dept consent]

HRIR 5443. Principles of Effective Coaching. (2 cr.; Student Option; Every Fall)
Skills/competencies required to coach, mentor, develop employees/leaders. Managing coaching process. Planning coaching relationship. Coaching as leadership development strategy. Coaching executives. prereq: HRIR MA student must register A-F, 3021, [CSOM or HRD junior or senior or dept consent]

HRIR 5655. Public Policies on Work and Pay. (3 cr.; Student Option; Every Spring)
Analysis of public policies regarding employment, unions, labor markets. Public programs affecting wages, unemployment, training, worker mobility, security, quality of work life. Policy implications of changing nature of work. prereq: HRIR MA student must register A-F, ECON 1101, [CSOM or HRD junior or senior or dept consent]

HRIR 5662. Personnel Economics. (2 cr.; Student Option; Every Fall & Spring)
Application of economic tools to issues in human resources/industrial relations. Incentives/imperfect information. Incentive-based pay. Promotions/tournaments. Human capital/training. Screening/signaling. Applications/limitations. prereq: Prereq: HRIR MA student must register A-F, ECON 1101, [CSOM or HRD junior or senior or dept consent]

HRIR 5992. Independent Study in Human Resources and Industrial Relations. (1-8 cr.; Student Option; Every Fall, Spring & Summer)
Individual readings or research topics. prereq: dept consent or instr consent

HRIR 6000. Graduate Topics in Human Resources and Industrial Relations. (1-8 cr.; A-F only; Every Fall & Spring)
Selected graduate topics of current relevance to human resource management/industrial relations. prereq: HRIR MA student or dept consent

HRIR 6001. Business Principles for the HRIR Professional. (4 cr.; A-F only; Every Fall)

HRIR 6009. Introduction to Human Resources and Industrial Relations. (3 cr.; A-F only; Every Fall)

HRIR 6111. Using Data and Metrics in Human Resources and Industrial Relations. (4 cr.; A-F only; Every Fall & Spring)
Theory/applications of methods of data analysis for using data in HRIR decision-making. Descriptive/inferential statistics, especially hypothesis tests/confidence intervals. Regression analysis. Identification of appropriate techniques. Avoiding unreliable inferences. Introduction to HRIR metrics. prereq: HRIR MA student or dept consent

HRIR 6114. Human Resource Information Systems. (2 cr.; A-F only; Every Fall & Spring)
Integrating human resources practices with information technology to effectively support organizational needs. Determining HRIS needs. HRIS implementation/acceptance. HRIR applications in HR administration/operations, recruitment/selection, talent management, other HR areas. Emerging trends. prereq: HRIR MA student or dept consent

HRIR 6115. Staffing and Selection: Strategic and Operational Concerns. (2 cr.; A-F only; Every Fall & Spring)
Theory/practice related to staffing decisions. Recruitment, selection, promotion, transfer, dismissal, layoff, retirement in organizations. Legal environment in which staffing decisions are made. Staffing from strategic/organizational perspectives. prereq: 6301 or dept consent

HRIR 6301. Staffing, Training, and Development. (4 cr.; A-F only; Every Fall)
Developing plans for hiring to facilitate strategic goals, attracting talent, selecting best candidates, helping new employees onboard, developing knowledge/skills over time, keeping talented people. Evaluation of staffing, training, development effectiveness. prereq: HRIR MA student or dept consent

HRIR 6302. Staffing and Selection: Strategic and Operational Concerns. (2 cr.; A-F only; Every Fall & Spring)
Theory/practice related to staffing decisions. Recruitment, selection, promotion, transfer, dismissal, layoff, retirement in organizations. Legal environment in which staffing decisions are made. Staffing from strategic/organizational perspectives. prereq: 6301 or dept consent

HRIR 6303. Employee Training: Creating a Learning Organization. (2 cr.; A-F only; Every Fall)
Theory, research, practice related to design/implementaion of employee training programs. Needs analysis. Training outcomes. Instructional design/training techniques. Program evaluation/costing. Role of employees, firm policies/practices in training. prereq: 6301 or dept consent

HRIR 6304. Employee Development: Creating a Competitive Advantage. (2 cr.; A-F only; Every Fall)
Career development/planning. Employee/management development techniques, organizational/employee concerns related to socialization, cross-cultural assignments, change, engagement, performance management. prereq: 6301 or dept consent

HRIR 6401. Organizational Theory Foundations of High-Impact HRIR. (2 cr.; A-F only; Every Fall & Spring)
Economic aspects of individual and group behavior in organizations. Individual and collective rationality, information, incentives, coordination problems, and contracts. Impacts on HRIR decisions and outcomes. Solutions and approaches to problems in organizations at micro and macro levels. prereq: dept consent

HRIR 6402. HR Practices, HRM Strategy, and Organizational Performance. (2 cr.; A-F only; Every Fall)
Analysis of how different organizational practices/combinations thereof affect organizations in competitiveness, profitability, workplace safety, employment stability, wages. Coherence/consistency of system of organizational practices in relation to various contingencies. prereq: 6401 or dept consent

HRIR 6403. Comparative Organizations and HRM Systems. (2 cr.; A-F only; Every Spring)
Variations in organizational practices related to variations in ownership. Profit, nonprofit, government, cooperatives, economic systems, culture, technology, market structure. Organizational practices.
Employee empowerment, job enrichment, profit sharing, employee stock ownership, individual incentives, international comparisons. prereq: 6401 or dept consent

HRIR 6441. Organizational Behavior Foundations of High-Impact HRIR. (2 cr.; A-F only; Every Fall & Spring) Psychological aspects of individual/group behavior in organizations. Individual motivation, attitudes/job satisfaction. Leadership Organization design/culture. Impacts on HRIR decisions/outcomes. Solutions/approaches to problems in organizations at micro/macro levels. prereq: HRIR MA student or dept consent

HRIR 6444. Employee Motivation, Engagement, and Well-being. (2 cr.; A-F only; Every Spring) Employee motivation, behavior, job attitudes. How they can be channeled into productive/unproductive behaviors/employee well-being. How work behavior is influenced by individuals, groups, features of organizations. prereq: 6441 or MBA 6110 or dept consent

HRIR 6465. Leadership and Personal Development. (2 cr.; A-F only; Every Fall & Spring) Understanding effective leadership. Identifying personal leadership strengths/vulnerabilities through feedback. Developing leadership skills through practice as informed by theory/evidence. Exercises, role play. Creating customized leadership development plan. prereq: MBA or HRIR MA student or dept consent


HRIR 6501. Compensation and Benefits. (4 cr.; A-F only; Every Spring) Pay/benefit determination by labor markets, internal structures, individual performance. Alignment of business strategies with complementary compensation practices. Performance evaluation, technical skills, compensation analytics, pay negotiations. Illustrates concepts from labor economics, behavioral economics, psychology with routine interactive case studies. prereq: HRIR MA student or dept consent

HRIR 6502. Compensation Theory and Applications. (2 cr.; A-F only; Every Fall) Relationships between economic/psychological theories, design/operation of compensation programs. Demographic influences on compensation program outcomes. Statistical analysis applied to pay program design/administration. Global pay variations. Current pay issues/controversies. prereq: 6501 or dept consent

HRIR 6503. Employer-Sponsored Employee Benefit Programs. (2 cr.; A-F only; Every Spring) Design, administration, management of non-mandatory compensation benefit programs, including health/dental care plans/insurance, retirement plans, disability benefits, paid time off, accommodation benefits. Effects of providing benefits on workers' incentives for performance. Psychological foundations of employee benefits. Role of benefits in employee recruitment/retention. prereq: 6501 or dept consent

HRIR 6504. Executive Compensation. (2 cr.; A-F only; Every Spring) Course emphasizes understanding and appreciation of the complexities of executive compensation. Course will develop your knowledge of analysis and design of executive compensation, teach you to read and understand executive compensation disclosures, develop an awareness of trends, issues and challenges and give you an idea of how accounting, tax regulations, and other regulations shape executive compensation. Through the use of cases, class discussions and interactive experiential activities this course will develop your intellectual ability to critically examine, analyze, and deal with the complexity and ambiguity of executive compensation. prereq: A-F only; prereq MBA or HRIR MA student

HRIR 6664. Topics in Labor Market Analysis. (; 2-4 cr.; Periodic Fall & Spring) May include micro aspects of unemployment, implicit contracts/efficiency wages, investment in human capital, occupational choice, job search, job matching/turnover, migration, labor force participation, government program evaluation. prereq: 6001, 6111, [Business Admin PhD student or dept consent]

HRIR 6701. Labor Relations and Collective Bargaining. (4 cr.; A-F only; Every Spring) Evolution of U.S. labor unions/public policy, bargaining environment/structure, goals/negotiations, contract administration/results. International comparisons, labor-management cooperation, newly emerging issues. prereq: HRIR MA student or dept consent

HRIR 6702. Contemporary Issues in Labor Relations. (2 cr.; A-F only; Every Fall) Focused issues of particular concern to various actors in contemporary labor relations. Topics vary. prereq: 6701 or dept consent

HRIR 6703. Dispute Resolution: Labor Arbitration. (2 cr.; A-F only; Every Fall) Arbitration to resolve grievances/impasses arising out of collective bargaining agreement's administration/negotiation. Arbitration law/legal issues, procedures/practices, case presentation, management rights, discipline/discharge, evidence, contract language interpretation, remedies. Newly emerging approaches. prereq: 6701 or dept consent

HRIR 6801. HRIR in Practice: Strategy, Execution, and Ethics. (2 cr.; A-F only; Every Spring) Types of strategies. Developing/executing HRIR strategies. Project management. Ethical frameworks, issues, considerations in HRIR.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Human Sexuality (HSEX)

HSEX 6001. Foundations of Human Sexuality. (3 cr.; A-F or Audit; Every Fall) Foundations of Human Sexuality covers topics in human sexuality, including biology and sexuality; sexuality across the lifespan, cultures and history; religions, epidemiology and clinical issues; and sexuality and legal/social aspects. Using readings, discussion forums, peer review, and an applied final project, students will understand the interactions between biological, social, and individual factors in producing variations in human sexuality.

HSEX 6011. Policy in Human Sexuality: Cutting Edge Analyses. (3 cr.; A-F or Audit; Every Fall) Policy in Human Sexuality: Cutting Edge Analyses offers an overview of United States and international policy related to gender and sexuality. The course will present the content and impact of such policies across human life stages, from youth reproductive health to aging LGBTQI folks; and a variety of contexts including education, military service, employment, and criminal legal systems. Using readings, multimedia sources, discussion forums, peer review, and an applied final project, students will understand the theory, process, and central actors in policy development and implementation, and the real-world effects of these processes.

HSEX 6012. Sexual Function and Dysfunction. (3 cr.; A-F or Audit; Every Spring) This course covers various aspects of sexual function and dysfunction as well as an in-depth overview of sexual health as it pertains to the general public. Using readings, discussion forums, peer review, and an applied final project, students will understand range of normal and abnormal sexual response, diagnostic categories of sexual dysfunction, and the range of therapies available.

HSEX 6013. Perspectives and Practices in Sexuality Education. (3 cr.; A-F or Audit; Every Spring) This course covers the history of sexuality education, primarily in the US with international comparison, as well as current and emerging issues in sexuality education. Using readings, discussion forums, peer review, and an applied final project, students will understand the temporal changes in sexual health education in the US and abroad and the empirical, theoretical, and educational foundations of sexual health education.

Icelandic (ICEL)

ICEL 1101. Intensive Modern Icelandic. (6 cr.; Student Option; Every Summer) Basic listening, speaking, reading, writing. Everyday subjects (shopping, directions, family, food, housing). Culture/society. First half is at University of Minnesota-Twin Cities; second half is at University of Iceland-Reykjavik. Six-week course. Prereq: dept consent

ICEL 4101. Intensive Modern Icelandic. (3 cr.; Student Option; Every Summer) Basic listening, speaking, reading, writing. Everyday subjects (shopping, directions, family, food, housing). Culture/society. First half is at University of Minnesota-Twin Cities; second half is at University of Iceland-Reykjavik. Six-week course. Meets with 1101. Prereq: grad student, dept consent

India (INDA)

INDA 1001. Beginning Hindi. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

INDA 1201. Beginning Kannada. (4 cr.; Student Option; Every Fall & Summer) Study abroad course

INDA 3005. Intermediate Hindi. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course

INDA 3008. Advanced Hindi. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

Industrial Engineering (IE)

IE 1101. Foundations of Industrial and Systems Engineering. (4 cr.; A-F only; Every Fall) History/development of industrial/systems engineering, operations planning, quality control, human factors, resource management, financial engineering, facility location/layout, optimization, probabilistic/stochastic models, simulation, project management. Prereq: [MATH 1372 or equiv]. CSE student

IE 2021. Engineering Economics. (4 cr.; A-F only; Every Fall) Cost/design process, cost estimation models, cash flow analysis, interest rate models, time value of money, evaluation of projects, internal rate of return, depreciation/income taxes, price changes/inflation, capital budgeting, decision making under uncertainty. Prereq: [MATH 1372 or equiv]. CSE student

IE 3011. Optimization I. (4 cr.; A-F only; Every Fall) Optimization models, data/solutions, linear programming, simplex method, duality theory, sensitivity analysis, network optimization models, integer programming. Prereq: 1101, MATH 2374, MATH 2373, Upper Division CSE


IE 3041. Industrial Assignment I. (2 cr.; A-F or Audit; Every Spring) Industrial work assignment in engineering intern program. Evaluation based on student's formal written report covering semester's work assignment. Prereq: ISyE upper division, registration in ME co-op program

IE 3521. Statistics, Quality, and Reliability. (4 cr.; Student Option; Every Fall, Spring & Summer) Random variables/probability distributions, statistical sampling/measurement, statistical inferencing, confidence intervals, hypothesis testing, single/multivariate regression, design of experiments, statistical quality control, quality management, reliability, maintainability. Prereq: MATH 1372 or equiv
IE 3522. Quality Engineering and Reliability. 
(4 cr.; A-F only; Every Spring) 
Quality engineering/management, economics of quality. Statistical process control, reliability, maintainability, availability. prerequisite: 3521, MATH 2373, MATH 2374, ISYE major 

IE 3553. Simulation. 
(4 cr.; A-F only; Every Fall) 
Introduction to techniques/tools of stochastic simulation. Applications from finance/insurance risk. Problems in inventory/queueing, prerequisite: CSCI 1133, IE 3521, ISYE major 

IE 4011. Stochastic Models. 
(4 cr.; A-F only; Every Spring) 

IE 4041W. Senior Design. 
(WI; 4 cr.; A-F only; Every Spring) 
Work in small teams to address open-ended problem in industrial/systems engineering. Teams work with faculty or industry advisers. Project, midterm/final presentation, final report. prerequisite: 1101, 2021, 3012, 3522, 3553, 4011, 4511, 4541W, 3521, 4551, ISYE senior 

IE 4043W. Industrial Assignment II. 
(WI; 4 cr.; A-F or Audit; Every Fall, Spring & Summer) 
Solution of system design problems that require developing criteria, evaluating alternatives, and generating a preliminary design. Final report emphasizes design communication and describes design decision process, analysis, and final recommendations. prerequisite: 3041 

IE 4044. Industrial Assignment III. 
(2 cr.; A-F only; Every Fall, Spring & Summer) 
Industrial work assignment in engineering co-op program. Evaluation based on student's formal written report covering semester work assignment. prerequisite: IE 4043, registration in ME co-op program 

IE 4091. Independent Study. 
(1-4 cr.; max 12 cr.; A-F only; Every Fall, Spring & Summer) 
Independent study of topic(s) involving industrial and systems engineering and operations research. 

IE 4094. Directed Research. 
(1-4 cr.; max 12 cr.; A-F only; Every Fall, Spring & Summer) 
Research with faculty adviser on a topic in industrial and systems engineering or operations research. Student contacts adviser to develop project description prior to registering for course. 

IE 4096. Curricular Practical Training. 
(1 cr.; max 3 cr.; S-N only; Every Fall, Spring & Summer) 
Industrial work assignment in engineering intern program. Evaluation based on student's formal written report covering semester's work assignment. 

IE 4511. Human Factors. 
(4 cr.; A-F only; Every Fall) 
Human factors engineering (ergonomics), methods engineering, work measurement. Human-machine interface: displays, controls, instrument layout, supervisory control. Anthropometry, work physiology and biomechanics. Work environmental factors: noise, illumination, toxicology. Methods engineering, including operations analysis, motion study, and time standards. prerequisite: Upper div CSE or grad student 

IE 4541W. Project Management. 
(WI; 4 cr.; A-F only; Every Fall) 
Introduction to engineering project management. Analytical methods of selecting, organizing, budgeting, scheduling, and controlling projects. Risk management, team leadership, program management. prerequisite: ISYE senior 

IE 4551. Production and Inventory Control. 
(4 cr.; A-F only; Every Spring) 
Methods for managing production, inventory, supply chain operations. Demand forecasting, inventory control, production planning/scheduling, supply chain coordination, manufacturing flow analysis. Implications of emerging technologies, business practices, government regulations. prerequisite: 3011, 3521, ISYE major 

IE 4894H. Senior Honors Thesis. 
(2 cr.; A-F only; Every Fall, Spring & Summer) 
Writing thesis under direction of ISYE faculty member. 

IE 5080. Topics in Industrial Engineering. 
(1-4 cr.; Student Option; Periodic Fall & Spring) 
Topics vary each semester. 

IE 5111. Systems Engineering I. 
(2 cr.; A-F or Audit; Every Fall) 
Overview of systems-level thinking/techniques in context of an integrated, design-oriented framework. Elements of systems engineering process, including lifecycle, concurrent, and global engineering. Framework for engineering large-scale, complex systems. How specific techniques fit into framework. prerequisite: CSE upper div or grad student 

IE 5113. Systems Engineering II. 
(4 cr.; A-F or Audit; Every Spring) 
Systems engineering thinking/techniques presented in 5111. Hands-on techniques applied to specific problems. Topics pertinent to effectiveness of design process. Practices and organizational/reward structure to support collaborative, globally distributed design team. 

(4 cr.; A-F only; Every Fall, Spring & Summer) 
Cash flow streams, interest rates, fixed income securities. Evaluating investment alternatives, capital budgeting, dynamic cash flow process. Mean-variance portfolio selection. Capital Asset Pricing Model, utility maximization, risk aversion. Derivative securities, asset dynamics, basic option pricing theory. prerequisite: CSE upper div or grad student 

IE 5511. Human Factors and Work Analysis. 
(4 cr.; A-F or Audit; Every Fall) 
Human factors engineering (ergonomics), methods engineering, and work measurement. Human-machine interface: displays, controls, instrument layout, and supervisory control. Anthropometry, work physiology and biomechanics. Work environmental factors: noise, illumination, toxicology. Methods engineering, including operations analysis, motion study, and time standards. prerequisite: Upper div CSE or grad student 

IE 5513. Engineering Safety. 
(4 cr.; A-F or Audit; Every Fall & Spring) 
Occupational, health, and product safety. Standards, laws, and regulations. Hazards and their engineering control, including general principles, tools and machines, mechanisms and structures, electrical safety, materials handling, fire safety, and chemicals. Human behavior and safety, procedures and training, warnings and instructions. prerequisite: Upper div CSE or grad student 

IE 5522. Quality Engineering and Reliability. 
(4 cr.; Student Option; Periodic Fall & Spring) 
Quality engineering/management, economics of quality, statistical process control design of experiments, reliability, maintainability, availability. prerequisite: [4521 or equiv], [upper div or grad student or CNR] 

IE 5531. Engineering Optimization I. 
(4 cr.; Student Option; Every Fall) 
Linear programming, simplex method, duality theory, sensitivity analysis, interior point methods, integer programming, branch/ bound/dynamic programming. Emphasizes applications in production/logistics, including resource allocation, transportation, facility location, networks/flows, scheduling, production planning. prerequisite: Upper div or grad student or CNR 

IE 5532. Stochastic Models. 
(4 cr.; Student Option; Every Fall) 
Introduction to stochastic modeling and stochastic processes. Probability review, random variables, discrete- and continuous-time Markov chains, queueing systems, simulation. Applications to industrial and systems engineering including production and inventory control. prerequisite: Undergraduate probability and statistics. Familiarity with computer programming in a high level language. 

IE 5541. Project Management. 
(4 cr.; A-F only; Every Fall & Spring) 
Introduction to engineering project management. Analytical methods of selecting, organizing, budgeting, scheduling, and controlling projects, including risk management, team leadership, and program management. prerequisite: Upper div or grad student 

IE 5545. Decision Analysis. 
(4 cr.; Student Option; Periodic Fall & Spring) 
Single-person and group decision problems. Structuring of decision problems arising in personal, business, and public policy contexts. Decision-making under uncertainty, value of information, games of complete information and Nash equilibrium, Bayesian games, group decision-making and distributed consensus, basics of mechanism design. prerequisite: 3521 or equiv 

IE 5551. Production Planning and Inventory Control. 
(4 cr.; Student Option; Every Fall & Spring) 
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu. 336
Applications in engineering, economics, and business problems, prerequisite: Familiarity with linear algebra and calculus.

IE 8531. Discrete Optimization. (4 cr. [max 8 cr.]; Student Option; Every Fall & Spring)

IE 8532. Stochastic Processes and Queuing Systems. (4 cr.; Student Option; Every Fall)
Introduction to stochastic modeling and processes. Random variables, discrete and continuous Markov chains, renewal processes, queuing systems, Brownian motion, and elements of reliability and stochastic simulation. Applications to design, planning, and control of manufacturing and production systems. prerequisite: 4521 or equiv.

IE 8533. Advanced Stochastic Processes and Queuing Systems. (4 cr.; Student Option; Periodic Spring)
Renewal and generative processes, Markov and semi-Markov processes, martingales, queuing theory, queuing networks, computational methods, fluid models, Brownian motion. prerequisite: 8532 or instr consent.

IE 8534. Advanced Topics in Operations Research. (4 cr. [max 8 cr.]; Student Option; Every Fall & Spring)
Special topics determined by instructor. Examples include Markov decision processes, stochastic programming, integer/combinatorial optimization, and queuing networks. prerequisite: 5531, 8532.

IE 8536. Advanced Topics in Engineering Management. (4 cr. [max 8 cr.]; A-F or Audit; Periodic Spring)
Areas such as financial engineering, revenue management, management of health systems, service operations, management of technology, and public policy.

IE 8538. Advanced Topics in Information Systems. (4 cr.; A-F or Audit; Periodic Fall & Spring)

IE 8541. Decision Support Systems. (4 cr.; A-F or Audit; Every Spring)
Decision Support Systems (DSSs) to assist people in making better decisions, interpreting complex information, and managing complex situations safely/effectively. Principles of human-centered design, cognitive engineering, and evaluation. Applications in projects of students' own choosing.

IE 8552. Advanced Topics in Production, Inventory, and Distribution Systems. (4 cr. [max 8 cr.]; Student Option; Periodic Fall & Spring)
Cutting edge research issues in production, inventory, distribution systems. Stochastic models of manufacturing systems, stochastic inventory theory, multi-echelon inventory systems, supply chains, supplier-retailer/supplier-manufacturer coordination, supplier/warehouse networks, business logistics, transportation. prerequisite: 5551.

IE 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Prerequisite: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

IE 8773. Graduate Seminar. (1 cr.; S-N or Audit; Every Fall & Spring)
Recent developments.

IE 8774. Graduate Seminar. (1 cr.; S-N or Audit; Every Fall & Spring)
Recent developments. prerequisite: 8773.

IE 8777. Thesis Credits: Master's. (1-18 cr.; max 50 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prerequisite. Max 18 cr per semester or summer; 10 cr total required (Plan A only).

IE 8794. Industrial Engineering Research. (1-6 cr.; max 10 cr.; Student Option; Every Fall, Spring & Summer)
Directed research. prerequisite: instr consent.

IE 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall, Spring & Summer)
Structured environment in which students can complete M.S. Plan B project.

IE 8893. Plan B. (2 cr.; A-F or Audit; Every Spring)
Structured environment in which students can complete M.S. Plan B project. prerequisite: 8951.

IE 8991. Curricular Practical Training. (1-2 cr.; max 6 cr.; S-N only; Every Fall, Spring & Summer)
Industrial work assignment involving advanced mechanical engineering. Review/approval by faculty member/director of graduate studies. Final report covering work assignment.
IMBA 6030. Financial Accounting. (3 cr.; A-F only; Every Summer)
Students learn about the accounting system used by firms to measure and report their economic performance and financial position to external parties. Students analyze corporate financial reports to discover the impact of significant economic events. Discussions and cases focus on the role of financial reporting standards in informing financial intermediaries and contributing to the efficient allocation of capital in a modern economy.

IMBA 6110. Leading Others. (2 cr.; A-F only; Every Spring)
Achieving organizational goals by leading in ways that create motivation, engagement, commitment, positive social interactions, and job performance. Understanding and managing the characteristics of organizations, work groups, and individuals. The role of group dynamics, decision making, cooperation, conflict, and power in leading others.

IMBA 6120. Data Analysis & Statistics. (3 cr.; A-F only; Every Summer)
Concepts for exploratory data analysis, basic inferential procedures, statistical process control, time series and regression analysis, and analysis of variance. These methods are selected for their relevance to managerial decision making and problem solving.

IMBA 6140. Managerial Economics. (3 cr.; A-F only; Every Summer)
How markets work, how positive economic rents (profits) are made, and how strategic behavior affects profits. Four major topical areas include market micro-structure, industrial structure, uncertainty, and incentives and firm governance.

IMBA 6210. Marketing Management. (3 cr.; A-F only; Every Summer)
Management of the marketing function; understanding the basic foundational marketing concepts and skills in strategy development and planning of operational and strategic levels pertaining to product offering decisions, distribution channels, pricing and communication.

IMBA 6220. Supply Chain Management. (3 cr.; A-F only; Every Fall)
An orientation to a supply chain paradigm. Domestic and global perspectives will be examined. Tools used in operations and optimization will be discussed in the context of linking consumers to technology providers and manufacturers on rapid and distributed global platforms.

IMBA 6230. Financial Management. (3 cr.; A-F only; Every Summer)
Tools and concepts of financial management. Emphasizes use by financial and non-financial managers to measure creation of value within an organization. Evaluating businesses and business opportunities, identifying financial requirements and sources. Prereq: 6030

IMBA 6240. Data Analytics. (3 cr.; A-F only; Every Fall)
It is critical for contemporary managers to understand how the convergence of mobility, analytics, social media, cloud computing, and embedded devices are transforming firms, industries, markets and society. Using the foundation of data-driven business analytics this course provides the tools and frameworks for competing in the digital age. Students will learn general state-of-the-art analytics skills in the context of new platform-based business models, digital search, big-data, social networks, social media, and open innovation that pervade competition in the digital age. Includes fundamentals of predictive modeling, large scale A/B testing, social networks analysis, and an exposure to the work-horse tools of data-driven classification and prediction to explore patterns in rich datasets (e.g., k-nearest neighbors, classification trees, design of recommendation systems). Using case studies in the digital domain, the methods taught have a wide range of applicability across functions and verticals in modern business environments. Prereq: IMBA student.

IMBA 6300. Strategic Management. (3 cr.; A-F only; Every Summer)
Introduction to the concepts and techniques used to create and implement a sense of corporate direction; choices about products and markets that involve the integration of different functional areas; positioning a business to increase returns for shareholders and stakeholders; the skills involved in identifying issues, evaluating options, and implementing business plans.

IMBA 6315. The Ethical Environment of Business. (2 cr.; A-F only; Every Spring)
Analysis of ethical dilemmas and development of appropriate responses; relationship of ethical management to the law; implications for corporate profitability; managing shareholders vs. managing stakeholders; issues such as protection of the environment, workplace safety, product liability, regulation, and fiduciary obligations.

IMBA 6401. Industry Overview & Business Law. (2 cr.; A-F only; Every Fall)
A comprehensive survey of the major U.S.-regulated and highly profitable industries including but not exclusive to?the technology, energy, finance and healthcare industries. The course will focus on the legislative and regulatory process that provide oversight to major verticals. Antitrust and competition policy enforced by the Department of Justice and the Federal Trade Commission will be explored. Prereq: Industry MBA Student

IMBA 6402. Industry Vertical: Technology. (2 cr.; max 3 cr.; A-F only; Every Fall)
This course focuses on firms engaged in three major sub areas of technology including e-commerce, defense, and manufacturing subsectors. Cases and live case studies to focus on firms ranging from 3M, Lockheed, Amazon, and Google. Federal agency oversight focus includes the Departments of Defense, Transportation, Commerce, and Education.

IMBA 6403. Industry Vertical: Energy. (2 cr. A-F only; Every Fall)
Focus on firms engaged in three major sub areas of financial services including retail banking, investment, and international markets subsectors. Cases and live case studies to focus on firms ranging from Wells Fargo, Berkshire Hathaway, Cargill, and Piper Jaffray. Federal oversight focus includes the Security and Exchange Commission and the Department of Treasury.

IMBA 6404. Industry Vertical: Finance. (2 cr. [max 3 cr.]; A-F only; Every Spring)
Focus on firms engaged in three major sub areas of financial services including retail banking, investment, and international markets subsectors. Cases and live case studies to focus on firms ranging from Wells Fargo, Berkshire Hathaway, Cargill, and Piper Jaffray. Federal oversight focus includes the Security and Exchange Commission and the Department of Treasury.

IMBA 6405. Industry Vertical: Health. (2 cr. [max 3 cr.]; A-F only; Every Spring)
Focus on firms engaged in three major sub areas of health including health care delivery, medical technology, and health insurance. Cases and live case studies to focus on firms ranging from United Health Group, Pfizer, Medtronic, and the Mayo Clinic. Federal oversight focus includes the Department of Health and Human Services, the Veteran Administration, and Office of Personal Management.

IMBA 6500. Virtual Team Project. (4 cr.; A-F only; Every Spring)
The Virtual Team Project (VTP) provides Carlson School MBA students with the unique opportunity to work in a collaborative team environment across professions, industries, and markets. As participants in the VTP, students develop advanced skills in teamwork, cross-cultural collaboration, and business plan development within a dynamic environment shaped by academic rigor and the demands of real-world international business.

IMBA 6501. Industry MBA Capstone. (4 cr.; A-F only; Every Spring)
Tying together foundational concepts of business with deep knowledge of specific industry, students will collaborate across teams, faculty, and a selected corporate partner and enter in to ?War Games? scenarios. Teams will represent corporate decision makers and act as stakeholders for an all out, winner take all, strategic battle comprised within each of the industry verticals.

Information Networking (INET)

INET 1001. Survey of Information Technology. (1 cr.; A-F or Audit; Every Fall & Spring)
Major classifications of information technology (IT). Business uses with focus on data, systems, networks. IT as career, including degrees, certifications, trends, opportunities, lifelong learning.

INET 3065. Computer Security for the Business Professional. (3 cr.; Student Option; Every Fall)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

**INET 3101. C Programming: Language and Applications.** (2 cr.; A-F or Audit; Every Fall)

Syntax of C language. How other languages use C to interact with operating system. Debugging. Assignments build upon real-world programming examples to demonstrate how/where to use C. Scripting using languages such as UNIX shell and Perl. prereq: Basic computer/internet navigation skills; laptop with browser and MS Word or equivalent.

**INET 3102. Web Infrastructure.** (2 cr.; A-F or Audit; Every Fall)

Infrastructure of the web, from its fundamental protocol (HTTP) to the organization and use of large-scale components and services. Cloud offerings (compute, storage, queuing) and platforms (AWS, Google Apps, Heroku). prereq: [3101, CSCI 2021] or equiv IT experience.

**INET 3350. Special Topics in IT Infrastructure.** (1-3 cr.; max 6 cr.; A-F or Audit; Every Fall)

Topics in information technology infrastructure.

**INET 4001. Foundations of Operating Systems.** (4 cr.; A-F or Audit; Every Fall)

Although the concept of an operating system has some core components, such as I/O, storage, CPU scheduling, process, and synchronization, the ways we use computing devices are radically changing. With the advent of concepts like IoT (internet of things), we need to not just simply take a single concept of a computer (PC or server) as de facto standard, we must adapt and understand how the core components that make up an operating system change how we need to use these components. We also have the ability to consume OS resources via networking like never before. What is commonly called "cloud computing" has now stretched what we think of a compute device across the globe as a connected system of services/processes. This course will start from the beginning of computing (briefly) to ground what we are actually trying to do with compute devices. From here, we'll understand the foundation of operating system components, but not just from a single platform. An introduction to cloud computing is essential as well, as there are many components we consume via compute devices that are across a WAN circuit as a "service." Prerequisites: CSci 2021 or EE 2361.

**INET 4002. Foundations of Networking.** (3 cr.; A-F or Audit; Every Fall & Spring)

Basics of data communications and computer networks. Foundations of network protocols, data communications models, networking devices, and network types. Local area, wide area, and wireless networks and their uses in business applications. Network monitoring, troubleshooting, security, and management fundamentals, including their application in enterprise networking. 3 credits. No prerequisites, but basic knowledge of computer architecture and operating systems is recommended. Note that credit will be granted for either INet 4002 or CSci 4211, but not both.

**INET 4007. Security II: Cyber Security.** (4 cr.; A-F only; Every Fall)

An exploration of information security, how it applies to current networking technologies, and ways these technologies are used and consumed. New authentication methods for securing user data, such as telemetry, biometrics, and N factor authentication, will be surveyed. The course will also look at recent instances of information breaches that have put a spotlight on security, especially as they relate to cloud services, virtual environments, and Internet standards. No prerequisites. Basic knowledge of security issues and processes (detection, risk assessment, technology, secure design, business continuity, forensics, and legal aspects) is recommended. If you have taken INet 4165, you will be well prepared. If you are unsure about whether your knowledge is sufficient for success in this class, contact the instructor.

**INET 4011. Networking I: Network Administration.** (4 cr.; A-F or Audit; Every Fall)

A combination of networking theory (lecture and expert guest speakers) and application (lab work). Topics include network architecture, switching, routing, algorithms, protocols, infrastructure hardware, cable plant, security, and network management. prereq: CSCI 4211-Introduction to Computer Networks or equivalent networking knowledge and understanding.

**INET 4021. Dev Ops I: Network Programming.** (4 cr.; A-F or Audit; Every Spring)

Network and distributed programming concepts. Design using C, Java, and other higher-level programming languages. Sockets, TCP/IP, RPC, streaming, CORBA, .NET, and SOAP. Labs use UNIX/Linux and MS Windows operating systems. prereq: major admission requirements completed.

**INET 4031. Introduction to Systems.** (4 cr.; A-F or Audit; Every Fall & Spring)

Overview of systems administration. Integration of hardware, software, and operational practice. Role of a systems administrator in today's infrastructure world, the environment within which the administrator operates, and various components that influence decision-making criteria. Ways these technologies are implemented in practice are conveyed through industry speakers, tours, and demonstrations. Hands-on labs when possible. prereq: Secure knowledge of operating systems, such as provided by INet 4001 or CSci 4061.

**INET 4032. Systems I: Storage.** (4 cr.; A-F or Audit; Every Fall)

Information is one of the most valuable commodities of the 21st century. This course deals with the proper care and handling of enterprise data, whether the ?enterprise? is a large multinational corporation, a family home, or something in between. Topics include storage network architecture and storage system design. We will examine data storage technology; local, network, and distributed storage; storage history; data protection policy and implementation (including redundancy, replication, backup, and archive storage); security; compression and encryption; and emerging technologies like Big Data, Cloud storage, AWS, Google, and vCloud Air. prereq: Fundamental understanding of an operating system such as Microsoft Windows, Linux, or Apple OSX, in the areas of file systems, I/O, computer architecture, and basic administration.

**INET 4041. Networking II: Emerging Technologies.** (4 cr.; A-F or Audit; Every Fall)

Emerging networking concepts, technologies, and applications. Topics will evolve to reflect current trends and expertise of the faculty, such as high speed networking, ATM, network security, wireless networks, multimedia, and electronic commerce. Each technology is considered for the underlying theory; the driving technological and business needs; the applications; the competing alternative technologies; and the design, implementation, and configuration of such systems. Case studies may be used to identify and analyze strategic issues and problems. Concepts and tools from this and previous ITI courses are applied to solve these problems and design realistic programs of action. Hands-on labs are included when possible. Industry speakers, tours, and demonstrations show practical applications. prereq: CSci 4211 or equivalent, or professional experience, to comprise a basic understanding and knowledge of operating systems, computer architecture, and probability theory. Senior status preferred.

**INET 4051. IT Infrastructure Operations.** (3 cr.; A-F or Audit; Every Spring)

Comprehensive review of major aspects of IT infrastructure and operations: networks, databases, servers, storage, project management, governance, compliance, monitoring, and more. Two research papers on current IT topics will be completed, along with weekly quizzes. prereq: senior; CSCI 4211 or instr consent

**INET 4061. Data Science I: Fundamentals.** (3 cr.; A-F or Audit; Every Spring)


**INET 4082W. IT Infrastructure Projects and Processes.** (WI; 3 cr.; A-F or Audit; Every Fall)

This course presents an IT management perspective on business partnerships, project management and lifecycle, methodologies, processes, and organizational structures. It
covers scope definition, resource estimating of time and cost, quality considerations, and metrics and risk analysis. Project management best practices are emphasized. All the concepts will be tied together with project simulation assignments. As a writing intensive designated course, it will spend significant time focusing on the writing process. Writing is crucial to this discipline because clear, accurate, and professional communication is essential to each element in the process of project management. The inability to write well, clearly, and in terms of specified audiences can, in the professional world, lead to not only miscommunication between team members but also, and more largely, to a failure of projects and the companies and employees they represent. prereq: 45 cr recommended

**INET 4083. Systems II: Analysis and Design.** (3 cr.; A-F or Audit; Every Spring) Requirements management, analysis, and design of computer system solutions targeting business objectives. System development life cycle. Development methodologies. Analysis/design tools/techniques; communication strategies. System architecture as business strategy. Prereq: INet 4082 or equivalent project management experience

**INET 4121. DevOps II: Development Strategies.** (4 cr.; A-F or Audit; Every Fall) DevOps (Development and Operations) is the term used to describe the collaboration of software engineers with the quality assurance and operations teams who test, deploy, and operate new systems. Its goal is to generate better and more continuous feedback regarding what is being developed, consumed, and operated, in order to increase delivery and deployment speed while maintaining system stability. Topics include configuration management, application deployment, monitoring of application and infrastructure performance, version control, and testing and building systems. Professional software engineering tools for the continuous integration tool chain are surveyed, and the Python language, combined with operating system and web functions, is used to develop tools for automating DevOps practices. (Though assignments are in Python, students with only Java or C++ should be able to learn Python quickly.) prereq: CSCI 4061 or operating system knowledge, basic knowledge of Python

**INET 4153. Introduction to Security: Policy and Regulation.** (4 cr.; A-F or Audit; Every Fall) Explores the significant domestic and international regulatory demands faced by information technology management (IT) in business and industry, with attention to the effects of those regulations on IT infrastructure policy, technology management, and decision making. Several major U.S. and international regulatory documents will be studied. IT governance, risk and compliance management frameworks, best practices, and common approaches used to meet today’s regulatory challenges and support common business functions will be examined, as well as IT policies, procedures, and processes in highly regulated business sectors. prereq: experience with Windows/Internet; 45 semester credits

**INET 4165. Security I: Principles.** (3 cr.; A-F or Audit; Every Spring) An in-depth look at the information security profession. Focuses on real-world IT security issues and processes rather than any particular technology or product solution. Topics include risk assessments/pen testing, ethics, malicious code, preservation of business continuity/disaster recovery, security policies and procedures, security awareness, encryption, privacy and legal issues, intruder detection, forensics, secure web design, incident response, vulnerability assessment, and security audits. prereq: CSCI 4061 or equiv experience with operating systems

**INET 4193. Directed Study.** (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent project. Topic arranged with and supervised by ITI faculty. prereq: ITI student, dept consent

**INET 4596. Internship.** (1-3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Hands-on work experiences in a professional IT setting. Students apply coursework, contribute to knowledge of best practices, and participate in career development. Prereq [ITI major or certificate student], [jr or sr], dept consent

**INET 4707. Introduction to Databases.** (4 cr.; A-F or Audit; Every Fall) Concepts, data models. Case studies, data manipulation languages, logical data models, database design, facilities for database security/integrity, applications. Prereq: CSCI 4061, at least 45 cr completed; CSci majors contact CSci Dept before registering.

**INET 4709. Data Management I: Fundamentals.** (3 cr.; A-F or Audit; Every Fall) Analyzing a business situation. Building a technology or product solution. Topics include selection of hardware and software components, backup and disaster recovery, performance metrics, high availability, and monitoring techniques. Hands-on lab exercises will utilize core concepts covered in lecture: installation of MySQL, backup and recovery, import and export, security, transaction management, data partitioning, and database replication. Prereq: INet/CSci 4707 and CSCI 4061, or professional experience with SQL and basic operating systems

**INET 4710. Data Science II: Big Data Analytics.** (4 cr.; A-F or Audit; Every Spring) Scales machine learning models and data analysis to a Big Data platform. Map Reduce and Spark frameworks are introduced as approaches to parallel algorithm development. Hands-on labs. Prerequisites: Basic programming knowledge (Java, Python, R). Linear algebra strongly recommended, especially matrix operations (e.g., MATH 2243, Linear Algebra and Differential Equations)

**INET 4711. Data Management II: Distributed Systems.** (4 cr.; A-F or Audit; Every Fall) Introduction to distributed programming and systems concepts in high-scale environments with a focus on application to commercial systems in the data center. Discussion of key protocols and algorithms as well as best-practice implementations on platforms commonly associated with big data in the enterprise. Hands-on experience in the design and engineering of distributed systems on cloud-oriented technologies. prereq: INet 4031 and 4707 or consent of instructor.

### Information and Decision Sci (IDSC)


**IDSC 3101. Introduction to Programming.** (2 cr.; A-F or Audit; Every Fall & Spring) Computer programings used by companies to build sophisticated information systems. Variables, control structures. Data structures such as arrays/collections. Programming style, graphical user interfaces (GUIs).

**IDSC 3102. Intermediate Programming.** (2 cr.; A-F or Audit; Every Fall & Spring) Programming concepts to develop large, full-featured applications. Object-oriented programming, database applications, Web applications. Style, performance, UI design.


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IDSC 4302. Analysis and Modeling of Business Systems. (4 cr.; A-F or Audit; Every Fall & Spring)

Improving/automating key business processes in manufacturing and service industries. Roles of business management and MIS. Selecting business process opportunities, business process analysis, process modeling of work/data flow, decomposition, software tools. Traditional/object analysis methods. prereq: 3001

IDSC 4110. Data Engineering for Business Analytics. (2 cr.; A-F only; Every Fall)

Modern organizations increasingly base their decisions on data which is becoming more abundant by each day. The first step of using data for decision making is to prepare data in a suitable format for analysis, a step commonly known as data engineering. Typical data engineering tasks may include data acquisition, parsing, handling missing data, summarization, augmenting, transformation, subsetting, sampling, aggregation, and merging. Data engineers also frequently use basic data visualization tools to detect and fix data issues. Most recently, there is increasing demand for data engineers to handle big data and unstructured data. A good data engineering process ensures quality, reliability, and usability of data. In fact, data engineering is such a critical and time-consuming step of data-driven decision making that many data scientists and analysts spend more than 80% of their time doing data engineering related tasks.

IDSC 4204W. Strategic Information Technology Management. (WI; 4 cr.; A-F or Audit; Every Fall & Spring)


IDSC 4210. Interactive Data Visualization for Business Analytics. (2 cr.; A-F only; Every Fall)

IDSC 4210 is an elective course for the undergraduate Business Analytics minor at the Carlson School of Management. It focuses on the fundamental and widely used exploratory data analysis technique of interactive visualization that is integral to modern business analytics. The key goal of this course is to prepare students for the rapidly changing digital environment faced by companies as it pertains to data-driven decisions. The students will also have hands-on experience with interactive data visualization using modern, state-of-the-art software on real-world datasets.

IDSC 4301. MIS in Action: A Capstone Course. (2 cr.; A-F only; Every Fall & Spring)

The course is designed for students to integrate a large number of concepts they have studied in previous course work within the department and school. The class uses a live-case/project-based design that requires students to identify and develop a detailed managerial analysis of an information technology and/or management information system (IT, MIS) project for a local corporation.

IDSC 4310. Prescriptive Analytics. (2 cr.; A-F only; Every Spring)

Prescriptive Analytics answer the question "What should I do?" This class of analytical techniques focuses on moving beyond simply analyzing the data to providing an optimal action plan. Prescriptive techniques combine learnings from the descriptive and predictive disciplines with a new layer of insight and computer algorithms that suggests an action plan rather than just describing the data or predicting what might happen. prereq: IDSC 4110 & 4210 recommended.

IDSC 4401. Information Security. (2 cr.; A-F only; Every Spring)

Concepts/issues of security and data integrity threats that undermine utility, robustness, and confidence in electronic technologies in facilitating business transactions. prereq: 3001

IDSC 4411. Information Technology Governance and Assurance. (2 cr.; A-F only; Every Spring)

Information technology audit function, internal control, audit process, smart operations, network security, systems development life cycle, enterprise resource planning risk, compliance issues. IT governance, business continuity, frameworks/methodologies. Lectures, case studies, real-world examples. prereq: 3001

IDSC 4431. Advanced Database Design. (2 cr.; A-F only; Every Spring)

Reviews ER/relational modeling and normalization, then focuses on fact modeling (ORM) to produce advanced richer business data models. "Flipped" class, fully online, including all lectures & final exam. Weekly in-class review session is recorded and online for questions, discussion, and results of assignments & quizzes. prereq: 3103 or CSCI 4707 or CSCI 5707 or instr consent

IDSC 4441. Electronic Commerce. (2 cr.; A-F or Audit; Periodic Fall, Spring & Summer)

Issues/trends in applying e-commerce initiatives. Technological infrastructure, revenue models, web marketing, business-to-business strategies, online auctions, legal and ethical aspects, hardware/software, payment systems, security. Conceiving, planning, building, and managing e-commerce initiatives. prereq: 3001

IDSC 4444. Descriptive and Predictive Analytics. (2 cr.; A-F only; Every Spring)

Data mining/personalization techniques. Exploratory/predictive data mining techniques. Data preparation, data visualization, online analytical processing (OLAP), recommender systems. How business analytics techniques are applied in variety of business applications/organizational settings. prereq: 3001

IDSC 4455. Web 2.0: The Business of Social Media. (2 cr.; A-F only; Every Spring)

Business use of social media technologies. Blogs, wikis, online social networks. Readings, forum discussion, case analyses. How technologies engage consumers, market products or services, benefit from open innovation, foster collaboration among employees. prereq: 3001

IDSC 4490. Information Systems Special Topics. (2 cr. [max 10 cr.]; A-F or Audit; Every Spring)

Discussion and analysis of current topics and developments in information systems.

IDSC 4491. Independent Study in Information Systems. (1-4 cr. [max 8 cr.]; A-F only; Periodic Fall, Spring & Summer)

Independent study in information systems. prereq: instr consent

IDSC 6003. Accounting and Information Systems. (4 cr.; A-F only; Periodic Fall & Spring)


IDSC 6040. Information Technology Management. (2 cr.; A-F only; Every Fall, Spring & Summer)

Management of information systems, information technology (IT) in global organization. Strategic uses of IT, management strategy, Internet/Web technologies, e-commerce customer services. Integration of e-business applications, interorganizational systems, systems implementation. Management of information as resource. Lecture, case analysis, classroom discussion. Prereq MBA student.

IDSC 6050. Information Technologies and Solutions. (2 cr.; A-F only; Every Fall & Spring)

Current/emerging technologies in modern Net-enhanced organizations. Internet/Web technologies, including Internet fundamentals, Web communications, Web 2.0/social media, information security, cloud computing, IT-driven innovation, emerging IT trends.

IDSC 6421. Financial Information Systems and Technology. (2 cr.; A-F only; Every Spring)


IDSC 6423. Enterprise Systems. (2 cr.; A-F only; Every Fall & Spring)

Requirements of architectures of information systems that help integrate business processes and optimize performance across diverse organizations/divisions. Capabilities of information systems in enterprise integration and supply chain management. Linkages
necessary between information systems and business processes.


IDSC 6444. Business Analytics for Managers I. (2 cr. ; A-F only; Every Spring) Use of information technologies to gather, store, analyze, and access data to help managers make decisions about their business and the way they serve customers. Data mining, personalization, recommender systems. prereq: [6040 or 6050 or MBA 6240], MBA student

IDSC 6446. Business Analytics for Managers II. (2 cr. ; A-F only; Every Spring) Builds upon IDSC 6444 Business Intelligence course. Cost-aware data analytics, mining text/ Web data, best practices in data visualization. Practical data-analytic thinking/decision making. Apply techniques in different settings, using real-world data sets. Value of advanced data analytics in variety of organizational contexts/business applications.

IDSC 6455. Web 2.0: The Business of Social Media. (2 cr. ; A-F only; Every Fall) Business use of social media, Web 2.0/driving forces, social media marketing/advvertising, engaging customers, peer production/open innovation. Ways businesses can leverage social media to foster collaboration, engage customers, build brand loyalty. prereq: MBA student

IDSC 6465. Global Sourcing of IT and IT Enabled Services. (4 cr. ; A-F only; Every Spring) Outsourcing IT and IT enabled services. Sourcing business/knowledge processes: finance/accounting, human resources, engineering services, data analytics. Strategic global sourcing planning/implementation. Managing off-shore service relationships. prereq: [6040 or 6050 or MBA 6240], MBA student

IDSC 6471. Knowledge Management. (2 cr. ; A-F only; Every Fall) Design, evaluation, use of knowledge in organizations. Leveraging knowledge in workers, structures, processes. Assessment of knowledge needs. Evaluation of key decision processes, information demands, usage patterns, content requirements. Behavioral/cultural barriers. Use of technology for knowledge management. prereq: MBA student

IDSC 6481. Managerial Decision Making. (2 cr. ; A-F only; Every Fall) Frameworks for making decisions as a manager, knowledge worker, or individual. How policies area adopted. Poor decision making. Learning from mistakes. Bounded rationality, system thinking, concepts of learning. prereq: MBA student

IDSC 6490. Advanced Topics in MIS. (3 cr. [max 15 cr. ] ; A-F only; Periodic Fall & Spring) Discussion and analysis of topics and developments in managing information systems.

IDSC 6491. Independent Study in Information Systems. (1-4 cr. [max 8 cr. ] ; A-F only; Periodic Fall, Spring & Summer) Independent study in Information Systems. prereq: inst consent

IDSC 8003. Accounting and Information Systems. (4 cr. ; A-F only; Every Fall) IS/IT infrastructure assessment methods, technology solutions, management issues. Digital data sources. Systems design in accounting and financial reporting information systems. Internal control requirements of Sarbanes-Oxley Act of 2002. Experiential learning, hands-on use of accounting enterprise software other packages. prereq: IDSC 3001 or equivalent

IDSC 8511. Conceptual Topics and Research Methods in Information and Decision Sciences. (3 cr. ; Student Option; Every Fall) Relationships to underlying disciplines; major research streams; seminal articles, survey literature, and major researchers. Provides framework for organizing knowledge about information and decision sciences. prereq: inst consent

IDSC 8521. System Development. (3 cr. ; Student Option; Spring Even Year) Why it is hard to develop efficient/effective information systems, what can be done to improve situation. Defining efficiency/ effectiveness in development process and in systems. Producing/evaluating artifacts (constructs, models, methods, tools) that enable more efficient/effective information systems to be developed. prereq: Business admin PhD student or inst consent

IDSC 8531. Organizational Theory and Research in Information Systems. (3 cr. ; A-F only; Spring Even Year) Introduction, adoption, use/exploitation of information systems in organizations. Critically examine empirical work. Formulate research questions, Conduct research, prereq: PhD student in Business Administration

IDSC 8541. Introduction to Economics of Information Systems. (3 cr. ; A-F only; Spring Odd Year) Classical research questions. Methods/findings that form backbone of economics of IS. Online auctions, electronic markets, offshoring, human capital issues. prereq: PhD student in Business Administration or inst consent

IDSC 8620. Data Mining and Personalization. (3 cr. ; A-F only; Spring Even Year) IDSC 8620 is intended primarily for research-oriented graduate students who are interested in learning about current data mining / machine learning methodologies and how to use them in research. The course will provide a comprehensive overview of the exploratory and predictive analytics techniques, focusing on the fundamentals but covering a number of advanced issues as well, and will demonstrate how these techniques can be applied various application areas (including the increasingly important areas of text analytics and recommender systems). The course puts significant emphasis on practical, hands-on experience applying data mining techniques in different settings using real-world datasets, but will also discuss the use and value of data mining in a variety of research contexts.

IDSC 8721. Behavioral Decision Theory. (3 cr. ; Student Option; Periodic Fall & Spring) Traditional/current research. Major models/methodologies. Issues of preference, judgment, and choice under conditions of certainty/uncertainty. Seminar format. prereq: Business admin PhD student or inst consent; offered alt yrs

IDSC 8722. Heuristic Decision Making. (2 cr. ; Student Option; Periodic Fall) How decisions are made, how knowledge is stored/used, how knowledge of variability/feedback influence decisions. Decisions at strategic, operational, individual level. Exceptional performance, pathologies of decision making. Basis for “best practice.” How knowledge is managed in decisions, decision failure. Folly, normal accidents, decision problems in which individuals manipulate information to influence/deceive others. prereq: Business Admin PhD student or inst consent; offered alt yrs

IDSC 8800. Research Seminar in Information and Decision Sciences. (3 cr. ; Student Option; Periodic Fall & Spring) Topics, which vary by semester, are selected from new areas of research, research methods, and significant issues. prereq: Business admin PhD student or inst consent

IDSC 8801. Research Seminar in Information and Decision Sciences. (2 cr. ; [max 20 cr. ] ; Student Option; Periodic Fall & Spring) New areas of research, research methods, issues. prereq: Business Admin PhD student or inst consent

IDSC 8890. Graduate Seminar in Information and Decision Sciences. (1-8 cr. ; max 16 cr. ) ; S-N only; Every Fall, Spring & Summer) Readings useful to a student's individual program and objectives that are not available through regular courses. prereq: Business admin PhD student or inst consent

IDSC 8894. Graduate Research in Information and Decision Sciences. (1-8 cr. ; max 16 cr. ) ; Student Option; Every Fall, Spring & Summer) Individual research on an approved topic appropriate to student's program and objectives. prereq: Business admin PhD student or inst consent
ISME 5101. Project Management. (3 cr.; A-F or Audit; Every Fall) Broad areas in project management/leadership. Emphasizes practical understanding of business/engineering project management. Project planning, scheduling, controlling. Budgeting, staffing, task/cost control. Communicating with, motivating, leading, managing conflict. prereq: Open to general grad students but with instr consent


ISME 5105. Computer Applications II. (1 cr.; A-F or Audit; Periodic Fall) Application features in Excel, Visual Basic, and Web Authoring. Data reduction, data presentation, interactive Web calculations. Student projects. prereq: ISE grad student

ISME 5112. Infrastructure Systems Engineering Management. (2 cr.; A-F or Audit; Every Spring) Managing public works infrastructure. Case studies of decision making in environment of conflicting interests. prereq: Open to advanced master's students

ISME 5113. Computer Applications in Infrastructure Systems Engineering. (2 cr.; A-F or Audit; Every Fall & Spring) Advanced application of computer tools/methods in infrastructure engineering problems. Spreadsheet Visual Basic programming, HTML, JAVA script. prereq: ISE grad student


ISME 5302. Critical Infrastructure Security and Protection. (2 cr.; A-F only; Every Spring) Security challenges of protecting critical infrastructure, facilities, and built environment. Security, agility, and robustness/survivability of large-scale critical infrastructure that face new threats and unanticipated conditions. Systems risk analysis, engineering, economics, and public policy approaches to infrastructure security. Design/management of complex civil infrastructure systems. prereq: ISE grad student or instr consent

ISME 5401. Water Distribution Systems. (1 cr.; A-F or Audit; Periodic Fall) Components/design of water distribution systems. Methods of evaluation/management. Maintenance/rehabilitation techniques. prereq: ISE grad student


ISME 5403. Water Treatment Systems. (2 cr.; A-F or Audit; Periodic Fall) Components/design of water treatment systems. Evaluation/management methods. Maintenance/rehabilitation techniques. prereq: ISE student

ISME 5500. Public Interactions. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall) Techniques for effective public communication. How to run public hearing. Resources for publishing public notices. Sequence course in three parts. prereq: Advanced grad student or open to general grad students with instr consent

ISME 5501. Geographic Information Systems. (2 cr.; A-F or Audit; Every Spring) Introduction to geographic Information Systems (GIS) for infrastructure. GIS application domains, data models/sources, analysis methods, and output techniques. Lectures, readings, hands-on experience with GIS software. prereq: ISE student


ISME 5504. Construction Law and Ethics. (2 cr.; A-F or Audit; Every Fall) Ethical framework for responsible management of public works projects. Moral leadership, trust in public/private organizations, quality control. prereq: ISE student

ISME 8105. Capstone Project. (1-2 cr.; max 3 cr.; A-F or Audit; Every Fall & Spring) Integrates knowledge from courses in Master's program with job experience. Students prepare proposal, conduct project, and report results in written and oral form. Project involves aspect of design, management, or operation of some feature of infrastructure. prereq: ISE student

ISME 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall & Spring) FTE: Master's Prereq Master's student, adviser approval, DGS approval.

Insurance and Risk Management

INS 4100. Corporate Risk Management. (2 cr.; Student Option; Every Fall & Spring) Theory applied to corporate risk management and insurance practices. Identification, measurement, and treatment of an organization's financial risks integrated with its property, liability, workers compensation, and human resource risks. Selection and application of risk control and risk financing tools: risk retention, reduction and transfer, including insurance.


INS 4200. Insurance Theory and Practice. (2 cr.; Student Option; Every Spring) Risk theory is applied to practices in health, liability, life, property, and workers compensation insurance. Insurance marketing, pricing, underwriting, and claims administration, with adverse selection and moral hazard effects. Policy issues of tort versus no-fault compensation systems. Self-insurance and integrated risk financing methods.

Integrated Behavioral Health (IBH)


IBH 6022. Foundations of Psychological Assessment. (2 cr.; A-F only; Every Fall & Spring)
Course focuses on major concepts and principles of educational and psychological assessment and the use of standardized instruments with differing populations.

IBH 6031. Methods and Models IV: Trauma and Anxiety, Assessment and Treatment Intervention. (2 cr.; A-F only; Every Fall & Summer)
Basic/applied research on trauma/anxiety. Asssessing/treating anxiety/post-trauma reactions in adults. Definition of anxiety, traumatic events, Assessment methods, PTSD assessment interview. Theory/techniques of evidence-based treatments. Field placement component. Note: This class is a required precuror to IBH 6041 Prolonged Exposure Therapy for PTSD.

IBH 6032. Advanced Multicultural Practice. (1 cr.; A-F only; Every Fall & Summer)
Incorporate various sources of knowledge/content to provide deepening perspective on multiple layers of diversity/counseling individuals with substance use/co-occurring mental health disorders. Aspects of various cultural experiences (i.e., race/ethnicity, class status, sexual/affectiveional orientation, gender, religion) as they impinge upon client, counselor, counseling relationship. prereq: ADDS 5081 or equivalent

IBH 6041. Prolonged Exposure Therapy for PTSD. (2 cr.; A-F only; Every Spring)
Advanced practice methods and interventions for working with trauma and co-occurring disorders. Emerging and evidence-based practices presented, practiced, and applied.

IBH 6051. Advanced Group Practice. (2 cr.; A-F only; Every Fall, Spring & Summer)
Trends/developments in group counseling. Evidence-based group processes/techniques for individuals with chronic/persistent mental illness, substance use disorders, co-occurring disorders. Field placement component.

IBH 6061. Applied Advanced Diagnostics I. (2 cr. [max 3 cr.]; A-F only; Every Fall & Spring)
Diagnosing individuals with chronic/persistent mental health disorders, personality disorders, associated substance use disorders. Case studies, field placement with multidisciplinary team. prereq: IBH student, ADDS 5091 and IBH 6011

IBH 6062. Applied Advanced Diagnostics II. (2 cr.; A-F only; Summer Even Year)
Applied Advanced Diagnostics II. prereq: 6061, must be admitted IBH student

IBH 6071. Advanced Professional Issues. (3 cr.; A-F only; Every Fall & Spring)
Develop ethical decision model that incorporates five moral principles. ACA/NAADAC codes of ethics/statutes/regulations that apply to mental health/substance abuse counseling. Case studies.

IBH 6081. Human Lifespan Development and Behavioral Health. (3 cr.; A-F only; Every Fall & Spring)

IBH 6091. Intersection of Career and Mental Health. (2 cr.; A-F only; Every Fall, Spring & Summer)
Vocational choice theory, lifestyle choices, occupational/educational information, career exploration, assessment tools. Diverse populations/ethical standards. Employment/career concerns for persons with mental health, substance use, previously incarcerated.

IBH 6101. Family Dynamics and Therapy. (3 cr.; A-F only; Every Fall & Spring)
Family dynamics/life cycle, communication patterns, multi-generational patterns. Systems theory/interventions for appropriate use of family resources to enhance intervention, treatment, family/individual functioning/maintenance processes.

IBH 6111. Research and Evaluation Methods. (3 cr.; A-F only; Every Fall, Spring & Summer)
Models of program evaluation. Use of research findings for program modification. Elements of research process, types of designs, program evaluation. Ethical considerations of research. Measurement concepts.

IBH 6112. Mental Health and Addiction Management and Administration. (2 cr.; A-F only; Periodic Summer)
State/regulatory standards rules/statutes. Health care financing/reimbursement. prereq: ADDS 5091 or ADDS 4001

IBH 6121. Professional Seminar 2. (1 cr.; S-N only; Every Fall, Spring & Summer)
The purpose of this seminar is to provide the groundwork for the development of the professional portfolio and should be taken 1 to 2 semesters before you plan to register for the IBH 8002 portfolio. Discussion and practice will focus on the main components to be included in the student’s professional portfolio such as professional statements and clinical competencies. IBH 6121 should be taken after completion of 50 credits.

IBH 6221. Applications of Counseling Theories. (2 cr.; A-F only; Every Spring)

IBH 6222. Adolescents and Co-occurring Substance Use and Mental Health Disorders. (3 cr.; A-F only; Every Fall)
Adolescents differ from adults physiologically, cognitively, and emotionally. Therefore, it is important for professionals who come into regular contact with this population to be familiar with the developmental issues and current trends in adolescent substance use. It is also essential to be able to recognize the risk and protective factors, biopsychosocial effects, and signs of potential substance use problems in adolescents.

IBH 6227. Supervision Models and Methods in Integrated Behavioral Health. (3 cr.; A-F only; Every Spring & Summer)
Supervision Models/Methods in Integrated Behavioral Health. prereq: Must be admitted IBH student

IBH 6228. Mental Health and Addiction Program Administration. (2 cr.; A-F only; Periodic Spring)
Most often, good employees or strong counselors are promoted into leadership positions with an assumption that a good clinician is a good leader. This course will review strategies to develop strong leaders along with understanding of the importance of regulations and accreditation standards in creating consistent practice and consistency across all treatment processes. Students will obtain an introductory understanding of leadership skills and begin using evidence-based leadership. Students will review and apply Department of Human Service Statutes and Joint Commission Standards. Students will learn how to read budgets and complete a review and analysis of assigned budgets.

IBH 6230. Clinical Application in Prolonged Exposure Therapy. (3 cr.; A-F only; Every Summer)
Clinical Application in Prolonged Exposure Therapy. prereq: 6031, 6041, must be admitted IBH student, dept consent

IBH 6232. Introduction to Navigating Issues of Sexual Health and Gender in the Therapy Session. (2 cr.; A-F only; Every Fall)
This is a graduate level course that is meant to broaden your understanding of issues regarding sexual health and gender that you may encounter in the therapy session. A large part of this course is focused on increasing your comfort and competence in having conversations about sexual health and gender with your clients, as well as knowing when to intervene and when to refer. Additional attention will be given to developing and keeping appropriate boundaries with clients when addressing issues of sexual health and gender. Theoretical frameworks regarding human sexuality, sexual disorders, normative vs. non-normative sexual behavior, issues of gender identity and expression, and applicable therapeutic interventions will be discussed. Specific focus will also be given to the co-occurrence of sexual and gender concerns with mental health and substance use disorders, including discussions regarding prevalence and potential presentations. Please be aware that in the process of this course, you will be asked to engage in dialogue about and reflect upon your own beliefs and values around issues of sex, sexuality, relationships, gender identity, etc. It is expected that you be willing to challenge yourself to critically examine course discussions and materials, particularly as they may apply to your future work as a counselor.
This course combines the use of lectures, group discourse, group presentations, clinical role-plays, readings, self-reflective activities, and additional experiential exercises to aid you in expanding your knowledge base and competence in managing these issues as they may arise in the therapy session.

IBH 6233. DBT Skills Training: Group Practices and Treatment Modalities. (2 cr.; A-F only; Every Summer) This course focuses on teaching the delivery of Dialectical Behavior Therapy (DBT) Treatment: Skills Training in a group format. This opportunity allows students to learn the skills taught in a DBT Program as well as learn the treatment components involved in a behavioral therapy orientation. Students will explore the core skill of mindfulness, behavioral therapy, dialectics and cognitive behavioral therapy in a group and experiential format. Students will be expected to participate in weekly group discussion and assignments. Discussion will assist students with learning how this treatment is delivered to clients. Weekly assignments will provide experiential learning of skills group and mindfulness, the foundation skill in a DBT Program.

IBH 6234. Counseling Grief and Loss. (2 cr.; A-F only; Every Fall & Summer) This course will provide students with an overview of current conceptualizations of grief and loss. It will prepare students with specialized knowledge and skills for understanding and identifying the process/progress of how people deal with loss. Special attention will be given to theoretical foundations of grief and loss, different types of loss, impact of loss, and cultural considerations. Additional strategies will be presented for intervening with those who have been impacted by loss.

IBH 6910. Topics in Integrated Behavioral Health. (1-4 cr.; max 32 cr.) A-F only; Periodic Fall, Spring & Summer) Topics in Integrated Behavioral Health.

IBH 6993. Directed Study in Integrated Behavioral Health. (1-3 cr.; max 6 cr.) A-F only; Every Fall, Spring & Summer) Directed study, prereq: Must be admitted IBH student, dept consent

IBH 6994. Directed Research in Integrated Behavioral Health. (1-3 cr.; max 6 cr.) A-F only; Every Fall, Spring & Summer) Directed research, prereq: Must be admitted IBH student, dept consent

IBH 6996. Internship for Integrated Behavioral Health. (1-4 cr.; max 16 cr.) S-N only; Every Fall, Spring & Summer) Culuminating field experience of MPS-IBH. On-site placement in public or private mental health, addiction/integrated treatment setting. Bridge between training/professionalism. Writing assignment. Pre/req: dept consent

IBH 8002. Portfolio Seminar. (1 cr.; S-N only; Every Fall, Spring & Summer) Required one credit registration for portfolio completion.

Inter-College Program (ICP)

ICP 3000. Career Skills in the Professional Environment. (2 cr.; Student Option; Every Spring & Summer) Career planning and job search processes appropriate to business/professional careers in corporate culture. Prereq: 60 cr

ICP 3093. Directed Study. (1-15 cr. A-F only; Every Fall, Spring & Summer) Independent, directed study. Prereq: instr consent

ICP 3101W. Inter-College Program Proposal Development. (WI; 2 cr.; A-F only; Every Fall & Spring) Write proposal of study/formulate plan of courses through which to complete degree. Prereq: ICP student or instr consent

ICP 3201. Career and Internship Preparation. (1 cr.; A-F only; Every Fall & Spring) Self exploration, networking, industry research, job/internship search, resumes, cover letters, interviewing, salary negotiation, goal setting. Prereq: Soph or jr or sr or grad student

Interdepartmental Study (ID)

ID 2201. Career Readiness for CLA Students. (1 cr.; Student Option No Audit; Every Fall & Spring) This course helps you become competitive for internships or other career-related opportunities as you explore connections between your academic interests and professional goals. You'll develop the skills to successfully apply for an internship or other career-related opportunity, explore possible careers, engage with employers in the class, and develop plans for building career readiness with your liberal arts degree. Throughout the semester, you'll learn about the Core Career Competencies that employers expect successful college graduates to have, and have opportunities to begin gaining experience through employer engagement within the class.

ID 3101. Major and Career Exploration for Transfer Students. (2 cr.; Student Option; Every Fall & Spring) Major and career planning for CLA transfer students. Students will gain insight into their academic major and career field of law. Off-campus informational interviews, site visits.

ID 3208. Internship Reflection: Making Meaning of Your Experience. (1 cr.; max 4 cr.) Student Option; Every Fall & Spring) Allows students to examine, reflect on, and construct meaning from their internship experience through self-assessment of personal and career needs and goals, examination of what it means to be a "professional" and operate within professional environments, evaluation of performance and accomplishments, articulation of knowledge and skills via effective resume writing. Prereq: dept consent

ID 3595W. HECUA Off-Campus Study Program: Agriculture and Justice Agroecosystems in Context. (CIV,WI; 4 cr.; Student Option; Every Spring) Through interdisciplinary/field-based methods, including farm stay/subsequent creation of "whole farm plan," students learn theory/practice of fundamental agroecological principles. Define, assess, interpret factors that contribute to greater sustainability of agroecosystems. Prereq: instr consent

ID 3596. HECUA Off-Campus Study Program: Agriculture and Justice - Justice and the U.S. Food System. (4 cr.; Student Option; Every Spring) Complexities of food system. Roots of land ownership/labor practices in U.S., unpacking economics/policies. Considering one's own role in creating sustainable future. Participatory Action Research projects place students at organizations working for food justice in Twin Cities. Prereq: concurrent registration is required (or allowed) in 3595, dept consent

ID 3597. HECUA Off-Campus Study Program: Agriculture and Justice Food Systems Internship (4 cr.). (4 cr.; Student Option; Every Spring & Summer) Minimum of 160 hours on substantive, mission-related projects at community-based organizations dedicated to food justice/food sovereignty in Twin Cities/greater Minnesota. Through written assignments/critical reflection, HECUA faculty link internship back to theoretical frames. Prereq: 3555, 3556, instr consent

ID 3598. HECUA Off-Campus Study Program: Agriculture and Justice Food Systems Internship (6 cr). (8 cr.; Student Option; Every Spring & Summer) Minimum of 300 hours on substantive, mission-related projects at community-based organizations dedicated to food justice/food sovereignty in Twin Cities/greater Minnesota. Through written assignments/critical reflection, HECUA faculty link internship back to theoretical frames. Prereq: dept consent

ID 3993. Directed Study. (1-4 cr.; max 32 cr.) Student Option; Every Fall & Spring) Guided individual reading or study. Prereq: instr consent, dept consent, college consent.

Interdisciplinary Archaeologic (INAR)

INAR 8200. Directed Readings. (1-7 cr.; Student Option; Every Fall & Spring)
INAR 6001. Directed Study I. (1-6 cr. ; max 18 cr.) ; P-N only; Every Fall, Spring & Summer
Directed study, directed readings and directed research opportunities for students to work individually with a faculty member to earn credit for individually designed content. The Medical School Directed Study course is available only for medical students during their foundational curriculum years 1 and 2. To register for a directed study course the student and faculty member must complete and sign the contract prior to submitting to the Medical School Registrar for processing.

INMD 6002. Directed Study II. (0-6 cr. ; P-N or Audit; Every Fall, Spring & Summer)

INMD 6120. Foundations of Preventive Medicine. (2 cr. ; P-N or Audit; Every Summer)
An introduction to the determinants and distribution of disease, the prevention of disease and promotion of health, medical research design and statistical analysis of data, and important aspects of health care delivery and public health. prereq: enrollment

INMD 6310. Topics in Medical Anthropology I: the Normal and the Pathological. (1-6 cr. ; max 12 cr.) ; P-N only; Every Fall, Spring & Summer
Themes vary depending on student interests. Health Disparities. Race and medicine.

INMD 6555. The Healer's Art: Awakening the Heart of Medicine. (1 cr. ; P-N only; Every Spring)
Developing a sense of personal/professional satisfaction from and ongoing commitment to the profession. prereq: Registered medical student

INMD 6755. Volunteer Community Outreach Experience. (0 cr. ; No Grade Associated; Every Fall, Spring & Summer)
The purpose of volunteer community outreach experiences are to provide medical trainees an opportunity to observe and/or assist in the provision of health care services to populations that are diverse in age, ethnicity, social environment, and need, as well as to experience unique clinical settings outside of the Medical School.

INMD 6802. Science of Medical Practice. (6 cr. ; max 7 cr.) ; P-N only; Every Fall) Genetic and biochemistry workings of the human body as they relate to normal daily function, including nutritional aspects.

INMD 6803. Essentials of Clinical Medicine Part 1. (5 cr. ; P-N only; Every Fall) Introduction to clinical medicine, including basic patient interview and hypothesis-driven physical exam. Basics of "doctoring." Students' first clinical experiences.

INMD 6804. Essentials of Clinical Medicine Part 2. (3 cr. ; P-N only; Every Spring) Clinical medicine, including basic patient interview and hypothesis-driven physical exam. Basics of "doctoring." Students' first clinical experiences.

INMD 6805. Essentials of Clinical Medicine Part 3A. (5 cr. ; P-N only; Every Spring) Clinical medicine, including basic patient interview and hypothesis-driven physical exam. Basics of "doctoring." Students' first clinical experiences.

INMD 6806. Essentials of Clinical Medicine Part 3B. (5 cr. ; P-N only; Every Fall) Clinical medicine, including basic patient interview and hypothesis-driven physical exam. Basics of "doctoring." Students' first clinical experiences.

INMD 6807. Essentials of Clinical Medicine Part 3C. (5 cr. ; P-N only; Every Spring) Clinical medicine, including basic patient interview and hypothesis-driven physical exam. Basics of "doctoring." Students' first clinical experiences.

INMD 6808. Human Health & Disease - Cardio & Resp. (4 cr. ; P-N only; Every Fall) Pathophysiologic of cardio-respiratory system, including infectious disease, pathologic/pharmacologic principles.

INMD 6809. Human Health & Disease - Rheum, Derm & Ophth, Ortho & Otol. (4 cr. ; P-N only; Every Spring)
Pathophysiologic of rheumatology, dermatology, ophthalmology, orthopaedics/otolaryngology disciplines, including infectious disease. Pathologic/pharmacologic principles.

INMD 6810. Human Health & Disease - Renal & Endo/Repro. (5 cr. ; P-N only; Every Spring) Pathophysiologic of endocrine/reproductive systems, including laboratory medicine/ infectious disease. Pathologic/pharmacologic principles.

INMD 6811. Human Health & Disease - GI & Heme. (4 cr. ; P-N only; Every Fall) Pathophysiologic of circulatory/gastrointestinal systems, including laboratory medicine/ infectious disease. Pathologic/pharmacologic principles.

INMD 6812. Micro Biology and Immunology. (5 cr. ; P-N only; Every Spring) Major bacterial, viral, fungal, and parasite diseases, including their life cycles and transmission, virulence factors, types of associated illnesses and diagnosis, general principles of treatment, and methods of prevention. Innate and acquired immunity, including cellular interactions, mechanisms, derangements, and serological use in diagnosis.

INMD 6813. Neuroscience. (3 cr. ; P-N only; Every Spring) Human neuroscience. Survey of molecular cellular systems neuroscience as related to medicine.

INMD 6814. Physiology. (3 cr. ; P-N only; Every Spring) Systems physiology. General physiology, endocrine, circulatory, respiratory, digestive, energy metabolism, and renal physiology examined at molecular, cellular, and organ level. Homeostasis and basic regulatory aspects of physiological processes of organ systems.

INMD 6815. Human Behavior. (1 cr. ; P-N only; Every Summer) Human activities, including those hidden from view such as cognition, feelings, and decision making. Focus on being a patient or a physician.

INMD 6816. Human Sexuality. (1 cr. ; P-N only; Every Summer) Basic and clinical skills. Teaching students the process of how to help provide patients with information and helpful suggestions concerning sexuality and referring patients who require more specialized forms of health care.

INMD 6817. Principles of Pathology. (1 cr. ; P-N only; Every Summer) General principles of human pathology.

INMD 6818. Principles of Pharmacology. (1 cr. ; P-N only; Every Summer) General principles of pharmacology.

INMD 6819. Human Health & Disease - Neuro & Psych. (3 cr. ; P-N only; Every Fall) Pathophysiologic of neurology/psychiatry disciplines, including infectious disease, along with pathologic/pharmacologic principles.

INMD 6820. Medical Gross Anatomy & Embryology. (3 cr. ; H-N only; Every Fall)
This course is a study of human gross anatomy with emphasis upon the anatomical structure (and a bit of function) of the components of the human body. It relies heavily on laboratory dissection in the approach to learning anatomy.

**INMD 6821. Human Histology.** (2 cr. [max 3 cr.]; P-N only; Every Fall)
Histology puts biochemistry, molecular biology and physiology in the context of cell structure and function. This lecture and laboratory course covers the microscopic structure of the body, using light and electron microscopic techniques, with an emphasis on the relationship of structure to function.

**INMD 6822. Human Health & Disease - Dermatology, Orthopedics, Rheumatology.** (3 cr. ; P-N only; Every Fall)
Pathophysiology of dermatology/orthopedics/ rheumatology disciplines, including infectious disease, along with pathologic/pharmacologic principles.

**INMD 6823. Human Health & Disease - Neurology, Psychiatry, Otolaryngology, Ophthalmology.** (4 cr.; P-N only; Every Spring)
Pathophysiology of neurology/psychiatry/ otolaryngology/ophthalmology disciplines, including infectious disease, along with pathologic/pharmacologic principles.

**INMD 6824. Foundations of Clinical Thinking 1A.** (1 cr.; P-N only; Every Fall)
A case-based course that links clinical scenarios and scientific foundations of the curriculum through small group, facilitator supported sessions. Students develop a patient-centered approach to analyzing clinical situations, one that is informed by the literature and considers multiple perspectives and issues across the biopsychosocial-cultural continuum. Students develop reflective practices and comfort with the ambiguity that exists in clinical practice. The course prepares students? ability to work together in teams and highlights the importance of teamwork throughout their medical career.

**INMD 7000. Interdisciplinary Research.** (2-12 cr. [max 24 cr.]; H-N only; Every Fall, Spring & Summer)
Clinical or basic science research.

**INMD 7002. Interdisciplinary Research-3.** (2-6 cr.; H-N only; Every Fall, Spring & Summer)
Clinical or basic science research, prereq: 3rd or 4th year medical student

**INMD 7050. Research in Health Care Management I.** (4 cr.; P-N or Audit; Periodic Fall)
Students select a topic of importance in health care management, formulate a problem, and carry out research, prereq: Registered in MD/ MBA dual degree program

**INMD 7051. Research in Health Care Management II.** (2-4 cr. [max 2 cr.]; P-N or Audit; Periodic Fall)
Students select a topic of importance in health care management, formulate a problem, and carry out research, prereq: Registered in MD/ MBA dual degree program

**INMD 7100. Development of Clinical Skills.** (0-6 cr. [max 12 cr.]; H-N only; Every Fall, Spring & Summer)
History, physical exam, assessment, and management skills related to patient care.

**INMD 7101. Becoming a Doctor I.** (1 cr.; P-N only; Every Fall)
Opportunity to provide standard curriculum across school now grounded in substantial clinical experience (e.g., integrated basic science curriculum). Opportunity for new or existing institutional assessments to happen in short time frame for all students (not interfering with clinical rotations). Opportunity for co-curricular activities (Service Learning, FA group reflections, eg) to become curricular and standard in timing, again, not interfering with clinical rotations. Transition into role of professional.

**INMD 7102. Becoming a Doctor II.** (1 cr.; P-N only; Every Spring)
Opportunity to provide standard curriculum across school now grounded in substantial clinical experience (e.g. integrated basic science curriculum). Opportunity for new or existing institutional assessments to happen in short time frame for all students (not interfering with clinical rotations). Opportunity for co-curricular activities (Service Learning, FA group reflections, eg) to become curricular and standard in timing, again, not interfering with clinical rotations. Transition into role of professional.

**INMD 7103. Becoming a Doctor III.** (1 cr.; P-N only; Every Fall)
Opportunity to provide standard curriculum across school now grounded in substantial clinical experience (eg integrated basic science curriculum). Opportunity for new or existing institutional assessments to happen in short time frame for all students (not interfering with clinical rotations). Opportunity for co-curricular activities (Service Learning, FA group reflections, etc.) to become curricular and standard in timing, again, not interfering with clinical rotations. Transition into role of professional.

**INMD 7104. Becoming a Doctor IV.** (1 cr.; P-N only; Every Spring)
Opportunity to provide standard curriculum across school now grounded in substantial clinical experience (e.g., integrated basic science curriculum). Opportunity for new or existing institutional assessments to happen in short time frame for all students (not interfering with clinical rotations). Opportunity for co-curricular activities (Service Learning, FA group reflections, etc.) to become curricular and standard in timing, again, not interfering with clinical rotations. Transition into role of professional.

**INMD 7110. REACH LIC Medicine.** (8 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based internal medicine clerkship with a psychiatrist in the outpatient setting and will follow patients to the inpatient setting.

**INMD 7111. REACH LIC Surgery.** (8 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based General Surgery Clerkship in which students will work directly with attending physicians while learning various responsibilities of surgical care and achieve competency in core surgical areas.

**INMD 7112. REACH LIC Psychiatry.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based psychiatry clerkship that will prepare medical students to recognize, diagnose and care for patients with psychiatric disorders encountered in most medical practices. Students will be working one-on-one with a psychiatrist in the outpatient setting and will follow patients to the inpatient setting.

**INMD 7113. REACH LIC Neurology.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based neurology clerkship that will increase clinical skills in diagnosing and treating neurologic illnesses. This will occur in the clinic and on the inpatient neurology consult service.

**INMD 7114. REACH LIC Ob/Gyn.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based ob/gyn clerkship in which students will work with attending physicians while learning various responsibilities of ob/gyn care.

**INMD 7116. REACH LIC Pediatrics.** (0 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based pediatric clerkship which provides basic pediatric skills and knowledge necessary for each student, no matter what field of medicine they select.

**INMD 7117. REACH LIC Emergency Medicine.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Regions-based rotation provides first-hand experience in dealing with emergency problems in a Level I trauma center. Students work with emergency medicine residents under supervision by board certified attending staff.

**INMD 7204. Rural Physicial Associate Program (RPAP): Surgery.** (8 cr.; H-N only; Every Fall, Spring & Summer)
Community-based required course with extensive primary care (surgery) experience in a rural setting. Students work with family physicians and local or visiting specialists. Problem-based learning, hands-on clinical experience, one-to-one teaching.

**INMD 7205. Rural Physicial Associate Program (RPAP): Obstetrics and Gynecology.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Community-based required course with extensive obstetrics/gynecology experience in a rural setting. Students work with family physicians and local or visiting specialists. Problem-based learning, hands-on clinical experience, one-to-one teaching.

**INMD 7206. Rural Physicial Associate Program (RPAP): Pediatrics.** (4 cr.; H-N only; Every Fall, Spring & Summer)
INMD 7208. RPAP: Emergency Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer) Community-based required course with extensive emergency medicine experience in a rural setting.

INMD 7213. MetroPAP: Surgery. (6 cr.; H-N only; Every Fall, Spring & Summer) Community-based required course with extensive surgery experience in a metropolitan setting.

INMD 7214. MetroPAP: OB/Gyn. (4 cr.; H-N only; Every Fall, Spring & Summer) Community-based required course with extensive obstetrics and gynecology experience in a metropolitan setting.

INMD 7217. MetroPAP: Emergency Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer) Community-based required course with extensive emergency medicine experience in a metropolitan setting.

INMD 7218. MetroPAP: Psychiatry Externship. (4 cr.; H-N only; Every Fall, Spring & Summer) To prepare the medical student to recognize, diagnose, and care for patients with psychiatric disorders encountered in most medical practices. This experience is set up in two parts: a 2-week experience of inpatient psychiatric care at a site near the Duluth or Twin Cities campus prior to the MetroPAP orientation, and a 2-week experience in ambulatory behavioral health completed during the 9-month LIC experience in a rural setting.

INMD 7219. Metropolitan Physician Associate Program: Pediatrics. (4 cr.; H-N only; Every Fall, Spring & Summer) This experience is set up in two parts: a 2-week experience of inpatient pediatric care at a traditional Twin Cities or Duluth clinical site prior to the orientation, and a 2-week experience in ambulatory behavioral health completed during the 9-month LIC experience in an urban setting.

INMD 7220. MetroPAP Primary Care Introduction Clerkship. (5 cr.; P-N only; Every Fall, Spring & Summer) This portion of the overall LIC curriculum occurs during the first three months of MetroPAP and is integrated with the other core disciplines encompassed within the LIC.

INMD 7221. MetroPAP Primary Care Intermediate Clerkship. (5 cr.; P-N only; Every Fall, Spring & Summer) This portion of the overall LIC curriculum occurs during the second three months of MetroPAP and is integrated with the other core disciplines encompassed within the LIC.

INMD 7222. MetroPAP Primary Care Advanced Clerkship. (8 cr.; H-N only; Every Fall, Spring & Summer) This portion of the overall LIC curriculum occurs during the final three months of MetroPAP and is integrated with the other core disciplines encompassed within the LIC.

INMD 7223. RPAP Primary Care Introduction Clerkship. (5 cr.; P-N only; Every Fall, Spring & Summer) This portion of the overall LIC curriculum occurs during the first three months of RPAP and is integrated with the other core disciplines encompassed within the LIC.

INMD 7224. RPAP Primary Care Intermediate Clerkship. (5 cr.; P-N only; Every Fall, Spring & Summer) This portion of the overall LIC curriculum occurs during the second three months of RPAP and is integrated with the other core disciplines encompassed within the LIC.

INMD 7225. RPAP Primary Care Advanced Clerkship. (8 cr.; H-N only; Every Fall, Spring & Summer) This portion of the overall LIC curriculum occurs during the final three months of RPAP and is integrated with the other core disciplines encompassed within the LIC.

INMD 7226. Rural Physicians Associate Program: Psychiatry. (4 cr.; H-N only; Every Fall, Spring & Summer) To prepare the medical student to recognize, diagnose, and care for patients with psychiatric disorders encountered in most medical practices. This experience is set up in two parts: a 2-week experience of inpatient psychiatric care at a site near the Duluth or Twin Cities campus prior to the RPAP orientation, and a 2-week experience in ambulatory behavioral health completed during the 9-month LIC experience in a rural setting.

INMD 7301. Medical Anthropology I: The Normal and the Pathological. (1 cr; P-N or Audit) Beliefs/practices concerning human affliction, health, and healing in cross cultural perspective. Body as biologically given and culturally/historically located. Meanings that individuals and social groups attach to health, sickness, suffering, and healing. The normal and the pathological in comparative perspective.

INMD 7302. Medical Anthropology II: International Health, Colonialism, and Emerging Diseases. (2 cr.; P-N or Audit) Beliefs/practices concerning human affliction, health, and healing in cross cultural perspective. Body as biologically given and culturally/historically located. Meanings that individuals and social groups attach to health, sickness, suffering, and healing.

INMD 7303. Medical Anthropology III: Comprehending Human Affliction and Healing Cross Cultural Anthropology III. (4 cr.; P-N or Audit) Beliefs/practices concerning human affliction, health, and healing in cross cultural perspective. Body as biologically given and culturally/historically located. Meanings that individuals and social groups attach to health, sickness, suffering, and healing. Ways in which diverse social groups cope with human affliction and seek to achieve health.

INMD 7310. VAMC LIC - Medicine I (VALUE). (8 cr.; H-N only; Every Fall, Spring & Summer) VA based Internal Medicine clerkship with experiences in both inpatient and outpatient Internal Medicine. The course will emphasize diagnostic approaches to patient problems and acquisition of knowledge and skills while working with internal medicine hospitalists in the inpatient setting and attending physicians in the primary care clinics.

INMD 7311. VAMC LIC - Surgery (VALUE). (8 cr.; H-N only; Every Fall, Spring & Summer) VA based General Surgery Clerkship in which students will work directly with attending physicians while learning various responsibilities of surgical care and achieve competency in core surgical areas.

INMD 7312. VAMC LIC - Psychiatry (VALUE). (4 cr.; H-N only; Every Fall, Spring & Summer) VA based Psychiatry clerkship that will prepare medical students to recognize, diagnose and care for patients with psychiatric disorders encountered in most medical practices. Students will be working one-on-one with a psychiatrist in the outpatient setting and will follow patients to the inpatient setting.

INMD 7313. VAMC LIC - Neurology (VALUE). (4 cr.; H-N only; Every Fall, Spring & Summer) VA based Neurology clerkship that will increase clinical skills in diagnosing and treating neuropsychologic illnesses. This will occur in the clinic and on the inpatient neurology consult service.

INMD 7314. VAMC LIC - Primary Care Selective - Internal Medicine (VALUE). (4 cr.; H-N only; Every Fall, Spring & Summer) Internal Medicine ambulatory setting based in VA Patient Aligned Care Teams (PACTs) with students taking primary responsibility for care of a panel of patients. Students will learn chronic disease management, population-based management of medical problems as well as routine preventative medicine.

INMD 7317. VAMC LIC - QI/Interprofessional Patient Care (VALUE). (4-5 cr.; H-N only; Every Fall, Spring & Summer) VALUE elective that will train medical students in patient-centered and inter-professional care that will lead to improved patient care and satisfaction. The experience will prepare students to meet the contemporary requirements of residency programs and future practice in a rapidly changing health care environment.

INMD 7319. VAMC LIC Radiology. (2 cr.; H-N only; Every Fall, Spring & Summer) This clerkship presents an overview of the various imaging modalities and image interpretation. Lectures cover fundamentals of image interpretation, nuclear medicine, computerized tomography, ultrason, and magnetic resonance imaging. This is an opportunity to observe the procedures and read films with staff and residents. Emphasis is on normal anatomy and basic pathologic patterns. There are also multiple opportunities to follow longitudinal patients through the radiology department. The clerkship will also focus on how radiology interfaces with other disciplines but attendance at multidisciplinary conferences; Morbidity and Mortality, Gastroenterology Multi-disciplinary Conference, Pulmonary
INMD 7350. HCMC LIC Internal Medicine. (8 cr.; H-N only; Every Fall, Spring & Summer) HCMC based Internal Medicine clerkship with experiences in both inpatient and outpatient Internal Medicine. The course will emphasize diagnostic approaches to patient problems and acquisition of knowledge and skills while working with internal medicine hospitalists in the inpatient setting and attending physicians in the primary care clinics.

INMD 7351. HCMC LIC Surgery. (8 cr.; H-N only; Every Fall, Spring & Summer) HCMC based General Surgery Clerkship in which students will work directly with attending physicians while learning various responsibilities of surgical care and achieve competency in core surgical areas.

INMD 7352. HCMC LIC Psychiatry. (4 cr.; H-N only; Every Fall, Spring & Summer) HCMC based Psychiatry clerkship that will prepare medical students to recognize, diagnose and care for patients with psychiatric disorders encountered in most medical practices. Students will be working one-on-one with a psychiatrist in the outpatient setting and will follow patients to the inpatient setting.

INMD 7354. HCMC LIC Primary Care Selective - Internal Medicine. (4 cr.; P-N only; Every Fall, Spring & Summer) Internal Medicine ambulatory setting based HCMC with students taking primary responsibility for care of a panel of patients. Students will learn chronic disease management, population-based management of medical problems as well as routine preventative medicine.

INMD 7355. HCMC LIC Obstetrics & Gynecology. (4 cr.; H-N only; Every Fall, Spring & Summer) HCMC based Ob/Gyn clerkship in which students will work with attending physicians while learning various responsibilities of Ob/Gyn care.

INMD 7356. HCMC LIC Pediatrics. (4 cr.; H-N only; Every Fall, Spring & Summer) HCMC based Pediatric Clerkship which provides basic pediatric skills and knowledge necessary for each student, no matter what field of medicine they select.

INMD 7357. HCMC LIC Health Disparities/Social Determinants. (4 cr.; P-N only; Every Fall, Spring & Summer) Students will have didactic sessions which emphasize the underpinnings of health disparities, social determinants of health, and utilizing public policy to address those issues. In addition, students will participate in a multidisciplinary project addressing one specific issue/goal and present their work and results in some form (poster, publication, etc).

INMD 7358. HCMC LIC Emergency Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer) HCMC based rotation provides first-hand experience in dealing with emergency problems in a Level I trauma center. Students work with emergency medicine residents under supervision by board certified attending staff. Students act as primary physician, including initial assessment, minor procedures, interpretation of lab results, and preparation for admission to inpatient services. Opportunities to observe critical resuscitation.

INMD 7401. Hospitalist Rotation. (1-8 cr. [max 12 cr.]; P-N only; Every Fall, Spring & Summer) One on one clinical educational experience with an internal medicine or medicine/pediatric hospitalist.

INMD 7410. Education in Pediatrics Across the Continuum LIC - Medicine I. (8 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal Internal Medicine clerkship based at the University of Minnesota Medical Center as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in Internal Medicine while working with a continuity preceptor in outpatient Internal Medicine; tracking patients to inpatient, subspecialty, or interdisciplinary arenas; and through inpatient burst experiences with the hospitalist team at the University of Minnesota Medical Center.

INMD 7411. Education in Pediatrics Across the Continuum LIC ? Surgery. (8 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal surgery clerkship based at the University of Minnesota Masonic Children’s Hospital and University of Minnesota Medical Center as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in pediatric surgery while working with a continuity preceptor in outpatient surgery and tracking patients to inpatient, subspecialty, or interdisciplinary arenas.

INMD 7412. Education in Pediatrics Across the Continuum LIC: Psychiatry. (4 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal psychiatry clerkship based at the University of Minnesota Masonic Children’s Hospital and University of Minnesota Medical Center as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in psychiatry while working with a continuity preceptor in outpatient psychiatry; and tracking patients to inpatient, subspecialty, or interdisciplinary arenas.

INMD 7413. Education in Pediatrics Across the Continuum LIC ? Neurology. (4 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal neurology clerkship based at the University of Minnesota Medical Center as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in neurology while working with a continuity preceptor in outpatient neurology and tracking patients to inpatient, subspecialty, or interdisciplinary arenas.

INMD 7414. Education in Pediatrics Across the Continuum LIC ? Primary Care Selective. (4 cr.; P-N only; Every Fall, Spring & Summer) Through continuity clinics as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC) at the University of Minnesota Medical Center, as well as online curriculum and weekly EPAC team meetings, the learner will get clinical exposure to primary care and acquire knowledge, skills and attitudes in the process of care and how to improve it.

INMD 7415. Education in Pediatrics Across the Continuum LIC ? Family Medicine. (4 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal Family Medicine clerkship based at Smiley’s Family Medicine Clinic/University of Minnesota Medical Center as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in Family Medicine while working with a continuity preceptor in Family Medicine, tracking them for both inpatient and outpatient experience, and by tracking patients to inpatient, subspecialty, or interdisciplinary arenas.

INMD 7416. Education in Pediatrics Across the Continuum LIC: Obstetrics/Gynecology. (4 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal Obstetrics and Gynecology clerkship based at the University of Minnesota Medical Center as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in Obstetrics and Gynecology while working with a continuity preceptor in Obstetrics and Gynecology in both the inpatient and outpatient setting and tracking continuity patients across their experiences at the University of Minnesota Medical Center.

INMD 7417. Education in Pediatrics Across the Continuum LIC: Pediatrics. (4 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal pediatrics clerkship based at the University of Minnesota Masonic Children’s Hospital and Fairview Children’s Clinic as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in pediatrics while working with a continuity preceptor in outpatient pediatrics; and tracking patients to inpatient, subspecialty, or interdisciplinary arenas.

INMD 7418. Education in Pediatrics Across the Continuum LIC ? Emergency Medicine. (4 cr.; P-N only; Every Fall, Spring & Summer) A longitudinal Emergency Medicine clerkship based at the University of Minnesota Masonic Children’s Hospital as a part of the Education in Pediatrics Across the Continuum Longitudinal Integrated Clerkship (EPAC LIC). The course emphasizes the acquisition of knowledge, skills and attitudes in Emergency Medicine while working with a continuity preceptor in Emergency Medicine; tracking
patients to inpatient, surgical or outpatient arenas as able; and through simulation experiences.

INMD 7421. Education in Pediatrics Across the Continuum LIC - Enrichment Elective. (2-8 cr. [max 24 cr.]; P-N only; Every Fall, Spring & Summer)
The EPAC enrichment elective is a focused experience with the goal of furthering a student’s developmental progress towards entrustment without direct supervision in one or more areas of professional development. In general the assessment framework are the Core Entrustable Professional Activities for Entering Residency (CEPAER). The student will work with the Course Director and EPAC leadership team to identify and assign an experience that is likely to facilitate the developmental goals. This could include direct patient care or not. The student and course director must sign an agreement prior to the start of the experience as to the final elective expectations.

INMD 7422. Education in Pediatrics Across the Continuum - Independent Study. (2-8 cr. [max 24 cr.]; P-N only; Every Fall, Spring & Summer)
The EPAC independent study elective is a semester long experience meant to complement patient care in pediatric medicine by developing a student’s non-direct patient care knowledge, skills and attitudes. The student will work with the course director to plan an independent study project; examples include a quality improvement project, drafting/submitting for presentation a case report, etc. They will identify a supervising preceptor. The student, course director and the supervising preceptor will sign an agreement prior to the start of the experience as to the final elective expectations. This elective may be repeated up to a total of three times, to move on to the next phase in a project in progress or to do a new project.

INMD 7423. Education in Pediatrics Across the Continuum - Medical Education Independent Study. (12 cr.; P-N only; Every Fall, Spring & Summer)
As a part of participation in the EPAC undergraduate medical education curricular experience, EPAC students will, in the EPAC Medical Education Independent Study: ? Actively participate in educational quality improvement of the local EPAC program? Contribute to the national data used to evaluate the national EPAC project and test feasibility? Actively participate in formal, documented self-assessment and feedback beyond that explicitly required for traditionally tracked medical students at the University of Minnesota Medical School To this end, EPAC students will, at a minimum, attend weekly meetings during the EPAC LIC curriculum, complete all required local and national assessments, and keep their diagnosis and procedure tracker up to date.

INMD 7450. Hospice & Palliative Care. (4 cr.; H-N only; Every Fall, Spring & Summer) Interdisciplinary course. Hospice, palliative medicine.

INMD 7500. ICU Translational Science. (4 cr.; H-N only; Every Fall, Spring & Summer) Year 4 students who want to experience how basic science concepts can be translated to quality care of patients requiring intensive care.

INMD 7508. Clerkship: Primary Care Medicine. (4 cr.; H-N or Audit; Every Fall, Spring & Summer) Participation in patient care in outpatient primary care settings located at internal medicine, family practice, pediatric, and geriatric clinics. prereq: 6104

INMD 7509. Clerkship II: Primary Care Medicine. (4 cr.; H-N or Audit; Every Fall, Spring & Summer) N/A prereq: 6508

INMD 7510. Health Systems Science. (4 cr.; P-N only; Every Fall) Health Systems Science (HSS) is a new and evolving term in medical education. It is considered the new 3rd science (where the other two are Basic Science and Clinical Science). All three are considered at least equally important for successful future clinical practice. It encompasses a wide range of topics including: patient safety, quality improvement, evidence-based medicine, value in health care, inter-professional teamwork, stewardship of health care resources, population management, clinical informatics, care coordination, leadership, and health care financing and reform.

INMD 7520. Interdisciplinary Health Science Elective in a Community Setting. (4 cr.; P-N or Audit; Periodic Fall) Students work with instructor and coordinator at one of three community sites. prereq: Health science student

INMD 7522. Migrant Health Elective. (4 cr.; H-N only; Every Summer) This rotation is an interprofessional, community-engaged medical rotation that focuses on the social determinants of health of the most marginalized population in the state, rural Latino hired agricultural workers. The clinical experience will be caring for patients on mobile medical units that travel to farms in rural, southern Minnesota. Learners will follow a curriculum that includes readings, documentaries, films, medical literature, discussions/workshops, tours of workplaces, and lectures by leading experts around the nation in the health of agricultural workers. We also have meetings with the local Mexican Consulate, community health centers, legal experts, occupational health physicians, and labor organizers. This rotation includes the opportunity to work with residents in internal medicine, pediatrics, emergency medicine, and pharmacy and professionals from other disciplines including pharmacy, dentistry, and vet medicine. We also work directly with Centro Campesino, an organization that pairs AHC students with promising Latino youth from rural farmworker families.

INMD 7523. Occupational and Environmental Medicine Elective. (4 cr.; H-N only; Every Fall, Spring & Summer) By the end of this rotation, students will be able to: 1) identify unique problems associated with occupationally and environmentally-related illness and injury; 2) obtain and organize a thorough occupational or environmental history; 3) formulate appropriate work/activity restrictions based on a specific illness or injury; 4) describe the role of preventive medicine, both patient-focused & programmatic, in individual wellness and overall population health.

INMD 7540. Ambulatory Clinic for the Physician-Scientist. (1-6 cr. [max 12 cr.]; H-N or Audit; Every Fall, Spring & Summer) Students develop/refine ambulatory patient evaluation and management skills. prereq: Med student

INMD 7542. Clinical Continuity Experience for Physician Scientists I. (3 cr. [max 6 cr.]; H-N only; Every Fall) Students paired with active physician scientist who serves as MSTP Clinical Mentor. One-on-one meetings between student/MSTP clinical mentor averaging one-half day per month. Mentors provide ongoing clinical opportunities/ teach clinical care skills.

INMD 7545. Clinical Continuity Experience for Physician Scientists II. (3 cr. [max 6 cr.]; H-N only; Every Fall) Students paired with active physician scientist who will serve as MSTP Clinical Mentor. One-on-one meetings between student/MSTP clinical mentor averaging one day per week for 9 weeks. Hands-on clinical experience.

INMD 7548. Clinical Foundations for the Physician Scientist. (4 cr. [max 8 cr.]; H-N only; Every Fall, Spring & Summer) Students paired with active physician scientist who serves as MSTP Clinical Mentor. One-on-one meetings between student/MSTP clinical mentor in clinic averaging one day per week for 9 weeks. Hands-on clinical experience.

INMD 7549. MSTP Directed Study. (3-6 cr.; P-N only; Every Fall, Spring & Summer) This course is for MD/PhD students to pursue independent research under the directed supervision of a research faculty mentor. The student must have a research mentor prearranged and approved by the MD/PhD program prior to taking the course.

INMD 7552. Traditional Indian Medicine Clerkship. (2-6 cr. [max 2 cr.]; H-N or Audit; Every Fall, Spring & Summer) Clinical experience in major hospital/center in approved (through Medical School Curriculum Affairs) Indian Health Service area. prereq: Med student, dept consent

INMD 7553. Elective Away at Centers for Disease Control (CDC). (2-8 cr.; H-N or Audit; Every Fall, Spring & Summer) Full-time experience in section of CDC. prereq: Med student, dept consent

INMD 7555. Elective Away for Credit. (2-8 cr. [max 32 cr.]; H-N only; Every Fall, Spring & Summer)
A rotation that students take at another institution to fulfill elective credits.

INMD 7565. Global Health Abroad. (; 4-8 cr. [max 24 cr.]; P-N only; Every Fall, Spring & Summer)
Student-arranged, structured, approved (through Medical School Global Health Abroad Office) clinical experience in foreign medical institution.

INMD 7568. Clinical Experience in International Medicine II. (; 2-6 cr.; H-N or Audit; Every Fall, Spring & Summer)
Student-arranged, structured, approved (through Medical School Curriculum Affairs) clinical experience in foreign medical institution; prereq: Med student, dept consent

INMD 7579. Rural Hawaii Public Health Elective. (; 2-6 cr.; H-N only; Every Fall, Spring & Summer)
Six week rotation. Public health issues, multicultural focus. Students participate in North Hawaii Outcomes Project. Design of outcome measures, data collection, data analysis, program development/implementation. Stroke prevention, chemical use, motor vehicle accidents, teenage pregnancy.

INMD 7580. Integrative Healing in Hawaii. (; 2 cr.; H-N only; Every Spring)
This course is a two-week elective rotation designed to provide medical students with the opportunity to gain knowledge and exposure to Integrated Healing modalities.

INMD 7650. Flex 5 Individualized Sub-Internship. (4-8 cr. [max 24 cr.]; H-N only; Every Fall & Summer)
Students accepted into the Flex 5 program may need additional sub-internship experiences for their portfolio. In the case where there is not another specialty-specific course in the medical school catalog for which the Flex 5 student can enroll, the Interdisciplinary Flex 5 Individualized Sub-internship will provide an option for an additional experience in the student’s area of interest. Experiences under this course will build upon the knowledge and skills learned during their core clerkships and previous advanced experiences, and further improve their clinical skills in their specialty of choice.

INMD 7700. Primary Care Clinic: Minnesota Community Engagement Program (MNCEP). (; 4 cr.; P-N only; Every Fall, Spring & Summer)
One month clerkship in rural or urban underserved community (initially will pilot in rural settings) Clinical experience with community physician. Participation in projects to address community health outcomes.

INMD 7900. Flexible MD Independent Study. (; 3-6 cr. [max 18 cr.]; P-N only; Every Fall, Spring & Summer)
Independent exploration of path toward graduate of medicine, serving needs of patients/communities; prereq: Registered medical student accepted into FlexMD Program

INMD 7901. Flexible MD Independent Study. (; 3-6 cr.; P-N only; Every Fall, Spring & Summer)
Exploration of path toward doctorate of medicine, serving needs of patients/communities; prereq: Registered medical student accepted into FlexMD Program

INMD 7902. Flexible MD Independent Study. (; 3-6 cr.; P-N only; Every Fall, Spring & Summer)
Exploration of path toward doctorate of medicine, serving needs of patients/communities; prereq: Registered medical student accepted into FlexMD Program

INMD 7910. ICU Sub-Internship - MICU. (4 cr.; H-N only; Every Fall, Spring & Summer)
Goal is to prepare medical students for internship and residency, through a clinically-focused experience focusing on higher acuity patients (ICU, IMC), clinical care, and emphasizing tasks necessary for internship. Students will use knowledge of pathophysiology and clinical epidemiology in order to develop a reasoned differential diagnosis. Finally, students will plan a logical and practical diagnostic evaluation, using the principles of evidence-based medicine.

INMD 7911. ICU Sub-Internship - SICU. (4 cr.; H-N only; Every Fall, Spring & Summer)
Goal is to prepare medical students for internship and residency, through a clinically-focused experience focusing on higher acuity patients (ICU, IMC), clinical care, and emphasizing tasks necessary for internship. Students will use knowledge of pathophysiology and clinical epidemiology in order to develop a reasoned differential diagnosis. Finally, students will plan a logical and practical diagnostic evaluation, using the principles of evidence-based medicine.

INMD 7912. ICU Sub-Internship - PICU. (4 cr.; H-N only; Every Fall, Spring & Summer)
Goal is to prepare medical students for internship and residency, through a clinically-focused experience focusing on higher acuity patients (ICU, IMC), clinical care, and emphasizing tasks necessary for internship. Students will use knowledge of pathophysiology and clinical epidemiology in order to develop a reasoned differential diagnosis. Finally, students will plan a logical and practical diagnostic evaluation, using the principles of evidence-based medicine.

INMD 7913. ICU Sub-Internship - NICU. (4 cr.; max 8 cr.; H-N only; Every Fall, Spring & Summer)
Goal is to prepare medical students for internship and residency, through a clinically-focused experience focusing on higher acuity patients (ICU, IMC), clinical care, and emphasizing tasks necessary for internship. Students will use knowledge of pathophysiology and clinical epidemiology in order to develop a reasoned differential diagnosis. Finally, students will plan a logical and practical diagnostic evaluation, using the principles of evidence-based medicine.

INMD 7914. ICU Sub-Internship 7 Gen Med Wards. (4 cr.; H-N only; Every Fall, Spring & Summer)
Goal is to prepare medical students for internship and residency, through a clinically-focused experience focusing on higher acuity patients (ICU, IMC), clinical care, and emphasizing tasks necessary for internship. Students will use knowledge of pathophysiology and clinical epidemiology in order to develop a reasoned differential diagnosis. Finally, students will plan a logical and practical diagnostic evaluation, using the principles of evidence-based medicine.

\[\text{Preferred Information:}
\text{Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.}\]

**IDES 2622. Computer Applications I.** (2 cr.; A-F or Audit; Every Fall)
Computer-aided design, its role in interior design. Use of software applications for construction drawings, two/three-dimensional representation. Modeling for interior design problem-solving/presentation. prereq: Interior design major

**IDES 3161. History of Interiors and Furnishings: Ancient to 1750.** (GP; 4 cr.; A-F or Audit; Every Fall)
Study of European and American interiors and furnishings, including furniture, textiles, and decorative objects.

**IDES 3162. History of Interiors and Furnishings: 1750 to Present.** (HIS; 4 cr.; A-F or Audit; Every Spring)
European/American interiors/furnishings, including furniture, textiles, and decorative objects.

**IDES 3196. Field Study: National or International.** (1-4 cr. [max 10 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Faculty-directed field study in national or international setting. prereq: instr consent

**IDES 3605. Interior Design Studio V.** (4 cr.; A-F only; Every Spring)
Advanced interior design problems dealing with small to medium scale spaces. Emphasizes special-needs populations.

**IDES 3606. Interior Design Studio VI.** (4 cr.; A-F only; Every Fall)
Interior design problems dealing with medium-scale spaces. Focuses on medium office design. prereq: [2604 or DHA 2604], 2612

**IDES 3612. Lighting Design.** (3 cr.; A-F only; Every Fall)

**IDES 3614. Interior Design Ethics and Professional Practice.** (CIV; 4 cr.; A-F only; Every Fall)
Business of interior design, professional ethics, and responsible design. Ethical theory/conduct. Responsibility to business, clients, colleagues, and community at large and globally. prereq: 2604 or DHA 2604; or Interior Environments Minor

**IDES 3622. Computer Applications II.** (2 cr.; A-F only; Every Fall)
Advanced concepts/terms in computer modeling. Computer graphics, three-dimensional modeling, rendering, animation to provide representation strategies for interior design problem-solving/presentation.

Applications such as Autodesk Revit, AutoCAD, Autodesk 3ds Max Design. prereq: 2622

**IDES 4160H. Honors Capstone Project.** (2 cr. [max 4 cr.]; A-F only; Every Fall & Spring)
Individualizes honors experience by connecting aspects of major program with special academic interests. prereq: Interior design honors

**IDES 4193. Directed Study in Interior Design.** (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Independent study in interior design under tutorial guidance. prereq: Undergrad, instr consent

**IDES 4196. Internship in Interior Design.** (1 cr.; S-N or Audit; Every Fall, Spring & Summer)
Supervised work experience relating activity in business, industry, or government to student’s area of study. Integrative paper or project may be required. prereq: 3606, instr consent

**IDES 4607. Interior Design Studio VII.** (4 cr.; A-F only; Every Fall)
Advanced interior design problems dealing with large scale spaces. Historic precedent, adaptive use, renovation. prereq: [3605, 3606] or [DHA 3605, DHA 3606] with grade of at least C-

**IDES 4608. Interior Design Thesis.** (4 cr.; A-F only; Every Spring)
Comprehensive independent interior design project developed from student-conducted research/program developed in 4615W. prereq: [4615W or DHA 4615W], [4607 or DHA 4607] with grade of at least C-

**IDES 4615W. Interior Design Research.** (WI; 3 cr.; A-F only; Every Fall)
Research methods for programming interior design solutions. Developing comprehensive program. Issues that affect interior design research/practices. prereq: 3605 or DHA 3605

**IDES 4616. Sustainable Commercial Interior Design.** (1 cr.; A-F or Audit; Every Spring)
Intent, requirements, submittals, technologies/strategies to achieve LEED CI standards in existing, new construction, or tenant improvement projects.

**IDES 5193. Directed Study in Interior Design.** (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Independent study in interior design under tutorial guidance. prereq: Jr or sr or grad student

**IDES 8170. Topics in Interior Design.** (1-3 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
In-depth investigation of topic, announced in advance.

**IDES 8180. Professional Seminar.** (1-2 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring)
Professional development issues/trends.

**IDES 8192. Readings in Interior Design.** (1-3 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Independent study, review of books/periodicals under tutorial guidance. prereq: instr consent

**IDES 8193. Directed Study.** (1-3 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Directed study in interior design. prereq: instr consent

**IDES 8222. Plan B Master’s Project.** (3 cr.; S-N or Audit; Every Fall & Spring)
Plan B master’s project. prereq: [DHA or design] master’s student, instn consent

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**International Business (IBUS)**

**IBUS 1400. International Programs Elective.** (1-4 cr. [max 8 cr.]; S-N only; Every Fall, Spring & Summer)
Education abroad program elective.

**IBUS 2950. Tracing the Global Supply Chain.** (4 cr.; A-F only; Every Fall)
Concepts, principles, techniques for managing global supply chains. Emphasizes decision-making in global supply chain strategy through hands-on experiential learning. prereq: Approved application

**IBUS 3002. Managerial Accounting in Argentina and Chile.** (4 cr.; A-F only; Every Fall)
Managerial accounting study abroad.

**IBUS 3004. International Internship: Personal and Professional Development in the Global Workplace.** (1 cr.; S-N only; Every Summer)
This course offers the opportunity for students to observe and explore the business culture of your host country through their full-time internship placement. Students will develop intercultural communication and leadership skills through observation and structured reflection. Students in this course are participating on a Carlson education abroad program where they intern with a company, organization, or government agency related to their academic discipline of interest (e.g., marketing, finance, human resources, supply chain, MIS, etc.). Students intern at their placement about 40 hours per week for 8 weeks, prereq: Acceptance in Business Internship Program through the Carlson Global Institute

**IBUS 3010. Introduction to Global Entrepreneurship.** (4 cr. [max 12 cr.]; A-F only; Every Spring)
Terms, concepts, skills for analyzing fundamental business practices in global economy.

**IBUS 3021. Human Resources Management in Australia.** (4 cr.; A-F only; Every Spring)

**IBUS 3033W. Business Communication in Spain.** (WI; 4 cr.; A-F only; Every Spring)
Education abroad course. Similar to MGMT 3033W with additional international experience end of semester.

**IBUS 3080. Sustainability and Corporate Social Responsibility in Costa Rica.** (4 cr.; A-F only; Every Spring)
Partnership with Caribou Coffee. Coffee value chain of Caribou Coffee, from coffee bean origins through coffee served at Caribou Coffee and stakeholders throughout. Students write report delivered to Caribou's top management team and employees.

**IBUS 3101. Undergraduate Semester: CIMBA (Consortium of Universities for International Studies).** (0-18 cr. [max 54 cr.; Student Option; Every Fall & Spring)
Semester of study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. For current offerings, contact Carlson Global Institute. prereq: 60 cr

**IBUS 3400. International Programs Elective.** (1-4 cr. [max 8 cr.; S-N only; Every Fall, Spring & Summer)
Elective course for education abroad.

**IBUS 3401. International Programs Elective.** (1-4 cr. [max 8 cr.; S-N only; Every Fall, Spring & Summer)
Elective course for education abroad.

**IBUS 3402. International Programs Elective.** (1-4 cr. [max 8 cr.; S-N only; Every Fall, Spring & Summer)
Elective course for education abroad.

**IBUS 3500. International Business: Undergraduate Exchange - BLOCK.** (0-18 cr. [max 90 cr.; S-N or Audit; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3501. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3502. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3503. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3504. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3505. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3506. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3507. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3508. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3509. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3510. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; Student Option; Every Fall & Spring)
Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: 60 cr

**IBUS 3600. International Business: Undergraduate Exchange.** (0-18 cr. [max 90 cr.; S-N only; Every Summer)
Summer study abroad exchange to one of Carlson Global Institute's partner universities. prereq: 60 cr

**IBUS 3601. Undergraduate Summer Exchange.** (0-4 cr.; S-N only; Every Summer)
Summer study abroad exchange to one of Carlson Global Institute's partner universities. prereq: 60 cr

**IBUS 3602. Undergraduate Summer Exchange.** (0-4 cr.; S-N only; Every Summer)
Summer study abroad exchange to one of Carlson Global Institute's partner universities. prereq: 60 cr

**IBUS 3603. Undergraduate Summer Exchange.** (0-4 cr.; S-N only; Every Summer)
Summer study abroad exchange to one of Carlson Global Institute's partner universities. prereq: 60 cr

**IBUS 3700. London School of Economics Summer Program.** (0-18 cr.; S-N only; Every Summer)
Summer study abroad at London School of Economics. Students select one or two sessions based on their academic needs/interests.

**IBUS 3701. Vienna Summer Program in International Business (Undergraduate).** (0-18 cr.; S-N only; Every Summer)
Summer study abroad at one of Carlson School's international exchange partner universities. Students select intensive/enrichment courses based on academic needs/interests.

**IBUS 3702. Copenhagen Summer Program in International Business (Undergraduate).** (0-18 cr.; S-N or Audit; Every Fall, Spring & Summer)
Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. For current offerings, contact Carlson International Programs. prereq: 60 cr

**IBUS 3703. Norway Summer Program in International Business (Undergraduate).** (0-18 cr.; S-N only; Every Summer)
Summer study abroad at one of Carlson School's international exchange partner universities. BI Norwegian School of Management. Three-week program. Focuses on Scandinavian management/Norwegian life/society.

**IBUS 3704. Shanghai Summer Program in International Business (Undergrad).** (0-18 cr.; S-N only; Every Summer)
Summer study abroad at one of Carlson School's international exchange partner universities. Antai College of Economics and Management. This is a three-week summer program integrating intense business education in China context with corporate experience.

**IBUS 3800. CIMBA Summer Program.** (0-18 cr.; Student Option; Every Summer)
CIMBA Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. For current offerings, contact Carlson International Programs. prereq: 60 cr

**IBUS 3999. International Experience Directed Study.** (1-3 cr.; S-N only; Every Fall, Spring & Summer)
Directed Study for international experience requirement. prereq: dept consent

**IBUS 4010. Management of Technology in the Middle East.** (3 cr.; A-F only; Every Spring)
Undergraduate study abroad in Israel. prereq: Undergrad

**IBUS 4050. Management of Innovation and Change.** (4 cr.; A-F only; Every Fall)
Applying theories/research on how new organizational programs, products, technologies are developed/implemented. Diagnostic skills. How innovation unfolds. prereq: Mgmt 1001 or 3001 or 3010, approved application

**IBUS 4082W. Brand Management.** (WI; 4 cr.; A-F only; Every Fall & Spring)

**IBUS 4325. IBUS 4325 - Behavioral Finance.** (2 cr.; A-F only; Every Fall)
Summer study abroad program at Europe's largest business school (WU-Vienna). Students take three business classes, plus German language. Program participants from Europe, Asia, Latin America, United States. prereq: Carlson grad student

IBUS 5150: IBUS 5150: Building on Frugal Innovations to Complete in a Global Environment. (4 cr. [max 8 cr.]; A-F only; Every Fall)

On this program, students will be exposed to concepts related to developing a global managerial mindset, with a particular focus on understanding global product/market innovation. A variety of successful examples highlights the potential of frugal innovation - the term used to describe of cost-effective innovations devised to solve local problems in resource constrained markets - as being a very powerful source of ideas for new products and services. Products of frugal innovation, once proven locally, can be subsequently integrated into the broader R&D and product innovation processes within firms and become the base platforms for global products targeted at markets across the world. Students will choose an industry or domain of focus in class sessions and be exposed to global R&D practices in large local firms and then interact with startups and innovators working on frugal innovation projects on the ground in India. This is an education abroad program. Contact the Carlson Global Institute at cgi@umn.edu with questions. Prereq: approved application

IBUS 5160. Cologne Summer Program: European Management (Grad). (8 cr. [max 24 cr.]; S-N only; Every Summer)

Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prereq: Carlson grad student

IBUS 5170. Global Business Practicum in Northern China. (4 cr. ; A-F only; Every Spring)

Collaboration with corporate partner/business school in China. Students work in multicultural teams to analyze real-life business problems that corporations face in China. Examine cultural, social, economic differences surrounding global business. prereq: Grad student

IBUS 5171. Global Business Practicum in Southern China. (4 cr. ; A-F only; Every Spring)

Collaboration with corporate partner/business school in China. Work in multicultural teams to analyze real-life business problems that corporations face in China. prereq: Grad student

IBUS 5172. IBUS 5172: Global Business Practicum Brazil. (4 cr. [max 8 cr.]; A-F only; Every Summer)

Study abroad course. Short-term global enrichment program traveling to Brazil in May.

IBUS 5175. India Seminar: Doing Business in India. (4 cr. ; A-F only; Every Summer)

Live consulting project for international Dairy Queen in India market. prereq: Grad student
IBUS 5209. International Business: Undergraduate Exchange. (1-6 cr. [max 60 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: 60 cr

IBUS 5260. Sustainability: The New Management Paradigm. (4 cr.; A-F only; Every Spring) View of integrated reporting (sustainability reporting) as it relates to various fields of business. Site visits, meetings with business executives/governmental agencies. Two weeks in the United Kingdom following commencement week, preceded by Spring B Term classes.

IBUS 5300. International Business: Graduate Exchange BLOCK. (0-18 cr. [max 54 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. For current offerings, contact Carlson International Programs. prerequisite: Carlson graduate student

IBUS 5301. Graduate Exchange in International Business - BLOCK. (0-18 cr. [max 54 cr.]; S-N only; Every Summer) Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5302. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5303. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5304. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5305. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5306. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5307. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5308. International Business: Graduate Exchange. (0-18 cr. [max 180 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5309. International Business: Graduate Exchange. (0-18 cr. [max 72 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5310. International Business: Graduate Exchange. (0-18 cr. [max 72 cr.]; S-N or Audit; Every Fall & Spring) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests. prerequisite: Carlson graduate student

IBUS 5400. Mergers and Acquisitions in a Global Context. (1-3 cr. [max 18 cr.]; A-F only; Every Fall & Spring) This course is an experiential learning model designed to provide student with an opportunity to apply global business knowledge and hone cross-cultural skills through a live international business project. This is an education abroad program. Contact the Carlson Global Institute with questions. prerequisite: approved application

IBUS 5401. Marketing in the Mayhem: Why Chile Thrives and How Argentina Tries. (4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) This course will explore the use of the Marketing Management Process by firms and governments as they seek to grow and will use the comparative perspectives of Argentina and Chile as case studies. This is an education abroad program. Contact the Carlson Global Institute at cgi@umn.edu with questions. prerequisite: approved application

IBUS 5402. Economic Diversification: Moving Beyond Oil in the Arab Gulf. (4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) This course will explore ways countries in the Arab Gulf are expanding their economies beyond a reliance on oil and consider the impact of culture, history and religion play in business development in the region. This is an education abroad program. Contact the Carlson Global Institute at cgi@umn.edu with questions. prerequisite: approved application

IBUS 5500. Mergers and Acquisitions in a Global Context. (1-4 cr.; A-F only; Periodic Fall & Spring) Challenges/strategies for success in mergers/acquisitions. prerequisite: Carlson graduate student

IBUS 5600. Global Summer Practicum. (4 cr. [max 8 cr.]; S-N only; Every Summer) Students spend two weeks in Europe meeting with leaders of multinational firms, governmental agencies, NGOs. Ethical challenges faced by individuals/organizations in era of globalization. Taught in English. prerequisite: Carlson graduate student

IBUS 5601. Graduate Summer Exchange. (0-4 cr. [max 8 cr.]; S-N only; Every Summer) Summer study abroad exchange to one of Carlson Global Institute's partner universities. prerequisite: Carlson graduate student

IBUS 5602. Graduate Summer Exchange. (0-4 cr. [max 8 cr.]; S-N only; Every Summer) Summer study abroad exchange to one of Carlson Global Institute's partner universities. prerequisite: Carlson graduate student

IBUS 5603. Graduate Summer Exchange. (0-4 cr. [max 8 cr.]; S-N only; Every Summer) Summer study abroad exchange to one of Carlson Global Institute's partner universities. prerequisite: Carlson graduate student

IBUS 5604. Graduate Summer Exchange. (0-4 cr. [max 8 cr.]; S-N only; Every Summer) Summer study abroad exchange to one of Carlson Global Institute's partner universities. prerequisite: Carlson graduate student

IBUS 5605. Shanghai Summer Program in International Business (Graduate). (0-18 cr.; S-N only; Every Summer) Summer study abroad at one of Carlson School's international exchange partner universities, Antai College of Economics and Management. This is a three week summer program integrating intense business education in China context with corporate experience.

IBUS 6041. IBUS 6041: Global Strategy and Modes of Entry. (4 cr.; A-F or Audit; Every Spring) Course explores issues related to target market analysis, modes of entry, decision making in international business to comprehend complexity of crafting global strategy. prerequisite: Carlson graduate student

IBUS 6315. Ethical Environment of International Business (Graduate). (4 cr.; A-F only; Every Spring & Summer) Current international business ethics. Students spend two weeks in Europe meeting with leaders of multinational firms, governmental agencies, NGOs. Ethical challenges faced by individuals/organizations in era of globalization. Taught in English. prerequisite: Carlson graduate student

IBUS 6316. Sustainability & Cooperative Advantage in Scandinavia. (4 cr.; A-F or Audit; Every Summer) Corporate responsibility through exploration of successful Scandinavian approach. prerequisite: Carlson graduate student

IBUS 6400. Carlson MBA Global Discovery. (1-3 cr.; A-F only; Every Fall & Spring) How companies/public agencies operate effectively in emerging-market economies. How emerging-market politics, law, social trends are shaping current Minnesota business/agency strategies. Classroom/2-week international visit/symposium following return to United States. prerequisite: 2nd yr full-time Carlson MBA student

IBUS 6401. Marketing in the Mayhem: Why Chile Thrives and How Argentina Tries. (4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) This course will explore the use of the Marketing Management Process by firms and governments as they seek to grow and will use the comparative perspectives of Argentina and Chile as case studies. This is an education abroad program. Contact the Carlson Global Institute at cgi@umn.edu with questions. prerequisite: approved application

IBUS 6402. Economic Diversification: Moving Beyond Oil in the Arab Gulf. (4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) This course will explore ways countries in the Arab Gulf are expanding their economies beyond a reliance on oil and consider the impact of culture, history and religion play in business development in the region. This is an education abroad program. Contact the Carlson Global Institute at cgi@umn.edu with questions. prerequisite: approved application

IBUS 6500. Mergers and Acquisitions in a Global Context. (1-4 cr.; A-F only; Periodic Fall & Spring) Challenges/strategies for success in mergers/acquisitions. prerequisite: Carlson graduate student

IBUS 6997. MILI Global Valuation Lab. (4 cr. [max 8 cr.]; A-F only; Periodic Fall, Spring & Summer)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

Interprsnl Relations Research (IREL)

IREL 8001. Proseminar in Interpersonal Relationships Research. (2 cr.; S-N or Audit; Every Fall)
Survey of major topics, including theoretical assumptions, methods, and samples of current research. prereq: Grad IRel minor

IREL 8021. Seminar: Statistical and Methodological Issues in Research on Dyadic Relationships. (3 cr.; S-N only; Spring Even Year)
Survey of topics in design/analysis of research on behavior in two-person interactions. prereq: Grad IRel minor, [one prior course in multiple regression or structural equation modeling], instr consent

IREL 8360. Seminar: Topics in Interpersonal Relationships Research. (1-3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
Intensive study of topics. prereq: Grad IRel minor or instr consent

Introduced Species, Genotypes (ISG)

ISG 5010. Risk Analysis for Introduced Species and Genotypes. (3 cr.; A-F only; Every Fall)

ISG 5020. Risk Analysis Modeling for Introduced Species and Genotypes. (1 cr.; S-N only; Every Spring)
Four-day workshop. Role/mechanics of mathematical modeling within ecological risk assessment. Integrated exercises, cases. prereq: [5010 or equiv], instr consent

ISG 8001. Discussions in Introduced Species and Genotypes. (1 cr. [max 10 cr.]; S-N only; Every Fall & Spring)
Forum for presentation of dissertation proposals, results from ISG practica, discussion of environmental risk assessment topics. Focuses on ongoing research or key publications on introduced species/genotypes.

ISG 8021. Problem Solving Practicum in Risk Analysis. (3 cr. [max 6 cr.]; A-F only; Every Summer)
Students address real-world problems in environmental risk analysis of introduced species and genotypes, with faculty guidance and in consultation with public/private partner, and apply societal deliberation and scientific/policy analysis. prereq: 5010, 5020

ISG 8031. Cooperative Learning Practicum. (1 cr.; A-F only; Every Spring)
Cooperative learning techniques. Scenario planning, decision cases. Students develop/test cooperative learning exercises for environmental risk assessment based on their research experience in 8021. Linking research to teaching. prereq: 8021

ISTANbul (ISTN)

ISTN 1101. Introductory Turkish I. (5 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 1102. Introductory Turkish II. (5 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3001. Contentious Politics: Turkey's Religious/Secular Balance. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3002W. Intercultural Engagement: Creating a Culture of Respect. (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3003. Sustainable Food Systems of Turkey. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3004. Design and its Discontent: Design, Society, Economy and Culture. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3005. Social Change in the Global City. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3006. The Many Religious Faces of Istanbul, Past and Present. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3011. Turkish Design Studio: Sensory Communications Studio. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3012. Turkish Design Studio: Sensory Communications Studio with Design Workshops. (6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3013. Internships in Istanbul: A Comparative Approach to the Turkish Workforce. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ISTN 3014. Design Studio in Istanbul: Traditions and Innovation. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

Italian (ITAL)

ITAL 100. Reading Italian in the Arts and Sciences. (0 cr.; S-N only; Every Summer)
Designed to teach a basic reading knowledge of the Italian language; full time is devoted to intensive reading and translation of texts from a wide variety of disciplines and to the teaching of translation techniques.

ITAL 1001. Beginning Italian I. (5 cr.; Student Option; Every Fall & Spring)
Ciao! Join us in learning Italian, the language of Dante, DaVinci, and la dolce vita! This melodic language spoken throughout the world in fields including music, fashion, cuisine, and fast automobiles will enrich you as a citizen of the world and allow you access to some of the most amazing art and culture on the planet! Beginning Italian, Italian 1001, is a proficiency-based course designed for students with little or no knowledge of the Italian language focusing on developing your intercultural, reading, listening, speaking, and writing skills. Preparatory activities designed to encourage students to analyze grammatical points in question need to be completed before class so class time can be primarily devoted to meaningful interactions in Italian. To further increase your confidence in communicating in Italian, you will also participate in several one-to-one online exchanges with native speakers of Italian throughout the semester. Upon successful completion of this course, you will be able to enroll in Italian 1002. Expect an average of 1.5 hours of outside preparation for each class session hour.

ITAL 1002. Beginning Italian II. (5 cr.; Student Option; Every Fall & Spring)
Bentornati! Ready to embark on a new journey to further develop your knowledge of our beautiful romance language, Italian? If you passed Italian 1001 or you have obtained DLI's consent, this course is for you! You will further develop your skills in Italian as you examine topics such as haute couture or alta moda and the phenomenon of Made in Italy, as well as music, from opera to hip hop. You will also learn about holidays, cultural celebration, and differences and similarities between the scholastic and healthcare systems in Italy and the US. Throughout the semester your learning will be continually enhanced by regular conversations with your Tandem partner in Italy. Preparatory activities designed to encourage students to analyze grammatical points in question need to be completed before class so class time can be primarily devoted
to meaningful interactions in Italian. Italian 1002 is a five-credit course, so you should plan to spend an additional 10-15 hours a week on coursework outside the classroom. Upon successful completion of this course you will be able to enroll in Italian 1003, prereq: 1001 or instr consent

ITAL 1003. Intermediate Italian I. (5 cr.; Student Option; Every Fall, Spring & Summer) BENVENUTO! AL 1° SEMESTRE D’ITALIANO! Throughout the semester in Italian 1003, you will be able to consider your own point of view while learning about various Italian perspectives as we examine topics ranging from housing and historical and contemporary urban design to responsible tourism, linguistic variety, and social problems. Upon completion of this course, you will be able to use Italian to communicate in everyday situations to share personal information about yourself, express your opinions, wishes and desires, make suggestions and give advice, as well as appropriately use active vocabulary. You will continue to acquire basic cross-cultural pragmatic information to help you manage conversations in a culturally appropriate manner, and once again, you will expand your cultural knowledge by talking face to face with your Italian Tandem partner several times over the semester. As with other Italian language course, preparatory activities designed to encourage you to analyze grammatical points in question need to be completed before class so class time can be primarily devoted to meaningful interactions in Italian. Upon successful completion of this course you will be able to enroll in Italian 1004.

ITAL 1004. Intermediate Italian II. (5 cr.; Student Option; Every Fall & Spring) Benvenuto! We invite you to join us in learning the language spoken by one of the most beloved countries and leading destinations for learning abroad in the world! Italy, the cradle of the Renaissance and home to some of the most beautiful architecture on earth, boasts the world’s seventh largest economy, a renowned creative design and fashion industry, as well as a rich and diverse history and heritage. In this course, you will engage directly with Italian culture and society through a variety of learning portals, including authentic short films and literature, in-class debates and presentations, and an array of assessment methods. Throughout the semester, vital current issues such as the impact of technology, justice and politics, and changing inter-generational and interpersonal dynamics will be discussed within a comparative lens, inviting you to reflect on how your own experiences contrast with a sample of those within the Italian culture (Italy). The fourth semester of Italian is designed using a proficiency-based approach to help you develop the ability to communicate effectively in Italian in everyday situations that have real world relevance. Listening, reading, speaking, and writing are integrated into all activities and assessments. By means of self-study preparatory activities designed to encourage students to analyze grammatical points in question before class, so class time can be devoted to meaningful, dynamic interactions with classmates and your teacher in Italian. To further increase your confidence in communicating in Italian, you will also be able to participate in several one-to-one online exchanges with native speakers of Italian throughout the semester. You may end up with a lifelong friend in Italy! Upon successful completion of this course students will be able to demonstrate proficiency by successful completion of the Italian Language Proficiency Exam (LPE) and/or enroll in Italian 3015. prereq: ITAL 1003

ITAL 1022. Accelerated Beginning Italian. (5 cr.; Student Option; Periodic Fall & Spring) This is a fast-paced course that covers the first two semesters of Italian in one semester. Students will be able to move more quickly toward proficiency in Italian to fulfill requirements and/or enroll in advanced Italian courses or expand research options. At the end of this course, you will be able to communicate about topics such as past times, food, family, school, health, sports and much more.

ITAL 1837. Imagining Italy: Italian and Italian-American Culture, History, and Society through Film. (AH,GP; 4 cr.; Student Option; Every Fall) Weekly guest lectures and critical readings expand from different disciplinary perspectives upon issues raised by films. Urban life, religion, nationalism, opera, violence, leisure, food, fascism, terrorism, family, emigration/immigration, ethnicity, Mediterranean culture.

ITAL 3015. Reading, Conversation, and Composition. (4 cr.; Student Option; Every Fall & Spring) How can a society manage an aging population? What steps can be taken to promote integration and overcome differences? Is technology helping or hindering our interpersonal relationship? Is history doomed to repeat itself? CONGRATULATIONS! You are about to embark into a rewarding journey to further deepen your Italian experience while developing your critical thinking skills. This class will increase your appreciation of Italian culture through engagement with articles, short films and literary extracts (of authors such as Nobel's prize Dario Fo, Salani, Buzzati and Ginzburg) on contemporary cultural topics ranging from social problems to the use and misuse of technology to the impact of historical events on people's everyday lives. You will also have the opportunity to interact face to face online with Italian students to improve your language skills as well as expand your cultural knowledge while drawing comparisons and reflecting on the U.S. societal views of those topics. This intensive, intermediate course is designed for students who have passed Italian 1004 and have mastered basic Italian grammar. The course will include preparatory activities that are designed to encourage students to analyze grammatical points in question. prereq: 1004

ITAL 3201. Reading Italian Texts: Poetics, Rhetoric, Theory. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) A basic course in understanding the rhetorical and poetic aspects of language and literature; interpretive methods and theoretical concepts. prereq: 3015

ITAL 3203. Italian Travelers: From the Enlightenment to the Present. (3 cr. [max 12 cr.]; Student Option; Periodic Fall) Examines literary representations of travel, migration, immigration, exile, and tourism in Italy from the Enlightenment to the present. prereq: 3015

ITAL 3305. Staging the Self: Theater and Drama in Modern Italy. (3 cr. [max 12 cr.]; Student Option; Periodic Fall) Theatrical representations of the self in modern Italy. Particular attention given to issues of identity, gender, and class in theatrical works ranging from Alferi's Mirra, Pirandello's Enrico IV to Dacia Maraini's Clytemnestra. prereq: 3015

ITAL 3459W. Senior Project. (WI; 2 cr.; Student Option; Every Fall & Spring) Research/writing on issue/theme in Italian studies. Projects range from scholarly paper to artistic/creative writing or musical composition, photography, poetry, or fiction. Research/analytical component. prereq: completion of pre-requisite for major (3015) and eight electives for the sum of 30 credits.

ITAL 3502. Making of Modern Italy: From the Enlightenment to the Present. (3 cr. [max 12 cr.]; Student Option; Periodic Spring) Italian literary, cultural, and symbolic practices from the Enlightenment to the present. prereq: 3015

ITAL 3550. Topics in 19th Century Italy. (3 cr. [max 12 cr.]; Student Option; Fall Odd Year) Literature/culture of Italy in 19th century. Content varies depending on instructor. Literary, critical, cultural, historical, or social issues. Specific author, genre, or topic of interest. Readings. Specific content posted in department/listed in Course Guide. prereq: 3015 or instr consent

ITAL 3640. Topics in Italian Studies. (3 cr. [max 12 cr.]; Student Option; Periodic Spring) Topics of interest in studies of Italian or Italian American culture of 20th century. Literary, critical, cultural, historical, or social issues, a specific author, a genre, or other topic. Content varies by instructor, see Course Guide. prereq: 3015 or instr consent

ITAL 3837. Imagining Italy: Italian and Italian-American Culture, History, and Society through Film. (AH,GP; 4 cr.; Student Option; Every Fall) Weekly guest lectures and critical readings expand from different disciplinary perspectives upon issues raised by films. Urban life, religion, nationalism, opera, violence, leisure, food, fascism, terrorism, family, emigration/immigration, ethnicity, Mediterranean culture.

ITAL 3850. Topics in Italian Cinema. (3 cr. [max 9 cr.]; A-F only; Every Fall & Spring) Examine theme, problem, style, period, or filmmaker in Italian cinema history. Attention devoted to locating Italian visual culture within context of wider transnational political/artistic
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

This is a fast-paced course that covers the first two semesters of Italian in one semester. Students will be able to move more quickly toward proficiency in Italian to fulfill requirements and/or enroll in advanced Italian courses or expand research options. At the end of this course, you will be able to communicate about topics such as past times, food, family, school, health, sports and much more.

ITAL 4307. Novellistica. (3 cr.; Student Option; Periodic Fall & Spring) Introduction to historical, formal and theoretical study of the Italian novella genre (including such alternative forms as the ?racconti?) and the impact of this genre on world literature. The study of the birth and development of the novella genre in Italian. Readings from and discussion of novellas and tales from: The Novellino, Boccaccio, Sacchetti, Bandello, Bigolini, Basile, Verga, Deledda, Moravia, Morante, Calvino, Ferrante prereq: 3015, 3201 or permission from the Italian DUS

ITAL 4970. Directed Readings. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Meets unique requirements decided on by faculty member and student. Individual contracts list contact hours, number of credits, written and other work required. prereq: instr consent

ITAL 5201. Reading Italian Texts: Poetics, Rhetoric, Theory. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Rhetorical/poetic aspects of language and literature. Interpretive methods, theoretical concepts. prereq: grad student or instr consent

ITAL 5203. Italian Travelers: From the Enlightenment to the Present. (3 cr. [max 12 cr.]; Student Option; Periodic Fall) Examines literary representations of travel, migration, immigration, exile, and tourism in Italy, from Enlightenment to present. prereq: grad student or instr consent

ITAL 5305. Staging the Self: Theater and Drama in Modern Italy. (3 cr. [max 12 cr.]; Student Option; Periodic Fall) Theoretical representation of the self in modern Italian. Focuses on issues of identity, gender, and class in theatrical works ranging from Alfieri’s Mirra, Pirandello’s Enrico IV to Dacia Maraini’s Clytemnestra. prereq: grad student or instr consent

ITAL 5401. Mondo di Dante. (4 cr. [max 16 cr.]; Student Option; Periodic Fall) Intensive reading of Dante’s Inferno, Purgatorio, and Vita Nuova with emphasis on Dante’s linguistic and cultural contributions. prereq: 3015, 3201 or instr consent

ITAL 5502. Making of Modern Italy: From the Enlightenment to the Present. (3 cr. [max 12 cr.]; Student Option; Periodic Spring) Italian literary, cultural, and symbolic practices, from Enlightenment to present. prereq: grad student or instr consent

ITAL 5609. World of Dante. (4 cr. [max 8 cr.]; Student Option) Taught in English. Intensive reading of Dante’s Inferno, Purgatorio and Vita Nuova with
emphasis on the personal, poetic, and political stakes of the journey of Dante’s pilgrim through hell to the earthly paradise.

**ITAL 5640. Topics in Italian Studies. (; 3 cr. [max 12 cr.]; Student Option; Every Fall) Topics of interest in studies of Italian and/or Italian American culture of the 20th century.** Topics and readings may include literary, critical, cultural, historical, and/or social issues, a specific author, a genre, or other topics. Content varies by instructor. Specific content posted in the department and in the Course Guide. prerequisites: Ital 3015

**ITAL 5970. Directed Readings. (; 1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Meets unique requirements decided on by faculty member and student. Individual contracts list contact hours, number of credits, written and other work required. prerequisites: instr consent**

**ITAL 8333. FTE: Masters. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisites: Master’s student, adviser and DGS consent**

**ITAL 8777. Thesis Credits: Master’s. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisites: Max 18 cr per semester or summer; 10 cr total required (Plan A only)**

**ITAL 8992. Directed Readings. (; 1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Requirements decided on by faculty member and student: contact hours, number of credits, written/other work. prerequisites: instr consent**

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**Japanese (JPN)**

**JPN 1011. Beginning Japanese I. (5 cr. [max 6 cr.]; Student Option No Audit; Every Fall & Summer) Introduction to speaking, reading, writing Japanese.**

**JPN 1012. Beginning Japanese II. (5 cr.; Student Option No Audit; Every Spring & Summer) Introduction to speaking, reading, writing Japanese. prerequisites: 1011**

**JPN 3021. Intermediate Japanese I. (5 cr.; Student Option No Audit; Every Fall) Intermediate speaking, reading, writing in Japanese. prerequisites: 1012 or instr consent**

**JPN 3022. Intermediate Japanese II. (5 cr.; Student Option No Audit; Every Spring) Intermediate speaking, reading, writing in Japanese. prerequisites: 3021 or instr consent**

**JPN 3031. Third Year Japanese I. (4 cr.; Student Option No Audit; Every Fall) Advanced intermediate-level instruction in speaking, reading, writing Japanese. Development of reading proficiency in modern Japanese prose. prerequisites: 3022 or instr consent**

**JPN 3032. Third Year Japanese II. (4 cr.; Student Option No Audit; Every Spring) Advanced intermediate-level instruction in speaking, reading, writing Japanese. Development of reading proficiency in modern Japanese prose. prerequisites: 3022 or instr consent**

**JPN 3090H. Honors Course: Tutorial. (; 1-4 cr.; Student Option; )**

**JPN 3290. Japanese Language Teaching Tutorial. (; 1 cr. [max 2 cr.]; S-N only; Every Fall & Spring) Students tutor beginning students of Japanese and are part of department’s Japanese language team. prerequisites: Grade of A in 4042**

**JPN 4001. Beginning Japanese I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring & Summer) Introduction to speaking, reading, writing Japanese. Meets with 1011.**

**JPN 4002. Beginning Japanese II for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring & Summer) Introduction to speaking, reading, writing Japanese. Meets with 1012. prerequisites: 4001**

**JPN 4003. Intermediate Japanese I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall) Intermediate speaking, reading, writing in Japanese. Meets with 3021. prerequisites: 4002**

**JPN 4004. Intermediate Japanese II for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring) Intermediate speaking, reading, writing in Japanese. Meets with 3022. prerequisites: 4003**

**JPN 4005. Third Year Japanese I for Graduate Student Research. (4 cr.; Student Option No Audit; Every Fall) Advanced intermediate-level instruction in speaking, reading, writing Japanese. Development of reading proficiency in modern Japanese prose. prerequisites: 4005**


**JPN 4041. Advanced Japanese Conversation and Composition I. (4 cr.; Student Option; Every Fall) Practice in advanced spoken/written Japanese. Assignments include essays, summaries, formal interviews in Japanese. prerequisites: 3032 or instr consent**

**JPN 4042. Advanced Japanese Conversation and Composition II. (4 cr.; Student Option; Every Spring) Practice in advanced spoken/written Japanese. Typical assignments include essays, summaries, formal interviews in Japanese. prerequisites: 4041 or instr consent**

**JPN 5040. Readings in Japanese Texts. (; 3 cr. [max 9 cr.]; A-F/Audit; Every Fall) Students read authentic materials of various kinds to increase reading and speaking ability. Topics specified in Class Schedule. prerequisites: 4042 or equiv or instr consent**

**JPN 5041. Reading Japanese Texts: Literature and Culture. (3 cr.; A-F/Audit; Periodic Fall & Spring) This course is conducted 100% in modern Japanese, including course materials, lectures, and discussions. Close reading of texts written in modern Japanese, including a recent novel, essays on social phenomena, critical essays on Japanese society, and/or academic papers. Read and translate these texts accurately and critically; discuss them in Japanese, and/or compose an essay entirely in modern Japanese. Pre-requisite: JPN 4042 or equivalent or instructor consent**

**JPN 5211. Introductory Classical Chinese I. (3 cr.; Student Option; Periodic Fall) Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese/its importance in study of East Asian cultures. Taught in English. prerequisites: Two years of an East Asian language (Chinese, Japanese, Korean) or equivalent or instr consent**

**JPN 5212. Introductory Classical Chinese II. (3 cr.; Student Option; Periodic Spring) Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese/its importance in study of East Asian cultures. Taught in English. prerequisites: 5211 and two years of an East Asian language (Chinese, Japanese, Korean) or equivalent or instr consent**

**JPN 5993. Directed Studies in Japanese. (1-15 cr.; Student Option; Every Fall & Spring) Individual study with guidance of a faculty member. prerequisites: instr consent, dept consent, college consent.**

**JPN 8333. FTE: Master's. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisites: Master’s student, adviser and DGS consent**

**JPN 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisites: Doctoral student, adviser and DGS consent**

**JPN 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisites: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr**

**JPN 8777. Thesis Credits: Master’s. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisites: Max 18 cr per semester or summer; 10 cr total required (Plan A only)**

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
JWST 1034. Introduction to Jewish History and Cultures. (HIS; 3 cr. ; Student Option; Every Fall) Jewish history, society, culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, artifacts of daily life. Emphasizes political, social, cultural contexts that shaped development of Jewish ideas, practices, and institutions.development of Jewish ideas, practices, and institutions.

JWST 1201. Bible:Context & Interpretation. (LITR; 3 cr. ; Student Option; Every Fall) Introduction to the modern academic study of the Old Testament/Hebrew Bible in the historical context of literature from ancient Mesopotamia. Read Babylonian Epic of Creation, Epic of Gilgamesh, Hammurabi, Genesis, Exodus, Psalms. Stories of creation, law, epic conflict, and conquest. prereq: Knowledge of Hebrew not required


JWST 3034. Introduction to Jewish History and Cultures. (HIS; 3 cr. ; Student Option; Every Fall) Jewish history, society, culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, artifacts of daily life. Emphasizes political, social, cultural contexts that shaped development of Jewish ideas, practices, and institutions.

JWST 3201. Bible:Context & Interpretation. (LITR; 3 cr. ; Student Option; Every Fall) Introduction to the modern academic study of the Old Testament/Hebrew Bible in the historical context of literature from ancient Mesopotamia. Read Babylonian Epic of Creation, Epic of Gilgamesh, Hammurabi, Genesis, Exodus, Psalms. Stories of creation, law, epic conflict, and conquest. prereq: Knowledge of Hebrew not required

JWST 3202. Bible: Prophecy in Ancient Israel. (3 cr. ; Student Option; Every Spring) Survey of Israelite prophets. Emphasizes Amos, Hosea, Isaiah, Jeremiah, Ezekiel, Second Isaiah. Prophetic contributions to Israelite religion. Personality of prophets. Politics, prophetic reaction. Textual analysis, biblical scholarship. Prophecy viewed cross-culturally. prereq: [RelS 1001] or [CINES 1201 or JWST 1201 or RELS 1201 or CNES 3201 or JWST 3201 or RELS 3201]

JWST 3205. Women, Gender, and the Hebrew Bible. (AH; 3 cr. ; Student Option; Spring Odd Year) How men, women, gender, sexuality is portrayed in Hebrew Bible. Social/religious roles/status of women in ancient Israel. Read biblical texts from academic point of view. 

JWST 3504. Apocalypticism, Cosmic Warfare, and the Maccabees: Jewish Strategies of Resistance in Antiquity. (3 cr. ; Student Option; Periodic Spring) The rise of Hellenistic kingdoms in the ancient Mediterranean and Near East created a variety of responses from local, subjugated peoples, and some of the most documented cases are those of Jewish populations in Koele-Syria/Palestine. The main objective of this course is to analyze Jewish responses to imperial rule and military conflict during the Hellenistic and early Roman periods (c. 300 B.C.E. - 150 C.E.), but we will also spend time examining the broader picture of how local, ancestral groups fared under foreign rule. Along with discussing pertinent archaeological evidence, we will discuss Jewish literature and documentary material from this period, including, the sectarian documents of the Dead Sea Scrolls, the Book of Judith (a Jewish "novel"), the Books of Daniel and the Maccabees (all of which provide historical information about the Maccabean revolt and rise of the Hasmonaees), and the writings of Josephus (a Jewish writer who witnessed the Roman takeover of Palestine in the first century C.E.). This course will stay within the confines of the ancient evidence and not examine later interpretations when analyzing each historical period; it will begin with Ptolemaic control of the region and conclude with the Bar Kokhba revolt, its aftermath, and the resilience of Jewish populations in northern Palestine. Topics that will be examined in depth are messianism and apocalypticism, the Jerusalem Temple, Jewish ancestral traditions (which include biblical literature), and theoretical models used by scholars to analyze power relationships in antiquity.

JWST 3511. Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa since 1700. (GP;HIS; 3 cr. ; Student Option; Fall Odd Year) Diversity of social/cultural interactions between Muslims and Jews and between Islam and Judaism since 1700. What enabled the two religious communities to peacefully coexist? What were causes of conflict? Why is history of Muslim-Jewish relations such a contested issue?

JWST 3512. History of Modern Israel/Palestine: Society, Culture, and Politics. (GP; 3 cr. ; Student Option; Fall Odd Year) History of Zionism/Israel. Arab-Israeli conflict, tensions between religious/Jews, Relationships between Mizrahi, Ashkenazi, Russian, Ethiopian, Arab citizens. Israeli cultural imagery, Newsreels, political posters, television shows, films, popular music.

JWST 3520. Ancient Israel: From Conquest to Exile. (3 cr. ; Student Option; Periodic Fall) Study of 1933-1945 extermination of six million Jews and others by Nazi Germany on basis of

**JWST 3601. Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood.** (AH; 3 cr.; Student Option; Fall Odd Year) German/American films by famous directors who left Europe in Nazi period. Analysis of films by Fritz Lang, Max Ophuls, Robert Siodmak, Otto Preminger, Billy Wilder, Douglas Sirk, and others. Films as art works and as cultural products of particular social, political, and historical moments.

**JWST 3606. Christians, Muslims, and Jews in the Middle Ages.** (GP,HIS; 3 cr.; Student Option; Fall Even, Spring Odd Year) Muslim/Christian expansion, jihad/crusade, anti-Jewish violence/persecution. Trade, intellectual exchange, religious dialogue.

**JWST 3631. Jewish Writers and Rebels in German, Austrian, and American Culture.** (3 cr.; Student Option; Periodic Fall) Literary/cultural modes of writing used by Jewish writers in Germany, Austria, and America to deal with problems of identity, anti-Semitism, and assimilation. Focus on 20th century. All readings (novels, poetry, stories) in English. prereq: No knowledge of German required; Extra work in German must be done in order to count this course toward a German minor or a German, Scandinavian, Dutch major.

**JWST 3633. The Holocaust: Memory, Narrative, History.** (GP,HIS; 3 cr.; Student Option; Periodic Fall & Spring) Seventy years after the end of the second world war, the Holocaust continues to play a formative role in public discourse about the past in Germany and Austria. As the event itself recedes into the past, our knowledge about the Holocaust has become increasingly shaped by literary and filmic representations of it. This course has several objectives: first, to deepen students' historical knowledge of the events and experiences of the Holocaust, and at the same time to introduce critical models for examining the relationship between personal experience, historical events, and forms of representation. This class will introduce students to the debates about the politics of memory and the artistic representation of the Holocaust, with special focus on public debates about the complex ways in which Holocaust memory surfaces in contemporary Germany and Austria, and by the accrual of layers of text and discourse about the Holocaust. Additional topics will include Holocaust testimony; Holocaust memoirs, and 2nd and 3rd generation Holocaust literature, the Historians’ Debate of the 1980s.

**JWST 3729. Nazi Germany and Hitler’s Europe.** (3 cr.; Student Option; Periodic Fall & Spring) Comprehensive exploration of Third Reich. How Nazis came to power, transformations of 1930s, imposition of racial politics against Jews/others, nature of total war. Historical accounts, memoirs, state documents, view films.

**JWST 3775. History of Jews in Europe and the Atlantic World, from 1700 to Present.** (3 cr.; Student Option; Periodic Fall & Spring) Social, cultural, and political experience of Jews in Europe and the Americas. Emancipation, social/economic development, assimilation, migration, political anti-Semitism, Zionism, the holocaust, transformations after 1945.

**JWST 3993. Directed Study.** (1-4 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer) Guided individual reading or study. Prereq: instr consent

**JWST 4000W. Final Project, Writing Intensive.** (WI; 4 cr.; A-F or Audit; Periodic Fall & Spring) Independent research/writing under supervision of a faculty sponsor. A student may approach any JwSt faculty member to develop a program of independent research/writing in an area of student's choosing. prereq: JwSt major, permission of dir of undergrad studies

**JWST 4001W. Final Project, Writing Intensive.** (WI; 1 cr.; A-F or Audit; Every Fall & Spring) Independent research and writing, under supervision of a faculty sponsor. Student makes a contract with instructor to write an in-depth research paper, or comparable project, to be completed in conjunction with a JwSt course. concurrent registration is required (or allowed) in 5xxx, JwSt major, permission of dir of undergrad studies

**JWST 4315. Never Again! Memory & Politics after Genocide.** (GP; 3 cr.; A-F or Audit; Spring Odd Year) Course focuses on the social repercussions and political consequences of large-scale political violence, such as genocide, war crimes, and crimes against humanity. Students learn how communities and states balance the demands for justice and memory with the need for peace and reconciliation and addresses cases from around the globe and different historical settings. prereq: SOC 1001 or 1011V recommended, A-F required for Majors/Minors

**JWST 4878W. Israeli-Palestinian Situation.** (GP, WI; 4 cr.; Student Option; Every Fall & Spring) Situation as clash of two communities. History, politics, respective narratives of each community. Divisions within each community that are consequential for reconciliation. Examples of reconciliation literature from both communities.


**JWST 5204. The Dead Sea Scrolls.** (3 cr.; Student Option; Periodic Fall & Spring) Introduction to Dead Sea Scrolls and Qumran. Contents of Dead Sea Scrolls, significance for understanding development of the Bible. Background of Judaism and Christianity. Archæological site of Qumran. Open to graduate students across the college; knowledge of classical Hebrew will not be required. The course is open to upper level undergraduate students with permission of the instructor.

**JWST 5513W. Scripture and Interpretation in Israelite Religion and Judaism.** (WI; 3 cr.; A-F or Audit; Spring Odd Year) Idea of divine revelation. Impact on religion/literature. How history of Bible's creation, transmission, interpretation help us think critically about role of revelation in religious traditions. prereq: At least one upper level course (3xxx or higher) in academic biblical or religious studies

**JWST 5992. Directed Readings.** (1-12 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study, prereq: instr consent

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**JOUR 1001. Media in a Changing World.** (SOC,TS; 3 cr.; Student Option; Every Fall, Spring & Summer) In an era when almost everybody’s a content creator and just about everyone is connected with media, what makes mass communication different from other forms of message exchange? We’ll examine journalism, advertising, public relations, video gaming, music recording, music and more. We’ll think about issues like free speech, “fake news,” censorship, social media, demographics, psychographics and graphic content. Hear from mass media professionals who provide real-world, real-time material for discussion and debate. This class covers ground that is shifting by the day and uses current cases to help you apply what you learn and sharpen your own media literacy skills.

**JOUR 1001H. Media in a Changing World.** (SOC,TS; 3 cr.; A-F or Audit; Every Fall) In an era when almost everybody’s a content creator and just about everyone is connected with media, what makes mass communication different from other forms of message exchange? We’ll examine journalism, advertising, public relations, video gaming, music recording, music and more. We’ll think about issues like free speech, fake news, censorship, social media, demographics, psychographics and graphic content. Hear from mass media professionals who provide real-world, real-time material for discussion and debate. This class covers ground that is shifting by the day and uses current cases to help you apply what you learn and sharpen your own media literacy skills.

**JOUR 1501. Digital Games and Society.** (AH,TS; 3 cr.; Student Option; Every Fall & Spring) Digital games have a wide-ranging impact on our culture and society and are one of the...
JOUR 1911. The Symbolic Meanings of Money and Property. (GP; 3 cr.; A-F only; Every Fall & Spring)
Do you ever wonder why some people run away from money, while most people chase after it? Or why some people who could afford better buy their clothes at Savers while others (who maybe can't afford it) prefer to shop at Gucci or Armani? Or why husbands and wives, and parents and children, so seldom agree on what to do with money? Understanding the symbolic messages money sends to people is the key to learning how to answer these questions. Whether your interest is business, liberal arts, or a particular profession, this seminar ought to be interesting and useful for you.

JOUR 1912. The Art and Science of Persuasion. (3 cr. [max 6 cr.]; A-F only; Every Spring)
Seven days a week everywhere in the world, people are busily trying to persuade other people. Students want their professors to accept late work. Professors want students to throw themselves into their coursework. Advertisers want consumers to buy their products. PR practitioners want people to think more highly of their clients. Newspaper editorialists want readers to change their minds. Defense lawyers want juries to acquit their clients. And politicians want constituents to vote for them. Some of these people are very effective persuaders; others less so. In this course, we will search out the best techniques for persuading different kinds of people to do various things. We'll study really good textbooks, meet top-quality professional persuaders, and search out real-life instances of good and bad persuasive efforts. And we'll try our hands at persuading someone to do something that's important to us. All the while we will be trying to build our own theories of persuasion and maybe have some fun!

JOUR 3004. Information for Mass Communication. (3 cr.; A-F only; Every Fall, Spring & Summer)
Information resources for professional/academic work in mass communication. Techniques for locating, retrieving, appraising, verifying information acquired from public records, libraries, research institutions, databases, Internet, observation, interviews. Prereq: Jour major or jour minor or approved BIS/IDIM/ICP program

JOUR 3004H. Information for Mass Communication. (3 cr. [max 6 cr.]; A-F only; Every Spring)
Information resources for professional/academic work in mass communication. Techniques for locating, retrieving, appraising, verifying information acquired from public records, libraries, research institutions, databases, Internet, observation, interviews. Prereq: Honors, [jour major or mass comm minor or approved BIS/IDIM/ICP program]

JOUR 3005. Mass Media Effects. (SOCS; 3 cr.; Student Option; Every Fall & Spring)
Does the media cause social problems, or just reflect them? Why and how have mass media been feared, bemoaned, used, and dismissed as tools to change public beliefs, attitudes, and behavior? This course explores a century's worth of thinking as to how and when media might have such effects. We examine media influence in a range of contexts, including political advertising, health campaigns, video game violence, pornography, and educational television. We approach the topic largely from a social science perspective (for example, by reviewing experimental tests of the effects of media violence) but will address some of the advantages and limitations inherent in looking for effects in that way. Although our focus is on mass media, interpersonal and digital media sources will be considered as well.

JOUR 3006. Visual Communication. (3 cr.; Student Option; Every Fall & Spring)
From Instagram to YouTube to memes—what do we live in a visual culture? How can we interpret this flood of images? Learn how to analyze advertisements, photographs, television, and social media from multiple perspectives. Historical, cultural, and ethical approaches unearth the changing role of visual media in society. You'll actively interpret current images to learn how to effectively communicate with visuals.

JOUR 3007. The Media in American History and Law: Case Studies. (HIS; 3 cr.; Student Option; Every Fall)
In this class, you'll study mass media and its impact during a specific historical time period, based on the instructor's expertise and area of research. Examples include: Journalism during the Civil War; Mass media and the African American struggle for civil rights; the Sixties and rise of the New Journalism.

JOUR 3101W. News Reporting and Writing. (WI; 3 cr.; A-F only; Every Fall & Spring)
Basic news gathering, journalistic writing. Developing story ideas. Problems associated with handling of news/features. Professional standards/responsibilities. Prereq: [3004W or 3004V or concurrent registration is required (or allowed) in 3004W or 3004V], [jour major or admitted pre-jour or approved BIS/IDIM/ICP program]

JOUR 3102. Multimedia Production and Storytelling. (3 cr.; A-F only; Every Fall & Spring)
Assemble content for distribution across integrated media platforms. Audio slide shows, video with sound, computer-based management of photos/video, web-related skills. Media platforms. Prereq: [3004W or 3004V or concurrent registration is required (or allowed) in 3004W or concurrent registration is required (or allowed) in 3004W], [3101 or 3101H or concurrent registration is required (or allowed) in 3101 or concurrent registration is required (or allowed) in 3101H or 3279W or concurrent registration is required (or allowed) in 3279W or 3241 or concurrent registration is required (or allowed) in 3241], [jour major or admitted pre-jour or approved BIS/IDIM/ICP program]

JOUR 3103. Interactive and Data Journalism. (3 cr.; A-F only; Every Fall)
Introduction to concepts, tools, techniques for journalism on digital platforms. Audience interactivity around news. Stories through data visualizations. Best practices for social media/blogging. Finding, assessing, structuring data. Prereq: [3004W or 3004V], [3101 or 3101H or 3279W], [jour major or approved BIS/IDIM/ICP program]

JOUR 3121. Intermediate News Reporting. (3 cr.; A-F only; Every Fall & Spring)
Reporting news fundamental to basic beats in most news organizations. Crime, government, politics, environment, health, in-depth profiles, issues relating to civic life. Prereq: [3004W or 3004V], [3101 or 3101H], [jour major or approved BIS/IDIM/ICP program]

JOUR 3155. Editing for Print and Digital Audiences. (3 cr.; A-F only; Every Spring)
Improving copy through copy editing/rewriting. Selecting/editing news-editorial content for newspapers, magazines, online services. Experience using news judgment to present information in print/on web. Prereq: [3004W or 3004V, 3101 or 3101H], [jour major or approved BIS/IDIM/ICP program]

JOUR 3173W. Magazine & Feature Writing. (WI; 3 cr.; A-F only; Every Fall & Spring)
Writing feature articles for consumer/trade publications. Market free-lance methods. Prereq: [3004W or 3004V, 3101 or 3101H, or 3279W], [jour major or approved BIS/IDIM/ICP program]

JOUR 3201. Principles of Strategic Communication. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
So, you have declared your journalism major and selected the strategic communication track? Or maybe, you are studying something completely different, but you have heard that advertising and public relations are great fields to work in? In this class, we will foster career exploration as you learn about key areas of advertising and public relations (history, theory, ethics, etc.). In the second half of the class, you will take a journey from media consumer to strategic planner as you create a strategic communication campaign as part of a group project that will start off your strategic communication portfolio.

JOUR 3241W. Advertising Strategy and Creative Development. (WI; 3 cr.; A-F only; Every Fall & Spring)
JOUR 3251. Evaluative Research in Strategic Communication. (3 cr.; A-F only; Every Fall & Spring)
Applied quantitative research methods in advertising/public relations campaign development, management, and evaluation. Focus on scientific primary research methods. Prereq: [3004W or 3004V], [3201 or 3202]. Jour major or approved BIS/IDIM/ICP program.

JOUR 3253. Account Planning. (3 cr.; A-F only; Every Fall & Spring)
Role of account planning in integrated strategic communications development. Students master skills needed to become an account planner/apply skills in various situations/settings. Prereq: [3004W or JOUR 3004V], [JOUR 3201 or JOUR 3202]. Jour major or approved BIS/IDIM/ICP major.

JOUR 3256. Media Planning. (3 cr.; A-F only; Every Fall & Spring)
Media strategy, planning, selection process within context of broader marketing communications process. Paid, earned, owned media across advertising, digital (including social), direct marketing/public relations disciplines. Prereq: [3004W or 3004V], [3201 or 3202], [jour major or approved BIS/IDIM/ICP program].

JOUR 3275. Digital Strategy in Strategic Communication. (3 cr.; A-F only; Every Fall & Spring)
Skills course focused on digital media, including integrating variety of social networking platforms with conventional strategic communication activities. Prereq: [3004W or 3004V], [3201 or 3202], [jour major or approved BIS/IDIM/ICP program].

JOUR 3279W. Professional Writing for Strategic Communication. (WI; 3 cr.; A-F only; Every Fall & Spring)
Writing expertise for public relations and advertising agency work, corporate and nonprofit strategic communication and development of tactical thinking. Prereq: [3004W or 3004V], [3201 or 3202], [major or approved BIS/IDIM/ICP].

JOUR 3321. Media Design. (3 cr.; A-F only; Every Fall, Spring & Summer)
Basic principles of graphic design. Develop aesthetic sense/graphic design skills through study/creation of effective communication tools. Tutorial guides. Develop software technology skills necessary to complete assignments. Prereq: [3004W or 3004V] or concurrent registration is required (or allowed) in 3004W or concurrent registration is required (or allowed) in 3004V, [major or admitted pre-jour or approved BIS/IDIM/ICP program].

JOUR 3451. TV, Radio and Digital News Reporting. (3 cr.; A-F only; Every Fall & Spring)
News writing, reporting, video photography/editing, on-air delivery. Prereq: [3004W or 3004V], [3101 or 3101H or 3279W], Jour 3102, [major or approved BIS/IDIM/ICP program].

JOUR 3551. The Business of Digital Media: Innovation, Disruption, and Adaptation. (TS; 3 cr.; Student Option; Every Spring)
Digital media enterprises have uprooted many established industries and continue to be among the most important factors shaping our economy and society today. Where do these innovations come from? Why do some startups prosper while others fail? How do legacy firms respond to disruptions to their business models? What makes adaptations possible? What makes them risky? Learn to analyze and evaluate the economic strategies of existing digital media firms across various sectors of society including news, entertainment, social media, mobile, and retail. Assess their impacts on cultural and civic life for better and for worse. Use these skills to incubate your own ideas for the next great media innovations of the future.

JOUR 3552. Internet and Global Society. (GP; 3 cr.; Student Option; Every Fall)
Structure/processes of Internet/global society in comparative context. Internet, via World Wide Web, as ideal site to explore how/why societies come to see world/issues.

JOUR 3614. History of Media Communication. (HIS,TS; 3 cr.; Student Option; Every Spring)
In the history of humankind, there have been five major changes in how we communicate and we're in the middle of the latest revolution. This class helps you make sense of these uncharted waters by exploring how humanity adopted, and adapted to, past disruptions. From the alphabet to the internet and social media, learn how technological innovations in the media have changed not only how people share information and values but also what people have communicated throughout history. We will learn about these five phases in mediated communication over 5,000 years, and how they relate to major changes in politics, society and culture. And then we'll use history's lessons to peek into the future: When presidents tweet and everyone's foodie photos are on Instagram, how does the world communicate?

JOUR 3615. History of the Documentary. (3 cr.; Student Option; Every Fall)

JOUR 3741. Diversity and Mass Communication. (DSJ; 3 cr.; Student Option; Every Fall)
How are our perceptions of crime been influenced by the news? How do social movements use media to share their messages? What can we as audiences do? Social media, news and entertainment media help shape our ideas about identity and differences. Learn how representation and inclusion have been negotiated through media with a particular focus on local case studies. Topics include race, ethnicity, social class, physical ability, and gender. Students will learn how to use media literacy to build a just and equitable society.

JOUR 3745. Mass Media and Popular Culture. (AH,DSJ; 3 cr.; Student Option; Every Fall, Spring & Summer)
Popular culture is everywhere. Social media, film, music, video games, television, websites, and news bring popular culture into our daily lives. In this class, we will examine popular culture in modern and historical contexts through various mass communication, sociological, and cultural theories. Is popular culture of the people? Or dictated by corporate interests? What social and commercial pressures result in stereotypes, misrepresentation and exclusion in popular culture? Does popular culture mirror or shape social reality? This course will provide you with the tools to become active and thoughtful consumers of media and popular culture.

JOUR 3751. Digital Media and Culture. (AH,TS; 3 cr.; Student Option; Every Fall, Spring & Summer)
How have digital media innovations like social media, mobile phones, artificial intelligence, drones and games shaped and been shaped by a culture and society globally? Learn to critically examine the function of digital media in your life. Take away a socio-historical understanding of digital media innovation, and the social, political, and economical impact of new media in creativity, industry, and culture from a cross-disciplinary perspective. Topics range from the concept of branding in an online context, to the varied uses of digital media in the context of journalism, social mobilization, law and privacy, business, globalization, content creation, and beyond. You will read, discuss, and debate cutting-edge material from documentaries, podcasts, popular press, and academic literature. This course balances local contexts with global perspectives, and provides details into the practicalities of working and living in a new media environment.

JOUR 3757. Principles of Health Communication Strategy. (3 cr.; Student Option; Every Fall)
Health information is in the news, nearly every corner of the internet, on your favorite television show, and advertising campaigns. Using principles of mass communication, public health, sociology, and psychology this course explores how mediated health content impacts students' lives at both micro- and macro-levels. We will explore questions such as: how do individuals use media to achieve health-related goals? What role does media and health literacy play in achieving these goals? What effect does health information in entertainment media or strategic public health campaigns, for example, effect our own health-related beliefs and behaviors? To what extent do media portrayals of health and illness impact society? Understanding of complex health issues such as mental health, substance use disorder, or cancers? What influence does news coverage of health issues have on health policy and health reform?
JOUR 3771. Media Ethics. (CIV; 3 cr.; Student Option; Every Fall & Spring)
Citizens expect journalists to separate fact from falsehoods, opinion and propaganda. But is it possible for journalists to be unbiased and objective? Advertisers are expected to push products. But is it acceptable to mislead by exaggerating what the product can do? Public relations professionals must protect a company's brand. But what should they do when a company becomes entangled in a scandal? This course examines the ethical and unethical ways that communicators respond to such challenges, and uses real-life examples to identify values and principles that can lead to sound, ethical decisions under the most difficult circumstances. Learn about ethical communication on all platforms, from television to social media to newspapers and magazines. Build a solid foundation for your own ethical thinking that can guide you as a student and as a professional communicator.

JOUR 3775. Administrative Law and Regulation for Strategic Communication. (CIV; 3 cr.; Student Option; Every Spring)
Learn practical legal skills and ethics as they pertain to marketing, public relations and advertising by focusing on the actions of the Federal Trade Commission, the Federal Communications, and the Federal Elections Commission. Learn about the administrative process including adjudication and rule making. Learn through a range of legal, policy and ethics discussions ranging from the First Amendment, the regulation of commercial speech, advertising deception, substantiation of material claims, digital privacy, contesting, political advertising, and controls on native advertising and social media influencers.

JOUR 3776. Mass Communication Law. (3 cr.; A-F only; Every Fall & Spring)
The First Amendment protects the freedom of speech, and of the press. Does that mean that journalists can write anything they want, broadcast any video images they choose, or go wherever they like in order to gather news? In this course, we will examine significant court decisions that have defined the legal rights and privileges of journalists. We will look at statutes like the Freedom of Information Act and journalist "shield laws." We will consider how new technology raises questions, and challenges, about how to balance First Amendment freedoms with other interests, like privacy and national security. Learn legal rules and principles, and apply them in classroom debate and discussion and in written exercises and examinations. The goal is to understand how the First Amendment and other laws protect the rights of freedom of expression, not just for journalists, but for all of us.

JOUR 3776H. Mass Communication Law. (3 cr.; A-F only; Every Spring)
The First Amendment protects the freedom of speech, and of the press. Does that mean that journalists can write anything they want, broadcast any video images they choose, or go wherever they like in order to gather news? In this course, we will examine significant court decisions that have defined the legal rights and privileges of journalists. We will look at statutes like the Freedom of Information Act and journalist "shield laws." We will consider how new technology raises questions, and challenges, about how to balance First Amendment freedoms with other interests, like privacy and national security. Learn legal rules and principles, and apply them in classroom debate and discussion and in written exercises and examinations. The goal is to understand how the First Amendment and other laws protect the rights of freedom of expression, not just for journalists, but for all of us.

JOUR 3796. Special Topics in Mass Communication: Context. (3 cr. [max 6 cr.]; A-F or Audit; Periodic Fall)
Context course not regularly offered. Topics specified in Class Schedule.

JOUR 3993. Directed Study. (1-3 cr. [max 6 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Directed study projects. Prereq [Jour major or jour minor or approved IDIM major or [CP major or BIS major], instr consent, dept consent, college consent].

JOUR 3996. Directed Internship. (1 cr. [max 3 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Internship supervised by communications organization at which student is working and by student's academic sponsor. Prereq: Jour major, dept consent

JOUR 4171. Covering the Arts. (3 cr.; A-F only; Every Spring)
Assignments follow Twin Cities arts/entertainment scene or particular arts organization (e.g., Jungle Theater) through its season. Weekly writing assignments, readings, field trips, guest lectures from artists/arts journalists. Prereq: [3004W or 3004V, 3101 or 3101H], [jour major or approved BIS/IDIM/ICP program] or instr consent

JOUR 4193. Broavl-Sim Community Journalism Practicum. (3 cr.; A-F only; Every Fall)
Develop journalistic storytelling skills applied to a specific community. Students work in teams to use the tools of journalism to find and tell important, multi-platform, engaging stories about those diverse communities, with a goal of publishing some of those stories in a community news source. Prereq: [3004W or 3004V], [3101 or 3101H], [jour major or approved BIS/IDIM/ICP program]

JOUR 4242. Advertising Portfolio Development. (3 cr.; A-F only; Every Fall & Spring)
Creative development, conceptual thinking. Develop creative ideas based on strategies. Emphasizes print. Applying creative thought to advertising ideas. How to put book together. Prereq: [3004W or 3004V], 3201, 3241, [jour major or approved BIS/IDIM/ICP program]

JOUR 4243. Digital Content Development and Production for Brand Communications. (3 cr.; A-F only; Every Fall & Spring)
Conceptual and practical skills to create, produce, publish and distribute content for branded storytelling including digital audio and video, blogs, web sites, and content created for social platforms; aspects of user experience and graphic design; skills to adapt and modify content after analyzing audience data; professional ethics. Prereq: [3004W or 3004V], 3201, 3241 or Jour 3279W, [jour major or approved BIS/IDIM/ICP program]

JOUR 4251. Psychology of Advertising. (3 cr.; Student Option; Every Fall & Spring)
Ever wonder what your brain does when you see an advertisement? Ever wonder why advertisements work? And why sometimes they don't? How does advertising compel you to buy things you don't need and what strategies do you use to resist these messages? In this course we explore a range of theories that explain how advertisements influence memory, attitudes, emotions, and behaviors and how humans actively process and resist persuasive messages.

JOUR 4259. Strategic Communication Case Analysis. (3 cr.; A-F only; Every Fall & Spring)
Strategic communication cases related to campaigns/issues in business, government, education, or community. Prereq: [3004W or 3004V], [3201 or Jour 3202], any one additional 32xx skills course, [jour major or approved BIS/IDIM/ICP program]

JOUR 4262. Management for Strategic Communication. (3 cr.; A-F only; Every Fall & Spring)
Concepts/methods for effective management in field of mass communication. Prereq: [3004W or 3004V], [3201 or 3202], one additional JOUR 32xx skills course, jour major or approved BIS/IDIM/ICP program

JOUR 4263. Strategic Communication Campaigns. (3 cr.; A-F or Audit; Every Fall & Spring)
Developing campaign strategy/tactics. Planning/decision-making skills. Students work in groups with varying specializations. Prereq: [3004W or 3004V], 3201, any 32xx skills
JOUR 4727. Digital Advertising: Theory and Practice. (3 cr.; A-F or Audit; Every Spring) This course introduces you to the fascinating and ever-changing world of digital advertising and marketing. Learn its history and evolution, current trends, future possibilities and legal/ethical issues. We'll study the innovative research and theories explaining the practice and effects of various forms, including social media, search marketing, gaming, native, viral, online video advertising, online behavioral advertising, and mobile. Through a combination of lectures, in-class discussions, and guest presentations by industry professionals, you’ll learn the basic theories for developing effective and socially-responsible digital advertising campaigns in the increasingly diverse and global media environment. Prereq: Jour major or Mass Comm minor or Digital Media Studies minor or approved BIS/IDIM/ICP program.

JOUR 4724W. Advertising in Society. (WI; 3 cr.; Student Option; Every Fall & Spring) Forms of regulation. Self-regulation/ governmental. Critique of advertising’s role in society. Current issues (e.g., stereotyping, political advertising, advertising to children). Ethics in advertising.

JOUR 4302. Photojournalism. (3 cr.; A-F or Audit; Every Fall & Spring) Practice of photojournalism in contemporary digital environment. Visual storytelling, digital processing, professional/ethical issues. Prereq: [3004W or 3004V], 3102, [jour major or approved BIS/IDIM/ICP program]

JOUR 4303. Documentary Photojournalism. (3 cr.; A-F only; Every Spring) Conceptualize, research, produce documentary projects consisting of edited photographs/ accompanying text. Projects presented in print or online. Examples of differing approaches, exemplary documentary work, prereq: [[3004W or 3004V], 3102, [jour major or approved BIS/IDIM/ICP program]] or instr consent

JOUR 4451. Advanced Multimedia Storytelling. (3 cr.; A-F or Audit; Every Fall) Long-form storytelling using video, audio, graphics, and still photography, edited into multimedia presentations for journalistic and persuasive messages.

JOUR 4452. Electronic Newscast Producing. (3 cr.; A-F only; Every Spring) Planning, writing, producing live TV newscasts. Lecture, lab, prereq: [3004W or 3004V], [3101 or 3101H], 3451, [3121 or concurrent registration is required (or allowed) in 3121] [jour major or approved BIS/IDIM/ICP program]

JOUR 4721. Mass Media and U.S. Society. (DSJ,SOCS; 3 cr.; Student Option; Every Spring) Are the news media doing a good job? How can you tell? Does it matter? Is The Daily Show the best news program on television? Why or why not? Most people seem to have an opinion about all of these questions. Most discussions seem to center on one of four themes: 1) who owns the media and what they care about; 2) whether the news media are becoming more or less credible and/or biased; 3) whether entertainment is replacing or enhancing information in news programming; and 4) how much, if at all, is the Internet changing everything about the way the media work, including who we think of as a journalist. Mass Media and U.S. Society explores the validity and importance of these themes in terms of what roles can the media play in society, what roles does it play, and have these roles changed over time. The course draws on ideas from various social sciences to develop tools for discussing a number of specific issues related to these themes. Prereq: honors

JOUR 4721H. Mass Media and U.S. Society. (DSJ,SOCS; 3 cr.; A-F only; Every Spring) Are the news media doing a good job? How can you tell? Does it matter? Is The Daily Show the best news program on television? Why or why not? Most people seem to have an opinion about all of these questions. Most discussions seem to center on one of four themes: 1) who owns the media and what they care about; 2) whether the news media are becoming more or less credible and/or biased; 3) whether entertainment is replacing or enhancing information in news programming; and 4) how much, if at all, is the Internet changing everything about the way the media work, including who we think of as a journalist. Mass Media and U.S. Society explores the validity and importance of these themes in terms of what roles can the media play in society, what roles does it play, and have these roles changed over time. The course draws on ideas from various social sciences to develop tools for discussing a number of specific issues related to these themes. Prereq: honors

JOUR 4733H. Honors Thesis Seminar. (WI; 3 cr.; A-F only; Every Fall & Spring) Students work under supervision of instructor, with input from subject or methodological advisers, to define research question, conduct research, and write thesis. Students serve as consultants to one another. Prereq: Jour major, [jr or sr], honors

JOUR 4801. Global Communication. (3 cr.; Student Option; Every Spring) How does communication affect international affairs? That's literally a question of war and peace, and this class guides you through the big theories and the real life stories of how news, information and entertainment travels around the world. Analyze the role of communication in globalization, addressing possible interpretations ranging from cultural imperialism to democratic development. Examine how different media cover foreign countries. What does it take to cover the world, historically and at a time of unprecedented challenges for professional journalism? What are the practices that have made international news what it is for the last century? Through theory and case studies from journalists and diplomats, examine the possible effects of international communication on international relations and policy making.

JOUR 4990. Special Topics in Mass Communication: Professional. (3 cr.; max 6 cr.; A-F or Audit; Periodic Fall & Spring) Professional-skills-learning opportunity not regularly offered. Topics specified in Class Schedule. Prereq: [3101 or 3201 or 3202], 3004, [jour major or approved IDIM major or ICP major or BIS major]

JOUR 4992. Field Based Practicum. (3 cr.; max 6 cr.; A-F or Audit; Every Fall & Spring) Professional-skills-learning experience on-site at media organization. Topics specified in Class Schedule. Prereq: Jour major

JOUR 4993H. Honors: Projects. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Honors projects. Prereq Jour major, honors div reg, college consent, dept consent, instr consent.

JOUR 5001. Introduction to Mass Communication Theory and Research. (3 cr.; A-F only; Every Fall) Course is designed to provide an overview of the evolution and content of the major intellectual perspectives, theories, and methodological approaches that serve as the basis for the mass communication discipline. Provides the intellectual base for first-year master’s students’ graduate work in mass communication, as well introduces advanced undergraduate students to graduate study in the discipline. Prereq: Grad students enrolled in Mass Communication MA or PhD program.

JOUR 5131. In-Depth Reporting. (3 cr.; A-F only; Every Fall) Techniques/issues of special project stories. Explanatory, investigative, civic, literary, or ethnographic journalism. Topics (e.g., civil rights, governmental malfeasance, health care problems) typically involved in stories. Prereq: [3004W or 3004V], [3101 or 3101H], 3121, [jour major or approved BIS/IDIM/ICP program]

JOUR 5155. Database Reporting. (3 cr.; A-F only; Every Spring) Obtaining and analyzing digital data for computer-assisted reporting that can be published on various media platforms. Using spreadsheets and databases to manage information, find news stories, produce maps and graphics. Prereq: [Jour 3004W or 3004V], 3101, [3103 or 3121]; jour major or approved BIS/IDIM/ICP program.

JOUR 5174. Magazine Editing and Production. (3 cr.; A-F only; Every Fall & Spring) Writing, editing, illustration, design, layout, photo-composition of print or web magazine. Emphasizes reporting, telling substantive stories. Work in groups with varying specializations. Prereq: [3004W or 3004V], [3155 or 3173W or 3279W or 3321 or 4302]. [jour major or approved BIS/IDIM/ICP program]

JOUR 5251. Strategic Communication Theory. (3 cr.; Student Option; Every Spring) This course is an introduction to psychologically-grounded concepts, theories and research and their applications for strategic communication. The course objectives involve comprehension and application of a range of psychological concepts and theories related to...
to attitude development, susceptibility to message influence, and opinion formation and change. The course will provide opportunities to apply theoretical concepts to critically evaluate strategic communications (advertising, public relations, brand marketing, etc.) and to use psychological theory and research to inform the development of communication strategies. The course will examine how these theories help us understand communication processes in digital media environments, as well as how they inform relationship-building areas of strategic communication such as reputation and crisis management. The course will provide students with strategies and theories to potential research for graduate degree capstone projects.

JOUR 5501. Communication, Public Opinion, and Social Media. (3 cr.; Student Option: Every Fall)
Sharpen your understanding of public opinion and its role in political and civic life: What does it mean? Where does it come from? How is it measured? What impact does it have? How are the public's preferences shaped by the larger communications environment and the strategic messages of politicians, interest groups, and other actors in society? What are polls really measuring, and why do they seem so unreliable sometimes? How are social media technologies giving voice to new segments and dimensions of public opinion? But how are they vulnerable to manipulation from bots and other efforts designed to alter perceptions of collective opinions? Examine the theories of communication, psychology, political science, and sociology that underlie these dynamic questions. We'll consider cutting-edge approaches used by market researchers, political analysts, and data scientists to harness new forms of data about what the public thinks. We investigate theories that explain how people form their opinions, deliberate with others, change their minds, and reveal their preferences, and we apply these frameworks to understand contemporary public opinion issues and campaigns.

JOUR 5541. Mass Communication and Public Health. (3 cr.; Student Option; Every Fall)
This course provides an overview of theory and research that lies at the intersection of mass communication and public health. We examine the potential for media exposure to influence public health outcomes, both as a product of people's everyday interactions with media and the strategic use of media messages to accomplish public health goals. To this end, we will explore large-scale public health campaigns in the context of tobacco, obesity, and cancer screening. We will also explore news media coverage of controversial health issues, such as the human papillomavirus (HPV) vaccine, and the impact of information in entertainment media, such as smoking in movies. This course seeks to understand whether media messages have had intended and/or unintended effects on public attitudes and behavior. Although our focus is on mass media, interpersonal, medical, and digital media sources will be considered as well.

JOUR 5542. Theory-based Health Message Design. (3 cr.; Student Option; Every Spring)
This course is designed to provide an overview of theory and research relevant for the design of health messages, and specifically focuses on how such theory and research informs message design. It builds on social and behavioral science approaches to public health communication and media effects with the primary objective to better understand issues and strategies related to the design of media health messages. Prerequisites: Jour 3005 or Jour 3757 or Jour 5541

JOUR 5543. Public Health Campaign Evaluation. (3 cr.; A-F or Audit; Every Fall)
Evaluate process and outcomes of message-based health interventions. Utilize campaign evaluation literature. Develop recommendations for evaluation research design based on cross-sectional, experimental, and time-based designs. Focus on evaluation options within constraints.

JOUR 5552. Law of Internet Communications. (3 cr.; A-F or Audit; Every Spring)
Digital communication technologies continue to raise a variety of legal issues, including whether and how (and which) traditional media and regulatory laws will apply, and how policy should be applied through regulatory law to enhance and regulate that communication. This course is conducted as a seminar, with an open discussion of legal precedent and the influence of policy on internet and digital communications. This course covers the First Amendment as it applies in a digital era as well as regulatory topics like net neutrality, broadband access, privacy, and copyright.

JOUR 5601W. History of Journalism. (WI; 3 cr.; Student Option; Every Spring)
What is (real/fake) news? Who's a journalist? What is journalism? How did we get to where we are today regarding journalism both as a profession and as an essential tool of democracy? Learn the fundamental chronology of the development of journalism in the United States from the Revolution to today, and then delve into the big quandaries: How free has journalism been? What have been its professional standards? How has journalism affected a diverse audience? What are the challenges of international journalism? And how have new communication technologies interacted with journalism?

JOUR 5606W. Literary Aspects of Journalism. (WI; 3 cr.; Student Option; Every Spring)
Journalism isn't fiction. Yet the relationship between what is true and what is artfully constructed toward a "larger truth" -- beyond the facts -- has a complex and intriguing history. This writing-intensive course explores that relationship through close readings of some of the best writers of long-form nonfiction, starting with the birth of the novel from journalistic roots in the 18th century and ending with postmodern forms that challenge the notion of what we can ever know. Discover the literary devices used by Stephen Crane's reported street scenes or Nellie Bly's first-hand investigations into conditions for the mentally ill in the 19th century, and, later, Truman Capote's nonfiction novel about a Kansas farm family's murder. Readings include works by pivotal 20th-century writers such as John Hersey, Joseph Mitchell, Lillian Ross, Michael Herr, Norman Mailer, Gay Talese, Joan Didion, Tom Wolfe, and Hunter S. Thompson, and we will trace how their pioneering methods influenced contemporary journalism as well as the documentary films of Errol Morris and contemporary nonfiction writers expanding into new forms.

JOUR 5725. Management of Media Organizations. (3 cr.; Student Option; Every Fall)

JOUR 5777. Contemporary Problems in Freedom of Speech and Press. (3 cr.; A-F only; Every Fall)
Most of us use devices like Smartphones, GPS, streaming services, or hands-free speakers like Amazon's Echo that connect to online voice services like Alexa without thinking about them very much. But, what kind of information are they collecting? Are merchants allowed to gather your shopping history and use it to send you targeted advertising, or to sell it to other companies for profit? Should other people be able to post your personal information or photos online without your consent? Can the government read your emails, track your online browsing, or intercept your text messages? This course considers how growing concerns about privacy and national security affect the First Amendment and the rights of journalists to gather and report the news. We will read significant court decisions and take a look at current statutory and regulatory initiatives both in the United States and abroad. You can expect lively debates and discussion, and the opportunity to explore a privacy or national security issue in depth in a substantial research paper.

JOUR 5993. Directed Study. (1-3 cr. [max 6 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Directed study/projects. Prereq [Jour major or minor or approved IDIM major or ICP major or BIS major]. GPA of at least 3.00, college consent, dept consent, instr consent.

JOUR 8001. Studies and Theories of Mass Communication. (3 cr.; A-F or Audit; Every Fall)
Introduction to key concepts, theories, methods in study of mass communication from social sciences perspective. Survey of research literature using individualistic/structural approaches.

JOUR 8002. Studies in Mass Communication II. (3 cr.; A-F or Audit; Every Spring)
Literature on history of the field, cultural and humanistic approaches to its study, and legal and ethical issues. prereq: 8001
JOUR 8003. Digital Media Issues and Theories. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Nonprofessional skills courses. Prepares entering graduate students to work in changing media environment. Political, social, economic, legal, ethical, technological implications nationally/globally. Produce scholarly research about changing media. prereq: Journalism grad student

JOUR 8009. Pro-seminar in Mass Communication. (1 cr.; S-N only; Every Fall)
Introduction/socialization to scholarly discipline of mass communication, mass communication pedagogy, pathways to successful career. Develop action plan for completing graduate school/starting career in academy or relevant communication industries. prereq: Grad students enrolled in Mass Communication MA or PhD program

JOUR 8191. Health Journalism: Introduction to Health and Medical Journalism. (3 cr.; A-F or Audit; Every Fall)
Best practices in health/medical reporting in different formats/media. Story ideas that challenge conventional wisdom about health care. Elements of health beat. Narrative/ investigative styles of journalism. Students do semester-long project. prereq: Enrolled in MA in health journalism or instr consent

JOUR 8192. Advanced Health Journalism: Computer-Assisted Reporting on Health. (3 cr.; A-F or Audit; Every Spring)
How to use data/databases to tell health news stories or help with health campaigns. Databases, how to access them. How to mine data for effective communication to consumer audience. prereq: Enrolled in MA in health journalism or instr consent

JOUR 8193. Health Communication Capstone. (3 cr.; A-F or Audit; Every Spring)
Focus on different aspects of a health issue, audience, context, and message mix that is central to the Health Communication M.A. program. Develop a final project focusing on a health communication topic of interest. Projects would be a publishable article, research paper, multimedia production, or any other format relevant for the chosen topic. Project is accompanied by a reflection paper.

JOUR 8194. Health Communication Practicum. (3 cr.; A-F or Audit; Every Summer)
Field-based practicum for students enrolled in the Health Communication M.A. program. Work with a local non-profit or for profit organization in the health care domain. Participatory observation study: work with organization staff on a strategic communication project and use experiences to analyze how message, audience, and context design processes take place in professional health communication settings.

JOUR 8200. Strategic Communication Research Methods. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Concepts, analytical techniques, and methods to analyze audiences, target markets, and social trends affecting communication strategy in context of complex and rapidly changing media environments. prereq: Strat Comm MA grad major

JOUR 8201. Factors Affecting Communication Strategy. (3 cr.; A-F only; Every Fall, Spring & Summer)
Literature/research concerning identification/analysis of the media and environmental, regulatory, competitive, and economic factors that affect the development of communication strategy. prereq: Strat Comm MA grad major

JOUR 8202. Generation and Selection of Communication Strategies. (3 cr.; A-F only; Every Fall, Spring & Summer)
Concepts/methods to support analytic/creative processes that lead to development of breakthrough communication strategies. Criteria for selecting among strategic alternatives. prereq: Strat Comm MA grad major

JOUR 8203. Integration of Communication Strategies Across Media. (3 cr.; A-F only; Every Fall, Spring & Summer)
Concepts, analytical techniques, and methodologies used to plan communication strategies and implement communication campaigns utilizing a diverse range of media. prereq: 8200, 8201, 8202, strat comm MA grad major

JOUR 8204. Measuring the Effectiveness of Strategic Communication Campaigns. (3 cr.; A-F only; Every Fall, Spring & Summer)
Examination, evaluation, and application of concepts/methods to evaluate effectiveness of strategic communication campaigns and their components. prereq: 8203, Strat Comm MA grad major

JOUR 8205. Cases in Strategic Communication. (3 cr.; A-F only; Every Fall, Spring & Summer)
Case study analysis concerning development, implementation, and evaluation of communication campaigns. Cases cover broad range of organizations, focus on such issues as brand introduction, brand reinforcement, revitalizations, crisis communication, issues management, and legal/ethical considerations. prereq: 8203, strat comm MA grad major

JOUR 8206. Directed Study: Development of an Integrated Strategic Communication Campaign. (3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Project to develop a case study analysis concerning development, implementation, and evaluation of a strategic communication campaign. prereq: 8205, strat comm MA grad major

JOUR 8290. Special Topics in Strategic Communication. (3 cr.; A-F only; Every Summer)
Topics specified in Class Schedule. prereq: Strat Comm MA grad major

JOUR 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prerequisites: Master’s student, adviser and DGS consent

JOUR 8442. Seminar: Broadcast News. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Major issues. Confrontations between federal government and network news departments. Historical studies. prereq: 4442 or instr consent

JOUR 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prerequisites: Doctoral student, adviser and DGS consent

JOUR 8501. Seminar: The Process of Quantitative Mass Communication Research. (3 cr.; A-F or Audit; Every Fall)
Logic of social sciences research. Relationship between theory and research, concept explanation, measurement, instrumentation, and design issues. prereq: 9 cr soc sci, EPsy 5260 or equiv or concurrent registration is required (or allowed) in EPsy 5260

JOUR 8502. Seminar: Multi-method research in Mass Communication. (3 cr.; A-F or Audit; Every Spring)
Quantitative/qualitative research principles/techniques applied to mass communication and kindred questions. Reliability, generalizability, and validity in their classic/contemporary senses. Survey methods, focus groups, interviews, other methods. Emphasizes "triangulation" of diverse methods. prereq: 8501, EPsy 5260 or equiv or concurrent registration is required (or allowed) in EPsy 5260

JOUR 8503. Seminar: Qualitative Methods in Mass Communication Research. (3 cr.; A-F or Audit; Every Spring)
Qualitative research methodology/data analysis techniques used in field of mass communication. How to conduct qualitative research to address questions related to mass communication. Ethnography, interviews, focus groups, case study, qualitative content analysis, historical research. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8504. Seminar: Analyzing Media Content. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Methods of analyzing media content/application of methods to theoretically-driven studies of media content. Conceptual/methodological issues surrounding analyzing media content in today's contemporary digital media environment, including collecting social media data, computer-aided analyses. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8513. Seminar: Ethnographic Methods in Mass Communication Research. (3 cr.; A-F or Audit; Every Spring)
Theoretical foundations in anthropology/sociology. Field projects. prereq: [8001, 8002] or instr consent; same as Anth 8810

JOUR 8514. Seminar: Advanced Mass Communication Theories. (3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Spring)
Research paradigms, concepts, findings for developing general theory of mass communication. prereq: 8001
JOUR 8601. Seminar: Methods in Mass Communication History Research. (3 cr.; A-F or Audit; Every Fall & Spring) Critical analysis of research in journalism/communication history. Research designs/methods. Development of a research project. prereq: 8001, 8002


JOUR 8603. Seminar: Theories and Models in Mass Communication History Research. (3 cr.; A-F or Audit; Periodic Fall & Spring) Literature on theory in historical research. Uses of theoretical models in historical explanations. Role of theory in historical research, debate about uses. Specific works in journalism/communication history in context of theoretical models. Development of major paper examining models/theories relevant to student's project. prereq: 5601, instr consent

JOUR 8620. Seminar: Advertising Theory and Research. (3 cr.; max 12 cr.) A-F or Audit; Periodic Fall & Spring) Advertising as persuasive communication. Current research/theory related to advertising decision-making process. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8621. Seminar: Public Relations Theory and Research. (3 cr.; A-F only; Periodic Fall & Spring) Study of theoretical body of knowledge in public relations field. Diverse roles played by public relations in organization. Current state of public relations research in regard to theory building. How theory informs professional practice of public relations. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8650. Seminar: Psychology of Media Effects. (3 cr.; A-F only; Periodic Fall & Spring) In-depth study of psychological concepts/theories concerning individual cognitive processing of content of both traditional/new electronic media. Critically evaluate latest empirical research concerning how individuals respond to the content of both traditional mass media/newest electronic digital media. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8651. Seminar: Mass Communication, Audiences, and Society. (3 cr.; A-F or Audit; Periodic Fall & Spring) Interplay between social theories/media studies. Pragmatism, structural-functionalism, Marxism, political economy, cultural studies, globalization. prereq: 8001 or 8002 or equiv

JOUR 8661. Seminar: Mediated Political Communication in the Digital Age. (3 cr.; A-F or Audit; Every Fall) Mediated political communication in the digital age. How news, advertising, and entertainment media shape political perceptions, motivate voters, and influence policy decisions. Agenda-setting, priming, and framing, networked communications, micro-targeting, and mobile technology.

JOUR 8662. Seminar: Literary Aspects of Journalism. (3 cr.; A-F or Audit; Periodic Fall & Spring) Research in literary aspects of journalism exemplified in careers/works of American/British writers. prereq: 5606

JOUR 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) td prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

JOUR 8671. Seminar: Communication Ethics--Public/Civic Journalism. (3 cr.; A-F or Audit; Periodic Fall & Spring) Historical underpinnings, philosophical debate, theoretical dynamics, legal concerns, ethical implications.

JOUR 8673. Seminar: Media Management. (3 cr.; A-F or Audit; Periodic Fall & Spring) Management issues in media organizations. Relation to dynamics of organization structure, employees, markets, economics/finances. prereq: 5725 recommended

JOUR 8675. Seminar: Issues in Information Access and Communication. (3 cr.; A-F or Audit; Periodic Fall) Societal, industry, technological, and policy aspects/developments that affect information access, particularly through mass media. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8676. Seminar: Constitutional Law--Theories of Freedom of Expression. (3 cr.; A-F or Audit; Every Spring) Problems of constitutional/tort law affecting the press. Underlying theories. prereq: 5777 or instr consent or law student

JOUR 8679. Seminar: Research Methods in Media Ethics and Law. (3 cr.; A-F or Audit; Periodic Fall & Spring) Research at intersection of first amendment and media ethics.

JOUR 8681. Seminar: International Media Perspectives. (3 cr.; A-F or Audit; Periodic Fall & Spring) Main problems/currents. Concepts, research, policy relevant to global development. Issues of freedom/constraint, media technology, role of journalism in world affairs.

JOUR 8720. Seminar: Mass Media and Health. (3 cr.; A-F only; Periodic Fall & Spring) Theories, methods, research that characterize field of health communication. Mass media influence on health, including use of mass media to promote health behaviors. Theoretical frameworks that inform health communication scholarship, as well as methodological approaches to studying health communication issues. prereq: Grad students enrolled in Mass Communication MA or PhD program or instr consent

JOUR 8721. Seminar: Communication Agencies as Social Institutions. (3 cr.; A-F or Audit; Every Fall & Spring) Influence/effects of mass communication, internal dynamics of media organizations, criticism/models of reform. Theoretical frameworks for analysis.

JOUR 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required (Plan A only)

JOUR 8801. Seminar: Comparative Research in Mass Communication, a Cross-National Approach. (3 cr.; A-F or Audit; Periodic Fall & Spring) Comparative research designs/strategies. Analysis of production, presentation, transmission, and consumption of mass media products/services (particularly news, entertainment, and information) across national borders. Theoretical concerns, empirical problems, policy. Ethical issues involving research on form/content of mass communication within/between countries. prereq: 4801 or 5825

JOUR 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

JOUR 8890. Special Problems in Mass Communications. (3-4 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Topics specified in Class Schedule. prereq: Mass comm grad student or instr consent

JOUR 8893. Directed Study. (1-6 cr.; A-F or Audit; Every Fall, Spring & Summer) Directed study. prereq: Grad mass comm major or minor, instr consent, dept consent

Kenya (KNYA)

KNYA 1211. Beginning Swahili I. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

KNYA 1222. Beginning Swahili II. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

KNYA 3001. Engineering in the Developing World. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

KNYA 3002. Intercultural Perspectives on Work. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

KNYA 3225. Intermediate Swahili I. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

KNYA 3226. Intermediate Swahili II. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
KIN 1050. Beginning Military Physical Fitness Training. (1 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring) The Army's model of physical fitness training is used to address five aspects of fitness in the context of running, weight training, strength exercise, circuit training, and team sport activities. Students are organized into groups of similar fitness levels.

KIN 1871. Survey of Kinesiology, Recreation, and Sport. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Professional practice and disciplinary dimensions of kinesiology, recreation, and sport. Subdisciplines, relevant issues, practical applications.

KIN 3001. Lifetime Health and Wellness. (SOCS; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Overview of health/wellness. Physical, emotional, intellectual, spiritual, social, environmental, and financial health. Influence of societal changes on general health/wellness of diverse populations.

KIN 3027. Human Anatomy for Kinesiology Students. (3 cr.; A-F or Audit; Every Spring) Introduction to human anatomy. Emphasizes musculoskeletal anatomy germane to athletic training, biomechanics, exercise physiology, motor learning/development.

KIN 3050. Advanced Military Physical Fitness Training. (1 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring) Students take on leadership roles in implementing Army's model of physical fitness training. Model addresses five aspects of fitness in the context of running, weight training, strength exercise, circuit training, and team sport activities. prereq: 4 cr of 1050 or instr consent

KIN 3112. Introduction to Biomechanics. (4 cr.; A-F only; Every Fall, Spring & Summer) Mechanical principles governing human motion. Human bone, muscle, and neurophysiology. Measurements of human performance. Clinical/applied sport biomechanics. Lab introduces technology for assessing human motor function such as electromyography or force sensors. prereq: PHYS 1101W or PHYS 1201W or PHYS 1301W or PHYS 1401L or 1107, [3027 or 3111 or ANAT 3001 or ANAT 3601 or ANAT 3611 or INMD 3001 or INMD 3601]; 3385 recommended

KIN 3114. Prevention and Care of Athletic Injuries. (3 cr.; A-F only; Every Fall, Spring & Summer) Principles in athletic training for prevention/ care of injury. Taping/bracing techniques. Lab. prereq: [3027 or ANAT 3001 or ANAT 3601 or ANAT 3611 or equiv]; CEHD student or instr consent

KIN 3126W. Sport and Exercise Psychology. (WI; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Thoughts, feelings, and behaviors of people in physical activity contexts. Foundations approach to theory/research in sport and exercise psychology. prereq: Kin major or instr consent

KIN 3131W. History and Philosophy of Sport. (WI; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Introductory description and interpretation of the historical and philosophical development of physical education and sport from primitive societies to 20th century civilization. prereq: Kin major or instr consent

KIN 3132. Introduction to Motor Development Across the Lifespan. (3 cr.; A-F only; Every Spring & Summer) Developmental aspects of human movement behavior/learning. Life span change of motor skills. prereq: Kin major or instr consent

KIN 3135. Introduction to Motor Learning and Control. (3 cr.; A-F or Audit; Every Fall & Spring) Main theoretical ideas/research that have advanced motor control/learning over last three decades.

KIN 3136. Mental Skills Training for Sport. (3 cr.; A-F only; Every Fall & Spring) Experientially-based course. Using mental skills training strategies (e.g., imagery, goal setting, relaxation, cognitive restructuring, motivation) for enhancing sport performance and personal growth of athletes.

KIN 3138. Teaching Physical Education in the Elementary School. (2 cr.; A-F only; Periodic Fall & Summer) Coaching theory and skill development necessary to coach track and field. prereq: [Enrolled in coaching program or Kin major or instr consent], skills sufficient for participating in drills/game/match/test for demonstration/teaching purposes.

KIN 3139. Track and Field Coaching Theory and Skill Development. (2 cr.; A-F only; Every Fall) Coaching theory and skill development necessary to coach track and field. prereq: [Enrolled in coaching program or Kin major or instr consent], skills sufficient for participating in drills/game/match/test for demonstration/teaching purposes.

KIN 3327. Teaching Physical Education in the Elementary School. (2 cr.; A-F only; Every Fall & Spring) KIN 3327 addresses inquiry, research, and reflection through class projects, reading assignments, discussions, and team-teaching. Inquiry is addressed as classroom teachers review several sources in order to formulate a philosophy about physical education and its importance in the lives of the students they teach. Research takes place as students delve into current curriculum practices, methodology and strategies as well as knowledge of age level characteristics and developmentally appropriate activities. Reflection is twofold as student's team-teach a variety of lessons. Students must present post reflective comments on their own teaching as well as offering positive comment as peers present physical education lessons. This course is activity based and is designed to give the classroom teacher the ability to teach elementary physical education with age appropriate, energizing activities. We will be utilizing the classroom and the gymnasium for instruction and team-teaching. Gymnasium classes will be active, experiencing current curriculum ideas and methodology. As classroom teachers, please realize the importance of physical education to the total school curriculum including the health, social, and emotional benefits for the child.

KIN 3385. Human Physiology. (4 cr.; A-F or Audit; Every Fall, Spring & Summer) Functional/integrative approach organized by level of description, from molecular genetics to dynamic movement/clinical conditions. Cellular mechanisms for major physiological functions.
Exercise, fitness, health, growth. prereq: [(KIN 3027 or ANAT 3001 or ANAT 3601 or ANAT 3611], KIN major) or instr consent

KIN 3505. Intro to Human-Centered Design. (; 3 cr.; Student Option; Every Fall) Application of design to meet human needs. Design of fabricated products, tools/machines, software/hardware interfaces, art/culture, living environments, and complex sociotechnical systems.

KIN 3696. Supervised Practical Experience. (; 1-10 cr.; S-N only; Every Fall, Spring & Summer) On-the-job supervised practical experience in the fields of sport and exercise under a specialist in a particular area of study or emphasis. prereq: instr consent

KIN 3720. International Studies in Kinesiology. (2-4 cr. [max 12 cr.]; Student Option; Periodic Fall, Spring & Summer) Topics from research exploration, to academic and engagement activities. Delivered in an international setting. Course requirements are determined by instructor(s) and reflect advanced undergraduate rigor. prereq: instr consent

KIN 3982. Research Methods in Kinesiology. (; 3 cr.; A-F only; Every Fall, Spring & Summer) How to understand/interpret/read research. Research question, study design, quantitative/qualitative methods. Instrumentation, statistical methods, study limitations/implications. Critiquing peer-reviewed articles. Designing a research study. prereq: KIN major or instr consent

KIN 3993. Directed Study in Kinesiology. (; 1-10 cr.; A-F only; Every Fall, Spring & Summer) Students work with faculty and graduate students on research or scholarly/creative activities. Students usually assist with faculty scholarship or carry out projects of their own under faculty supervision. prereq: instr consent

KIN 3993H. Directed Study in Kinesiology: Honors. (; 1-10 cr.; A-F only; Every Fall, Spring & Summer) Student-selected clinical or research experience. prereq: KIN honors, instr consent

KIN 4001H. Honors Seminar in Kinesiology. (; 3 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) Contemporary issues in kinesiological research. Laboratory rotations, development of UROP project proposal, development of senior thesis topic, advanced study, career opportunities in Kinesiology, special learning opportunities. prereq: Kinesiology honors

KIN 4133. Perceptual-Motor Control and Learning. (; 3 cr.; A-F or Audit; Every Fall & Spring) Concepts/principles of coordination/control of perceptually guided movement. Constraints imposed by properties of environment, body (including the nervous system), and goals of behavior. Why we move the way that we do. prereq: [3112, 3132, 3135, KIN major] or instr consent

KIN 4134. The Aging Motor System. (3 cr.; A-F only; Every Fall & Spring) Impact of aging on the motor system and its influence on activities of daily living (ADL); posture, falls, participation in physical activity, performance operating personal transportation systems. Effects of aging (behavioral and biological) on coordination/control and its related perceptual-cognitive correlates. prereq: [3132, 3135, KIN major] or instr consent

KIN 4136. Embodied Cognition. (3 cr.; A-F only; Every Fall & Spring) Introduction to relations between physical behavior/mental activity. Cognitive, emotional, social aspects. Concepts of embodied cognition, their relation to traditional concepts of mind/body. Lifespan development, empirical research. prereq: 3132 or 3135 or instr consent

KIN 4214. Health Promotion. (3 cr.; A-F only; Every Fall & Spring) Behavioral and environmental theories of health promotion. How to develop and evaluate programs. Smoking cessation, asthma management programs. Students develop a health promotion program for their class project.

KIN 4385. Exercise Physiology. (; 4 cr.; A-F only; Every Fall, Spring & Summer) Effects of exercise on physiological systems of human body. Energy/nutritional requirements of exercise, exercise prescription, athletic conditioning, ergogenic aids, exercise in environmental extremes, gender/heritability factors related to adaptation to training. prereq: [3385 or PHSL 3051, or equiv], KIN major) or instr consent

KIN 4441. Movement Neuroscience. (3 cr. [max 6 cr.]; A-F only; Periodic Fall) Neural basis of human motor function. Neuroanatomy and neurophysiology of motor control and learning. Seminar for students in kinesiology, neuroscience, physical therapy, psychology, psychology, bioengineering, and human movement science. prereq: 3135 or instr consent

KIN 4520. Current Topics in Kinesiology. (; 2-4 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Issues in kinesiology or in areas not normally available through regular curriculum offerings. prereq: Upper div in KIN or REC or SMGT or coaching or instr consent

KIN 4641. Training Theory & Analytics I for Sport Performance. (3 cr.; A-F only; Every Fall & Spring) Course prepares students to systematically design training & conditioning programs for performance, specific to speed, power, reaction & agility. This course utilizes periodization models with expected physiological & neuromuscular adaptations to maximize human performance in sport, dance, public safety and military elites. prereq: KIN 4641, [upper level undergrad or M.Ed. or grad student]

KIN 4741. Training Theory & Analytics II for Sport Performance. (3 cr.; A-F only; Every Fall, Spring & Summer) Course prepares students to systematically design training & conditioning programs for performance, specific to speed, power, reaction & agility. This course utilizes periodization models with expected physiological & neuromuscular adaptations to maximize human performance in sport, dance, public safety and military elites. prereq: KIN 4641, [upper level undergrad or M.Ed. or grad student]

KIN 5001. Foundations of Human Factors/ Ergonomics. (; 3 cr.; A-F or Audit; Every Fall) Variability in human performance as influenced by interaction with designs of machines and tools, computers and software, complex technological systems, jobs and working conditions, organizations, and sociotechnical institutions. Emphasizes conceptual, empirical, practical aspects of human factors/ergonomic science.

KIN 5104. Physical Activities for Persons with Disabilities. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Different approaches to providing physical education service and related movement interventions for persons with disabilities. Topics: movement behavior foundations, movement skill progressions, unique considerations for specific impairments, and sport for persons with disabilities

KIN 5111. Sports Facilities. (; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Steps in planning/building facilities for athletics, physical education, and sport for college, professional, and public use. prereq: KIN or Rec grad student or MEd student

KIN 5115. Event Management in Sport. (; 3 cr.; A-F or Audit; Every Spring & Summer) Techniques/principles of planning, funding, and managing sport events. Collegiate championships, non-profit events, benefits, professional events. prereq: Grad student, instr consent

KIN 5122. Applied Exercise Physiology. (; 3 cr.; A-F or Audit; Periodic Fall) Mechanisms of cardiorespiratory and muscular responses to exercise; application of exercise physiology to assessment of work capacity, athletic conditioning, and requirements of human powered vehicles; low to moderate exercise as an intervention in lowering risk for common health problems. prereq: 4385 or equiv or instr consent

KIN 5123. Motivational Interventions in Physical Activity. (; 3 cr.; A-F or Audit; Every Fall & Spring) Psychological principles related to physical activity (PA). Delivery of motivational interventions for physical activity. Motivational PA interventions. Two papers, one presentation, two exams. prereq: 3126W or grad student
KIN 5125. Advances in Physical Activity and Health. (3 cr.; A-F only; Periodic Fall & Spring)
This course exposes students with accurate and up-to-date information regarding physical activity as it relates to health in the United States. It is intended to enhance students' ability to identify important issues pertinent to physical activity and health, as well as develop and maintain a physically active lifestyle. Credits will not be given if taken as KIN 5720 with the same title.

KIN 5126. Social Psychology of Sport & Physical Activity. (3 cr.; A-F only; Every Fall & Spring)
Theory/research on social influences, individual differences, motivational processes. How sport/ physical activity contribute to psycho-social development. Social psychological factors influencing physical activity beliefs/behaviors. prereq: 3126W or equiv or grad student or instr consent

KIN 5136. Psychology of Coaching. (3 cr.; Student Option; Every Fall, Spring & Summer)
Psychological dimensions of coaching across age levels, including coaching philosophy, leadership, communication skills, motivation, and mental skills training for performance enhancement.

KIN 5141. Nutrition and Exercise for Health Promotion and Disease Prevention. (3 cr.; A-F only; Every Fall)
Requirements/physiologic roles of nutrients/ physical activity in promotion of health. Assessment of energy requirements. RDAs, food composition/safety, weight management. Prevention of chronic diseases. Coronary heart disease. prereq: FScH 1112 or equiv

KIN 5142. Applied Nutrition for Sport Performance and Optimal Health. (3 cr.; A-F only; Every Spring)
This course is designed for students interested in nutrition as it relates to health, exercise and athletic training. Evidenced based information is used to apply current nutrition concepts to improve health, physical and athletic performance. Case studies as well as personal data are employed throughout course to support concepts of lecture.

KIN 5152. Curriculum Development in Physical Education. (2 cr.; A-F or Audit; Every Spring)
Trends, issues, and challenges in early childhood/K-12 physical education. Potential effect on curriculum. prereq: initial licensure/ MEd phys ed student

KIN 5181. Understanding Kinesiology Research. (3 cr.; A-F only; Every Fall)
Prepares students to critically analyze research specific to kinesiology. prereq: Intro statistics recommended

KIN 5196. Practicum: Developmental/Adapted Physical Education. (1-4 cr.; S-N only; Every Fall & Spring)
Observation of, participation in physical education instruction for students with disabilities. Current issues in developmental/ adapted physical education. Exchange of ideas/problems. prereq: [5103 or 5104], instr consent

KIN 5201. Health Education Foundations. (3 cr.; A-F only; Every Summer)

KIN 5202. Current Issues in Health. (2 cr.; A-F only; Every Summer)
Critical thinking for health issues in research/ media. Issues specific to conflict, stress, public policy, and communication. Projects, debates.

KIN 5203. Health Media, Consumerism, and Communication. (2 cr.; A-F only; Every Spring)
Effects of media, consumerism, technology, and health related issues. Students form/ defend opinions on positive/negative aspects of how health information is disseminated and how individual health decisions are made.

KIN 5204. Methods in Health Education. (3 cr.; A-F only; Every Fall)
Background knowledge/skills to deliver comprehensive health education program. Techniques, skills, and methods for teaching active learning projects. Lessons/units in health curriculum discussed/demonstrated. Focuses on grades 5-12. prereq: Health licensure student or instr consent

KIN 5205. Health Education Curriculum. (3 cr.; A-F only; Every Fall)
Curriculum development in health education. Trends in society. How they impact teaching of health curriculum. Culminates in written curriculum for grades 5-12. prereq: Health licensure student or instr consent

KIN 5235. Advanced Biomechanics II: Kinetics. (3 cr.; A-F or Audit; Spring Odd Year)
Kinetic aspects of human movement (single/ multi-joint torques, simple inverted pendulum models, mass-spring systems). Analysis of experimental data and of computer simulations. Lectures, seminars, lab. prereq: [3112 or equiv]. PMed 5135, undergrad college physics, intro calculus

KIN 5371. Sport and Society. (3 cr.; A-F or Audit; Every Spring)
Sport, sporting processes, social influences, systems. Structures that have effected and exist within/among societies, nations, and cultures. Contemporary issues such as social differentiation, violence, and honesty. prereq: [3126W, grad student] or instr consent

KIN 5375. Youth Sport Science. (3 cr.; A-F only; Every Spring)
Cognitive, behavioral, and biological factors having important implications for competitive sport participants from early childhood through high school age. Emphasis on translating sport science research into practical implications for youth sport coaches, teachers, and administrators.

KIN 5385. Exercise for Healthy Aging & Disease Prevention and Management. (3 cr.; A-F only; Every Spring)
Exercise testing/prescription with modifications required because of special considerations associated with aging, gender differences, or presence of medical conditions. prereq: Physiology or biology undergrad

KIN 5421. Sport Finance. (3 cr.; A-F or Audit; Every Fall)
Introduction to financial analysis in sport. Cash flow statements, budgeting issues, traditional/ innovative revenue producing strategies available to sport organizations. Discussion, practical analysis of current market. prereq: Grad student or instr consent

KIN 5435. Advanced Theory and Techniques of Exercise Science. (3 cr.; A-F only; Every Spring)
Theoretical constructs, in-depth description of procedures used in exercise science research and clinical settings. Laboratory exercises, lectures. prereq: [3385, 4385, Kin major] or instr consent

KIN 5441. Applied Sport Science Research. (3 cr.; A-F only; Every Fall, Spring & Summer)
Introduction to varied contributions of sport sciences to athletic performance. Evaluation of historical research's contributions toward modern day research questions.

KIN 5461. Issues in the Sport Industry. (3 cr.; A-F only; Every Fall)
Critical analysis of management issues within sport industry. Strategic management, corporate social responsibility, human resource management/diversity, governance, sport globalization, sport development. prereq: postbac or grad student or instr consent

KIN 5485. Advanced Electrocardiogram Interpretation. (3 cr.; A-F only; Every Fall)
Placement and interpretation. Clinical exercise testing hands-on experience in electrocardiogram for resting and exercise testing situations. prereq: [3385, 4385] or instr consent

KIN 5505. Human-Centered Design - Principles and Applications. (3 cr.; A-F only; Every Fall)
Application of design to meet human needs. Design of fabricated products, tools/machines, software/hardware interfaces, art/culture, living environments, and complex sociotechnical systems.

KIN 5511. Sport and Gender. (3 cr.; A-F only; Every Fall)
Critically examines women's involvement in/ contributions to sport, physical activity, and leisure.

KIN 5585. Pediatric Physiology and Health: Concepts and Applications. (2 cr.; A-F only; Every Summer)
Current understanding of pediatric medicine and exercise physiology. Use of physical activity and weight management in the treatment of various diseases (i.e. obesity) that affect children and adolescents. prereq: 3385 or 4385

KIN 5601. Sport Management Ethics and Policy. (3 cr.; A-F or Audit; Every Spring)
How to critically analyze ethical concepts that underpin or inform sport policies and evaluate sport policies from a normative point
of view. Selected sport policy issues are used to illustrate relevance of ethical considerations in policy development and to explore the ethical implications of sport policy. prereq: MEd or grad student or instr consent

KIN 5631. Programming and Promotion in Sport. (3 cr.; A-F or Audit; Every Fall & Spring)
Introduction to marketing concepts as they apply to sport industry. Consumer behavior, market research, marketing mix, corporate sponsorship, licensing. Discussion, practical application. prereq: Kin or Rec grad student or instr consent

KIN 5641. Scientific Theory and Application of Training and Conditioning in Sport. (3 cr.; A-F only; Every Spring & Summer)
Current scientific literature on physiological adaptation through training/conditioning for sport. Applying methods in research journals to improve physiological adaptation through training/conditioning with sport specificity. prereq: 4385 or SPST 3641 or SPST 4641 or exercise physiology course or instr consent

KIN 5643. Applied Motion Capture and Movement Analysis Technology. (3 cr.; A-F only; Every Fall)
Course provides students with the knowledge and tools to effectively analyze human movement patterns in a wide variety of field-based settings, such as assessing sport performance or measuring movement deficits after injury. Students will comprehend the basic, underlying components of movement and movement deficits. It is strongly suggested students have taken Physics, Biomechanics, and Human Anatomy. Credit will not be received if taken KIN 5720: Special Topics in Kinesiology with the topic title, Sport Movement Analysis.

KIN 5696. Practicum in Kinesiology. (1-6 cr.; S-N only; Every Fall, Spring & Summer)
Practical experience in kinesiology under supervision of a University faculty member and an agency supervisor. prereq: [Kin MEd or grad student], instr consent

KIN 5720. Special Topics in Kinesiology. (2-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Current issues in broad field and subfields in kinesiology, or related coursework in areas not normally available through regular offerings.

KIN 5723. Psychology of Sport Injury and Rehabilitation. (3 cr.; A-F only; Every Fall)
Psychosocial factors of risk factors preceding sport injury, responses to the occurrence of sport injury, and the rehabilitation process. Lecture, discussion, guest lecture, interviews, and presentation experience. prereq; Intro psych course

KIN 5725. Organization and Management of Physical Education and Sport. (3 cr.; A-F only; Every Spring & Summer)
Comprehensive analysis of organization and management of physical education and sport in educational settings. Focus on management and planning processes, management skills, functions, roles, decision making, leadership, shared systems, and organizational motivation. For physical education teachers, coaches, community sport administrators. prereq: Grad/ initial licensure or instr consent

KIN 5801. Legal Aspects of Sport and Recreation. (4 cr.; A-F only; Every Fall & Spring)
Legal issues related to recreation, park, and sport programs/facilities in public/private sectors.

KIN 5804. National Collegiate Athletic Association (NCAA) Compliance. (2 cr.; A-F only; Every Spring)
Governance structure, policies, and procedures in intercollegiate athletics. Careers in college athletics as coach, administrator, athletic trainer, counselor, etc. prereq: [Upper div undergrad or grad student] in KIN, instr consent

KIN 5861. Elite Performance and Environmental Considerations. (3 cr.; A-F only; Every Summer)
An examination of elite athletic performance and the effects of environmental conditions on sport performance. Topics include altitude, heat and humidity, cold, wind, and other high stress environments. Students will investigate strategies such as nutrition/dehydration, training, and acclimatization. prereq: KIN 4385 or 4641 or instr consent suggested

KIN 5941. Clinical Movement Neuroscience. (3 cr.; A-F only; Periodic Spring)
Various neural subsystems involved in controlling human motor function. How injury and disease of the nervous system affects motor behavior. Possibilities for rehabilitation and treatment. Lectures, seminars, class presentations. prereq: [3027 or ANAT 3001 or ANAT 3601 or ANAT 3611 or equiv], [PHSL 3051 or equiv], [4441]

KIN 5981. Research Methodology in Kinesiology and Sport Management. (3 cr.; A-F only; Every Fall)
Defines/reviews various types of research in exercise/sport science, and physical education. Qualitative research, field studies, and methods of introspection as alternative research strategies to traditional scientific paradigm.

KIN 5987. Professional Skills and Grant Writing for Health Sciences. (2 cr.; Student Option No Audit; Spring Odd Year)
Introduction to structure/function of different organizations (e.g., NIH, AHA). Writing/ reviewing grants/manuals. Preparing for a job in academia. prereq: Grad student

KIN 5992. Readings in Kinesiology. (1-9 cr.; A-F only; Every Fall, Spring & Summer)
Independent study under tutorial guidance. prereq: [KIN upper div undergrad or MEd or grad student], instr consent

KIN 5995. Research Problems in Applied Kinesiology. (1-6 cr.; A-F only; Every Fall, Spring & Summer)
Selected topics in physical activity and human performance. prereq: [KIN upper div undergrad or MEd or grad student], 15 cr of major coursework [including 4981 or 5981], instr consent

KIN 6151. Theoretical Foundations of Curriculum and Instruction in Physical Education. (2 cr.; A-F or Audit; Every Summer)
Selection of effective instructional strategies/ assessment. Design, progression, and presentation of tasks in physical education curriculum. prereq: initial licensure/MEd phys ed student

KIN 6201. Clinical Experience I: Health Education. (1-4 cr.; A-F only; Every Spring)
Half-day supervised teaching in urban or suburban middle or high school health education setting.

KIN 6202. Clinical Experience II: Health Education. (2-6 cr.; A-F only; Every Spring)
Full-day supervised teaching in urban or suburban middle or high school health education setting. prereq: Health licensure student or instr consent

KIN 6521. Pedagogy I: Elementary Physical Education. (4 cr.; A-F or Audit; Every Summer)
Instructional components/knowledge structures for teaching/learning process of K-6 physical educator in diverse settings. prereq: initial licensure/MEd phys ed student

KIN 6522. Pedagogy II: Secondary Physical Education. (4 cr.; A-F or Audit; Every Summer)
Instructional components for teaching/learning process of grades 6-12 physical educator in diverse settings. prereq: initial licensure/MEd phys ed student

KIN 6596. Clinical Experience I: Physical Education. (4 cr.; S-N or Audit; Every Fall)
Half-day supervised teaching in an urban elementary school physical education setting. prereq: 6151, 6521, 6522, initial licensure/MEd phys ed student or instr consent

KIN 6597. Clinical Experience II: Physical Education. (1-4 cr.; A-F only; Every Spring)
Half-day supervised teaching in urban or suburban elementary, middle, or high school physical education setting. prereq: 6596, initial licensure/MEd phys ed student or instr consent

KIN 6598. Clinical Experience III: Physical Education. (2-6 cr.; A-F only; Every Spring)
Supervised teaching in urban or suburban elementary, middle, or high school physical education setting. prereq: [6597, init licensure/ MEd phys ed student] or instr consent

KIN 8001. Special Topics: Human Factors/ Ergonomics. (2-3 cr.; Student Option; Every Fall)

KIN 8002. Proseminar in Human Factors/ Ergonomics. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring)
Issues/concerns tailored to interests of faculty/students regarding human factors/ergonomics. Interaction of performance/behavior with design
KIN 8122. Seminar: Exercise Physiology. (2 cr. [max 8 cr.]; A-F only; Every Fall & Spring) Classic/contemporary literature in exercise physiology/allyed disciplines. Contributions of major leaders in field. Opportunities for interdisciplinary research. Spring semester students/faculty in exercise science present original research. prereq: 5122 or equiv or instr consent

KIN 8126. Sports Medicine Psychology. (3 cr.; A-F only; Periodic Spring) Advanced seminar course. Multidisciplinary contributors to sports medicine psychology. Theory, research, and practice in the behavioral/social aspects of injury prevention/experiences among physically active populations across the life span. prereq: Grad student or instr consent

KIN 8128. Doctoral Sport Management Seminar. (3 cr.; A-F or Audit; Periodic Fall & Spring) Analysis of current literature, theoretical constructs, research methodology and design relative to sport management. Focuses on student-selected topics, research problems. prereq: PhD student, instr consent

KIN 8132. Seminar: Motor Development. (3 cr.; A-F or Audit; Periodic Spring) Contemporary research literature on motor skill development from birth to senescence. Emphasizes interaction between physical/environmental/performer constraints. Coordination/control of movement. prereq: grad student or instr consent

KIN 8135. Seminar: Motor Control and Learning. (3 cr.; A-F or Audit; Periodic Spring) Advanced reading/discussion of research on motor control, motor learning, human performance. prereq: grad student or instr consent

KIN 8136. Developmental Sport and Exercise Psychology. (3 cr.; A-F or Audit; Every Fall & Spring) Sport and exercise psychology from a life span developmental perspective. Theoretical perspectives, self-perceptions, social influences, emotional development, motivational processes, self-regulation, development of expertise, moral development, sport injury, and gender and cultural diversity. prereq: Grad student or instr consent

KIN 8211. Seminar: Perception and Action. (3 cr.; A-F or Audit; Periodic Spring) Survey of theory/research on use of perceptual information for control of action. Behavioral research on perceptual guidance of daily activities (e.g., standing, walking, driving). Perceptual control in context of expertise (e.g., sports). Perceptual-motor development. prereq: grad student or instr consent

KIN 8285. Cellular and Molecular Exercise Physiology. (3 cr.; A-F only; Periodic Fall & Spring) This course emphasizes the cellular and molecular mechanisms in response to acute and chronic physical exercise. Biochemical pathways of regulating energy metabolism during exercise, change of gene expression as adaptation to altered diet, environmental factors and aging, and cellular oxidative/antioxidant homeostasis will be the main foci. The course will expose graduate students and advanced undergraduate students to current topics of biomedical issues affecting human health and wellbeing, modern techniques of exercise science research, and important research articles in literature. prereq: KIN 3385: Human Physiology and KIN 4385: Exercise Physiology; KIN 5122: Applied Exercise Physiology; college level chemistry. Suggested: organic chemistry, or instr consent Credits will not be given if taken as KIN 5720 with the same title.

KIN 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

KIN 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

KIN 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 24 cr.]; No Grade Associated; Every Fall, Spring & Summer) tbd prereq: Doctoral student who has not passed prelim oral; Dept consent required; No grade associated; 4 completions allowed; up to 24 combined cr.

KIN 8896. Internship: Applied Sport Psychology. (3-6 cr.; S-N or Audit; Periodic Fall & Spring) Supervised internship: emphasis on educational sport psychology approaches to athletic performance enhancement and psychological adjustment to sport injury. prereq: 5126, 8126, Kin PhD student, instr consent

KIN 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required (Plan A only)

KIN 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

KIN 8980. Graduate Research Seminar in Kinesiology. (1 cr. [max 9 cr.]; S-N only; Every Fall & Spring) Reporting/discussion of student/faculty research activity. prereq: KIN M.S. or Ph.D. or SMGT M.A. or instr consent

KIN 8995. Research Problems in Kinesiology. (1-12 cr.; S-N only; Every Fall, Spring & Summer) Individual scholarly research. prereq: Kin Ph.D. student or SMGT grad student or instr consent

KOR 1011. Beginning Korean I. (5 cr.; Student Option No Audit; Every Fall) Basic grammatical structure, vocabulary, expressions of modern colloquial Korean. Introduces Korean writing system.

KOR 1012. Beginning Korean II. (5 cr.; Student Option No Audit; Every Spring) Basic grammatical structure, vocabulary, expressions of modern colloquial Korean. prereq: 1011

KOR 3021. Intermediate Korean I. (5 cr.; Student Option No Audit; Every Fall) Speaking, reading, writing at intermediate level in modern colloquial Korean. Simple narration/written reports. Some basic Chinese characters may be introduced. prereq: 1012

KOR 3022. Intermediate Korean II. (5 cr.; Student Option No Audit; Every Spring) Speaking, reading, writing at advanced level in modern colloquial Korean. Narration/written reports. Introduction of additional basic Chinese characters. prereq: 3021

KOR 3031. Third Year Korean I. (4 cr.; Student Option No Audit; Every Fall) Speaking, reading, writing at advanced level in modern colloquial Korean. Narration/written reports. Further Chinese characters introduced. prereq: 3022

KOR 3032. Third Year Korean II. (4 cr.; Student Option No Audit; Every Spring) Speaking, reading, writing at advanced level in modern colloquial Korean. Narration/written reports. Further Chinese characters introduced. prereq: 3031

KOR 3290. Korean Language Teaching Tutorial. (1-3 cr. [max 12 cr.]; S-N only; Every Fall & Spring) Students tutor beginning students of Korean and are part of department's Korean language team. prereq: Grade of A in 3032

KOR 3993. Directed Studies. (1-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Directed study in topics of Korean literature, culture, language, or linguistics. Prereq instr consent, dept consent, college consent.

KOR 4001. Beginning Korean I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall) Basic grammatical structure, vocabulary, expressions of modern colloquial Korean. Introduces Korean writing system. Meets with 1011.

KOR 4002. Beginning Korean II for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring) Basic grammatical structure, vocabulary, expressions of modern colloquial Korean. Meets with 1012. prereq: 4001

KOR 4003. Intermediate Korean I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall) Speaking, reading, writing in modern colloquial Korean. Simple narration/written reports. Basic Chinese characters may be introduced. Meets with 3021. prereq: 4002. grad student
KOR 4004. Intermediate Korean II for Graduate Student Research. (5 cr.; Student Option No Audit; Every Spring)
Speaking, reading, writing at intermediate level in modern colloquial Korean. Narration/ written reports. Introduction of additional basic Chinese characters. Meets with 3022. prerequisite: 4003

KOR 4005. Third Year Korean I for Graduate Student Research. (4 cr.; Student Option No Audit; Every Fall)

KOR 4006. Third Year Korean II for Graduate Student Research. (4 cr.; Student Option No Audit; Every Spring)
Speaking, reading, writing at advanced level in modern colloquial Korean. Narration, written reports. Further Chinese characters introduced. prerequisite: 4005

KOR 4041. Advanced Readings in Modern Korean I. (4 cr.; Student Option; Every Fall)
Speaking, listening, reading, writing. Content/task-based course. Study vocabulary/read novels, journals, selections from Korean history/arts. Writing summaries, reports, simple reaction papers. prerequisite: 3032 or equiv or instr consent

KOR 4042. Advanced Readings in Modern Korean II. (4 cr.; Student Option; Every Spring)
Speaking, listening, reading, writing. Content/task-based course. Study vocabulary/read novels, journals, selections from Korean history/arts. Writing summaries, reports, simple reaction papers. prerequisite: 4041 or equiv or instr consent

KOR 5040. Readings in Korean Texts: North Korean Dialect. (3 cr. [max 9 cr.] ; Student Option No Audit; Periodic Fall)
Exposure advanced students of Korean to various North Korean contexts. Improve ability to understand North Korean literary work. Various authentic texts from North Korea. Mostly taught in Korean. prerequisite: 3022 or intermediate level of Korean proficiency

KOR 5140. Readings in Sino-Korean Texts. (3 cr. [max 9 cr.] ; Student Option; Periodic Fall & Spring)
Sino-Korean vocabulary/characters necessary for advanced and superior level of knowledge in Korean. Students conduct research projects based on specialized readings in their own fields of study. prerequisite: 3032 or equiv or instr consent

KOR 5211. Introductory Classical Chinese I. (3 cr.; Student Option; Periodic Fall)
Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese/its importance in study of East Asian cultures. Taught in English. prerequisite: Two years of an East Asian language (Chinese, Japanese, Korean) or equivalent or instr consent

KOR 5212. Introductory Classical Chinese II. (3 cr.; Student Option; Periodic Spring)
Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese/its importance in study of East Asian cultures. Taught in English. prerequisite: 5211 and two years of an East Asian language (Chinese, Japanese, Korean) or equivalent or instr consent

KOR 5993. Directed Studies. (1-5 cr. [max 15 cr.] ; Student Option No Audit; Every Fall & Spring)
Guided individual study of Korean language or linguistics. prerequisite: instr consent, dept consent, college consent

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LAMP 4177. Nature of Disease: Pathology for Allied Health Students. (4 cr.; Student Option; Every Spring & Summer)
Human disease as alteration of normal structure/function of anatomy/physiology. Variety of lecturers cover their area of expertise. Grade based on five unit exams. Offered online in spring and summer. prerequisite: One anatomy course, one physiology course, or instr consent

LAMP 7114. Surgical Pathology. (4 cr.; H-N only; Every Fall, Spring & Summer)
The student participates in all areas of surgical pathology activities.

LAMP 7119. Forensic Pathology. (4 cr.; H-N only; Every Fall, Spring & Summer)
This course acquaints students with the field of forensic medicine. The student will become familiar with the function of a medical examiner's office in determining the various causes and manners of death that fall under the jurisdiction of such a public official.

LAMP 7120. Perinatal/Pediatric Pathology. (4 cr.; P-N only; Every Fall, Spring & Summer)
This elective will expose medical students to pediatric pathology, a diagnostic subspecialty that ranges broadly across anatomic and clinical pathology as these relate to children and adolescents, fetuses and infants, and pregnant women. It should prove useful for medical students interested in pediatric medicine, pediatric surgery, obstetrics and gynecology, or pathology.

LAMP 7145. Neuropathology. (4 cr.; H-N only; Every Fall, Spring & Summer)
The course is a practical introduction to neuropathology. The students will work with the attending neuropathologist and residents (from LMP, Neurology and/or Neurosurgery) performing diagnostic services in neuropathology.

LAMP 7150. Anatomical Pathology. (4 cr.; H-N only; Every Fall, Spring & Summer)
The student will become acquainted with current basic concepts of anatomical pathology, especially in relation to morphological interpretation.

LAMP 7152. Anatomical Pathology-VA. (4 cr.; H-N only; Every Fall, Spring & Summer)
The goal of this rotation is to familiarize the medical student with the role of pathology in the diagnosis, prognosis and treatment of patients through the activities of pathologist as members of the clinical team.

LAMP 7158. Cardiac Pathology. (2 cr.; H-N only; Every Fall, Spring & Summer)
Students will observe examinations of existing and newly acquired cardiovascular specimens to identify variations of specific congenital and acquired disease entities and their functional significance.

LAMP 7181. Hematopathology. (4 cr.; H-N only; Every Fall, Spring & Summer)
Over the course of the rotation, students will be fully integrated into the blood and bone marrow biopsy service, with "ownship" of their cases and graduated responsibility for their level of training. They will learn to preview/interpret blood smears and write up preliminary diagnostic reports.

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Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
LAAS 5050. Integrated Topics in Land & Atmospheric Science. (3 cr.; A-F or Audit; Every Fall) Earth system science. Interactions between the land and atmosphere. Biogeochemistry, human-environment interactions, environmental biophysics, and global environmental change.

LAAS 5051. Thesis Proposal Writing for Land & Atmospheric Science. (2 cr.; A-F or Audit; Every Spring) Grant proposals, including proposal formats of various funding sources, how to develop a significance statement, hypotheses and objectives, background, methods, project summary, time line, and budget. Critique proposal samples/discuss other aspects of seeking funding for research. Discuss LAAS graduate program prelim exam process.

LAAS 5311. Soil Chemistry and Mineralogy. (3 cr.; Student Option; Every Fall & Spring) Structural chemistry, origin/identification of crystalline soil clay minerals. Structure of soil organic matter. Chemical processes in soil: solubility, adsorption/desorption, ion exchange, oxidation/reduction, acidity, alkalinity. Solution of problems related to environmental degradation, plant nutrition, and soil genesis. prereq: [Chem 1022 or equiv], Phys 1102, grad or instr consent

LAAS 5425. Atmospheric Processes I: Thermodynamics and Dynamics of the Atmosphere. (3 cr.; A-F or Audit; Fall Odd Year) Basic laws governing atmospheric motion through analysis of atmospheric dynamics and thermodynamics at the micro, synoptic, and global scales. Fundamental thermodynamic and dynamical processes/equations governing the behavior of the atmosphere/applied to larger-scale geophysical situations. prereq: One yr college-level [calculus, physics]

LAAS 5426. Atmospheric Processes II: Radiation, Composition, and Climate. (3 cr.; A-F or Audit; Spring Odd Year) Atmospheric radiation, composition/chemistry, climate change. Radiative transfer in Earth’s atmosphere. Changing chemical makeup of troposphere/stratosphere. Interplay between natural processes and human activities in air pollution, stratospheric ozone depletion, and chemical forcing of climate. Anthropogenic contribution to climate change/role of land-atmosphere feedbacks affecting atmosphere’s energy budget and cycling of greenhouse gases. Application to numerical modeling. prereq: [one yr college-level [calculus, physics, chemistry]]; LAAS 5425 recommended

LAAS 5480. Special Topics in Land and Atmospheric Science. (1-4 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule. prereq: grad student or instr consent


LAAS 5621. Soil and Environmental Genomics. (3 cr.; Student Option; Every Fall) Molecular and genomic approaches to answer ecological questions related to soil and environmental sciences. Genomics/transcriptomics/proteomics. Metagenomics and single cell genomics. Includes computer exercise to learn basic bioinformatics. No prior programming skills are required. prereq: basic microbiology courses (e.g., MicB 3301) recommended.

LAAS 8005. Supervised Classroom or Extension Teaching Experience. (2 cr.; S-N or Audit; Every Fall & Spring) Teaching experience in biosystems and agricultural engineering or agronomy and plant genetics or horticultural science or soil, water, and climate or plant pathology. Discussions about effective teaching to strengthen skills and develop a personal teaching philosophy. prereq: instr consent

LAAS 8128. Land and Atmospheric Science Seminar. (1.5 cr.; max 3 cr.; S-N or Audit; Every Fall & Spring) Students present an open seminar on an advanced topic and attend seminars presented by other graduate students.

LAAS 8195. Research Problems in Soils. (1-5 cr.; max 10 cr.; Student Option; Every Fall, Spring & Summer) Directed research on special topics of interest in soil science or climatology supervised by individual or small groups of faculty. prereq: [Grad major in soil sci or related field], instr consent

LAAS 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

LAAS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

LAAS 8550. Teaching Experience. (1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring) Provides students with practical experiences in instructional techniques in a university setting. prereq: Grad major in soil sci or related field, instr consent

LAAS 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

LAAS 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

LAAS 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Landscape Architecture (LA)

LA 1001. Sustainability by Design. (ENV; 3 cr.; A-F only; Every Spring) How the Twin Cities region (as example of many metropolitan areas) can adapt to climate change, depleted energy resources, and other environmental impacts. How cities and places are designed, how places influence sustainable lifestyles. How to adapt the Twin Cities/other cities to a changing world.

LA 1201. Learning from the Landscape. (AH,DSJ; 3 cr.; A-F or Audit; Every Fall) Physical elements shaping the world. Shapes, forms, and order of towns, cities, and countryside. How design, planning, and natural systems, taken together, shape physical surroundings. Lectures, discussions, field trips.

LA 1301. Introduction to Landscape Architecture Drawing. (AH; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Development of basic skills in perceiving/representing material environment. Sketching/drawing conventions of visual phenomena/forms.

LA 1401. The Designed Environment. (AH; 3 cr.; A-F or Audit; Every Fall & Spring) Examination of relationships between place and space, and realms of the ideal and real, public and private. Survey of how the fields of architecture, landscape architecture, and urban design have explored those issues.

LA 1601. Design and Equity. (AH,DSJ; 3 cr.; A-F or Audit; Every Spring) Investigate world from new perspectives. Spaces of everyday life that reflect/shapes of everyday life. How cities and places are designed, how places influence sustainable lifestyles. How to adapt the Twin Cities/other cities to a changing world.

LA 2301. Advanced Representation for Environmental Design. (3 cr.; Student Option; Every Fall) Perceiving/representing material environment. Multiple media approaches in environmental design representation. Analytic diagramming
as means of developing design ideas. Interface between hand rendered and digital representation. prereq: 1301

LA 3001. Understanding and Creating Landscape Space. (; 4 cr.; A-F or Audit; Every Fall) The subject of this course is Landscape Architecture. In this class we investigate its principles, focusing on the discipline’s distinct fusion of both the arts and sciences to create useful and meaningful outdoor spaces to meet specific environmental and social needs. Class periods alternate between lectures and ?studio’ work periods in which students actively work on projects (site analysis, representation, modeling and oral presentation). Over the course of the semester student receive feedback (instructor, guests and peer review) and participate in class discussion. Students receive additional assignments including critical literature review, site analysis and infrastructure research.

LA 3002. Informants of Creating Landscape Space. (; 4 cr.; A-F or Audit; Every Spring) In this course, you will analyze and design specific projects, considering both their physical and conceptual connection to the larger context in which they are located. The aim is for you to gain an understanding of the relationship of landscape to architecture at the site and urban scales; consider the effects of construction and ground manipulation on the perception and experience of space; and explore the possibilities of layering and transparency, enclosure and adjacencies, in between spaces and connectors. Ultimately, the course will investigate the intersection of physical, biological, and cultural attributes, the opportunities and constraints they produce, the design of space based upon these features, and the [re]presentation of these designs. We will also be building the soft skills that help us grow to be more empathetic and understanding of our client’s needs and desired outcomes and practice them throughout the workshop in order to translate experience and input into program + design.

LA 3003. Climate Change Adaptation. (; 3 cr.; Student Option; Every Fall) This course will study nations, regions, cities, and communities that have adapted or are undergoing adaptation to climate change. The course will examine different approaches in planning, policy, economics, infrastructure, and building design that increase the adaptive capacity of human settlements. These approaches will vary in scale from the construction of new neighborhoods to the implementation of storm water gardens. The course will emphasize multi-functional strategies which couple climate change adaptation with other urban improvements. Learning Objectives: To understand role of climate adaptation in the reconfiguration of human settlements. To apply design thinking to the issue of climate adaptation in the context of an urban society. To apply knowledge to challenge-based coursework on managing climate risk, decreasing climate vulnerability, and building resilience to climate change.

LA 3004. Regional Environmental Landscape Planning. (4 cr.; Student Option; Every Spring) An exploration of critical regional landscape parameters affecting the growth and development of metropolitan areas. Students assess these parameters and prepare a multifunctional land use plan for a defined locale. prereq: prereq FR 3131 or Concurrent registration is required (or allowed) in FR 3131 or GEOG 3561 or Concurrent registration is required (or allowed) in GEOG 3561, or equivalent

LA 3204. Holistic Landscape Ecology and Bioregional Practice. (; 3 cr.; A-F or Audit; Every Spring) Bioregional practice, how it responds to landscape ecology of great bioregions. Scientific/cultural basis for bioregional design and landscape sustainability. prereq: [EEB 3001 or ESPM 3108], or BED major or equiv

LA 3413. Introduction to Landscape Architectural History. (GP,HIS; 3 cr.; A-F or Audit; Every Spring) Study of landscape architect’s roots by examining the creation of landscapes over time. Influences of ecological and environmental issues as well as political, economic, and social contexts on the cultural construction of landscape ideas and meaning and creation of landscape architectural works.

LA 3501. Environmental Design and Its Biological and Physical Context. (ENV; 3 cr.; A-F or Audit; Every Spring & Summer) Dynamic relationships between environmentally designed places and biological/physical contexts. Integration of natural place and biological/physical contexts. Case studies, student design.

LA 3514. Making the Mississippi. (CIV; 3 cr.; A-F or Audit; Every Spring) Environmental parameters affecting growth/development of metropolitan areas. Students assess these parameters and prepare a multifunctional land use plan for a defined locale.

LA 3571. Landscape Construction: Site Systems and Engineering. (; 3 cr.; A-F or Audit; Every Fall) Theory applications of landfill systems for design. Landform typology, representation methods, manipulation techniques, use of land survey data, earthwork construction issues. Spatial accommodation of vehicles in landscape architecture, including road design. prereq: BED major or BED minor or instr consent


LA 4001. Sustainable Landscape Design and Planning Practices. (; 3 cr.; Student Option; Every Fall) Changes in global biodiversity. Quality of air/water resources. Development/consumption of energy resources. Climate change. Design for sustainable practices to create evocative/meaningful landscapes. prereq: 1301, [2301 or ARCH 3301], 3001, 3002

LA 4002. Implementation of Sustainable Landscape Design and Planning Practices. (; 3 cr.; A-F only; Every Spring) Capstone experience. Service-learning project. Groups of students develop sustainable landscape designs/plans that address project implementation. prereq: 1301, 2301, 2302, 3001, 3002, 3003, 4001

LA 4096. Internship in Landscape Design and Planning. (; 1 cr.; S-N only; Every Fall, Spring & Summer) Supervised professional experience in environmental design firms or government agencies. Students perform professional services and relate these experiences to their education in environmental design. prereq: 1301, 2301, 2302, 3001, 3002, 3003

LA 4160H. Thesis/Capstone Project. (; 2 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Individualizes honors experience by connecting aspects of major program with special academic interests.

LA 4755. Infrastructure, Natural Systems, and Space of Inhabited Landscapes. (TS; 3 cr.; A-F or Audit; Every Fall) Seminar, cross-disciplinary. Urban infrastructural solutions to mitigate/reverse anthropogenic impacts on Earth. Design of sustainable urban infrastructure systems. Policy options, technologies. Criteri, design methods. prereq: Jr or sr

LA 5001. Sustainable Landscape Design and Planning Practices. (; 3 cr.; Student Option; Every Fall) Systemic, formal and spatial relationships. Quantitative and qualitative changes in global biodiversity, quality of the earth’s air, soil, and water resources, development and consumption of energy resources and climate change. Development of design processes for selection, deployment, and management of sustainable practices. prereq: 5201, 5203

LA 5002. Implementation of Sustainable Landscape Design and Planning Practices. (; 3 cr.; Student Option; Every Spring) Design exploration of a complex urban site. Habitation patterns and sociocultural systems that slow and reverse environmental degradation and climate change. Researching creating landscape patterns that address multiscalar sustainability. prereq: 5201, 5203

LA 5003. Climate Change Adaptation. (; 3 cr.; Student Option; Every Fall) This course will study nations, regions, cities, and communities that have adapted or are undergoing adaptation to climate change. The course will examine different approaches in planning, policy, economics, infrastructure, and building design that increase the adaptive capacity of human settlements. These approaches will vary in scale from the construction of new neighborhoods to the implementation of storm water gardens. The course will emphasize multi-functional strategies which couple climate change adaptation with other urban improvements. Learning Objectives: To understand role of
climate adaptation in the reconfiguration of human settlements. To apply design thinking to the issue of climate adaptation in the context of an urban society. To apply knowledge to challenge-based coursework on managing climate risk, decreasing climate vulnerability, and building resilience to climate change.

LA 5004. Regional Environmental Landscape Planning. (4 cr.; Student Option; Every Spring)
An exploration of critical regional landscape parameters affecting the growth and development of metropolitan areas. Students assess these parameters and prepare a multifunctional land use plan for a defined locale. prereq: PA 5271 or LA 5131 or FR 3131 or GEOG 3561 or GEOG 5561 or equivalent

LA 5096. Internship for Master of Landscape Architecture Students. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Students will receive supervised professional experience in a landscape architectural design firm. In order to gain employment experience related to the field as well as receiving graduate credit. As a requirement of the course, students will submit a reflection paper relating the professional experiences to their education. Must have director of graduate studies (DGS) approval of the internship to register.

LA 5131. Geospatial Data Analysis and Design. (3 cr.; A-F only; Every Fall)
Introduction to geospatial data analysis/application in landscape architectural, environmental design research/practice. prereq: Master of Landscape Architecture Student or instr consent

LA 5201. Making Landscape Spaces and Types. (6 cr.; A-F or Audit; Every Fall)
Design exploration using 3-D models and historical precedent studies to create outdoor spaces for human habitation and use. Application of the basic landscape palette of form, plants, and structures to give physical, emotional, cognitive, and social definition to created places. prereq: B.E.D accelerated status or LA grad or instr consent

LA 5202. Landscape Analysis Workshop. (1 cr.; S-N only; Every Fall)
Introduction to field techniques for site analysis, including vegetation, soil, and landform description. One-week session, before fall term, at lake Itasca Forestry and Biological Station.

LA 5203. Ecological Dimensions of Space Making. (6 cr.; A-F or Audit; Every Spring)
Design studio experience drawing on ecological, cultural, aesthetic influences to explore development of design ideas responsive to ecological issues and human experience. prereq: LA major or instr consent; recommended for both BED and Grad students

LA 5204. Metropolitan Landscape Ecology. (3 cr.; A-F only; Every Fall & Spring)
Theorizations/principles of holistic landscape ecology. People, nature, and environmental stewardship in metropolitan landscapes. Urban areas, rural areas that provide food, water, energy, and recreation. prereq: BED accelerated status or LA grad student or instr consent

LA 5376. Representation I. (4 cr. [max 8 cr.]; A-F only; Every Fall)
Strengthens freehand sketching ability. Develop observation skills. Develop ability to communicate ideas clearly through visual expression. Learn/explore conventions of landscape architectural drawing. Basic tools/techniques associated with Adobe Photoshop CS6. Promote fluidity between analog/digital media. Create drawing personality/graphic style, prereq: Master of Landscape Architecture (MLA) or Accelerated Bachelor of Environmental Design.

LA 5377. Representation II. (4 cr. [max 8 cr.]; A-F only; Every Spring)
Explore multi-media rendering techniques. Increase knowledge of art materials/graphic programs. Increase hand-drawing ability. Color, theory, contemporary graphic styles. Layout, grid systems/type. Increase speed of drawing/projection renderings. Create or strengthen graphic style, prereq: Master of Landscape Architecture (MLA) or Accelerated Bachelor of Environmental Design

LA 5378. Representation III. (3 cr.; A-F or Audit; Every Spring)
Increase skills learned in Representation I and Representation II and develop 3-D modeling skills, distill complex information to visually explain a design concept while gaining skills that are valuable in the workplace and create portfolio quality work.

LA 5381. The City in Visual Culture. (3 cr.; A-F only; Every Spring)
Visual culture is not just what we see. It is the way we do because we are social animals, but also that our social arrangements take the forms they do because we are seeing animals. The social arrangements of the city, the buildings and public spaces, are concretizations of power and culture. The course will, through multiple drawings, attempt to critically examine these social arrangements as they have evolved over time (history) by re-presenting the city (as human experience and aesthetic form). The course will be structured around on-site work sessions, critical readings, on- and off-site lectures, and weekly drawing assignments.

LA 5400. Topics in Landscape Architecture. (1-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Current topics in landscape architecture. Taught by regular or visiting faculty in their areas of specialization, prereq: B.E.D. accelerated status or LA grad or instr consent

LA 5401. Directed Studies in Emerging Areas of Landscape Architecture. (1-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
tbd prereq: instr consent

LA 5402. Directed Studies in Landscape Architecture History and Theory. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Independent studies under the direction of landscape architecture faculty. prereq: instr consent

LA 5403. Directed Studies in Landscape Architecture Technology. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Independent studies under the direction of landscape architecture faculty. prereq: instr consent

LA 5404. Directed Studies in Landscape Architecture Design. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Independent studies under the direction of landscape architecture faculty. prereq: instr consent

LA 5405. Interdisciplinary Studies in Landscape Architecture. (3-4 cr.; A-F or Audit; Every Fall & Spring)
Students assess these parameters and prepare a multifunctional land use plan for a defined locale. Applied practice of ecological restoration of landscapes. Grasslands, wetlands, forests, disturbed agricultural sites, former industrial parcels. Restoration management, skills
needed to lead successful projects. prereq: [MLA student, senior B.E.D.] or senior or grad with one college course in ecology/one college course in plant science or botany or instr consent

LA 7505. Regreening Minds, Cities, and Regions. (3 cr.; A-F only; Every Fall) Emerging types of green spaces. Urban agriculture, urban waterscapes, urban wilderness. Politics, policies, metrics, planning of alternative visions of urban nature/sustainability in American cities. Role of social networks in creating emerging types of green spaces. prereq: Landscape Architecture graduate student or instr consent

LA 7555. Infrastructure, Natural Systems and the Space of Inhabited Landscapes. (3 cr.; A-F or Audit; Every Fall) Cross-disciplinary exploration of urban infrastructural solutions to mitigate/reverse anthropogenic impacts on Earth. Design of sustainable urban infrastructure systems, policy options, available technologies, criteria, design methods. prereq: Grad student

LA 5761. Infrastructure + Culture. (3 cr.; A-F only; Every Spring) As attitudes about ecology and nature are shifting and as the threats from climate change are becoming more pronounced, new infrastructure works in the Netherlands are caught a double bind of responding to ecological concerns and protection of the land. This course will explore both historic and modern water management infrastructures as cultural and engineering constructs through visual representation as a form of critique. The course will be structured around study trips, preparatory readings, on-site lectures, and will be supplemented by the participation of several guest speakers.

LA 5771. Landscape Infrastructure and Systems I. (3 cr. [max 6 cr.]; A-F only; Every Fall) Basic principles, techniques, skills of creating infrastructures of built landscapes. Basic concepts of simple plant taxonomy, plant community structure, earthwork, water management, landscape structures. Small site scale design development. prereq: Master of Landscape Architecture Student, [Accelerated Track B.E.D or instr consent]

LA 5772. Landscape Infrastructure Systems II. (3 cr. [max 6 cr.]; A-F only; Every Spring) Principles, techniques, skills of creating ecological infrastructures of built landscapes systems. Builds on basic concepts taught in LA 5771. Focuses on ecological connections among plants, landscape structure, earthwork techniques, water management, landscape structural systems. prereq: Master of Landscape Architecture Student, [Accelerated BED Student or instr consent]

LA 8201. Designing Landscapes for Dwelling and Settlement. (6 cr.; A-F or Audit; Every Fall) Professional design studio. Hypothetical projects include development of schematic master plans for site layout, grading, and planting. Design for residential, commercial, and civic uses with attention to zoning and other controls, environmental quality, human behavior, markets, project finance, and techniques. Requires concurrent registration in LA 8202. prereq: 5203, 5571, grad LA major, concurrent registration is required (or allowed) in 8202 or instr consent

LA 8202. Design of Planned Developments. (2-3 cr.; Student Option; Every Fall & Spring) Issues related to planned community developments: historical precedents; design for residential, commercial, and civic uses; role of zoning and other controls; deed restrictions; preparation of design brief; environmental quality; human behavior; market; project finance; and techniques of site development. prereq: Grad LA major or instr consent

LA 8204. Regional Landscape Space. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theoretical investigations and current advances in use of landscape ecology, landscape perception, regional economics, and public policy as informants of design decision-making in regional landscapes at or exceeding township level. Geographic information systems as design tools. prereq: Grad LA major or instr consent

LA 8205. Urban Form Options: Landscape Architecture Studio. (6 cr. [max 8 cr.]; Student Option; Every Fall & Spring) Urban landscape design issues, theories, and problems explored via formal/spatial inquiry in studio, reading, and the exposition of ideas in paired seminar. Urban systems, gathering spaces, ecology, infrastructure, recreation, and public space, prereq: 2 yrs of studio, grad LA major or instr consent

LA 8206. Making Urban Landscape Space. (6 cr.; A-F only; Every Fall) Studio course focusing on the restoration and reuse of urban brownfield (former industrial) sites. Biological and mechanical remediation processes and the development of hard and soft site infrastructure to deal with storm water, energy generation, and the handling of waste. Re-design sites in terms of new uses and economies, and to re-integrate sites into existing and future urban systems of transportation. prereq: MLA grad student

LA 8207. Cities on Water International Workshop. (6 cr. [max 16 cr.]; A-F only; Every Spring) Intensive studio course on international applications of sustainable urban design. prereq: Grad LA or ARCH major or instr consent

LA 8301. Landscape Architecture: Research Issues and Methods. (3 cr.; A-F or Audit; Every Fall & Spring) Alternative methodological approaches to landscape architectural research and consideration of their appropriateness for contemporary research topics. prereq: 8201 or concurrent registration is required (or allowed) in 8201, grad LA major or instr consent

LA 8302. Professional Practice. (3 cr.; A-F or Audit; Every Spring) Office and project management case studies. Organizational behavior, marketing, sales, strategic planning, financial and cost accounting, insurance, legal issues and contracts. prereq: 8205, grad LA major or instr consent

LA 8333. FTE: Masters. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) Prerequisite: Master's student, advisor and DGS consent

LA 8400. Topics in Landscape Architecture. (1-8 cr. [max 96 cr.]; Student Option; Every Fall, Spring & Summer) Seminar offered by regular or visiting faculty in their area of specialization. Content varies with interest of instructor.

LA 8401. Directed Studies in Emerging Areas of Landscape Architecture. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Current topics in landscape architecture. Seminar offered by regular or visiting faculty in their area of specialization. Subject matter varies with instructor. prereq: instr consent

LA 8402. Directed Studies in Landscape Architecture History and Theory. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Advanced independent studies under direction of landscape architecture faculty. prereq: Grad LA major or instr consent

LA 8403. Directed Studies in Landscape Architecture Technology. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Advanced independent studies under direction of landscape architecture faculty. prereq: Grad LA major or instr consent

LA 8404. Directed Studies in Landscape Architecture Design. (1-6 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Advanced independent studies under direction of landscape architecture faculty. prereq: Grad LA major or instr consent

LA 8405. Interdisciplinary Studies in Landscape Architecture. (1-6 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Research, planning, and/or design project. Sample topics: energy efficient design, historic preservation, urban revitalization, agricultural land use, computerized land-use planning, housing. prereq: Grad LA major or instr consent

LA 8406. Concepts of Landscape Evaluation. (3 cr.; A-F or Audit; Periodic Fall & Spring) Philosophical basis for wide-ranging approaches to evaluating qualitative aspects of landscape. Aesthetic factors and integration of landscape evaluation into regional design decision-making. prereq: Grad land arch major or instr consent

LA 8407. Perception Manipulation in Design of Exterior Space. (3 cr.; Student Option; Periodic Fall & Spring) Historic and modern design devices that alter one's sense of spatial control and arrangement to create illusionary situations in exterior environment. Organized to inform and test
Fourth course in landscape infrastructure/systems sequence that introduces students to technical skills required to work/obtain professional licensure as landscape architect. Use/implementation of complex constructed assemblies in urban context. prereq: Master of Landscape Architecture Student or instr consent

LA 8775. Landscape Infrastructure and Site Technology V. (3 cr. [max 6 cr.]; Student Option; Every Spring)
Seminars, cross-disciplinary. Advanced inquiry into complex site-scale problems requiApplied theory. Professional practice applications with emphasis on urban/post-industrial sites. Programmatic, regulatory/construction contexts. Directed research of emerging/speculative infrastructure. prereq: 8773, 8774 preferred, students outside of Master of Landscape Architecture program are encouraged to enroll upon demonstration of similar pre-requisite coursework and instr consent

LA 8777. Thesis Credits: Master’s. (1-18 cr.) [No Grade Associated; Every Fall, Spring & Summer]
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required (Plan A only)

Lang, Teaching, and Technology (LGTT)

LGTT 5110. Technology in the Second Language Classroom. (2 cr.; Student Option; Every Spring & Summer)
Examine, evaluate, and use technology in language teaching. Theoretical background, demonstration, hands-on exploration.

LGTT 5710. Special Topics in Language Teaching and Technology. (2 cr. [max 6 cr.]; Student Option; Periodic Fall & Summer)
Examine, evaluate, apply specific area of technology to K-higher education, second/foreign language teaching/learning in classroom, independent study, distance education environments.

Language Centr CLA Courseshare (LANG)

LANG 1021. Beginning Czech I. (4 cr.; Student Option; Every Fall)
CourseShare course hosted by Indiana University. Received via video conferencing. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 1051. Beginning Indonesian I. (4 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Please email the Language Center at elsie@umn.edu for more information.

LANG 1061. Beginning Persian I. (4 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by University of Wisconsin-Madison. Received via video conferencing. Please email the Language Center at elsie@umn.edu for more information.

LANG 1101. Beginning Modern Tibetan I. (4 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 1111. Beginning Turkish I. (4 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 1121. Beginning Vietnamese I. (4 cr.; Student Option No Audit; Every Fall)
Online CourseShare course hosted by Michigan State University. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 1122. Beginning Vietnamese II. (4 cr.; Student Option; Every Spring)
Online CourseShare course hosted by Michigan State University. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 1131. Beginning Yiddish I. (3 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by the University of Maryland. Received via video conferencing. Please email the Language Center at elsie@umn.edu for more information.

LANG 1161. Beginning Hungarian I. (4 cr.; Student Option; Every Fall)
CourseShare course hosted by Indiana University. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 1162. Beginning Hungarian II. (4 cr.; Student Option; Every Spring)

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

CourseShare course hosted by Indiana University. Received via video conferencing.
Email the CLA Language Center at elsie@umn.edu for more information.

LANG 1171. Beginning Aramaic I. (3 cr.; Student Option; Every Fall & Spring)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 1182. Beginning Filipino II. (4 cr.; Student Option; Every Spring)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 1211. Beginning Maya I. (4 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by Indiana University. Received via video conferencing. Please email the Language Center at elsie@umn.edu for more information.

LANG 2021. Intermediate Czech I. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by Indiana University. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 2022. Intermediate Czech II. (3 cr.; Student Option; Every Spring)
CourseShare course hosted by Indiana University. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 2061. Intermediate Persian I. (4 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 2062. Intermediate Persian II. (4 cr.; Student Option; Every Spring)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 2071. Intermediate Polish I. (4 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by Ohio State University. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 2081. Intermediate Modern Tibetan I. (4 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Please email the Language Center at elsie@umn.edu for more information.

LANG 2121. Intermediate Vietnamese I. (4 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by Michigan State University. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 2122. Intermediate Vietnamese II. (4 cr.; Student Option; Every Spring)
CourseShare course hosted by Michigan State University. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 2192. Intermediate Romanian II. (4 cr.; Student Option; Every Spring)
CourseShare course hosted by Ohio State University. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 2201. Accelerated Basque I. (3 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by the University of Chicago. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3011. Catalan Culture and Society: Art, Music, and Cinema. (2 cr.; Student Option; Every Spring)
CourseShare course hosted by the University of Chicago. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3012. Advanced Catalan: Language, Society and Culture. (2 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Chicago. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3051. Advanced Indonesian I. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3111. Advanced Turkish I. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Illinois Urbana-Champaign. Received via video conferencing. This course requires intermediate-level proficiency in Spanish, French or another Romance language. Please email the Language Center at elsie@umn.edu for permission to register.

LANG 3501. Introduction to Korean Civilization. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Michigan Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3502. Introduction to Korean History. (3 cr.; Student Option; Every Spring)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3503. Traditional Korean Poetry: Sijo. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by Rutgers University. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 3504. Korean Language in Culture and Society. (3 cr.; Student Option No Audit; Every Fall)
CourseShare course hosted by the University of Iowa. Received via video conferencing. Please email the Language Center at elsie@umn.edu for more information.

LANG 3601. Sami Culture, Yesterday, and Today. (4 cr.; Student Option; Every Spring)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 3651. Islamic Studies Seminar: Rumi, Sufi Poet. (3 cr.; Student Option; Every Spring)
CourseShare course hosted by Rutgers University through the Digital Islamic Studies Curriculum (DISC). Received via video conferencing. Please email the CLA Language Center at elsie@umn.edu for more information.

LANG 4171. Beginning Aramaic I for Grad Research. (3 cr.; Student Option; Every Fall & Spring)
CourseShare course hosted by Penn State University. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 5051. Advanced Indonesian III. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 5111. Advanced Turkish and Azeri III. (3 cr.; Student Option; Every Fall)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 5112. Advanced Turkish and Azeri IV. (3 cr.; Student Option; Every Spring)
CourseShare course hosted by the University of Wisconsin-Madison. Received via video conferencing. Email the CLA Language Center at elsie@umn.edu for more information.

LANG 5651. Islamic Studies Seminar: Rumi, Sufi Poet. (3 cr.; Student Option; Every Spring)
CourseShare course hosted by Rutgers University through the Digital Islamic Studies...
Latin (LAT)

LAT 1001. Beginning Latin I. (5 cr.; Student Option; Every Fall)
Introduction to grammar/vocabulary of classical Latin as written in Rome in 1st centuries BCE/CE. Forms/simplc constructions. Some reading of simple, heavily adapted passages from ancient texts.

LAT 1002. Beginning Latin II. (5 cr.; Student Option; Every Spring)
Continuation of Latin 1001. More complex constructions, including participles, clauses, indirect discourse. Some reading of adapted passages from ancient texts. prereq: Grade of at least C- or S in 1001 or instr consent

LAT 3003. Intermediate Latin Prose. (4 cr.; Student Option; Every Fall)
Introduction to Latin prose authors of 1st centuries BCE/CE. Readings of continuous passages of unadapted Latin texts (history, speeches, letters). Review of grammar/ vocabuary as needed. Some discussion of major themes/issues in Roman culture as illustrated by texts. prereq: Grade of at least C- or S in 1002 or 5001 or instr consent

LAT 3004. Intermediate Latin Poetry. (4 cr.; Student Option; Every Spring)
Introduction to Roman epic poetry. Readings of selections from Vergil's Aeneid. Quantitative meter and poetic devices. Discussion of major themes and issues as developed in Vergil's poetry.

LAT 3199. Latin AP Credit. (4-8 cr.; No Grade Associated; Every Fall)
Prereq score of [3 or 4 or 5] on [AP Vergil or AP Latin Literature] exam.

LAT 3993. Directed Studies. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. prereq: instr consent and dept consent

LAT 4951W. Major Project. (WI; 4 cr.; Student Option; Every Fall & Spring)
Research project using documents and other sources from the ancient world. Students select project in consultation with a faculty member who directs the research and writing. prereq: [Greek-Latin or Latin major], three 3xxx Latin courses, instr consent, dept consent

LAT 5001. Intensive Latin. (3 cr.; Student Option; Every Fall)
Covers material usually taught over two semesters. prereq: Prev experience in another foreign language is desirable

LAT 5003. Intermediate Latin Prose for Graduate Student Research. (4 cr.; Student Option; Every Fall)
Introduction to Latin prose authors of 1st centuries BCE/CE. Readings of continuous passages of unadapted Latin texts (history, speeches, letters). Review of grammar/ vocabuary as needed. Some discussion of major themes/issues in Roman culture as illustrated by texts. prereq: [Grade of at least C- or S in [1002 or 5001] or instr consent]

LAT 5004. Intermediate Latin Poetry for Graduate Research. (4 cr.; Student Option; Every Spring)
Introduction to Roman epic poetry. Readings of selections from Vergil's Aeneid. Quantitative meter and poetic devices. Discussion of major themes and issues as developed in Vergil's poetry. Meets with 5004.

LAT 5100. Advanced Reading. (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading in Latin texts/authors. Texts/authors vary. prereq: [LAT 3004 or equiv], at least two yrs of college level Latin. Must contact Classical/Near Eastern Studies department for permission to register.

LAT 5200. Advanced Reading in Later Latin. (3 cr. [max 18 cr.]; Student Option; Periodic Fall & Spring)
Authors of late antiquity, Middle Ages, Renaissance. Topics specified in Class Schedule. prereq: [LAT 3004 or equiv], at least two yrs of college level Latin. Must contact Classical and Near Eastern Studies department for permission to register.

LAT 5701. Latin Prose Composition. (3 cr.; Student Option; Periodic Fall & Spring)
Latin grammar, syntax, diction, and prose style. Graduated exercises in prose composition. prereq: Grad student or inst consent

LAT 5703. Epigraphy. (3 cr.; Student Option; Periodic Fall & Spring)
Practical/theoretical introduction to Latin epigraphy (study/interpretation of inscriptions). Readings/discussion of epigraphic texts. Their value as historical documents, as evidence for development of Latin language, and as literary texts. prereq: Grad student or inst consent

LAT 5705. Introduction to the Historical-Comparative Grammar of Greek and Latin. (3 cr.; Student Option; Periodic Fall & Spring)
Historical/comparative grammar of Greek and Latin from proto-Indo-European origins to classical norms. prereq: Two yrs college [Greek or Latin] or instr consent

LAT 5706. Readings in Latin Prose. (3 cr.; Student Option; Periodic Fall & Spring)
Supervised teaching internship. prereq: Grad student or instr consent

LAT 8100. Readings in Latin Prose. (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading/discussion of Latin prose texts.

LAT 8120. Latin Text Course. (3 cr. [max 15 cr.]; Student Option; Every Fall & Spring)
Students attend 3xxx Latin courses. Supplementary work at discretion of instructor. prereq: 3111 or dept consent; not for students in dept of Classical and Nr East Studies

LAT 8200. Readings in Latin Verse. (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading/discussion of Latin poetic texts. prereq: Advanced grad student

LAT 8262. Survey of Latin Literature I. (3 cr.; Student Option; )
Extensive readings in variety of works from republican and early Augustan period.

LAT 8263. Survey of Latin Literature II. (3 cr.; Student Option; )
Variety of works from Augustan and imperial periods.

LAT 8267. Graduate Survey of Latin Literature of Late Antiquity. (3 cr.; Student Option; Periodic Spring)
Latin literature of 3rd to 6th centuries A.D., including Ammianus and Augustine. prereq: instr consent, dept consent

LAT 8300. Readings in Latin Texts. (3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Reading/discussion of literary or documentary texts from Roman antiquity. Topics may include subjects that draw on various sources, genres, or methods. prereq: Advanced grad student

LAT 8910. Seminar. (3 cr. [max 30 cr.]; Student Option; Periodic Fall & Spring)
Topics in Latin literature examined in depth. Emphasizes current scholarship, original student research.

Latin American Studies (LAS)

LAS 3401V. Honors Early Latin America to 1825. (GP, WI, HIS; 4 cr.; A-F Only; Every Fall & Spring)
Societies of Americas, Spain, and Portugal before contact. Interactions among Native Americans, African slaves, and Europeans, from colonization through independence. Religion, resistance, labor, gender, race. Primary sources, historical scholarship.

LAS 3401W. Early Latin America to 1825. (GP, WI, HIS; 4 cr.; A-F or Audit; Every Fall & Spring)
Societies of Americas, Spain, and Portugal before contact. Interactions among Native Americans, African slaves, and Europeans, from colonization through independence. Religion, resistance, labor, gender, race. Primary sources, historical scholarship.

LAS 3402W. Modern Latin America to 1825. (GP, WI, HIS; 4 cr.; Student Option; Every Fall, Spring & Summer)
National and contemporary period 1825 to present. Social, cultural, political, and economic change.

LAW 3429. Latin American History in Film and Text. (AH,GP; 3 cr.; Student Option; Periodic Fall, Spring & Summer) Cinematographic representations of Latin America in the context of other historical and literary narratives. Experiences of Latinos in Hollywood. Compare U.S. films with those produced in Latin America. Specific themes vary by term (e.g., women, revolution, colonialism).

Law School (LAW)

LAW 3000. Introduction to American Law and Legal Reasoning. (3 cr.; A-F only; Every Fall & Spring) Law pervades all areas of modern life. Yet it remains mysterious to those without legal training. This course will equip you to better answer such questions by exploring the tools that lawyers use to interpret and apply the law. Students will learn to think like lawyers through a series of contemporary case studies that require reading, writing, thinking, and problem solving like a lawyer. Cases will be drawn from topics such as contracts, torts, civil procedure, property, business law, criminal law, sports law, privacy, and law and science.

LAW 3050. Law of Business Organizations. (3 cr.; A-F only; Every Spring) This course surveys the leading forms of legal business association governing the formation of business entities, including the laws of agency, partnerships, limited liability companies, and corporations. Emphasis is put on the methods lawyers use to interpret statutes and cases.

LAW 5000. Introduction to American Law and Legal Reasoning. (3 cr.; A-F only; Every Fall) Law pervades all areas of modern life. Yet it remains mysterious to those without legal training. This course will equip you to better answer such questions by exploring the tools that lawyers use to interpret and apply the law. Students will learn to think like lawyers through a series of contemporary case studies that require reading, writing, thinking, and problem solving like a lawyer. Cases will be drawn from topics such as contracts, torts, civil procedure, property, business law, criminal law, sports law, privacy, and law and science.

LAW 5001. Introduction to the American Legal System. (2 cr.; A-F only; Every Fall) This is an introductory course in American law, providing an overview of a wide variety of constitutional, statutory and common law legal issues. A primary focus will be on American constitutional law: legislative, judicial, and executive powers; the legal structure of checks and balances? among the three national governmental powers; the distribution of powers between the national government and state governments (federalism); and the constitutional rights of individuals (including rights of free speech, freedom of religion, due process, and equal protection). We will also examine the American system of litigation: the structure of the court system, the jurisdiction of federal (national) and state courts, and the litigation process. We will also address some common law substantive topics in American law including torts and contracts. Students will have the opportunity to learn how to read and interpret American legal materials, to do legal research within the legal system, and to write an analytical legal memorandum.

LAW 5002. MSPL Legal Research and Writing. (1 cr.; S-N only; Every Fall) This course covers the process of communicating about the law. Our goal is to teach students the building blocks of legal communication through multiple practice exercises so that students can repeat the process on their own after successful completion of the course. In the fall (one credit), we begin class with a short exercise, then move on to email, letter, and office memorandum exercises written in an objective/predictive mode.

LAW 5025. Patent Law Proseminar. (1 cr.; S-N only; Every Spring) The field of patent law extends across the boundaries of business, technology, innovation, and law. In this course, students will be introduced to current topics and compelling issues in patent law presented by leading patent and intellectual property law professionals. Students will gain real-world insights from in-house and private practice attorneys and agents, with a focus on patent prosecution and patent litigation.

LAW 5026. Intellectual Property and Technology Proseminar. (1 cr.; S-N only; Every Fall) The field of intellectual property extends across the boundaries of business, technology, innovation, and law. In this course, students will be introduced to a broad range of IP related topics presented by leading practitioners working at the intersection of law and technology. Topics may include trade secrets, copyrights, trademarks, patents, IP transactions, IP litigation, emerging technologies, intellectual asset management, IP valuation and commercialization. Lecturers may include corporate general counsels, firm lawyers, transactional lawyers, litigators, consultants, tech transfer officers, R&D Leaders, and CTO.

LAW 5050. Law of Business Organizations. (3 cr.; A-F only; Every Spring) This course surveys the leading forms of legal business association governing the formation of business entities, including the laws of agency, partnerships, limited liability companies, and corporations. Emphasis is put on the methods lawyers use to interpret statutes and cases.

LAW 5051. Business Associations/Corporations. (4 cr.; Student Option; Every Fall & Spring) The initial part of this course is an introduction to the general law of multi-person unincorporated business organizations, principally partnerships, limited partnerships and limited liability companies. Matters covered include the procedures for forming such organizations and the rights and obligations of the participants as among themselves and with respect to third persons. The remaining class hours constitute the first portion of the basic Corporations course, and will cover such matters as corporate organization, the distribution of powers among the corporate board of directors, its officers and its stockholders; the proxy system; control devices in the close corporation; and the fiduciary duties of directors, officers and controlling shareholders. Matters dealing with "corporate finance? (issuance of shares, payment of dividends, and corporate reorganizations) are covered in Advanced Corporate Law.

LAW 5061. Financial Regulation. (3 cr.; Student Option; Periodic Fall & Spring) This course will be a high-level overview of several different areas of financial regulation: banking regulation, insurance regulation, and elements of securities regulation (particularly broker-dealer and investment company regulation).

LAW 5062. Energy Law. (3 cr.; Student Option; Periodic Fall & Spring) This course provides an introduction to US energy law. The first portion of the course introduces the nation's primary sources of energy: coal, oil, biofuels, natural gas, hydropower, nuclear, wind, solar, and geothermal energy. In doing so, it explores the physical, market, and legal structures within which these energy sources are extracted, transported, and converted into energy. The second portion of the course turns to the two major sectors of our energy economy--electricity and transportation--and the full range of federal and state regulation of each sector. The third portion of the course explores case studies of hot topics in energy law and policy that highlight the complex transitions taking place in the energy system. These topics include electric grid modernization, electric vehicles, risks and benefits associated with hydraulic fracturing and deepwater drilling for oil and gas, and the continued role of nuclear energy. In addition to traditional textbook reading and class discussion, the course will include industry, government, and nonprofit guest speaker presentations. Grading will be based on a final exam given at the end of the semester as well as class discussion and weekly written postings on the TWEN site for the course.

LAW 5075. Ethics for Patent Agents. (1 cr.; A-F only; Every Spring) This course is designed to provide students with an introduction and understanding of the ethics and rules of professional responsibility and the unauthorized practice of law.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
professional by introducing them to various scenarios that they are likely to encounter in their professional career. By the end of the course, students will understand the principles behind the ethics and rules of professional responsibility and the unauthorized practice of law as it applies to nonlawyers. Pre: Master of Science Patent Law Students.

LAW 5076. Essentials of Business for Lawyers. (3 cr.; Student Option; Every Fall & Spring)
This course will teach you how to: (1) Understand basic accounting principles; (2) Read an annual report and analyze financial statements; (3) Look beyond numbers to gauge the financial performance and strength of an entity; (4) Employ cash flow analysis to value a business or determine the potential financial rewards of an investment opportunity; and (5) Understand the strategic questions that business managers must confront in governing their companies. The course surveys foundational concepts, analytical techniques and practices related to finance, accounting and strategic management issues lawyers confront when working with business executives either as an outside consulting attorney or as an inside corporate counsel. It may also consider other concepts used by business executives, including organizational behavior, marketing and quantitative analysis. The aim of the course is to help law students better appreciate the broader business context of legal decision-making so that they can contribute more effectively as a member of a firm's top management team or as outside counsel.

LAW 5078. Legislation and Regulation. (3 cr.; Student Option; Every Fall)
This course explores lawmaking in the administrative state. Topics include: the legislative process, delegation of legislative authority to administrative agencies, the rulemaking process, statutory interpretation by courts and agencies, and judicial review of agency decisions. The course will focus on how statutes structure and constrain judicial and administrative decisionmaking.

LAW 5100. Taxation I. (3 cr.; A-F only; Periodic Fall & Spring)
This basic course in federal income taxation introduces the student to the Internal Revenue Code and the income taxation of individuals through the following topics: definition of income, relevant accounting concepts, exclusions, deductions, income splitting, sales and dispositions of property, amortization, capital losses, and current issues of tax policy.

LAW 5102. Mergers and Acquisitions. (3 cr.; Student Option; Every Fall)
This class will cover the theory behind, the Federal and state law governing, and the practice of, mergers and acquisitions. Our main focus will be what a transactional lawyer would want and need to know as to why mergers and acquisitions might occur and how and why companies or shareholders would embrace or disfavor them, how the transactions are documented and how disclosure requirements are met, and what the present cases say.

LAW 5103. Data Privacy Law. (3 cr.; A-F only; Periodic Fall & Spring)
Every single day, the newspaper contains stories?plural intended?about data privacy and security. Whether they concern the National Security Agency, Facebook, or a data breach at a small business, the handling of personal information has become a central concern of our time. In response, a complex law of data privacy has emerged, and now it is a fast growing area of legal practice. This course will equip students to counsel clients about an array of federal, state, and international legal requirements?while also analyzing them critically and thinking about the societal challenges posed by new information technology. Assessment will include group projects and a take-home final.

LAW 5112. Essentials of Business. (3 cr.; A-F only; Periodic Fall & Spring)
This course will teach you how to: (1) Understand basic accounting principles; (2) Read an annual report and analyze financial statements; (3) Look beyond numbers to gauge the financial performance and strength of an entity; (4) Employ cash flow analysis to value a business or determine the potential financial rewards of an investment opportunity; and (5) Understand the strategic questions that business managers must confront in governing their companies. The course surveys foundational concepts, analytical techniques and practices related to finance, accounting and strategic management issues lawyers confront when working with business executives either as an outside consulting attorney or as an inside corporate counsel. It may also consider other concepts used by business executives, including organizational behavior, marketing and quantitative analysis. The aim of the course is to help law students better appreciate the broader business context of legal decision-making so that they can contribute more effectively as a member of a firm’s top management team or as outside counsel.

LAW 5214. Insurance Law. (3 cr.; Student Option; Every Fall)
Insurance is omnipresent in the practice of law because insurance is the primary means by which companies and individuals deal with risks. Lawyers, of course, often make a living either by counseling clients about how to plan for risks or by serving clients whose risks have developed into losses. This course introduces students to fundamental principles of insurance law and regulation. It will survey the nature and function of insurance, insurance contract formation and meanings, and insurance regulation. We will also look at specific legal issues relating to different lines of insurance, such as property, life, health, and liability insurance.

LAW 5224. Patents. (3 cr.; A-F only; Every Fall)
This course offers an overview of patent law for both those students intending to specialize in patent prosecution and those whose general practice may include patent litigation and licensing. Topics to be covered include the requirements for patentable subject matter; standards of novelty, utility, and non-obviousness; statutory bars; conception, priority, enablement, and written description requirements in patent procurement; direct and vicarious patent infringement; claims interpretation.

LAW 5231. Patent Prosecution Practice I. (2 cr.; A-F only; Every Fall)
Patent Prosecution Practice I is recommended for all students interested in intellectual property and patent law, including students considering practicing in the areas of patent prosecution, litigation, licensing, technology commercialization, and patent portfolio management. The course focuses on US patent practice and is designed to extensively develop the student's skills. Throughout the semester each student will complete two projects: (1) formulate and draft patent claims for a number of different inventions in view of prior art, (2) develop strategies for responding to a patent examiner according to rules of the U.S. Patent Office, arguing patentability and allowance of a patent application over cited prior art. Each student will be paired with a senior practicing attorney who will act as a mentor, including reviewing drafts and providing candid feedback to the student. Lectures and discussion topics include: - Organization and structure of the U.S. Patent Office, -The US patent process including the entire life cycle of a patent from application preparation and filing through examination and grant, -Formulating patent claims in view of prior art and potential infringers, -Architecting patent portfolios including all types of US patent applications, such as provisional, utilities, continuations and divisions, -Examination of patent applications including responding to Office Actions issued by the US Patent Office; -Invention and ownership determination and legal ramifications flowing therefrom, -US law and regulations governing patent prosecution practice. A technical background is not required to take this course.

LAW 5232. Patent Prosecution Practice II. (3 cr.; A-F only; Every Spring)
Patent Prosecution Practice II is recommended for all students interested in intellectual property and, in particular, students interested in advancing their skills and understanding of patent law and practice. Throughout the semester each student will complete the practical and diverse assignments designed to develop the student's skills. Each student will be paired with a senior practicing attorney who will act as a mentor, including reviewing drafts and providing candid feedback to the student. Specifically, in this class, each student will: (1) prepare a complete US Patent Application based on a real invention, (2) write an appeal brief according to rules of the U.S. Patent and Trademark Appeal Board, arguing patentability and reversal of the patent examiner in view of an examination history by the US Patent Office, and (3) provide clearance counseling to a client about to launch a new product, including reviewing issued US patents and developing a full non-infringement / invalidity opinion.
for the client. The course grade is primarily based on these three projects in lieu of a final exam. Lectures and discussion topics throughout the semester include: - skills and strategies for writing patent applications, - appeal practice including brief writing before the Patent Trial and Appeals Board (PTAB) at the US Patent Office, - clearance analysis including invalidity and non-infringement counseling and opinions, - foreign practice including national filings in foreign countries and international filings using the Patent Cooperation Treaty (PCT), including leveraging patent prosecution highways for accelerated examination, - expert witness matters including recent case law and claim drafting tips, - accelerated examination procedures within the US Patent and Trademark Office, - legal and practical considerations of infringement counseling including formulating invalidity and non-infringement opinions, - post grant review and other mechanisms for challenging issued patents before the US Patent and Trademark Office, - patent prosecution related considerations that arise in relation to participation in industry standards organizations, - patent prosecution related considerations that arise in the context of universities and technology licensing organizations, and - design patents. prereq: Master of Science Patent Law Students only.

LAW 5242. Patent Application Drafting. (1 cr. ; A-F only; Every Spring) Patent Application Drafting. Students must also be enrolled in Law 5232 Patent Prosecution Practice II to take this course.

LAW 5243. Patent Research and Writing. (2 cr. ; A-F only; Every Fall) Patent lawyers and agents spend their entire professional careers communicating (with clients, patent examiners, judges, colleagues) no matter what their individual career paths may be. This course is about the process of research and communicating about patents. In other words, the goal of the course is to teach the building blocks of patent research and communication through multiple practice exercises so the student may repeat the process independently after successful completion of this course. This course leverages free, patent office, and commercial research tools. Deliverables and works include: patent landscape search and report, patentability search and opinion, patent risk search and assessment, patent invalidity search and opinion. Recommended prereq: Patents (5232), Patent Prosecution Practice (5231) or Patent Portfolio Management (5250)

LAW 5250. Patent Portfolio Management. (2 cr. ; A-F only; Every Fall) Patent portfolio management is the art of aligning patent strategy with business objectives. In general, the successful portfolio manager must have the ability to transform complex patent information into actionable insights that provide decision-making value to a wide variety of stakeholders. This course introduces students to the various practices and skills that go into building, implementing, and managing a patent portfolio whether from the point of view of a small, innovative, start-up company or a Fortune 500 company in a highly competitive market space.

LAW 5290. Patent Law Capstone: Innovation. (3 cr. ; A-F only; Every Spring) This capstone course introduces students to the principles of successful innovation and the integral role of patents in this process. This is a course in innovation. There are no right or wrong answers. Large companies with very smart people often launch products that fail. Venture capitalists seeking to invest in winners more-often-than-not end up investing in losers. Innovation is an art not a science. There is no 'secret formula' that guarantees success. There are simply different tools, skills, methods of analysis and approaches that may or may not work better than others. We will explore the art of innovation and the integral role that patents play in turning an idea into an innovation. Goals: Students will learn how to research complex subject matter across the intersecting domains of business, finance, marketing, science, technology and intellectual property. Students will then develop the ability to present their findings in a clear and concise manner that is understandable to and can be acted upon by a cross-functional audience of high-level decision makers.

LAW 5601. International Business Transactions. (3 cr. ; Student Option; Periodic Fall & Spring) International Business Transactions is a three-credit course whose main focus of discussion and study is the private law aspects pertaining to international business transactions, rather than issues of national and international trade regulation. Thus, the course is primarily concerned with private international business law. We examine three basic methods of doing business abroad, namely, the sales of goods (export) transaction, licensing and franchising, and foreign direct investment. The course materials touch upon substantive law in areas as diverse as commercial transactions and the uniform commercial code, antitrust, intellectual property, conflict of laws, civil procedure, contracts, bankruptcy, taxation, and international law. While knowledge or background in these areas is certainly helpful it is not necessary for success in the course and for dealing with the issues raised in the readings or in class.

LAW 5603. Intellectual Property Survey. (3 cr. ; Student Option; Periodic Fall & Spring) The intellectual property survey course presents an overview of patent, copyright, and trademark law. The course also may include some coverage of trade secrets, unfair competition, or federal preemption of state intellectual property laws. The course provides an opportunity for students to acquaint themselves with the basics of intellectual property law, and may be most useful for students who intend to pursue careers in general business law or civil litigation; intend to specialize in one of the major branches of intellectual property law but want to develop a basic understanding of the other branches as well; or are interested in learning something about the field before committing to further in-depth study of one or more of its branches. Students should not enroll in this course if they already have taken, or will have taken by the end of the semester in which they plan to enroll in this course, two or more of the following courses: Patent Law, Copyright Law, Trademark Law, or Unfair Competition Law.

LAW 5608. Trademarks. (3 cr. ; Student Option; Periodic Fall & Spring) This course will consider how marketers secure and enforce trademark rights. Trademarks are the indicators that consumers rely upon to determine the origin of goods and services. The course will focus on U.S. federal trademark law, but will also look at state and international trademark law as well as related areas such as false advertising, publicity rights, and cybersquatting. This course will provide a solid foundation for students interested in practicing trademark law (application, enforcement, licensing, or litigation) or more general intellectual property law. It will also be useful to attorneys who do any work with trademark-dependent industries such as retail sales, advertising, or media and entertainment. Finally and more generally, trademark law offers excellent case studies of the interaction between law, culture, and technology, and of the evolution of traditional doctrine under pressure from rapid changes in surrounding circumstances.

LAW 5613. Copyright. (3 cr. ; Student Option; Periodic Fall & Spring) This course provides a detailed introduction to the basic law of copyright/traditional copyright subject matter, the concept of originality and authorship, copyright transfers (and terminations of transfers), infringement, and fair use. The course coverage excludes patent law, except in brief overview, and only touches briefly upon related areas of intellectual property law. Copyright (and copyright-like schemes) have increasingly become a necessary tool of the general practitioner as a result of the explosive growth in economic value of information-based products, like computer software and digital networks and databases. The lawyer ignorant of basic copyright principles will be increasingly handicapped in many areas of practice, such as negotiating technology transfers, drafting contractual rights, developing schemes of protection and privacy, distinguishing criminal from non-criminal behavior, and in litigation.

LAW 5624. Strategic Management of Intellectual Property. (3 cr. ; Student Option; Periodic Fall & Spring) Firms competing in a knowledge economy depend increasingly on intellectual property (IP): patents, trademarks, copyrights, trade secrets. Domain names. Adroit firms understand that IP-based competition demands close coordination between legal and strategic management executives. This course introduces you to fundamental IP concepts, competitive strategies, and public policy challenges from legal and strategic management perspectives. Learn how the
scope of IP protection and legal weaponry to vindicate IP rights has changed substantially in the past 15 years. Learn how IP management fits within a broader strategy for sustained profitability in high-tech industries. Learn how firm IP strategy to limit competitors is reconciled with antitrust policies promoting competition. Learn how managers price IP-protected products and services differently in developed versus developing economies. Come away with legal and managerial tools for applying IP-based strategies that will advance your firm and career.

LAW 5707. Intellectual Property Transactions. (2 cr.; A-F only; Every Spring) Intellectual property rights have been described as a "sword and shield." Rights holders are thought to act offensively by suing or threatening to sue infringers and seeking money damages, irrespective of the holders? marketing and product sales programs. Or they act defensively to protect their current or future market positions by having federal courts enjoin competitors. This course considers a third way: intellectual property rights are also valuable intangible assets that may be bought and sold. In this course, we will explore the principal theories and practices of intellectual property transactions. We will be considering closely the doctrines regulating the assigning and licensing of patent, copyright, trademark and other intellectual property rights, and we will be questioning critically whether these laws and practices encourage or inhibit commercial activity and innovation. While studying specific transactions in the course, we will be examining the practical uses of intellectual property law to meet commercial objectives.

LAW 5908. Independent Research and Writing. (1-2 cr.; max 8 cr.); Student Option; Every Fall, Spring & Summer) Students may earn 1 or 2 credits (and in exceptional circumstances, 3 credits) for researching and writing a note, article, memo, or other paper on a legal topic. At least 3,750 words are required for one credit, at least 7,500 for two credits, and at least 11,250 for three credits. To register, the student should confer with a supervising faculty member, draft a description of the proposed project, and complete the online Independent Research form. LAW 5908 is for students who are not enrolled in the Law School, as well as MSPL candidates. Other law school degree candidates should enroll in LAW 7606 or LAW 7608 instead of LAW 5908.

LAW 5909. Independent Field Placement. (1-3 cr.; S-N only; Every Fall, Spring & Summer) Students may earn up to three credits in a semester for work in a patent practice setting under the supervision of a qualified field supervisor and a faculty advisor. At least 50 hours of patent-related activities are required per credit. The student is responsible for identifying a field placement setting and supervisor, finding a faculty advisor, and submitting the Independent Field Placement Enrollment Form for approval by the Associate Dean of Academic Affairs prior to enrollment.

LAW 6000. First Year Law Coursework. (13-16 cr.; max 32 cr.); A-F only; Every Fall & Spring) First year Law Students have 16-credits of required coursework in fall and 13-credits of required coursework in spring. Registration in Law 6000 represents registration in these courses.

LAW 6001. Contracts. (; 4 cr.; A-F only; Every Fall) Basic course in law of contract and promissory obligation; formation of contracts; legal validity and construction; breach; legal and equitable remedies for breach; conditions; third-party rights.

LAW 6002. Legal Research & Writing. (1 cr.; P-F only; Every Fall) This year-long course covers the process of communicating about the law. Our goal is to teach students the building blocks of legal communication through multiple practice exercises so that students can repeat the process on their own after successful completion of the course. In the fall (one credit), we begin at orientation with a short exercise, then move on to email, letter, and office memorandum exercises written in an objective/predictive mode. In the spring (two credits), we proceed gradually to a persuasive trial court brief and delivery of formal oral arguments. The spring also includes a Statutory Interpretation module (one credit).

LAW 6003. Legal Research & Writing. (; 3 cr.; P-F only; Every Spring) The course continues in the spring (Fall Law 6002 - 1 credit; Spring Law 6003 - 3 credits) with a focus on statutory law. Students learn the basic doctrines of statutory interpretation while preparing a trial court (persuasive) brief. Students work through building block assignments in researching and drafting the brief. Students also learn the basic guidelines for formal oral argument, and the semester concludes with two rounds of oral argument. The semester also includes: additional research training focused on statutes, legislative history, and administrative law; individual conferences with instructors; peer review; a writing workshop; and an observation of oral argument before the Minnesota Supreme Court.

LAW 6004. Property. (; 4 cr.; A-F only; Every Spring) The law's protection of possession and ownership of real and personal property.

LAW 6005. Torts. (; 4 cr.; A-F only; Every Fall) Civil liability for infliction of harm, including assault, battery, false imprisonment, infliction of mental distress, negligence, and their respective defenses; function of torts process.

LAW 6006. Civil Procedure. (; 4 cr.; A-F only; Every Fall & Spring) This course addresses rules governing civil litigation, with emphasis on rules applicable in federal district courts. Topics may include due process, pleading, joinder, discovery, case management, the relationship between judges and juries, settlement, alternative dispute resolution, summary judgment, post-trial motions, finality, and preclusion. The course will also provide a brief survey of the topics covered in Civil Procedure II.

LAW 6007. Constitutional Law. (; 3 cr.; A-F only; Every Fall & Spring) Judicial review authority; problems of government structure (federalism, intergovernmental relations, separation of powers); and individual rights and limitations on government power (protection of economic and property claims, equality under the law, personal liberties, freedom of speech and of religion).

LAW 6008. Criminal Law. (; 3 cr.; A-F only; Every Fall & Spring) Purposes/functions of criminal processes and of several deprivations they impose. Requisites for official designation of acts and persons as "crimes" and "criminals." Justifications for acts otherwise designated "criminal." Emphasizes concepts of criminal responsibility. Nature/limits of criminal sentencing process. prereq: dept consent

LAW 6010. Perspectives: 1L. (3 cr.; A-F only; Every Spring) This course, offered in first-year and upper-year sections, is team-taught by faculty who approach the law from three different disciplinary perspectives. The disciplines presented will vary from year to year.

LAW 6011. International Law: 1L. (3 cr.; A-F only; Every Spring) The course is an introduction to public international law. It will examine the sources and history of the law of nations, and how international law is formed, interpreted and (sometimes) enforced. It will also provide a brief introduction to the law of international organizations (specifically the United Nations), concepts of jurisdiction and conflicts of jurisdiction among nation states, international protection of human rights, the law of the sea, international criminal law, and the control of the use of force (including peacekeeping and related topics).

LAW 6013. Law In Practice: 1L. (; 3 cr.; P-F only; Every Spring) This course introduces first year students to the skills needed to apply emerging knowledge of legal doctrine and reasoning in the actual practice of law. The course involves a series of simulation experiences related to two case files?one litigation case and one transactional matter. Students attend ?Law Firm? classes taught by Law School faculty that explore the doctrinal and strategic rights in the simulated cases. Students also perform simulations in ? Practice Groups? of eight students led by local practicing attorneys. Each student individually takes and defends a deposition. Groups of two students engage in client or witness interviews, client counseling and negotiation simulations. Students also complete either a simulated conference in the chambers of a local judge or engage in a simulated mediation conducted by a qualified neutral.

LAW 6015. Civil Procedure II: 1L. (; 3 cr.; A-F only; Every Spring)
This course builds on Civil Procedure I by examining additional facets of civil litigation. Topics may include personal jurisdiction, subject matter jurisdiction, venue, preliminary injunctions, temporary restraining orders, the Erie doctrine, appeals, and class actions.

LAW 6016. Essentials of Business for Lawyers. (3 cr. ; A-F only; Every Spring) This course will teach you how to: (1) Understand basic accounting principles; (2) Read an annual report and analyze financial statements; (3) Look beyond numbers to gauge the financial performance and strength of an entity; (4) Employ cash flow analysis to value a business or determine the potential financial rewards of an investment opportunity; and (5) Understand the strategic questions that business managers must confront in governing their companies. The course surveys foundational concepts, analytical techniques and practices related to finance, accounting and strategic management issues lawyers confront when working with business executives either as an outside consulting attorney or as an inside corporate counsel. It may also consider other concepts used by business executives, including organizational behavior, management, and quantitative analysis. The aim of the course is to help law students better appreciate the broader business context of legal decision-making so that they can contribute more effectively as a member of a firm's top management team or as outside counsel.

LAW 6018. Legislation and Regulation. (; 3 cr. ; A-F only; Every Spring) This course explores lawmaking in the administrative state. Topics include: the legislative process, delegation of legislative authority to administrative agencies, the rulemaking process, statutory interpretation by courts and agencies, and judicial review of agency decisions. The course will focus on how statutes structure and constrain judicial and administrative decision-making.

LAW 6019. Leadership and Law - LL.M.s. (; 2 cr. ; A-F only; Periodic Spring) In this age of globalization, leadership and professionalism within the legal profession takes on new and complex meanings. Research has demonstrated that introducing legal practitioners to emotional intelligence competencies impacts their professionalism and professional identity by increasing their ability to persuade, advocate, influence, and communicate. In this course, students will begin to develop their personal leadership identity and explore how that identity is influenced by culture. Students will explore what it means for the lawyer to be a leader. They will be challenged to: determine their professional strengths and developmental points; consider how individual personality and cultural traits affect group processes in legal institutions; explore the contextual nature of professionalism and how to adjust techniques based upon cultural cues (especially in international settings); navigate professional, legal settings to maximize their organizational impact; and discover and develop various leadership skills.

LAW 6020. LL.M. Introduction to American Law. (; 2 cr. ; A-F only; Every Fall) This course introduces law students and lawyers from other legal systems to the basics of the U.S. legal system and its legal institutions. The course will include legal research exercises designed to develop legal research skills.

LAW 6021. LL.M. Legal Writing and Legal Skills I. (; 3 cr. ; A-F only; Every Fall) The fall course introduces legal writing and focuses on legal analysis. Students will draft and edit letters and office memoranda and engage in exercises such as mock client meetings and professional presentations. The focus of the fall semester is predictive legal writing. Some time will also be spent discussing how to prepare for and take law school exams.

LAW 6022. LL.M. Legal Writing and Legal Skills II. (; 3 cr. ; A-F only; Every Spring) The spring semester course continues to build upon the foundation presented in the fall semester and to examine the fundamentals of U.S. legal analysis and legal writing. The focus of the second semester is persuasive legal writing and students will draft and edit a legal memorandum for motion practice in litigation as well as professional correspondence. To accomplish these goals, students act as attorneys in fictitious law firms, representing either the plaintiff or the defendant in a litigation matter. Students will also engage in simulated oral exercises such as mock client meetings and mock oral arguments. We will also spend time examining how to improve legal writing by doing editing and revising exercises and by analyzing samples of good (and bad) legal writing.

LAW 6023. LL.M. Contract Drafting. (; 2 cr. [max 3 cr.]; A-F only; Every Fall) This seminar will cover general contract principles and build upon them in a practical way. Students will review and revise contracts, draft sample provisions, draft contracts from "scratch" and discuss options for managing risk through effective drafting.

LAW 6024. LL.M. Trial Practice. (; 3 cr. ; A-F only; Periodic Spring) Selected problems in litigation. Exercises in jury selection, introduction of evidence, expert testimony, direct and cross examination and impeachment of witnesses, opening statements and closing arguments. Prerequisite: LL.M. student

LAW 6025. Wrongful Convictions. (; 2 cr. ; A-F only; Every Fall) Wrongful Convictions is run in conjunction with the Innocence Project of Minnesota. Its purpose is to educate students about the causes of wrongful convictions as well as provide students with an opportunity to work on hypothetical courtroom situations in a classroom setting. The reading materials and classroom discussion will cover topics such as unreliable eyewitness identifications, false confessions, jailhouse informant testimony, ineffective assistance of counsel, government misconduct, problematic forensic science, and racial bias in the court system. We will also discuss how DNA testing works and its application in the courtroom. Students are expected to perform in-class exercises such as examination of witnesses making eyewitness identification, challenging confessions, cross-examine a cooperating witness and conduct voir dire on racial bias. Finally, students will be required to evaluate inmate applications for assistance submitted to the Innocence Project of Minnesota as part of their midterm sample assignment and final assignment.

LAW 6026. Gaming Law. (; 3 cr. ; A-F only; Periodic Spring) This course covers the law related to one of the fastest growing and most regulated industries in the United States. It will focus on the $28 billion a year industry of Indian gaming and the issues tribes frequently face. The core of the course will develop an understanding of the relationship between federal, tribal, and state gaming regulatory schemes. It also reaches several substantive law fields, including administrative law, constitutional law, contracts, federal Indian law, labor law, and tribal law. Students do not need a background in federal Indian law or tribal law to successfully complete this course.

LAW 6027. Law of the Sea. (2 cr. ; A-F only; Periodic Fall) This course will examine the United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS has been established as arguably the most comprehensive expression of multilateral treaty negotiation and practical application since it entered into force in 1994. The Convention is the definitive word on articulating the use by nation states of the world's seas and oceans and the concomitant rights and responsibilities arising therefrom. The course will examine the historical perspective of the use of seas and oceans and the evolution of this body of international law. The course also address older regimes of the sea as well as the innovations that UNCLOS has ushered in, which include: the territorial sea, contiguous zone, and rights of innocent passage; archipelagic states; the exclusive economic zone; the continental shelf; access by landlocked states to the resources of the sea; geographically disadvantaged states; protection of the environment; the high seas and the resources thereof for the common heritage of mankind; the international seabed authority; maritime delimitation and the dispute settlement arrangements through the International Tribunal of the Law of the Sea, among others. The course will also study the wealth of case law mapping the development of international law of the sea. The course will adopt a practical approach to enhance skills in the drafting of treaties pursuant to UNCLOS, such as arrangements between coastal states and landlocked states for the sharing of EEZ resources. Students will be exposed to ?mock? maritime boundary delimitations and guest lecturers/visiting professors will facilitate this simulation.

LAW 6028. LL.M. Judicial Observation. (1-2 cr. ; S-N only; Every Spring) Students work with a judge and observe how matters are handled in the courtroom. Students are expected to participate in class exercises such as examining of witnesses making eyewitness identifications, challenging confessions, cross-examinining a cooperating witness and conducting voir dire on racial bias. Finally, students will be required to evaluate inmate applications for assistance submitted to the Innocence Project of Minnesota as part of their midterm sample assignment and final assignment.
LAW 6029. Introduction to Roman Law. (3 cr.; A-F only; Periodic Spring) Introduction to Roman private law, focusing particularly on the law of property. The initial part of the semester will be spent introducing the sources of Roman law. Roman legal procedure, and the post-antique reception(s) of Roman law.

LAW 6030. Contemporary Problems in Freedom of Speech and Press. (3 cr.; A-F only; Every Fall) Most of us use devices like Smartphones, GPS, streaming services, or hands-free speakers like Amazon's Echo that connect to online voice services like Alexa without thinking about them very much. But, what kind of information are they collecting? Are merchants allowed to gather your shopping history and use it to send you targeted advertising, or to sell it to other companies for profit? Should other people be able to post your personal information or photos online without your consent? Can the government read your emails, track your online browsing, or intercept your text messages? This course considers how growing concerns about privacy and national security affect the First Amendment and the rights of journalists to gather and report the news. We will read significant court decisions and take a look at current statutory and regulatory initiatives both in the United States and abroad. You can expect lively debates and discussion, and the opportunity to explore a privacy or national security issue in depth in a substantial research paper.

LAW 6031. Smart Growth. (2 cr.; max 3 cr.; A-F only; Periodic Spring) This class examines emerging legal strategies to address the fiscal, environmental, and social impacts of unrestrained metropolitan regional growth (?urban sprawl!?). Topics include: inequalities in access to housing, jobs, and educational opportunities; local fiscal competition; federal, state, regional regulatory responses to metropolitan development; environmental impacts of metropolitan development; and evolving legal structure of regional governance in America's large metropolitan areas.

LAW 6034. Sem: Women's Legal History. (2-3 cr.; A-F only; Periodic Spring) Passage of National Historic Preservation Act (NHPA) as watershed in cultural property law. NHPA direction of federal government to protect/preserve cultural property.

LAW 6035. Corporate Externship. (3 cr.; P-F only; Periodic Summer) In this program, students are placed in company law departments to experience day-to-day work of in house counsel and the flow of work and life in the corporate world. The instructor matches students and companies using a questionnaire. Students also attend up to two on-campus workshops and complete written assignments, including journals of their experiences. There is a required orientation meeting at the beginning of the semester.

LAW 6036. Reproductive Rights. (3 cr.; A-F only; Every Fall) The age-old debate on the rights of individuals to sexual determination and reproductive autonomy rages on. It grows more contentious as new technology and heated political confrontations alter the playing field. This course, using cases, statutes, and ancient and contemporary critical writings, examines the legal foundations and social implications of regulating contraception, abortion, pregnancy, childbirth, and assisted reproduction. It addresses access, funding, the rights of men, women, minors, fetuses, and government. It also explores ethical considerations and international perspectives.

LAW 6037. Emerging Sciences and Technologies: Law, Ethics and Policy. (3 cr.; A-F only; Periodic Fall) This interdisciplinary course will examine issues at the nexus of law, ethics, public policy, and emerging sciences and technologies (ES&T) including nanotechnology, genetic and biomedical engineering, cognitive science, synthetic biology, and robotics. Topics we will explore include the role of science and technology as both a tool for and the subject of law and policy; the legal, ethical, economic, and policy implications of ES&T research and development; environmental and human health risk analysis and regulation (e.g., EPA, FDA, OSHA, and state and local regulatory mechanisms); intellectual property issues; liability issues; and global impacts. Topics will be approached from the perspective of different stakeholders (e.g., federal agencies, industry, academic researchers, the environment, international organizations, and the public) and in the context of different application areas (e.g., drugs, devices, food, agriculture, energy, environmental remediation) using a variety of interdisciplinary approaches. Students with a broad range of interests are encouraged to enroll.

LAW 6038. Biomedical Ethics. (3 cr.; A-F only; Periodic Fall) Topics in biomedical ethics. Patients' rights/ duties, informed consent, confidentiality, ethical issues in medical research, initiation/ termination of medical treatment, euthanasia, abortion, allocation of medical resources.

LAW 6039. Great Cases. (3 cr.; A-F only; Periodic Spring) Eighteen U.S. Supreme Court cases that have shaped our nation. Five nationally publicized trial court cases. Historical, political, and legal context.

LAW 6040. Perspectives on the Law. (3 cr.; A-F only; Every Spring) This course, offered in first-year and upper-year sections, is team-taught by faculty who approach the law from three different disciplinary perspectives. The disciplines presented will vary from year to year.

LAW 6041. Investment Management Law. (2 cr.; A-F only; Periodic Spring) This course will cover policy and regulation governing pooled investment vehicles and their managers. We will engage in a close study of the Investment Company Act of 1940 and its companion statute, the Investment Advisers Act of 1940. The primary focus will be the regulation of mutual funds, but attention will also be given to alternative investment vehicles, such as hedge funds, private equity funds and exchange-traded funds.


LAW 6043. Nonprofit and Public Sector Externship. (2 cr.; P-F only; Periodic Summer) Externships for nonprofit/public sectors.

LAW 6044. Immigration Law Externship - Center for New Americans. (3 cr.; max 6 cr.; Periodic Fall & Spring) Externship in immigration law with Center for New Americans.

LAW 6046. Human Trafficking. (2 cr.; A-F only; Periodic Spring) Seminar will examine the breadth and depth of efforts to combat and raise awareness about human trafficking, a form of modern-day slavery in which people are compelled through force, fraud, coercion, or other means to engage in commercial sexual exploitation or forced labor. An optional two-credit externship, Law 6047, is available.

LAW 6047. Human Trafficking Externship. (2 cr.; A-F only; Periodic Spring) Registration in the Law 6046 Sem: Human Trafficking is required to enroll in this externship. Students gain a practical experience by participating in an externship at a human trafficking-related placement and apply the classroom lessons in the legal work place.

LAW 6049. Unincorporated Business Associations. (3 cr.; A-F only; Every Fall) This course introduces students to the main features of leading forms of unincorporated business associations, including limited liability companies (LLCs), partnerships, limited partnerships, and limited liability partnerships. Topics covered include authority and management structure, fiduciary duty of financial rights, transfer rights, and dissolution and dissolution. The course is structured around a series of exercises in which students negotiate, draft, and analyze the governing agreement for a simulated LLC. The course is strongly recommended for students who have taken the 1L Corporations elective.
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

LAW 6050. Commercial Paper. (3 cr.; A-F or Audit; Every Fall & Spring) Commercial payment and credit devices, such as checks, drafts, and promissory notes, and applicable commercial and banking practices. Topics include the Uniform Commercial Code.

LAW 6051. Business Associations/Corporations. (3 cr.; A-F only; Every Fall) The initial part of this course is an introduction to the general law of multi-person unincorporated business organizations, specifically partnerships, limited partnerships, and limited liability companies. Matters covered include the procedures for forming such organizations and the rights and obligations of the participants as among themselves and with respect to third persons. The remaining class hours constitute the first portion of the basic Corporations course, and will cover such matters as corporate organization; the distribution of powers among the corporate board of directors, its officers and its stockholders; the proxy system; control devices in the close corporation; and the fiduciary duties of directors, officers and controlling shareholders. Matters dealing with ?corporate finance? (issuance of shares, payment of dividends, and corporate reorganizations) are covered in Advanced Corporate Law.

LAW 6052. Sales Law. (3 cr.; A-F only; Periodic Spring) Law related to transactions in tangible personal property, primarily as codified in Article 2 of the Uniform Commercial Code. Emphasizes code methodology and problem solving; formation, modification, performance, and breach of sales contracts. Remedies for breach.

LAW 6053. Analytical Methods for Lawyers: An Introduction. (3 cr.; A-F only; Periodic Spring) The course provides the analytical foundations for legal practice in the modern world?a world in which sound legal advice requires the mastery of the techniques and language of disciplines such as economics, decision theory and game theory. After a brief review of the methodology of law and economics, this course exposes students to a broad survey of micro-economics, decision-theory, and game-theory concepts. These analytical methods play a crucial role in the design and understanding of legal rules. The second part of the course builds on these premises to study the economic structure of several areas of law. Through this course students will develop a framework for the analysis of legal rules that will aid them in the remainder of their legal studies and professional life.

LAW 6055. Advanced Corporate Law. (3 cr.; A-F only; Every Spring) This course will focus on corporate finance and corporate structure. Specifically, the course will explore: methods of financing the corporate enterprise including capital stock structures with preferred and common stock, as well as debt types and obligations; payments to stockholders by way of dividends, redemptions, purchase of shares or spin-offs; and reorganizations including mergers, sales of assets, and recapitalizations. The evaluation is by way of final essay exam.

LAW 6057. Judicial Externship. (2-3 cr.; max 6 cr.; P-F only; Every Fall, Spring & Summer) The Judicial Externship class provides an opportunity for students to learn about both lawyering and judging by observing and participating in the work of a judge and his or her staff. While judges and courts participate varies each term, externships are typically available with federal magistrate-judges and with judges at the federal district court, federal court of appeals, federal bankruptcy court, state trial court, state court of appeals, state tax court, and American Indian tribal courts. State trial court placements are with judges handling criminal, civil, family, or juvenile court matters and with problem-solving courts (e.g., drug court). Externships may also be available at the Office of Administrative Hearings and with the federal Immigration Court. Separate application to those courts is required; watch for notice about placement possibilities through the Career Office. Federal court placements (Federal District Court, Federal Magistrate-Judges, and Federal Court of Appeals) are made using an application process that occurs a few months before the start of the term. Notification will be sent to all students about deadlines for applying. For the rest of the placements, students registered for the class will be asked to complete a form specifying their preferences and to submit a resume, transcript, and cover letter to be used in the placement process. Students will be assigned based on their requests and the judges' needs. After placement, each student arranges a work schedule with the assigned judge and his or her staff. Students are encouraged to arrange their class schedules to have several large blocks of time available for fieldwork; free mornings are especially important for attending court hearings. Fieldwork in chambers generally includes both substantive assignments in research and writing and observation of court proceedings. Substantive assignments will depend upon the nature of the court's calendar and may include such work as preparing a memorandum or proposed order and decision on a summary judgment motion, summarizing and evaluating deposition testimony, or researching substantive legal issues raised in a motion, trial, or appeal. Students may observe a variety of proceedings, ranging from settlement conferences to motions hearings to trials to appellate arguments. They may be proceedings conducted in chambers for which the student is performing research or they may be part of unrelated cases. The precise nature of the assignments and observation opportunities in chambers is at the discretion of the judge and the judge's staff.

LAW 6058. Human Rights Advocacy. (3 cr.; A-F only; Every Fall) This course will study the histories, philosophies and activities of human rights activists and organizations. The course examines the theoretical basis of the human rights movement, the principles underlying key organizations in the human rights field, as well as their strategies, tactics, and programs. The class will use case studies and other active methods to understand and to evaluate the work of human rights activists. Topics to be considered include fact-finding and documentation, campaigns on human rights issues, cultural relativism, economic rights, and corporate responsibility for human rights. Students will consider the basic organizational structure and fundraising needs of NGOs. Students will design and present a research project based on their selection of in-class topics. Readings include material on the history of NGOs; roots and development of the human rights movement; analysis of key NGOs; advocacy within international institutions; and reports and publications from NGOs working in the field.

LAW 6059. Constitutional Law - Theories of Freedom of Expression. (3 cr.; A-F only; Periodic Spring) This course will survey the evolution of First Amendment law as it affects the legal rights and privileges of the print and electronic media. Topics will include prior restraints, libel, privacy, reporters? privilege, access to courts (including free press/fair trial), commercial speech, and obscenity/indecency. The course will examine the statutory and common law rights of access to information and will consider the constitutional implications of government regulation of media content, including the new media. We will read court opinions as well as seminal scholarly articles on the historical origins and philosophical foundations of freedom of press and speech and review doctrinal themes.

LAW 6060. Assisted Reproduction and the Family. (3 cr.; A-F only; Every Fall) Study of Assisted Reproduction/how laws work for family.

LAW 6061. Financial Regulation. (3 cr.; A-F only; Periodic Spring) This course will be a high-level overview of several different areas of financial regulation: banking regulation, insurance regulation, and elements of securities regulation (particularly broker-dealer and investment company regulation).

LAW 6062. Energy Law. (3 cr.; A-F only; Every Spring) This course provides an introduction to U.S. energy law. The first portion of the course introduces the nation's primary sources of energy: coal, oil, biofuels, natural gas, hydropower, nuclear, wind, solar, and geothermal energy. In doing so, it explores the physical, market, and legal structures within which these energy sources are extracted, transported, and converted into energy. The second portion of the course turns to the two major sectors of our energy economy -- electricity and transportation--and the full range of federal and state regulation of each sector. The third portion of the course explores case studies of hot topics in energy law and policy that highlight the complex transitions taking place in the energy system. These topics include electric grid modernization, electric...
vehicles, risks and benefits associated with hydraulic fracturing and deepwater drilling for oil and gas, and the continued role of nuclear energy. In addition to traditional textbook reading and class discussion, the course will include industry, government, and nonprofit guest speaker presentations. Grading will be based on a final exam given at the end of the semester as well as class discussion and weekly written postings on the TWEN site for the course.

**LAW 6063. Law and Neuroscience.** (2 cr.; A-F only; Every Fall)

What are adolescents, psychopaths, and white-collar fraud artists thinking? Why does emotional trauma for victims of abuse last so long? Why is eye-witness memory so poor? Do violent video games lead to violent children? How can you get into the heads of the judge and jury? Lawyers and courts, including the US Supreme Court, are already integrating neuroscience research into their arguments and opinions on questions such as these. This Law and Neuroscience course will introduce the exciting new field of ?neurolaw? by covering issues such as the neuroscience of criminal culpability, brain-based lie detection, cognitive enhancement, emotions, decision making, and much more. Along the way we?ll discuss how the legal system can and should respond to new insights on topics such as adolescent brain development, addiction, psychopathy, Alzheimer?s, the effects of combat on soldiers? brains, and concussions from sports injuries. New in the 2017 version of the course is a ?Bridge to Practice? track, which emphasizes the real-world brief writing related to the use of neuroscientific evidence in practice. (Note that all scientific material in the class will be presented in an accessible manner, so no previous science background is required.)

**LAW 6066. Seaks Public Interest Residency.** (2 cr. [max 4 cr.]; A-F only; Every Fall)

The Seaks Public Interest Residency Program is a new program established by Allen (56) and Linda Saeks that connects leading public interest and government organizations with high-achieving 3L students. Students work full-time during their third year of law school for a nonprofit or government agency and have a guaranteed, full-time, paid legal position with the same organization the year following graduation. This innovative model provides students with valuable legal training while providing the organizations with much-needed legal work. prereq: JD Students only; 6219 prereq or coreq; concurrent enrollment in 6066 required

**LAW 6068. Information Access Practicum.** (3 cr.; P-F only; Periodic Spring)

This course will expose students to the theory and practice of government secrecy law at the state and federal levels. The heart of the course will be practice-based. Students will be paired with non-governmental organizations to assist those organizations with government secrecy related legal, policy, and public education work. The exact work and mix of organizations may change somewhat from year to year. The organizations most likely will include the Minnesota Coalition for Government Information and Public Record Media. Students will assist the groups on projects ranging from litigation appealing the denial of information under the Minnesota Data Practices Act or the federal Freedom of Information Act, lobbying the Minnesota state legislature regarding amendments to the Data Practices Act, and preparing white papers or other public education and advocacy materials.

**LAW 6071. International Law.** (3 cr.; A-F only; Every Spring)

The course is an introduction to public international law. It will examine the sources and history of the law of nations and how international law is formed, interpreted, and (sometimes) enforced. It will also provide a brief introduction to the law of international organizations (specifically the United Nations), concepts of jurisdiction and conflicts of jurisdiction among nation states, international protection of human rights, the law of war, international criminal law, and the control of the use of force (including peacekeeping and related topics). prereq: Upper division students only

**LAW 6075. Civil Procedure II.** (3 cr.; A-F only; Every Spring)

This course builds on Civil Procedure I by examining additional facets of civil litigation. Topics may include personal jurisdiction, subject matter jurisdiction, venue, preliminary injunctions and temporary restraining orders, the Erie doctrine, appeals, and class actions. prereq: Upper division students only

**LAW 6076. Essentials of Business for Lawyers.** (3 cr.; A-F only; Every Fall & Spring)

This course will teach you how to: (1) Understand basic accounting principles; (2) Read an annual report and analyze financial statements; (3) Look beyond numbers to gauge the financial performance and strength of an entity; (4) Employ cash flow analysis to value a business or determine the potential financial rewards of an investment opportunity; and (5) Understand the strategic questions that business managers must confront in governing their companies. The course surveys foundational concepts, analytical techniques and practices related to finance, accounting and strategic management issues lawyers confront when working with business executives either as an outside consulting attorney or as an inside corporate counsel.

**LAW 6078. Legislation and Regulation.** (3 cr.; A-F only; Every Fall & Spring)

This course explores lawmaking in the administrative state. Topics include: the legislative process, delegation of legislative authority to administrative agencies, the rulemaking process, statutory interpretation by courts and agencies, and judicial review of agency decisions. The course will focus on how statutes structure and constrain judicial and administrative decisionmaking.

**LAW 6081. Constitutional Law: 14th Amendment.** (3 cr.; A-F only; Every Fall & Spring)

This course offers an overview of civil liberties and civil rights under the United States Constitution. It will cover First Amendment freedoms, including freedom of speech and of the press, freedom of assembly and association, and religious freedoms (prohibition on establishment of religion and protection of free exercise of religion). It will also cover rights protected by the Fourteenth Amendment, including due process of law and equal protection of the laws. A few other individual rights and liberties guaranteed by the Constitution will be briefly discussed (takings, contract clause, Second Amendment gun rights, Ninth Amendment ?privacy? rights). It does not cover constitutional rights in criminal law matters, which are covered in the Criminal Procedure course.

**LAW 6082. Constitutional Law: Civil Rights and Liberties Survey.** (3 cr.; A-F only; Periodic Fall & Spring)

This course includes coverage both of civil rights (Fourteenth Amendment protection of due process and of equal protection) and of civil liberties (First Amendment protection of speech and of religion), as well as limited coverage of other constitutionally protected rights and liberties. The First Amendment portion of this course includes an examination of freedom of speech and the press, as well as the Establishment Clause and Free Exercise Clause protections of freedom of religion. The Fourteenth Amendment portion deals with due process of law (procedural due process, substantive due process, the incorporation of the Bill of Rights protections to limit the powers of states and municipalities) and with equal protection of the laws (examining racial discrimination, gender discrimination, other
courses listed in this catalog are current as of 2018-08-23. for up-to-date information, visit www.catalogs.umn.edu.

law 6083. first amendment. (3 cr.; a-f only; every fall) an in-depth inquiry into the first amendment, including both the doctrine and theory of free expression. topics may include political incitement, commercial speech, hate speech, school prayer, parochial school vouchers and religious exemptions.

law 6084. equal protection and civil rights acts. (3 cr.; a-f only; periodic fall & spring) the course will cover the equal protection clause of the 14th amendment and the three major civil rights acts passed in the 1960s to give content to that clause. the choper casebook will be used for the equal protection clause and provide materials about the legislative histories and regulatory and statutory constructions of the major provisions of the 1964, 65, and 68 civil rights acts.

law 6085. criminal procedure. (3 cr.; a-f only; every fall & spring) this course explores key supreme court cases interpreting the 4th, 5th and 6th amendments that form our constitutional criminal procedure law defining the boundary between the individual and the state. topics include: search and seizure, stop and frisk, self-incrimination, involuntary confessions, line-ups, the right to counsel, and the role of defense counsel and prosecutors in an adversarial system. to bring our study into the 21st century, we will consider three important progressions that the supreme court is slowly acknowledging: the steady transformation of our adversarial process into an inquisitorial one focused on guilty pleas; the rapid rise in technology that has exponentially increased the possibilities for criminal law violation and detection; and the explosion of social science literature that informs the fundamentally human processes and interactions at the heart of encounters between citizens and police. the course will invite several guest speakers who, through their work in the trenches, have developed expertise in specific criminal justice areas.

law 6100. taxation i. (3 cr.; a-f only; every fall, spring & summer) this basic course in federal income taxation introduces the student to the internal revenue code and the income taxation of individuals through the following topics: definition of income, relevant accounting concepts, exclusions, deductions, income splitting, sales and dispositions of property, amortization, capital losses, and current issues of tax policy.

law 6102. mergers and acquisitions. (3 cr.; a-f only; periodic spring) this class will cover the theory behind, the federal and state law governing, and the practice of, mergers and acquisitions. our main focus will be what a transactional lawyer would want and need to know as to why mergers and acquisitions might occur and how and why companies or shareholders would embrace or disfavor them, how the transactions are documented and how disclosure requirements are met, and what the present cases say.

law 6103. data privacy law. (3 cr.; a-f only; periodic spring) every single day, the newspaper contains stories?plural intended?about data privacy and security. whether they concern the national security agency, facebook, or a data breach at a small business, the handling of personal information has become a central concern of our time. in response, a complex law of data privacy has emerged and now it is a fast growing area of legal practice. this course will equip students to counsel clients about an array of federal, state, and international legal requirements?while also analyzing them critically and thinking about the societal challenges posed by new information technology. assessment will include group projects and a take-home final.

law 6104. legal writing ii. (1 cr.; a-f only; every spring) this course provides additional instruction in the legal analysis and legal writing concepts covered in the first-year legal research and writing course. students will meet individually and in groups with the instructor and will have multiple short assignments.

law 6105. advanced statutory interpretation. (2-3 cr.; a-f only; every spring) general principles that courts/lawyers use in interpreting statutes. canons that refer to statutory text, legislative history, administrative agency interpretation, various sources of public policy.

law 6106. federal tax procedure. (2 cr.; a-f only; every fall & spring) overview of all major irs functions including returns selection, examinations, administrative appeals, tax litigation, collection activities (liens and levies), bankruptcy, and criminal tax enforcement. effective representation of clients in all phases of irs encounters.

law 6107. bankruptcy. (3 cr.; a-f only; every spring) after surveying the rights of creditors and debtors under state law, this course will consider the impact of bankruptcy upon secured and unsecured creditors and stockholders. the bankruptcy trustee?s avoiding powers will be studied. chapters 7, 11, and 13 liquidations and reorganization will be surveyed with selected topics considered in-depth. the negotiated settlements and ? workout agreements? which characterize this area of practice will be emphasized.

law 6109. creditors? remedies/secured transactions. (3 cr.; a-f only; every fall & spring) this three-hour course examines the full array of state-law remedies available to secured and unsecured creditors in the collection of debts and also examines the correlative procedural and substantive rights of debtors in shielding their assets from creditors? claims. the course focuses, however, on the rights and duties of parties to secured transactions under article 9 of the uniform commercial code. primary attention is given to the ordering of claims when the debtor has insufficient assets to satisfy all of her debts and also when she files, or is forced into, bankruptcy. throughout the course students will practice statutory interpretation; consider the relationship among sources of law (including the law of the parties? agreement, enacted law, and common law); argue about the proper roles of the legislator and judge in making law; and debate a variety of other jurisprudential issues (and some social/policy issues, too) that transcend the substance of the law of creditors? rights.

law 6111. lawyers in film. (2 cr.; a-f only; periodic spring) influence hollywood has had on how society perceives lawyers, legal profession, ethical standards of legal profession. critically evaluate films/television programs, identify ethical issues, gain increased understanding of role in society played by lawyers/legal system.

law 6113. construction law. (2 cr.; a-f only; periodic fall) the construction industry, comprised of owners, lenders, architects and engineers, contractors and subcontractors, material suppliers, sureties and insurers, by many measures is the largest production industry in the u.s. this industry-oriented course will address (1) the complex world of construction, (2) the climate that leads to controversies, (3) the application of legal principles to the complex factual contexts of the construction process, (4) contract formation and administration issues involved in the process, including project delivery methods, contract types, allocation of risk, implied warranties, competitive bidding and contractor selection procedures, changes and extras, differing site conditions, schedule delay and disruption, bonds and suretyship, insurance, and claims of many types, and (5) how disputes are resolved through mediation, litigation, and arbitration.

law 6114. partnership taxation. (3 cr.; a-f only; every spring) federal income taxation of partnerships and limited liability companies including formation, operation and management, distributions, allocations, sales and liquidations of entity interests, and terminations.

law 6115. civil litigation: case development and discovery. (2 cr.; a-f only; periodic spring) much of what civil litigators do involves case development. case development is a form of storytelling. the story, of course, should be persuasive, but it must also satisfy the requirements of applicable law, and it must be based upon admissible evidence. an integral part of case development is discovery. the rules of civil procedure, specifically rules 26 through 37, set forth the scope and types of discovery that may be conducted. yet, depending upon the nature of the case, questions relating to what forms of discovery
are appropriate, in what order, and for what purposes cannot be found in the rules. The goal of this course is to teach the student how to think both strategically and tactically with regard to case development and discovery. You will be introduced to basic (and some advanced) concepts and skills relating to design? and ?building? the case, including through discovery practice. In addition, you will participate in a number of skills-related exercises.

**LAW 6116. Pretrial Skills.** (2 cr.; A-F only; Every Spring)

This course focuses on pre-trial advocacy skills. Practically every lawyer interviews and counsels clients and engages in negotiation of transactions or resolution of disputes. Theoretical and practical exploration of these topics and other topics including fact development and case planning, alternative dispute resolution, discovery and motion practice form the basis for this course. Each topic will be explored with readings and simulated exercises. Specific topics may vary from year to year.

**LAW 6119. Sem: Criminal Prosecution Appeals.** (2-3 cr.; A-F only; Every Fall)

Basics of appellate practice pursuant to MN Rules of Criminal/Appellate Procedure. Present oral arguments to panel of experienced appellate practitioners. Course taught by County Attorney representing state of MN in criminal appeal pending before MN Court of Appeals.

**LAW 6200. Remedies.** (3 cr.; A-F only; Periodic Fall & Spring)

Three-credit course will cover approximately half of a traditional five- or six-credit ?Federal Courts? curriculum; the other half is covered in LAW 6120 Federal and State Courts. Students may take either course or both courses, in any order. This course will explore issues that were raised in Constitutional Law and Civil Procedure course discussions.

**LAW 6159. Education Law and Policy.** (3 cr.; A-F only; Every Fall)

Public control of land use and development and its constitutional limitations.

**LAW 6202. Conflict of Laws.** (3 cr.; A-F only; Every Fall & Spring)

Suppose a company in Minnesota contracts with a company in California to do some work on a construction site in New York and the laws of the three states are different on a critical issue of contract law? How would a court decide which state?s law would govern? Does it matter in which state the lawsuit is brought? Would the considerations instead be different if the underlying issue was a matter of tort? Or property? These are issues of choice of law, the primary focus of the Conflicts course. The course also considers the circumstances under which an American court is required in this area and therefore we will be interested in drafting and professional responsibility as those issues arise throughout the course.

**LAW 6159. Education Law and Policy.** (3 cr.; A-F only; Periodic Fall)

The Supreme Court has famously said that ?education is perhaps the most important function of state and local governments,? and Americans consistently rank K-12 education as one of the most important issues they want policymakers to address. Yet K-12 education is also one of the nation?s most contentious policy arenas. Education law stands at the center of these policy debates, and in this seminar students will be exposed to the many ways in which K-12 education is shaped by law and policy. Topics to be covered include: the structure of education law and governance; school finance; the interplay of federal, state, and local laws; religion and public schooling; charter schools and school choice vouchers; school boards; segregation; students? rights; and teachers? rights and teacher unions. In addition to case law, students will consider policy perspectives on school reform. Several guest speakers are planned. Students will be required to complete a paper (minimum 25 pages), as well as be active participants in course discussions.

**LAW 6151. Estate Planning.** (3 cr.; A-F only; Periodic Fall & Spring)

This course will cover both tax and non-tax considerations in estate planning. In light of the doubling of the federal estate tax exemption to $11,180,000 in the 2017 tax reform act, the course will cover the changes that may need to be made in many existing estate plans to adapt to the new provisions. Other topics covered include use of revocable trusts, retirement benefit planning, life insurance planning, charitable gift planning, and ethical considerations in estate planning.

**LAW 6120. Federal and State Courts.** (3 cr.; A-F only; Periodic Spring)


**LAW 6126. Water Law.** (3 cr.; A-F only; Periodic Spring)

This course examines the legal mechanisms by which society allocates and protects its most vital natural resource: water. The primary emphasis is on current legal and policy issues, but the course also addresses the historical development of water policy and water law in the United States. Topics include: the riparian and prior appropriation doctrines and modern administrative permitting schemes governing private uses of surface water and groundwater; public rights in water resources; federal and state water resource development, allocation, and control; alternative means of responding to the growing scarcity of fresh water and adapting to changes in the hydrological cycle due to climate change; the appropriate role for market-based approaches; allocation and protection of groundwater resources; environmental limits on water development, including the Endangered Species Act, Clean Water Act, and public trust doctrine; tribal water rights; the doctrine of federal reserved water rights; mechanisms for resolving or avoiding conflicts over transboundary water resources.

**LAW 6133. Data Compliance Practicum.** (1 cr.; S-N only; Periodic Spring)

The enormous growth in the importance of data privacy law over the past ten years has created opportunities for attorneys with expertise in this fascinating and fast-moving field. The Data Privacy Practicum aims to prepare students who may wish to specialize in the area with real-world exposure to practice and credentials that demonstrate readiness for its challenges. Students will 1) study for and take an exam overseen by the International Association of Privacy Professionals that will entitle them to become Certified Information Privacy Professionals; many attorneys working in this area display the ?CIPP? credential proudly on their business cards, demonstrating its reputational value; 2) shadow a privacy professional in the Twin Cities working in organizations such as Target, 3M, US Bank, Cargill, Optum Health, and major law firms; 3) attend six prosemninar sessions with guest speakers practicing in the field; and 4) research and write a short paper tackling an important problem in current data privacy law.
to enforce, without questioning the merits, a judicial decision from another state or country. This is a vital course not only for prospective litigators but also for transactional lawyers. Lawyers who have not taken this course are unlikely even to be able to spot the critical issues.

LAW 6203. Labor Law. (2 cr.; A-F only; Every Fall)
This course focuses on the system of federal law regulating labor-management relations. The course examines the law and strategy of labor organizing, collective bargaining, and economic action in labor disputes as well as of contract enforcement. The course also considers emerging trends of labor law reform and the intersection with other bodies of law, including employment and international human rights law. The course further analyzes how a fundamental tension between collective rights and individual rights has shaped the evolution of doctrine as well as policy debates in labor law. The course includes simulations and experiential projects related to union elections, negotiations, and grievance arbitration.

LAW 6207. Antitrust I. (3 cr.; A-F only; Every Fall & Spring)
The course in Antitrust will focus on competition, how that term has been defined by the court and agencies, and the role that competition plays in society. We will study the federal antitrust statutes and the case interpretation and application of those statutes. To put antitrust perspective, the interdisciplinary nature of the subject will be emphasized, including the historical debates, enforcement trends and economic theories. The antitrust substantive law will cover horizontal restraints (between competitors), vertical restraints (franchise or distributional restrictions), monopolies (market power), mergers, and price discrimination. We also will focus on procedural issues relevant in both public and private enforcement suits. The goals and objectives of the course are to teach: 1) the substantive law of antitrust, 2) the relevant procedural and litigation issues, 3) the economic analysis of antitrust issues and 4) the historical and doctrinal development of antitrust.

LAW 6208. Local Government Law. (3 cr.; A-F only; Periodic Fall & Spring)
This course will cover local government law on a national basis. Since much of local government law is on a statutory basis, we will use Minnesota statutes as a primary example. We will, however, also look at alternative approaches from other parts of the country.

LAW 6211. Federal Securities Regulations. (3 cr.; A-F only; Every Spring)
This course covers concepts and problems in the regulation of securities transactions under the Securities Act of 1933, the basic federal statute governing rights, duties, and remedies in connection with the financing of business operations through the distribution of securities to the public. Topics covered will include the definition of a security and the exemptions from federal registration (crucial knowledge for the small business advisor), the registration process, the contents of the prospectus, civil liabilities, and the applicability of the 1933 Act to secondary transactions (sales of securities by persons other than the issuing entity). Because of the expansive scope of federal securities law and the draconian nature of the penalties imposed even for innocent violations, knowledge of this material is vital not only for business lawyers who advise large corporations but also those whose business clients are closely held. The course will not focus, however, on litigation strategy or technique. Classes are problem-oriented.

LAW 6212. Legal Malpractice. (2 cr. [max 3 cr.]; A-F only; Periodic Spring)
Legal malpractice law is a specialized form of tort law that sometimes varies from classic negligence doctrine. This course will focus on teaching the substantive law and helping students recognize and avoid real life risks of legal malpractice exposure and liability.

LAW 6213. Real Estate Transactions. (3 cr.; A-F only; Every Fall & Summer)
The course examines the acquisition and development of real property. Topics include listing agreements, purchase agreements, conveyancing, real estate finance and security instruments, foreclosure, mechanics? liens, and forms of real estate development.

LAW 6214. Insurance Law. (3 cr.; A-F only; Every Fall)
Insurance is omnipresent in the practice of law because insurance is the primary means by which companies and individuals deal with risks. Lawyers, of course, often make a living either by counseling clients about how to plan for risks or by serving clients whose risks have developed into losses. This course will introduce students to fundamental principles of insurance law and regulation. It will survey the nature and function of insurance, insurance contract formation and meanings, and insurance regulation. We will also look at specific legal issues relating to different lines of insurance, such as property, life, health, and liability insurance.

LAW 6215. Environmental Law. (3 cr.; A-F only; Every Fall)
Legal aspects of major environmental problems with emphasis on issues that appear in various regulatory contexts, such as the degree to which environmental quality should be protected; who should bear the cost of enhancing environmental quality; allocation of responsibilities among courts, legislatures, and administrative agencies; the role of citizens, groups, and environmental litigation.

LAW 6216. European Union Law. (2-3 cr.; A-F only; Periodic Spring)
International law/issuies.

LAW 6217. Securities Litigation. (3 cr.; A-F only; Periodic Spring)
This course focuses on SEC enforcement of the federal securities laws and on the express and implied private rights of action under the federal securities laws, including the procedural rules for class action securities litigation. Students will read and critique federal cases, draft complaints, answers, motions to dismiss and other pleadings, and participate in a mock oral argument on their written pleadings. Evaluation will be based on class participation, written pleadings, the oral argument, and a final exam.

LAW 6219. Evidence. (3 cr.; A-F only; Every Fall, Spring & Summer)
This course provides an introduction to the use of evidence in litigation, with an emphasis on the Federal Rules of Evidence. Topics may include admission and exclusion of evidence, direct and cross examination, judicial notice, hearsay, expert testimony, burdens of proof and presumptions, and privileged communications.

LAW 6220. Poverty Law. (3 cr.; A-F only; Every Fall)
This course reviews constitutional, federal, state, and municipal law as they specifically affect low income persons. Poverty Law I and II cover complementary aspects of the subject. They may be taken independently or in any order. Poverty Law I focuses on government benefits programs, family law, consumer law, and administrative agencies; the role of citizens. Poverty Law II focuses on civil juvenile and public and subsidized housing law, with additional topics including migrant farmworkers, government benefits for immigrants, third party legal custody, direct care jobs, expungement of criminal records, special education law, and rural practice. This is a practice-based class with an emphasis on Minnesota law. Taking either or both courses will prepare the student for providing pro bono work while in private practice, working at a legal aid office, or serving in public law.

LAW 6222. Poverty Law II. (3 cr.; A-F only; Periodic Spring)
This course reviews constitutional, federal, state, and municipal law as they specifically affect low income persons. Poverty Law I and II cover complementary aspects of the subject. They may be taken independently or in any order. Poverty Law I focuses on government benefits programs and landlord-tenant law, with additional topics including consumer and elder law. Poverty Law II focuses on civil juvenile and public and subsidized housing law, with additional topics including migrant farmworkers, government benefits for immigrants, third party legal custody, direct care jobs, expungement of criminal records, special education law, and rural practice. The course requires two papers and has no exam. This is a practice-based class with an emphasis on Minnesota law. Taking either or both courses will prepare the student for providing pro bono work while in private practice, working at a legal aid office, or serving in public law.

LAW 6224. Patents. (3 cr.; A-F only; Every Fall)
This course offers an overview of patent law for both those students intending to specialize in patent prosecution and those whose general practice may include patent litigation and licensing. Topics to be covered include the requirements for patentable subject matter; standards of novelty, utility, and non-obviousness; statutory bars; conception,
Criminal Process examines a variety of assumed. previous background in American history and historiography of the United States. No clarifying how law has figured in the history examination of these sources with the aim of both for insights into the topics covered, and to secondary sources will also be considered, works, which will help to situate the legal constitutions, and landmark cases, as well as legal sources, such as treatises, statutes, American polity. Readings will include primary Reconstruction; industrialization; expansion law, politics, and culture in American society, This course explores the interaction between law, politics, and culture in American society, concentrating on the period from the Revolution through the New Deal. Topics include: democracy and the rule of law; slavery; the public-private distinction; Civil War and Reconstruction; industrialization; expansion of the federal administrative state; law and the human sciences; crime and punishment; legal education and the role of the lawyer in the American polity. Readings will include primary legal sources, such as treatises, statutes, constitutions, and landmark cases, as well as contemporary religious, scientific, and literary works, which will help to situate the legal materials in broader cultural context. Several secondary sources will also be considered, both for insights into the topics covered, and to illustrate various approaches to legal-historical analysis. The course will encourage critical examination of these sources with the aim of clarifying how law has figured in the history and historiography of the United States. No previous background in American history is assumed.

LAW 6229. Criminal Process: From Bail to Jail. (3 cr.; A-F only; Periodic Spring) Criminal Process examines a variety of procedures governing the prosecution of crime. It covers, in essence, criminal procedure from the time that the police have handed a case over to the lawyers. Major topics include: prosecutorial charging discretion, judicial screening, the grand jury, discovery, speedy trial, double jeopardy, plea bargaining, jury selection, jury deliberations, sentencing, appeals, and habeas. This class is sometimes known as "Criminal Procedure II" because it picks up chronologically where Criminal Procedure ends. Criminal Procedure, however, is not a prerequisite. prereq: Criminal procedure recommended.

LAW 6230. Advanced Torts. (3 cr.; A-F only; Every Fall) Study of injuries to relational interests, including defamation, privacy (a relational interest in some contexts, not in others), misuse of legal procedure, business torts, interference with family relations, wrongful death actions, and if time permits, no-fault auto compensation system in Minnesota. prereq: Torts.

LAW 6231. Patent Prosecution Practice I. (2 cr.; A-F only; Every Fall) Patent Prosecution Practice I is recommended for all students interested in intellectual property and patent law, including students considering practicing in the areas of patent prosecution, litigation, licensing, technology commercialization, and patent portfolio management. The course focuses on U.S. patent practice and is designed to extensively develop the student's skills. Throughout the semester each student will complete two projects: (1) formulate and draft patent claims for a number of different inventions in view of prior art, (2) develop strategies for responding to a patent examiner according to rules of the U.S. Patent Office, arguing patentability and allowance of a patent application over cited prior art. Each student will be paired with a senior practicing attorney who will act as a mentor, including reviewing drafts and providing candid feedback to the student. Lectures and discussion topics include: Organization and structure of the U.S. Patent Office, The U.S. patent process including the entire life cycle of a patent from application preparation and filing through examination and grant, Formulating patent claims in view of prior art and potential infringers, Architecting patent portfolios including all types of U.S. patent applications, such as provisions, utilities, continuations and divisionals, Examination of patent applications including responding to Office Actions issued by the U.S. Patent Office, and ownership determination and legal ramifications flowing therefrom, and U.S. law and regulations governing patent prosecution practice. A technical background is not required to take this course.

LAW 6232. Patent Prosecution Practice II. (3 cr.; A-F only; Every Spring) Patent Prosecution Practice II is recommended for all students interested in intellectual property and, in particular, students interested in advancing their skills and understanding of patent law and practice. Throughout the semester each student will complete three practical and diverse assignments designed to develop the student's skills. Each student will be paired with a senior practicing attorney who will act as a mentor, including reviewing drafts and providing candid feedback to the student. Specifically, in this class, each student will: (1) prepare a complete U.S. Patent Application based on a real invention, (2) write an appeal brief according to rules of the U.S. Patent Trial and Appeal Board, arguing patentability and reversal of the patent examiner in view of an examination history by the U.S. Patent Office, and (3) provide clearance counseling to a client about to launch a new product, including reviewing issued U.S. patents and developing a full non-infringement / invalidity opinion for the client. The course grade is primarily based on these three projects in lieu of a final exam. Lectures and discussion topics throughout the semester include: - skills and strategies for writing patent applications, - appeal practice including brief writing before the Patent Trial and Appeals Board (PTAB) at the U.S. Patent Office, - clearance analysis including invalidity and non-infringement counseling and opinions, - foreign practice including national filings in foreign countries and international filings using the Patent Cooperation Treaty (PCT), including leveraging patent prosecution highways for accelerated examination, - eligible subject matter issues including recent case law and claim drafting tips, - accelerated examination procedures within the U.S. Patent and Trademark Office, - legal and practical considerations of infringement counseling including formulating invalidity and non-infringement opinions, - post grant review and other mechanisms for challenging issued patents before the U.S. Patent and Trademark Office, - patent prosecution related considerations that arise in relation to participation in industry standards organizations, - patent prosecution related considerations that arise in the context of universities and technology licensing organizations, and - design patents.

LAW 6234. Public Lands and Natural Resources. (3 cr.; A-F only; Periodic Spring) Public Lands and Natural Resources studies the expansive body of federal and state constitutional provisions, statutes, rules, customs, and processes that govern the ways individuals, corporations, and federal, state, and local governments interact with federal public lands, state lands, private lands, water, air, wildlife, minerals, and other natural resources. We will study: (1) the history and statutes of U.S. federal public lands, and the past and present conflicts governing these lands; (2) the laws and regulations governing national parks, national monuments, national forests, grazing lands, energy resources, wildlife, and other natural resources; and (3) ownership interests and rights relating to public and private lands and resources. The course will help students gain an appreciation of our relationship with the natural environmental from cultural, historical, and economic perspectives, in addition to a legal perspective.

LAW 6236. Indian Law. (3 cr.; A-F only; Periodic Spring)
This course examines the evolution of Indian law from colonization onward as impacted by treaties, executive orders, congressional enactments, and the development of federal common law. Students will gain an understanding and appreciation of one of the more particularized areas of the law, and acquire the necessary tools to become able practitioners within the field. The course will also focus upon the unique historical experience of the Midwest tribal nations.

**LAW 6241. Patent Remedies.** (1 cr. [max 3 cr.]; A-F only; Periodic Spring)

This course provides in-depth coverage of issues relating to remedies for patent infringement. Specific topics may include permanent and preliminary injunctions, ITC proceedings, lost profits, reasonable royalties, FRAND royalties, enhanced damages, attorneys’ fees, awards of infringer’s profits for design patent infringement, patent marking, declaratory judgments of noninfringement or invalidity, and comparative remedies law. Prereq Law 6224 or 5224

**LAW 6243. Patent Research and Writing.** (2 cr.; A-F only; Every Fall)

Patent lawyers and agents spend their entire professional careers communicating (with clients, patent examiners, judges, colleagues) no matter what their individual career paths may be. This course is about the process of research and communicating about patents. In other words, the goal of the course is to teach the building blocks of patent research and communication through multiple practice exercises so the student may repeat the process independently after successful completion of this course. This course leverages free, patent office, and commercial research tools. Deliverables and works include: patent landscape search and report, patentability search and opinion, patent risk search and assessment, patent invalidity search and opinion. Recommended prereq: Patents (5224/6224), Patent Prosecution Practice 1 (5231/6231) or Patent Portfolio Management (5250/6250)

**LAW 6244. Employee Benefits.** (3 cr.; A-F only; Periodic Fall & Spring)

Qualified pension and profit-sharing plans. Quality of the law and its administration, limitations on contributions/benefits, treatment of participants/beneficiaries. Emphasizes federal income tax aspects of qualified plans.

**LAW 6245. Interviewing, Counseling, and Negotiating.** (3 cr.; A-F only; Every Fall & Spring)

This course will focus on basic skills necessary for all lawyers. We will discuss and do simulated exercises in each of the skills, focusing on skill development and self-reflection to improve skills. The course will emphasize planning, performance and reflection over a range of civil and criminal cases.

**LAW 6247. Depositions.** (2 cr.; A-F only; Periodic Fall & Spring)

Skills necessary to prepare for, defend, and take depositions in civil litigation under federal rules of civil procedure. Learn-by-doing, skills simulation course.

**LAW 6248. Advanced Patents.** (2 cr.; A-F only; Periodic Spring)

This course will be a continuation of the three-credit Patent Law course. The course will provide in-depth coverage of topics such as remedies (injunctions, lost profits and reasonable royalties, enhanced damages, declaratory judgment, and issues relating to patent marking); appellate review of USPTO decisions; reissue and reexamination; inequitable conduct; inventorship and ownership; double patenting; and patent misuse and related antitrust claims.

**LAW 6249. Evidence Drafting.** (1 cr.; A-F only; Every Fall, Spring & Summer)

This one-credit course is an optional supplement to the 3-credit Evidence course offered as LAW 6219. Students may enroll in this course only if concurrently enrolled in LAW 6219 with the same instructor. The course will provide an opportunity for students to write about evidence issues in various formats (e.g., motions, memos). prereq: concurrent registration in 6219

**LAW 6250. Patent Portfolio Management.** (2 cr.; A-F only; Every Fall)

Patent portfolio management is the art of aligning patent strategy with business objectives. In general, the successful portfolio manager must have the ability to transform complex patent information into actionable insights that provide decision-making value to a wide variety of stakeholders. This course introduces students to the various practices and skills that go into building, implementing, and managing a patent portfolio whether from the point of view of a small, innovative, start-up company or a Fortune 500 company in a highly competitive market space.

**LAW 6400. International Environmental Law.** (2 cr.; A-F only; Every Spring)

This seminar will examine issues of international environmental law. Although there is a limited body of older law, most of the topic has emerged during the past half century.

**LAW 6402. Food and Drug Law.** (3 cr.; A-F only; Periodic Fall)

The primary focus of the class will be on the Food, Drug and Cosmetic Act and the FDA. In addition, time will be spent on specific food and drug aspects of other areas of the law. For example, the class will review the special rules and cases in the product liability field relating to food and drugs and the interface between food and drug regulation and subjects such as environmental law, the practice of medicine, and free choice in medical care.

**LAW 6403. Environmental Law Capstone: Brownfields Redevelopment and Litigation.** (4 cr.; A-F only; Periodic Spring)

Legal/practical issues surrounding redevelopment of and litigation over underutilized real property that has been subject to environmental contamination.

**LAW 6405. Labor and Employment Law Capstone.** (5 cr.; A-F only; Periodic Spring)

The course is largely simulation-based. It will provide students with experience integrating diverse areas of workplace law with practice skills and professional ethics. Students will work in teams representing a particular client. The roles of clients and witnesses will be played by a combination of actors and volunteers. Real arbitrators and mediators will play those roles. Claims may include unfair labor practice proceedings before the National Labor Relations Board, employment discrimination and sexual harassment charges before the EEOC, arbitration of employee discipline under a collective bargaining agreement, arbitration under non-union employment contracts, defamation, and claims under FMLA and ERISA. Students may experience interviewing and counseling clients, filing claims with administrative agencies, conducting research, drafting pleadings and legal memoranda, negotiations, discovery, and representing clients in arbitration, mediation and litigation motion practice.

**LAW 6408. Climate Change and Clean Energy Capstone.** (4-5 cr.; A-F only; Periodic Fall)


**LAW 6409. Twin Cities Regional Planning Capstone.** (4-5 cr.; A-F only; Periodic Spring)

Regional development challenges/legal regional regulatory frameworks in areas of housing, transportation, water, air, parks, airports.

**LAW 6411. Legislative Process Capstone.** (5 cr.; A-F only; Periodic Spring)

Field work course designed to teach law students about how the state legislature operates and makes law. It is good preparation for careers in government as legislative staff, agency lawyers, or as elected officials or for work in the private sector in fields where legislative relations are relevant.

**LAW 6412. Environmental and Energy Justice Capstone.** (4 cr.; A-F only; Periodic Spring)

Course focuses on the complex justice issues surrounding (1) environmental harms and benefits and (2) the production and use of energy. These two topics are considered individually, and how they are interrelated.

**LAW 6413. Family Law Capstone.** (3 cr.; A-F only; Periodic Spring)

This capstone course is designed to expose students to the ways in which family law concepts are implemented practically and procedurally. The course will touch on traditional family law topics such as premarital agreements, custody, and property divisions in the contexts that practicing attorneys are likely to encounter these topics. The course will accordingly focus on interviewing potential clients, retaining and using experts.
incorporating financial planners and therapists in family dispute resolution, conducting a mediation, and drafting documents such as cohabitation agreements, divorce petitions, settlement decrees, and parenting plans. Assignments will be designed both to prepare students for practice and to capture the way that family law practice is changing to deal with the realities of modern families. The course will offer rigorous practical experience and advanced theoretical and policy discussion.

**LAW 6414. Civil Rights and Social Justice Capstone.** (4 cr.; A-F only; Periodic Spring) The United States has made significant progress in addressing de jure discrimination, but persistent de facto discrimination and inequality remain. This class focuses on the role of law in making progress against both subtle and overt forms of discrimination in a variety of spheres and settings based on race, ethnicity, class, national origin, gender, sexual orientation, age, disability, and religion. Topics may include the segregation of neighborhoods and schools by race and class; encounters with the police and criminal justice system; how poverty limits access to crucial social goods; the location of environmental hazards near low-income communities and communities of color; unequal pay and opportunities for advancement for women in the workplace; access to adequate child care for working parents; barriers to marriage; and treatment of migrants.

**LAW 6490. Patent Law Capstone: Innovation.** (3 cr.; A-F only; Every Spring) This capstone course introduces students to the principles of successful innovation and the integral role of patents in this process. This is a course in innovation. There are no right or wrong answers. Large companies with very smart people often launch products that fail. Venture capitalists seeking to invest in winners more-often-than-not end up investing in losers. Innovation is an art not a science. There is no ?secret formula? that guarantees success. There are simply different tools, skills, methods of analysis and approaches that may or may not work better than others. We will explore the art of innovation and the integral role that patents play in turning an idea into an innovation. Goals: Students will learn how to research complex subject matter across the intersecting domains of business, finance, marketing, science, technology and intellectual property. Students will then develop the ability to present their findings in a clear and concise manner that is understandable to and can be acted upon by a cross-functional audience of high-level decision makers.

**LAW 6601. International Business Transactions.** (3 cr.; A-F only; Periodic Fall & Spring) International Business Transactions is a three-credit course whose main focus of discussion and study is the private law aspects pertaining to international business transactions, rather than issues of national and international trade regulation. Thus, the course is primarily concerned with private international business law. We examine three basic methods of doing business abroad, namely, the sales of goods (export) transaction, licensing and franchising, and foreign direct investment. The course materials touch upon substantive law in areas as diverse as commercial transactions and the uniform commercial code, antitrust, intellectual property, conflict of laws, civil procedure, contracts, bankruptcy, taxation, and international law. While knowledge or background in these areas is certainly helpful it is not necessary for success in the course and for dealing with the issues raised in the readings or in class.

**LAW 6603. Intellectual Property.** (3 cr.; A-F only; Every Fall) The intellectual property survey course presents an overview of patent, copyright, and trademark law. At the professor?s discretion, the course also may include some coverage of trade secrets, unfair competition, or federal preemption of state intellectual property laws. The course provides an opportunity for students to acquaint themselves with the major branches of intellectual property law, and may be most useful for students who (1) intend to pursue careers in general business law or civil litigation; (2) intend to specialize in one of the major branches of intellectual property law, such as patents, but who want to develop a basic understanding of the other branches as well; or (3) are interested in learning something about the field before committing to further in-depth study of one or more of its branches.

**LAW 6604. Family Law.** (3 cr.; A-F only; Every Fall, Spring & Summer) This course examines how the law creates family relationships, regulates their dissolution, and defines the rights and responsibilities of family members. Topics include: limits on who may marry and who may adopt children, divorce and its economic consequences, dissolution of nonmarital relationships, termination of parental rights, child custody and support, surrogate motherhood, domestic violence, and child abuse.

**LAW 6605. Health Law.** (3 cr.; A-F only; Periodic Fall) This course is a comprehensive introduction to health law. We will investigate the organization of health care delivery in the United States; the nature of the physician-patient relationship; methods of quality control; responses to harm and error, including through medical malpractice litigation; problems of access to health care; and approaches to cost control. We will also analyze proposals for health care reform.

**LAW 6608. Trademarks.** (3 cr.; A-F only; Periodic Fall) The course will focus on U.S. federal trademark law, but will also look at state and international trademark law as well as related areas such as false advertising, publicity rights, and cybersquatting. This course will provide a solid foundation for students interested in practicing trademark law (application, enforcement, licensing, or litigation) or more general intellectual property law. It will also be useful to attorneys who do any work with trademark-dependent industries such as retail sales, advertising, or media and entertainment. Finally and more generally, trademark law offers excellent case studies of the interaction between law, culture, and technology, and of the evolution of traditional doctrine under pressure from rapid changes in surrounding circumstances.

**LAW 6609. International Intellectual Property.** (3 cr.; A-F only; Periodic Spring) This course provides an overview of international intellectual property law. Likely topics include (1) a comparison of US and foreign law relating to patents, copyrights, and trademarks; (2) the principal multinational agreements relating to intellectual property, including the Paris Convention, Berne Convention, and the TRIPs Agreement, as well as the implementation of these agreements within the domestic law of the United States and other countries; and (3) other topics such as the protection of indigenous knowledge and the law of judgments, jurisdiction, and choice of law as it relates to intellectual property disputes. It is highly recommended that students enrolling in this course have taken, or be in the process of taking, at least one other intellectual property course. prereq: One prior or concurrent intellectual property course.

**LAW 6610. Unfair Competition.** (2 cr. [max 3 cr.]; A-F only; Every Spring) This course provides an overview of false advertising and product disparagement under the Lanham Act; the right of publicity; and trade secret law. The course does not provide comprehensive coverage of antitrust, trademarks or trade dress, or consumer protection law.

**LAW 6612. Antitrust and Intellectual Property.** (2 cr.; A-F only; Every Spring) This course will address the intersection of antitrust and intellectual property (IP) law, from the early twentieth century to the important disputes of the present day. Topics to be considered will include, among others, Walker Process and sham litigation claims involving IP; tying and bundling of IP rights; unilateral refusals to deal; deceptive conduct before standard setting organizations; patent pools and package licensing; and pharmaceutical patent settlements involving reverse payments. Students are strongly urged, though not required, to have taken or be in the process of taking, either antitrust or an intellectual property course, before enrolling in this course.

**LAW 6613. Copyright.** (3 cr.; A-F only; Periodic Spring) This course provides a detailed introduction to the basic law of copyright?traditional copyright subject matter, the concept of originality and authorship, copyright transfers (and terminations of transfers), infringement, and fair use. Copyright law is now important well beyond the entertainment industry, and many of the decisions we study derive from that genre (Humphrey Bogart, George Harrison, J.D. Salinger, Superman, Mickey Mouse, and many other luminaries make cameo appearances in our cases). Copyright has increasingly become a necessary tool of the general practitioner due to the explosive
LAW 6619. International Trade. (3 cr.; A-F only; Every Fall & Spring)

This course will be a general survey course of the most important ideas, concepts, theorists, and schools of law in contemporary legal philosophy. The course will examine foundational legal questions relating to the nature of law, rights, justice, and punishment; questions concerning the role of judges. We will examine different organizing frameworks for understanding why and how multinational firms and cross-border transactions can be effectively addressed by a single entity or technique. This course focuses on key integrative leadership questions and the diverse theories, disciplines, experiences and techniques that can help us answer them. Learning occurs through reading foundational materials, personal leadership coaching, engaging with examples from guest speakers and case materials, and developing a final group project. You will learn to recognize and address integrative leadership challenges and opportunities, and build your own capacity to contribute to integrative leadership through group work and through being exposed to a range of boundary work practices.

LAW 6620. Community Policy Development. (2-3 cr.; A-F or Audit; Periodic Spring)

Role of lawyers in community. Complex interactions among legal service providers, nonprofit community-based organizations, community activists in addressing systemic problems.

LAW 6621. Civil Rights: Citizenship and Human Rights. (3 cr.; A-F only; Every Spring)

This course explores an emerging, interdisciplinary field of inquiry that focuses on the relationships between Civil Rights Law in the United States and International Human Rights Law in the global context. Although the two areas represent distinct bodies of law, they also share many important features, objectives, and impediments. By examining the historical emergence of (1) Civil Rights Law in the United States, and (2) International Human Rights Law in the global context, students will gain a better understanding of the critical relationships and interactions between these two important areas of public law. Through an examination of the seminal cases and controversies in these areas, this course will explore the differences between various categories of rights; America’s exceptionalism? why the United States pursues a strong human rights agenda abroad that is rarely applied in the domestic context; the gains (and losses) that the domestic civil rights movement has experienced in recent decades, among other topics.

LAW 6622. International Business Operation and Negotiation. (3 cr.; A-F only; Periodic Spring)

The course surveys foundational concepts, analytical techniques and practices related to organization and strategic management of multinational firms and cross-border transactions they negotiate with host-country governments, firms and non-governmental organizations. The overall aim of the course is to give law students basic proficiency in theories, practices and analytical techniques for understanding why and how multinational firms emerge and operate differently, negotiate cross-border transactions differently, and perform differently over time. Students will gain this basic proficiency with special reference to the multinational firm’s top management team. The pedagogical approach of this course will be a modified Socratic method utilizing business and legal cases as well as in-class exercises letting law students play different organizational roles in different negotiating contexts.

LAW 6623. Integrative Leadership: From Theory to Practice. (3 cr.; A-F only; Periodic Spring)

Leaders with different skills and from different sectors need to be able to collaborate in new ways to meet challenges ranging from improving public education, to writing smarter and more consistent regulations for healthcare delivery, to humane and effective approaches to current migrant. Integrative leadership is shared leadership of public, private and nonprofit actors or approaches to address complex and significant issues that cannot be effectively addressed by a single entity or technique. This course focuses on key integrative leadership questions and the diverse theories, disciplines, experiences and techniques that can help us answer them. Learning occurs through reading foundational materials, personal leadership coaching, engaging with examples from guest speakers and case materials, and developing a final group project. You will learn to recognize and address integrative leadership challenges and opportunities, and build your own capacity to contribute to integrative leadership through group work and through being exposed to a range of boundary work practices.

LAW 6624. Strategic Management of Intellectual Property. (2-3 cr.; A-F only; Periodic Spring)


LAW 6625. Disability in the Workplace. (3 cr.; A-F only; Periodic Spring)

This class explores legal issues relating to physical and mental disabilities in the contexts of employment, governmental services, public accommodations, and education. The principal regulatory focus is on the Americans with Disabilities Act. Legal issues under that statute include determining who is disabled, proving discrimination, and the concepts of reasonable accommodation and undue hardship. Other statutes covered include the Family and Medical Leave Act, the Rehabilitation Act, and Individuals with Disabilities Education Act. This course has no written paper requirement, but will have a final examination. There is no prerequisite for taking this course.

LAW 6626. Complex and Cross-Cultural Negotiations. (2 cr.; A-F only; Periodic Spring)

Principles, role play of multi-party/-issue, team-based negotiations/conflicts. How to structure ambiguous situations, bridge national/organizational cultures (e.g., alliances, mergers), functions (R&D, finance), institutional contexts (regulators, interest groups).

LAW 6627. International Tax. (2 cr.; A-F only; Every Spring)

The course examines U.S. taxation of foreign individuals and corporations earning U.S. source income from activities in this country, taxation of U.S. citizens and residents abroad, taxation of business and investment activities of U.S. persons, companies and subsidiaries operating abroad, foreign tax credits, transfer pricing issues, the use and applicability of tax treaties, and the obligations under U.S. law for U.S. persons to report interests in and transactions with foreign accounts.
LAW 6628. Advanced Trial Practice. (3 cr.; A-F only; Every Spring) This course will be to help students learn to recognize and anticipate a large number of important evidentiary issues which can arise during a trial and to help them learn how to deal with the issues when they arise. Students will perform direct and cross examinations, opening and closing statements, and voir dire. Students will be expected to write brief motions in limine and short memoranda on evidentiary issues to learn to present concise persuasive memoranda to a court before and during trial.

LAW 6630. Health Care Decision-Making: Markets, Regulation and Bioethics. (2 cr.; max 3 cr.; A-F only; Periodic Spring) This class will focus on health-care decision-making at the beginning and end of life, the role of informed consent, the influence of potential tort liability, the framework for the introduction of new technologies, and the growing impact of medical tourism. It explores the role of lawyers in shaping health care decisions and policy discussions.

LAW 6631. Employment Discrimination. (3 cr.; A-F only; Every Fall) Employment Discrimination. This course considers the principal statutory and constitutional prohibitions on employment discrimination. It focuses most prominently on Title VII of the 1964 Civil Rights Act, which prohibits employment discrimination based on race, color, religion, sex, or national origin. The course considers the basic frameworks for proving discrimination under Title VII and the jurisprudence defining Title VII's protected classes. The course also investigates newer Title VII fields, such as the law of sexual harassment and pregnancy discrimination. Using Title VII as a basis for comparison, the course then examines the constitutional law of employment discrimination, Title I of the Americans with Disabilities Act (ADA), the Age Discrimination in Employment Act (ADEA), and various state and local statutes addressing emerging issues in employment discrimination law, such as employment discrimination based on weight or attractiveness.

LAW 6632. Employment Law. (3 cr.; A-F only; Periodic Fall & Spring) This course explores the rapidly expanding body of law governing the workplace. The Employment Law course goes beyond the traditional employment fields of Labor Law (union/management relations) and Employment Discrimination to focus on a number of recurring workplace issues. Topics include medical and drug screening, workplace privacy, the emerging exceptions to the employment-at-will doctrine, wage and hour regulation, and occupational safety and health.

LAW 6633. Public Health Law & Ethics: From Prevention & Emergencies to Bioterrorism. (3 cr.; A-F only; Periodic Fall) Intensive/interdisciplinary examination of wide range of issues in public health law/ethics, including prevention strategies, emergency preparedness/response, averting/copying with bioterrorism.

LAW 6634. Regulated Industries. (2-3 cr.; A-F only; Periodic Fall) Law of public utilities, cognate schemes for economic regulation in United States. Emphasizes laws regulating entry, total firm revenue, rate structure. Mass communication law.

LAW 6635. European Union Tax Law. (2 cr.; A-F only; Periodic Fall & Spring) The main objective of the course is to explore the fundamentals of EU tax law, in order to give an understanding of the tensions between the objectives of the EU and the Member States' fiscal sovereignty. Focus will be on the application of the EU law fundamental freedoms in direct tax cases. To some extent, we will also cover the legislative harmonization within the EU in the field of direct taxes. There will be a short introductory part where you will get acquainted with EU law. After that, we will have weekly discussion sessions where we closely study case law in tax matters by the European Court of Justice. You will study 40-50 of the most essential EU tax law cases. From these cases, we will examine how to conceive of EU tax law as a systematic whole.

LAW 6636. European Human Rights Law. (2 cr.; A-F only; Periodic Spring) Introduction to international human rights, Law, policy, process.

LAW 6637. Business and Human Rights. (2 cr.; A-F only; Periodic Spring) This seminar will explore the growing area of law and advocacy around corporate accountability and corporate social responsibility related to international human rights standards. The course has several goals: 1) We will examine the development and content of international human rights standards pertaining to corporations and corporate officers, including state, national and international and regional laws and principles including the UN Guiding Principles on Human Rights and Business. 2) We will next focus on the implementation and varying points of intervention on BHR issues: a) internal corporate policies, b) socially responsible investment shareholder advocacy and divestment, c) disclosure and anti-corruption laws and sanctions, d) trade policies, e) civil litigation, criminal prosecution and internal grievance mechanisms, f) reporting and documentation by human rights organizations, g) international standard-setting mechanisms. To examine these questions, we will use case studies across various industries including supply chains and labor conditions, environmental practices, and violations by security forces employed by multinational corporations. 3) The readings and seminars will encourage students to explore the debates about the most effective ways for businesses to protect and advance respect for human rights, prevent violations, and provide redress to victims of violations that occur as a result of their actions/inaction, and defend themselves when they are falsely accused. 4) Three papers throughout the semester will encourage students to integrate different arguments and course materials, conduct related independent research and develop their own arguments.

LAW 6639. Internet Law. (3 cr.; A-F only; Periodic Spring) Legal issues raised by networked digital technology. Likely topics include jurisdiction, intellectual property, privacy, hacking, telecommunications regulation.

LAW 6642. Consumer Protection Law. (3 cr.; A-F only; Periodic Spring) This course examines a wide variety of consumer protection laws. Topics include consumer privacy, credit reporting, credit discrimination, consumer product warranties, abusive debt collection practices, and predatory lending.

LAW 6643. Business Strategy for Legal Professionals. (3 cr.; A-F only; Periodic Spring) This course introduces the concept of strategy in a business context and applies it in diverse situations legal professionals face, whether as lawyers in private practice advising external clients, as in-house counsel advising internal clients within a firm, or as government lawyers advising agency clients about the conduct of private individuals and firms in the agency's regulatory or other investigative scope. We will consider how lawyers can think like their non-lawyer clients. The overall aim of the Business Strategy for Legal Professionals (BSLP) course is to provide students with an opportunity to observe and develop business generalship skills relevant to legal professionals through readings, case discussion, class exercises and occasional examination.

LAW 6644. Economic Analysis of Law. (3 cr. [max 6 cr.]; A-F only; Periodic Fall) After an introduction to the methodology of law and economics, this course utilizes the standard tools of economic analysis for the study of law and legal institutions. After a review of some of the basic methods and concepts of economic analysis, the course will consider applications with special focus on: (i) sources of law and models of legal evolution; (ii) economics of property; (iii) economics of contracts; and (iv) economics of tort law.

LAW 6645. Feminist Legal Theory. (2-3 cr.; A-F only; Periodic Fall) Feminist theories, critiques, and models for application. Feminist history. Legal issues of relevance to women. Impact of law upon women. Means by which law can be used to redress inequality in larger social arena.

LAW 6646. Law, Technology, Inequality and Opportunity. (3 cr.; A-F only; Periodic Spring) Examine competing arguments followed by examination of particular technological developments/their impact on inequality.

LAW 6648. International Criminal Law. (3 cr.; A-F only; Periodic Spring) This course will cover developments in the prosecution of mass atrocity by international and hybrid criminal tribunals. It will discuss the history and development of the field of international criminal law from Nuremberg to the ICC; the sources of international criminal law; and jurisdiction over the investigation.

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and prosecution of international crimes. The course will examine the elements of the international crimes of genocide, war crimes, crimes against humanity, and aggression. It will also address recent developments in international criminal justice, including victim participation, sentencing, and reparations.

LAW 6650. Advanced Administrative Law. (3 cr.; A-F only; Every Spring) This course will study laws and doctrines governing the administrative practices of federal government agencies and judicial review thereof. The course will cover topics including privatization of government functions, presidential supervision and control of agency officials, and various doctrines limiting judicial review of agency actions.

LAW 6661. Professional Responsibility - General. (3 cr.; A-F only; Periodic Fall, Spring & Summer) This course examines the ethical issues that lawyers confront in diverse areas of practice. The primary focus will be on the Model Rules of Professional Conduct and state law. Students will also explore a broader set of ethical questions including how attorney ethics are defined, how they are depicted in pop culture, and what type of conduct lawyers should aspire to in their practice. The course will also consider strategies for reconciling personal values, the law, and the rules of lawyering.

LAW 6662. Professional Responsibility - Business. (3 cr.; A-F only; Periodic Fall) This course is a survey of rules of professional responsibility for lawyers with an emphasis on the rules that apply to lawyers in corporate and transactional practice. Issues covered include client conflicts, representing close corporations and partnerships, representing venture capitalists and entrepreneurs in start-ups, taking stock in lieu of legal fees, representing public companies, Securities Exchange Commission rules of professional responsibility for lawyers under the Sarbanes-Oxley Act, representing banks and other regulated companies, the role of in-house counsel, the responsibility of lawyers for client conduct, and malpractice liability for business lawyers.

LAW 6663. Professional Responsibility - Civil Trial Lawyer. (3 cr.; A-F only; Periodic Fall & Spring) The goal of this class is to learn the Model Rules of Professional Conduct and be able to apply them to situations involving ethical issues, with an emphasis on (but not completely limited to) civil litigation situations.

LAW 6664. Professional Responsibility - Criminal Law Ethics. (3 cr.; A-F only; Periodic Fall) The primary objective of this course is to educate you about the ethical problems facing lawyers and judges in criminal investigations and lawsuits. You will study the lawyer’s morality, the adversary system and the duties of the criminal defense lawyer, client autonomy, the duty and limits of zealous representation, lawyer-client trust and confidence, perjury and the search for the truth, counseling and preparing witnesses, the ethics of cross-examination, judges? ethics, conflicts of interest, and prosecutors? ethics.

LAW 6665. Professional Responsibility - Government. (3 cr.; A-F only; Periodic Fall) Students in this course should become familiar with the ABA Model Code of Professional Conduct and other aspects of the law governing lawyers, as well as with selected statutes and regulations governing conflicts of interest and ethical obligations of United States government employees. Throughout the course, there will be an emphasis on ethics rules, other laws, and practical considerations of importance to government lawyers.

LAW 6667. Professional Responsibility - Legal Malpractice. (3 cr.; A-F only; Every Fall) This course will survey ethics rules governing lawyers with a focus on the interrelationship between the Rules of Professional Conduct and legal malpractice law, a specialized form of tort law that varies in critical aspects from classic negligence doctrine. In addition to teaching the substantive law of legal ethics and legal malpractice, the course will focus on helping students recognize and avoid real life risks of malpractice exposure and liability.

LAW 6700. Consortium Study. (0-12 cr.; A-F or Audit; Every Spring & Summer) Study at another law school. prerequisite: dept consent

LAW 6701. Criminal Law and Literature: Examining Criminal Practice & Theory through Didactic Fiction. (3 cr.; A-F only; Periodic Spring) The aim of this seminar is to examine classic issues in criminal law practice, theory and jurisprudence through the prism of didactic fiction. Class readings are works of fiction and the primary work product is a short story.

LAW 6702. Legal History Workshop. (2 cr.; A-F only; Periodic Fall) This seminar brings in leading scholars engaged in projects at the intersection of law and history. The goal of the seminar is to provide students with an introduction to the field of legal history and an opportunity to engage with scholars working on innovative projects that span from the ancient to the modern world, covering a range of geographical regions as well. Workshop sessions will be devoted to the presentation and discussion of works-in-progress of the guest scholars. Collectively, their works will encourage students to think comparatively about the role of law in defining the nature and limits of state power, and more broadly about the historical dynamics of law and society, with particular attention to the ways in which law has served not only as a mode of governance, but also as a cultural resource, enabling individuals to contest conventional ideas about race, class, and gender difference, and the very meaning of social justice.

LAW 6704. Seminar: Mass Torts: What They Are and How To Resolve Them. (2 cr.; A-F only; Periodic Fall) Legal dilemma of finding ways to compensate the truly injured while protecting legitimate business concerns.

LAW 6705. Information Governance. (2 cr.; A-F only; Every Fall) Students will explore the values placed on information in the modern corporate enterprise, as well as the risks, costs and challenges associated with governing various forms of information, given the innumerable laws and regulations that apply to information. The purpose of the broad survey is to expose students to multiple disciplines that will undoubtedly affect their careers, and help them to develop a real-world sense of options to enhance risk avoidance, cost containment, and compliance. Students will be exposed to various disciplines related to the management of information, which have traditionally been siloed, or separate? including e-discovery, privacy, records and information management, and security? but which increasingly are seen as parts of a greater, integrated whole.

LAW 6706. Punishing Corporations and Governments. (3 cr.; A-F or Audit; Periodic Spring) To what extent can we be punished or be made to pay compensation, for actions other than our own, but in which we are deemed complicit.

LAW 6707. Intellectual Property Transactions. (2 cr.; A-F only; Every Spring) Intellectual property rights have been described as a ?sword and shield.? Rights holders are thought to act offensively by suing or threatening to sue infringers and seeking money damages, irrespective of the holders? marketing and product sales programs. Or they act defensively to protect their current or future market positions by having federal courts enjoin competitors. This course considers a third way: intellectual property rights are also valuable intangible assets that may be bought and sold. In this course, we will explore the principal theories and practices of intellectual property transactions. We will be considering closely the doctrines regulating the assigning and licensing of patent, copyright, trademark, and other intellectual property rights, and we will be questioning critically whether these laws and practices encourage or inhibit commercial activity and innovation. While studying specific transactions in the course, we will be examining the practical uses of intellectual property law to meet commercial objectives.

LAW 6709. Current Agriculture-Environment Issues. (2 cr.; A-F only; Periodic Spring) The seminar will cover selected legal environmental issues related to agriculture. Half the semester will explore the Des Moines Water Works litigation. Filed in 2015 by a water utility, this lawsuit has attracted wide attention in the farming and environmental communities. It seeks to hold farming accountable for dramatically increased cost of treating water to meet public health standards. Legal issues center on water quality and lead to questions of drainage, fertilizers, pesticides, erosion, irrigation, genetically modified organisms, livestock manure, and antibiotics. Also the
course will consider ag/environment/legal aspects of organic farming, air quality, global warming, endangered species, and state and federal farm programs. Attorneys, scholars, and public officials will be invited classroom guests. Students will present their research topics to the class. Readings will be selected portions of texts, articles, & cases.

**LAW 6710. Federalism, the Intersection of Law and History.** (2 cr.; A-F only; Spring Even Year)
Federalism: The relationship between 50 sovereign states and the United States. From the founding of the republic to the present day, federalism issues have vexed the American people, their political institutions, and their judiciaries. Federalism decisions are often driven as much by cultural, social, and political forces as they are by any discernible legal doctrine. This seminar will enable the student to explore how historical currents have shaped the law of federalism, and how the law, in turn, has influenced historical developments. Students will be assigned Supreme Court cases and legislative enactments to research, write about, and present to the class. The topics will look at how Americans have viewed federalism from Chisholm v. Georgia, 2 US 419 (1793) (whether individual states enjoy sovereign immunity) to Franchise Tax Board of California v. Hyatt, 136 S Ct. 1277 (2016) (whether Nevada state court, under Nevada v. Hall, 440 U.S. 410 (1979), had jurisdiction over California tax agency).

**LAW 6711. National Security Cases in Federal Courts.** (2 cr.; A-F only; Periodic Spring)
This two-credit seminar will impart to students a good understanding of the unique investigative tools used by federal law enforcement in the investigation of national security cases, and of the ways the federal courts have adapted to the challenge of terrorism and espionage cases. Moving in chronological succession through England, the role it played in conflicts between the ?Great Charter,? before studying its status in the law. The seminar will cover the underpinnings of the English Bill of Rights. We will proceed to analyze the influence on documents like the English Bill of Rights. We will proceed to analyze the significance of Magna Carta in colonial and Revolutionary America, particularly in early state constitutions, the US Constitution and the development of federalism. Students will study English and American case law relevant to Magna Carta and work with key historical sources in original published form. A unique aspect of the course will be the integration of material from the Law Library?s Arthur C. Pulling Rare Books Collection. LL.M. students may request instructor permission to enroll.

**LAW 6717. U.S. Citizenship: A Legal History.** (2 cr.; A-F only; Periodic Spring)
This two-credit seminar is intended to provide students with a broad historical foundation in U.S. citizenship. We will focus on five broad questions: (1) how war, economic transformation, and territorial expansion have reshaped citizenship; (2) how the relationship between state and federal citizenship has changed over the course of U.S. history; (3) how the rights and obligations of citizenship have changed over the course of U.S. history; (3) how race, gender, sexuality, disability, marital status, birthplace, religion, and poverty have shaped access to or enjoyment of citizenship; and (4) how refugees and guest workers fit into a nation in which rights rest largely on citizenship.

**LAW 6718. Immigration and Criminal Law: Immigration Consequences of Crimes and Criminalizing Migration.** (2 cr.; A-F only; Periodic Spring)
In the last decade, there has been an increased emphasis on using the criminal justice system to help determine who is and who is not suitable to live and work in the United States. This phenomenon has had some increasingly interesting effects as the immigration apparatus has been for most of the history of the United States a civil and agency system. The increased reliance on the criminal justice system has caused some overlap of criminal justice norms- including concepts of right to counsel, detention and detainers and warrants. At the same time, the prosecution of federal immigration crimes has skyrocketed in the same period to the point where the majority of all federal prisoners are imprisoned because of immigration crimes.

**LAW 6800. International Contracts.** (3 cr.; A-F only; Every Spring)
Simulated negotiation of complex international sale-of-goods contract, requiring mastery of issues such as choice of law, dispute settlement, payment terms and devices, quality control terms and devices, and shipment terms.

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This seminar focuses on the substantive law of capital punishment and on the procedural aspects of post-conviction proceedings. The course will include an examination of the history of death penalty jurisprudence, the Antiterrorism and Effective Death Penalty Act of 1996, habeas corpus, and state and federal death penalty statutes.

**LAW 6803. Health Insurance and Health Care Reform.** (2 cr.; A-F only; Periodic Spring)

This seminar explores the role that private and social insurance play in managing and responding to health-related problems. It focuses on these issues through the lens of the Patient Protection and Affordable Care Act (ACA). The seminar is split into three units. The first unit aims to appreciate the centrality of insurance to health care. It examines how insurance underpins issues regarding access to health care, the increasing cost of health care, and responsibility for one’s health. The second, and most substantial, unit then focuses attention on the ACA. It explores the ACA’s use of public and private insurance mechanisms to attempt to alter health care in the United States. Finally, the third unit of the seminar considers alternative approaches to health insurance reform, and their costs and benefits relative to the approach embodied in the ACA.

**LAW 6804. Government Secrecy.** (2 cr.; A-F only; Periodic Fall)

This course introduces students to major mechanisms by which the executive branch of the federal government keeps secrets, including the classification system, the doctrines of executive privilege and state secrets privilege, and prosecuting information leakers. The course also introduces students to some of the major means by which secrecy is challenged, including the Freedom of Information Act, first amendment access and newsgathering claims, and whistleblower protection laws. Throughout the semester, we will discuss a number of recurring themes including the connection between government secrecy and constitutional theories of presidential power, the politics of secrecy and transparency and the role of constitutional discourse in the same, and the costs and benefits of secrecy and transparency.

**LAW 6807. Cooperatives and Collective Entrepreneurship: Law, Policy and Practice.** (2 cr.; A-F only; Periodic Fall)

Cooperative and mutual business forms have been widely used for purposes of economic development, workforce development and social innovation. Historic examples include agricultural cooperatives, rural electric cooperatives, insurance mutuals and fraternals, credit unions, health maintenance organizations, housing cooperatives and mutually organized non-profits with significant earned income. This seminar will: 1) illuminate public policy considerations for cooperative forms; 2) consider several common and not-so-common practices of this business model; and 3) discuss and debate the merits of both economic and social? of coops as a double bottom line business form.

**LAW 6808. Street Law.** (2 cr.; A-F only; Every Spring)

Build your understanding of various areas of law and the legal system as you prepare classroom presentations for area high school students. By polishing your ability to explain the law to non-lawyers, Street Law will prepare you to be engaged members of your communities and more effective lawyers. During the Street Law seminar, we will focus on legal topics of interest to teens (and the general public) such as criminal law and procedure, the First Amendment, Constitutional law, the court system, and practical law (juvenile, consumer, employment, cyber). You will also learn teaching strategies including deliberation, case studies, moot court, mini-mock trials, continuums, snap debate and other engaging methods that will transform boring old civics into experiences your students will remember.

**LAW 6809. Seminar: Advanced Intellectual Property: Special Projects.** (2 cr.; A-F or Audit; Periodic Fall)

Special projects in intellectual property for students with prior IP coursework.

**LAW 6810. Seminar: Advanced Intellectual Property: Special Projects.** (2 cr.; A-F or Audit; Periodic Fall)

Key concepts/tools required for managing large, complex litigation.

**LAW 6812. Statistics for Legal Practice.** (2 cr. [max 3 cr.]; A-F only; Periodic Fall)

The goal of this course is to prepare students to be knowledgeable consumers of statistics as practicing lawyers. The course will draw on a wide range of cases and other legal issues as examples of where statistics have played a role. The course will cover most core statistical methods, but it does assume some prior familiarity with basic statistics. While the emphasis will not be on the mathematics underlying the various statistical methods covered, the course does presume a willingness to deal with basic algebra. After completing this course, students will be familiar with the broad range of areas of the law and legal process where statistics have played a role, and should be able to (1) understand the kinds of issues that arise in the use of statistics, (2) to read and understand expert reports using statistics, and (3) to ask intelligent questions of their own and opposing experts.

**LAW 6813. Seminar: Social Science in Law.** (2-3 cr.; A-F only; Periodic Spring)

Relationship of social science to law.

**LAW 6814. Racketeering and the RICO Act: Criminal & Civil Liability.** (2 cr.; A-F only; Periodic Spring)

This course will consider the Racketeer Influenced and Corrupt Organizations Act (RICO), which grabs more headlines and is more sweeping in its application than practically any other federal statute. Originally intended as a weapon against the Mafia, RICO has evolved into a statute used to fight a wide variety of corrupt practices. RICO is also increasingly becoming an important aspect of international business. In 2014, Chevron brought RICO claims against a U.S. lawyer who allegedly bribed foreign officials in order to obtain a multibillion dollar judgment in a foreign tribunal. RICO, however, has its limits. Courts are beginning to weigh in heavily against RICO’s application to extraterritorial disputes. When RICO claims were alleged in the sex abuse cases against the Catholic Church, courts struck down the claims on the basis that the plaintiffs sought compensation for personal injuries, which are not within the scope of the statute. Enterprise, pattern and causation issues under RICO present some of the most complicated legal questions that any lawyer will ever confront.

**LAW 6815. State Constitutional Law.** (2 cr.; A-F only; Periodic Fall)

Explores the important federal and state constitutions and constitutional law in the United States. Topics addressed will include the politics of state supreme court systems and the role of these courts in protection of individual rights and the definition of the American political process. Of importance will be examination of the ways state courts and constitutions adjudicate differently from the United States Supreme Court on a variety of important issues including abortion and privacy, criminal due process, education, taxation, as well as the issues of state power and governmental organization. Please note that this class is taught in very few law schools. This means that this class is a unique experience in learning more about a body of law that will have a dramatic and direct impact upon a lawyer’s daily practice of law.

**LAW 6817. Practical Estate Planning.** (2 cr.; A-F only; Every Spring)

This course will focus on the day to day life of the estate planning lawyer, from the initial client interview and analysis of financial data to the implementation of appropriate planning techniques based upon a client’s situation and assets. Subjects addressed will include: ethical considerations; probate and methods for avoiding it; use of trusts; gift, estate and generation-skipping transfer tax planning; planning with life insurance; planning with retirement assets; planning for charitable gifts and bequests; planning for lifetime gifting...
to individuals; post-mortem planning and premarital agreements.

**LAW 6818. White Collar/Corporate Crime.** (2 cr.; A-F only; Periodic Spring)
This class will consider the theory and practice of white collar litigation in the criminal arena. We will begin with a survey of basic principles and theories and then turn to the main substantive areas of white collar criminal liability, examining the most common regulatory schemes encountered in the interface between corporations and criminal law: mail and wire fraud, money laundering, RICO, and obstruction of justice. Next, we will discuss practice in white collar defense and prosecution, looking at discovery, plea negotiation and trial challenges unique to allegations of criminal malfeasance in corporate settings. We will examine federal laws, sentencing regulations, and Supreme Court pronouncements that control punishment for common white collar offenses. Finally, we will return to overarching policy questions, considering the role of federal courts in the imposition of criminal liability, and the consequences of overlapping state and federal jurisdiction over white collar offenses, particularly as revealed in the investigation and prosecution of public corruption cases.

**LAW 6819. Litigation Finance.** (2 cr.; A-F only; Periodic Spring)
Litigation financiers provide capital to a party involved in litigation in exchange for a portion of the financial recovery from the lawsuit. For example, a finance group may agree to cover $1mm in legal expenses in exchange for $5mm of the recovery if the lawsuit is successful. If the case loses, the finance group completely loses their $1mm case investment. Litigation finance is completely changing the way lawsuits are financed, yet it is still little understood by a large percentage of the legal world. By understanding this field as a law student, upcoming lawyers will put themselves at a huge advantage going into the practice of law - whether as a solo practitioner, in-house counsel, or working at a major law firm. Further, litigation finance groups are forming every year, and they are looking to hire lawyers that understand the field. This seminar will explore third-party litigation financing from a financial and legal perspective. We will analyze the field in practical terms and from the perspectives of economic theory, public policy, and legal ethics. For the group presentation, students will pitch litigation finance to a theoretical investor and explain how it works and why an investor should supply them with capital. For the final paper, students will prepare a memorandum analyzing a legal case and determine whether or not it is a good investment opportunity from a variety of different perspectives.

**LAW 6822. Legislative Process.** (2 cr.; A-F or Audit; Periodic Fall & Spring)
Examines and tests academic and judicial assumptions and theories about the legislative process.

**LAW 6823. Investment Banking.** (2 cr.; A-F only; Periodic Spring)
The objective of this seminar is to provide an introduction to investment banking and private equity. We will discuss the players, the industry, and how investment banking and private equity provide capital to public and private companies. Using case studies and examples of recent transactions, we will discuss the background, process and art? of deals involving investment bankers and private equity professionals. We will spend time discussing the intersection of investment banking, private equity, and corporate law in the context of transactions. What are the respective roles of the lawyers and bankers? How do lawyers and bankers work together with mutual clients on deals on issues like fiduciary duty, valuation, disclosure, and regulation? The seminar will require some interest? though not necessarily a background? in basic finance. We will spend time on financing, accounting, and valuation concepts that are helpful for both bankers and lawyers to know in the context of a transactional practice.

**LAW 6824. Genetics: Law and Ethics.** (2 cr.; A-F only; Periodic Spring)
This interdisciplinary seminar will examine the legal, ethical, medical, and scientific issues posed at the cutting edge of biomedical science, focusing on genetics, genomics, and assisted reproductive technologies (ART) in human beings. Topics will include the human genome project; history of eugenics; issues posed by genetic and genomic research; commercialization of genetic research, including issues raised by gene patents; genetic testing, counseling, and screening; prenatal screening and preimplantation genetic diagnosis; the use of genetics in ART; human gene therapy; pharmacogenetics; the privacy of genetic information; and issues of discrimination. Together, the class will work through the scientific, medical, legal, and ethical issues. In each instance, we will evaluate the legal, ethical, and policy challenges posed, critique current approaches, and explore alternative recommendations.

**LAW 6827. Women’s International Human Rights.** (2 cr.; A-F only; Every Spring)
This seminar addresses the history and legal context of women’s human rights; the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and its impact; gender and human rights in the international system; specific topics such as property and other economic rights, reproductive rights, and violence against women; and the role of nongovernmental organizations in making CEDAW work for women.

**LAW 6828. Law and Cultural Property Seminar.** (2 cr.; A-F only; Every Fall & Spring)
Collectors, museums, countries, native cultures, religious groups. New stakeholders’ uneasy fit with traditional, scholarly caretakers. Archaeologists/historians.

**LAW 6830. Corporate Counsel.** (2 cr.; A-F only; Every Fall & Spring)
Participants will learn the unique challenges of working in-house as corporate counsel with public, private, or nonprofit organizations, developing perspectives and skills to think like and be effective business lawyers and leaders. Students will work individually and in teams to address simulations of problems regularly encountered by corporate counsel, including in areas of risk, compliance and ethics management, governance and the board of directors, leading in crisis, business strategy and planning, international transactions, investigations, litigation management, employment, and intellectual property. Participants may conduct research, draft agreements and memoranda, conduct interviews, negotiate, and develop papers based on practical exercises that are the backbone of the course. Students will explore the three fundamental roles of corporate counsel: acute technician, wise counselor, and lawyer as leader. This course involves questions beyond “what is legal?” and focuses on “what is right?” using specific illustrations drawn from the contemporary business world.

**LAW 6831. Law, Race, and Social Psychology.** (3 cr.; A-F only; Periodic Fall)
Study of how the law affects race and social psychology.

**LAW 6832. Cybercrime and Cybersecurity.** (2 cr.; A-F only; Periodic Spring)
This course will cover the key constitutional, statutory, technological, and policy issues regarding computer crime, electronic-evidence gathering (including electronic surveillance), and cybersecurity. The course grade will be determined by a final paper, a brief class presentation based on the final paper, and class participation. Criminal Procedure (LAW 6085) is recommended but not required as a prerequisite.

**LAW 6833. Alternative Dispute Resolution.** (2-3 cr.; A-F only; Every Fall & Spring)
Alternative forms of dispute resolution techniques. Validity of critiques of traditional litigation and court-based responses to these problems.

**LAW 6834. Federal Habeas Corpus.** (2 cr.; A-F only; Periodic Fall)
This course will study the evolution of habeas corpus and how the habeas remedy is utilized in the federal court system today. This study provides students an opportunity to observe how constitutional law, criminal law and procedure, civil procedure and even trial and appellate practice all bear upon the courts’ struggle to apply habeas corpus law to individual cases. The cases studied are representative of the detentions that may be challenged in federal habeas, e.g. enemy combatants in military custody, state prisoners on death row and immigrants in Homeland Security custody.

**LAW 6835. Supreme Courts in Comparative Perspectives.** (2 cr.; A-F only; Periodic Fall)
The course will cover the differing roles and powers of supreme courts, including the US Supreme Court, the European Court of Justice, and other supreme courts of more limited jurisdiction. The course will address topics such as agenda setting, case selection, and court procedures.
LAW 6837. Contract Drafting. (2 cr.; A-F only; Every Fall & Spring)
This seminar will take the contract principles that students learned in their first year and build upon them in a practical way. Students will review and revise contracts, draft contract provisions, draft contracts from ?scratch,? and discuss options for managing risk through effective drafting.

LAW 6838. American Indian Law. (2 cr.; A-F or Audit; Periodic Fall)
American Indian history through the early 20th century from legal perspective. Social and economic factors that influenced developments within American Indian legal history.

LAW 6840. Comparative Antitrust. (2 cr.; A-F only; Every Spring)
The seminar explores the similarities and differences between U.S. and EU antitrust law (usually called ?competition law? in Europe), with a focus on the differences. Topics include: 1) An overview of the U.S. and EU antitrust systems. 2) Review of microeconomics. 3) Vertical restraints. 4) Monopolization in the U.S.; abuse of dominant position in the EU. 5) Merger law. 6) Efficiencies as a merger justification. 7) Predatory pricing. 8) Price discrimination. 9) Exclusive distributorships. 10) Loyalty discounts and rebates. 11) Bundled discounts and rebates. 12) Intellectual property related antitrust issues. 13) Microsoft related issues. 14) Dynamic competition (and the ? new economy?). 15) Other matters, including judicial review and ordinalism. The seminar is designed to assist students in: (a) developing an ability to analyze court decisions involving economic issues; (b) developing an ability to anticipate when EU authorities will substitute noneconomic values for economic ones; and (c) improving their ability to articulate complex issues involving both law and economics.

LAW 6842. Advanced Criminal Procedure. (2 cr.; A-F only; Spring Even Year)
This course will allow students to experience the practical realities of practicing in the field of criminal law. Simulated proceedings each week will explore issues that typically arise during the course of a criminal prosecution. Each class session will simulate a different stage of a federal criminal prosecution, progressing chronologically from arraignment to trial to sentencing. Students will work in teams to present arguments to the magistrate judge, conduct motions, maintain records, and prepare court documents. The class session will simulate a different stage of a federal criminal prosecution, progressing chronologically from arraignment to trial to sentencing. Students will develop an ability to articulate complex issues involving both law and economics.

LAW 6843. Seminar: Structured Finance. (2 cr.; A-F only; Every Spring)
Introduces concept of securitizing assets. Reviews legal/accounting issues related to securitization, structured finance.

LAW 6844. Advanced Real Estate Transactions. (2 cr.; A-F only; Periodic Spring)
This ?hands on? course exposes students to the real world issues, documentation, and experiences that an attorney in the area of commercial real estate law would encounter. The course emphasizes the theory behind the provisions that are contained in various transaction documents as well as the realistic results of negotiation and their effect upon actual transactions. Students draft real estate documents, participate in negotiation sessions with fellow classmates discussing the results of those negotiations, and evaluate alternative real estate investments. The course provides a well-rounded understanding of basic commercial real estate documentation and transactions. The class also provides a foundation for all transactional lawyers, whether or not they will practice in the real estate field. Major topics include the following: real property contracts and conveyance documents; mortgage loans, deeds of trust and other loan documents; leasing documentation; title insurance and land title surveys; real estate markets, securitization and development; and real estate investments and analysis.

LAW 6845. Employment and Family-Based Immigration Law. (2 cr.; A-F only; Periodic Spring)
Students will learn how to use business, employment, and family-based immigration law procedures and strategies in private practice. These areas comprise more than 60% of the work performed by immigration lawyers, as measured by the 2011 and 2016 American Immigration Lawyers Association Practice Surveys. Students will explore the relationship between federal and state control of immigration and benefits associated with immigration status. They will also explore how to build an evidentiary record that will carry them through administrative and judicial appeals. Students will apply ethical rules within the family and business immigration law contexts.

LAW 6846. Philosophy of Punishment. (3 cr.; A-F only; Every Spring)
This seminar concerns normative justifications for the substantive criminal law and for state systems of punishment for crime. It examines literature in the philosophy of punishment from the early 19th century (e.g., Kant, Hegel, Bentham) onwards, in contemporary criminal law and punishment theory (many writers), and in social theory (e.g., Durkheim, Weber, Marx, Foucault, Wacquant), concerning justifications for punishing at all, and whom, and how much, and functional questions about the larger social purposes that punishment serves. A focus is on the usefulness of existing paradigms for understanding and justifying such recent developments as restorative justice, community justice, therapeutic jurisprudence, and specialized drug and domestic violence courts.

LAW 6848. Appellate Advocacy. (2 cr.; A-F only; Periodic Spring)
This experiential learning course will provide simulation experiences for all phases of appellate advocacy, from post-trial motions through cert. petitions. We will develop case studies based on trials that present numerous issues for appeal, then use these studies as the foundation for exploration of each step of the appellate process. Students will strategize appellate choices, learn the importance of issue preservation, become conversant with Federal Rules of Appellate Procedure, and apply their brief writing and oral advocacy skills. Experienced appellate advocates will work with the students and provide insight.

LAW 6849. Comparative Theories of Ownership. (2 cr.; A-F only; Every Spring)
This seminar will examine different philosophies concerning property ownership and the property laws of different countries.

LAW 6851. Practice-Ready Legal Research. (2 cr.; A-F only; Every Fall & Spring)
Practice-Ready Legal Research is a simulation course in which students apply legal research methods and techniques to scenarios involving a hypothetical client. Over the semester, students learn legal research concepts, sources, and tools through a combination of lectures, in-class activities, and writing assignments.

LAW 6853. Law, Biomedicine and Bioethics. (3 cr.; A-F only; Periodic Fall)

LAW 6854. Seminar: Biotechnology and Law. (2-3 cr.; A-F or Audit; Every Fall & Spring)
Private law aspects of the biotechnology industry. Legal/regulatory issues faced by commercial start-ups.

LAW 6857. Corporate Tax. (3 cr.; A-F only; Every Fall)
An introduction to Subchapter C of the Internal Revenue Code, the ?crown jewel? of the Tax Code, and the taxation of shareholders and corporations. The class will include an indepth study of Section 351 and corporate formations; the capital structure of a corporation; nonliquidating distributions including dividends and Section 301; redemptions of corporate stock including Section 302; both taxable and tax free acquisitions, including Section 368 reorganizations; and, corporate divisions such as spin-offs under Section 355. The course will not address international transactions, but will attempt to emphasize real world, current corporate tax problems.

LAW 6858. Principles of Corporate Governance: The Role and Responsibilities of the Corporate Board. (2 cr.; A-F only; Periodic Fall)
This course will provide students with the tools and understanding to better advise corporate and nonprofit board clients. This course will also help students in their roles as future corporate and nonprofit board members.

LAW 6859. Conflict Resolution. (2 cr.; A-F only; Periodic Fall)
Conflict resolution lies at the heart of the practice of law. The temptation for practitioners, however, is to rely on superior knowledge and understanding of a substantive body of law or superior presentation and argument skills to prevail in settling disputes. A more pragmatic
approach is to examine why conflict arises and how it can be effectively addressed in both individual and group contexts. This course recognizes that nearly all lawyers will face conflict not only in their practice, but in how that practice is lived, understood, and reflected through relationships with others. Practitioners who master the art of conflict competency, defined as the ability to identify and effectively respond to conflict, will find greater success in both professional and personal realms.

**LAW 6860. Advanced Topics in Labor and Employment Law. (2 cr.; A-F only; Periodic Fall & Spring)**

During the first two months of the semester, this course will examine eight cutting-edge topics in labor and employment law. For each topic, the instructor will first provide an overview of the topic with particular focus on some of the key difficulties and shortcomings of the current legal regime. One or two students will then guide the class through a discussion of possible options for law and policy reform. The students may work as a team or as individuals presenting competing visions.

Students will have the opportunity to sign-up for the topic of their choice. Students also will be expected to prepare a research paper of approximately 25 pages in length on a selected labor and employment topic. The instructor will distribute a list of suggested paper topics. Students may select from this list or, with the instructor's permission, design a topic of their own choosing. Students will present their respective papers during the last month of the semester. The research paper will satisfy both the senior writing requirement and the Labor & Employment Law Concentration writing requirement. As a prerequisite for enrollment in this course, students must have taken at least one of the following courses: Employment Law, Employment Discrimination, or Labor Law.

**LAW 6861. International Law Workshop. (2 cr.; A-F only; Periodic Fall & Spring)**

This seminar brings in nationally recognized scholars to the law school to present their current work and provide students with the opportunity to engage with cutting edge scholarship in international law. Workshop sessions will be devoted to the presentation and discussion of works-in-progress of the guest scholars on various topics in international law. The seminar is aimed at exposing students to the world of international legal scholarship and the nature of scholarly debate. Students will be encouraged to develop a thoughtful and critical approach to scholarly work through guided discussions, so as to assist them in developing skills that are necessary to produce high quality scholarship with a view to publication. The course will be assessed on the basis of short reaction papers examining the work to be presented.

**LAW 6863. Public Choice and Regulation. (2 cr.; A-F only; Periodic Spring)**

This seminar uses the methods of law and economics to examine alternative sources of law and to provide some insights on the institutional theory of lawmaking. Part 1 of the course introduces the methodology for the course and some of the fundamental theorems in public choice theory. Part 2 presents the different economic theories of regulation and optimal allocation of regulatory power. Part 3 concludes examining four different methods of lawmaking, described respectively as: (1) lawmaking through legislation (codified law); (2) lawmaking through adjudication (judge-made law); (3) lawmaking through practice (customary law); and (4) lawmaking through agreement (treaty law). The readings and class analysis aim at providing a birds-eye view on public choice and regulation theory from an economic perspective. The readings will shed new light on the following four aspects of the institutional design of lawmaking, emphasizing the respective advantages and proper scope of application of legislation, judge-made law, customary law, and treaty law in the creation of a legal order.

**LAW 6864. Seminar: Law of Lobbying. (2 cr.; A-F only; Periodic Spring)**

This class is intended to provide students with an understanding of the legal regulations on federal and state lobbying, as well as provide them with practical experience with the profession of lobbying.

**LAW 6865. Law and Economics Workshop. (2 cr. [max 4 cr.]; A-F only; Periodic Fall & Spring)**

This seminar primarily consists of presentations by leading law and economics scholars on major issues in law and economics, with a different focus each year. After an introductory session, the seminar will consist of paper presentations by prominent scholars in the field. Students will be required to write short critiques/commentaries on the papers. A student’s grade will be based on 75% on her papers, and 25% on her class participation. As the coverage of this seminar is different each year, students may take this seminar in both their 2nd and 3rd years.

**LAW 6866. Sex Discrimination. (2 cr.; A-F only; Periodic Fall)**


**LAW 6867. Practice Ready International Legal Research. (2 cr.; A-F only; Every Spring)**

Manual and on-line research techniques for public international law sources (e.g., treaties, decisions of international tribunals, materials issued by international organizations such as the EU), private international law sources from foreign countries, as well as research on selected topics of international interest such as GATT/trade law, human rights, environmental law, and intellectual property.

**LAW 6868. Sentencing Advocacy. (2 cr.; A-F only; Periodic Fall)**

Sentencing advocacy has assumed the vanguard position of criminal defense. In what the Supreme Court has acknowledged has become an essentially administrative system of criminal justice, sentencing advocacy is now a critical - in some cases, the only - component in the criminal defense lawyer's arsenal, and the site of some of the most sophisticated developments in the litigation of criminal cases. Taking this understanding as its backdrop, this class explores the role of sentencing advocacy in state and federal sentencing systems, the factors that influence its quality, and the insights from social scientists that can critique and improve it. The class will introduce the students to several guest speakers (defense lawyers, prosecutors, judges, social scientists and mitigation specialists) who will outline the role and quality of sentencing advocacy in perspective. Most significantly, students will learn themselves, through hands-on involvement in actual pending cases, how to strategize, research, and develop an effective sentencing petition. Thus, the class instructor will seek out cutting-edge/novel/interesting sentencing issues in the cases of court-appointed lawyers in state and federal cases (with the appointed lawyer's consent) for which students can draft the sentencing memoranda, research the sentencing guideline and mitigation issues, and develop the client's counter-narrative to the prosecutor's position. The students' work in this class will be subject to a strict confidentiality protocol to be developed in consultation with the Director of the Law Clinics. prereq: Law 6085 Criminal Procedure or Law 6229 Criminal Process: From Bail to Jail

**LAW 6870. Seminar: Negotiations. (2 cr.; A-F only; Every Fall)**

Negotiations and procedures.

**LAW 6871. Visual Advocacy. (1 cr. [max 2 cr.]; A-F only; Periodic Fall)**

Lawyers are, above all, communicators. In your legal career, you will advocate for your clients by communicating with long, type-written documents like legal briefs and memoranda. Plan on it. But communicators need more than written words—now more than ever. The world in which you will practice communicates in a manner foreign to most lawyers, using a wide array of sensory tools geared to persuade, clarify, entertain, and enthral. This course is designed to train you to use what may be the most important non-written tool a communicator can possess: the doctrine of visual design. In this course, we will review: the principles of visual design, - the fundamental skills of graphic design, - the design cycle process, and -the application of these principles to the legal practice. This course will cover specific strategies for visualizing legal arguments and concepts, including the creation of case organization tools, argumentative graphics, and trial demonstrations. Class assignments will entail drafting and revising the types of documents that you might be asked to create in practice. We will also explore the theory and impact of visual advocacy by questioning judges and first-chair lawyers on the most valuable and persuasive use of visual design. We expect you will learn that visual advocacy is not about making boring things look pretty. Rather,
it provides a process for enhancing legal communication by improving comprehension and engagement.

**LAW 6872. Immigration Law.** (3 cr.; A-F only; Every Spring)

This course deals with the history of immigration to the United States, the role of the federal government in regulating immigration, visas for non-immigrants and immigrants, procedures and grounds for removal, asylum, refugee status, citizenship, discrimination against aliens, the intersection between criminal law and immigration law, and ethical issues facing immigration lawyers. The course includes in-class lawyering skill exercises such as client interviewing and counseling, participating in an immigration court hearing, and legislative advocacy on immigration reform measures. These exercises are designed to train students in the skills necessary to become successful immigration lawyers.

**LAW 6873. Nonprofit Law.** (2 cr.; A-F only; Periodic Spring)

This seminar covers the legal requirements and policy implications for nonprofit organizations. Course topics include state law issues related to the formation of nonprofit organizations, nonprofit models, director fiduciary responsibilities, liability concerns for directors and volunteers, dissolution, state attorney general oversight, and regulation of fundraising. We will also study federal tax law governing nonprofit organizations, including tax exempt status, classification of charities as private foundations or public charities, deductibility of contributions, challenges and opportunities for charitable organizations to partner with for profit entities and otherwise engage in commercial activities, limits on compensation for executives, and the ability of nonprofit organizations to engage in advocacy. Students will consider ?best practices? for operation and governance of nonprofit organizations and ways to demonstrate accountability to donors and other stakeholders. Prerequisite or Corequisite: Law 6012/6072 Corporations or Law 6051 BA/Corps of Law 6100 Tax I.

**LAW 6874. Politics of Legal Policy.** (2 cr.; A-F only; Periodic Fall)

This seminar has three goals. First, and most important, the seminar allows students to write a research paper on a subject of their choice. Second, the seminar introduces students to selected tools used for policy analysis such as cost-benefit analysis. Third, the seminar introduces students to selected issues concerning education. As to the paper, students may pick any topic which provides them with professionally relevant intellectual capital that they wish to acquire. The topic must be sufficiently narrow that they can make an intelligent contribution to the subject they present. A broad subject which might require a book-length treatment for the author to make a contribution would not be appropriate. During the last third of the semester, each student will present their research topic to the class. Most often the presentation is of a draft, not a final version, of their papers.

**LAW 6875. Joint Degree Program in Law, Science & Technology Proseminar.** (0.5 cr. [max 4 cr.]; S-N only; Every Fall & Spring)

Many of the most challenging issues of the 21st century will be those at the intersection of law and the life sciences. How do we govern research, assess the safety and potential impact of new technologies, and regulate or even ban them? This seminar will explore those questions, examining a wide range of developments in health, environment, and the life sciences, such as genomics, gene therapy, genetically modified organisms, genetic patents, ecosystems change, environmental health, managed care, and challenges to public health. Weekly presentation will be made by faculty drawn from graduate programs affiliated with the Joint Degree Program in Law, Science & Technology. Faculty will lead discussion of articles on topics that may range from science policy and regulation of genetic engineering to natural resource conservation and international harmonization of pharmaceutical patents. The seminar is required each year for Joint Degree Program students and open to other students by consent of the instructor.

**LAW 6876. Digital Evidence.** (2 cr.; A-F only; Every Spring)

This seminar will cover the fast growing area of digital evidence and the legal issues that arise when digital evidence is investigated and used in criminal law and civil practice.

**LAW 6877. Seminar: Energy Project Development and Finance.** (2 cr.; A-F only; Periodic Fall)

This course is intended to focus largely on the practical aspects of how energy projects are developed, financed, and ultimately put into operation.

**LAW 6878. Regulating Personal Health Information.** (2 cr.; A-F only; Periodic Spring)

Students will explore the legal frameworks that regulate how personal health information may or may not be shared and the competing policy goals that often underlie these frameworks: protecting individual privacy enhancing the quality of care. The seminar has three components. It will survey the myriad laws, regulations, and contractual arrangements that govern the sharing of personal health information?e.g., the evolving body of federal rules and regulations relating to the Health Insurance Portability and Accountability Act (HIPAA/HITECH) and recent Medicare and Medicaid Incentive Programs promoting meaningful use? of Electronic Health Record systems, as well as state-specific disclosure rules. It will also expose students to diverse, real-world experiences with health information-sharing needs and risks. Finally, building on this legal grounding and these contextual ? focus sessions, ? students will have the opportunity to define specific questions related to sharing personal health information, reflect on the impact of applicable rules, and propose changes or additions to them.

**LAW 6879. Poverty and Human Rights.** (2 cr.; A-F only; Periodic Fall)

This course focuses on how the international human rights legal framework addresses the symptoms and causes of systemic poverty with an emphasis on the practical application of those norms to real-life situations. We will explore what a rights-based approach to poverty eradication means for governments and other development actors and learn how communities and advocates are leveraging human rights law to combat poverty in a variety of contexts. The class will consider a wide range of topics spanning domestic and global poverty: urban and rural contexts; the gendered dimensions of poverty; environmental justice; privatization of public services; threats to the rights to food, water, education, and housing; collective rights and issues facing indigenous peoples and peasants; the situation of human rights defenders; and reparations. Students will study primary documents and interact with practitioners working in the U.S. and abroad on litigation, policy advocacy, mobilization, and governance. The coursework consists of simulated advocacy and advisory reports. Students will finish the seminar equipped to bring a working knowledge of the international human rights system to their future roles.

**LAW 6880. Campaign Finance and Election Law.** (2 cr.; A-F only; Periodic Fall & Spring)

This course will provide students with an in-depth review of federal and state campaign finance and election law. We will begin with a review of the Supreme Court decisions that have shaped the current status of federal election law, most notably Buckley v. Valeo. We will review other notable cases like McConnell, Austin, and Wisconsin Right to Life and will conclude with Citizens United. Also, the federal component will include an overview of the Federal Election Campaign Act and a review of the powers of the Federal Election Commission and a review of some of its notable advisory opinions. Additionally, a second portion of the class will be devoted to a review of Minnesota Statute Chapters 10A and 200-212, the corpus of Minnesota campaign finance and election law. We will review decisions by the Minnesota Campaign Finance Board and review decisions by the Minnesota Supreme Court, as well as those of the Minnesota Federal District Court interpreting Minnesota election law.

**LAW 6881. Comparative Laws.** (2 cr.; A-F only; Periodic Fall)

The aim of this course is to introduce you to the largest legal system in the world, namely the Civil Law System, which is used by most countries where Common Law doesn't apply. We will study the basics of Contracts and Torts in the two leading countries, through the French Code Civil (CC) and the German one (BGB). We will make a short introduction to civil procedure, in order to allow you to work on Court decisions in both systems and, by the same time, we will analyze, and discuss, as usual, some Court's decisions (in English) to familiarize you with them. Lectures, in the book, will give you an overview of the subject of each class, and the courts? decisions will allow us to understand how judges make decisions in the two systems, by comparison to Anglo-American Common Law. The goals are to make you comfortable with the main aspects of contracts.
and torts laws as well as with Court decisions, their reasoning, how judges justify decisions on given articles of the code and not others.

**LAW 6883. Contemporary Issues Facing Courts.** (2 cr.; A-F only; Periodic Fall) This seminar, led by a former Chief Judge of the 4th Judicial District of Minnesota, will address a broad range of challenges facing courts and the innovations in judicial administration and judging that seek to advance the cause of justice. Topics include: courts as organizations; therapeutic justice; understanding case management and its impact on judging and lawyering; court funding and its impact on the delivery of justice; judicial selection and retention; wrongful conviction and other court mistakes; and public satisfaction and dissatisfaction with the courts. Students will explore the topics in class discussion and write papers analyzing one or more court challenges or innovations.

**LAW 6884. Seminar: Comparative Constitutional Law.** (2 cr.; A-F only; Every Fall & Spring) Historical background/changes of rule of law, democracy, human rights, market economy. Role that legal profession can play in development of these concepts.

**LAW 6885. Advanced Environmental Law.** (2 cr.; A-F only; Every Spring) This seminar will examine current environmental issues through class discussion led by leading public, private, and nonprofit environmental lawyers. Students will prepare two 2,500 word papers during the semester relating to seminar topics. There is no exam. The course will provide students with in depth knowledge of current environmental issues and also introduce them to life and practice as an environmental lawyer.

**LAW 6886. International Human Rights Law.** (3 cr.; A-F only; Every Fall) Role of lawyers using procedures of the United Nations, Organization of American States, State Department, Congress, U.S. Courts, and nongovernmental organizations to address international human rights problems. Is there a law of international human rights? How is that law made, changed, and invoked? Problem method used.

**LAW 6887. Law of International Organizations.** (2 cr.; A-F only; Periodic Spring) This course will examine the principal issues regarding organizations whose membership is that of states. This examination will scrutinize the legal powers using that of such institutions; the manner in which the states parties as members participate; enforce decisions through mechanisms; dispute settlement; peace and security undertakings.

**LAW 6888. Creative Legal Reasoning.** (1 cr.; P-F only; Periodic Spring) This is a discussion based seminar in which the students decide from the facts of actual cases what the law should be. They use logic, instinct, experience, common sense, and all other mental and emotional processes that are the substance of the law and very much involved in its making. The only forbidden ingredient in the discussions is known or suspected law.

**LAW 6889. Laws of War.** (3 cr.; A-F only; Every Spring) This course focuses on two interrelated bodies of law: rules pertaining to the use of force in international law (known as the jus ad bellum) and rules regulating the conduct of hostilities under the laws of international and non-international armed conflict (known as international humanitarian law, the laws of armed conflict, or the jus in bello). The course will cover such issues as the jus of War? theory, its history and its relevance in the modern world; the general prohibition on the use of force under Article 2(4) of the UN Charter; use of force by the UN: collective security and law enforcement actions; individual and collective self-defense; humanitarian intervention; and nuclear weapons in international law. The course will also consider regulation of the means and methods of warfare focusing on the Geneva and Hague laws: the four Geneva conventions protecting the wounded, sick, and shipwrecked, prisoners of war, and civilians; the means and methods of war, including lawful and unlawful weapons and targets; the law of internal armed conflicts; and asymmetric warfare.

**LAW 6890. Rule by Law in China: An Advanced Seminar.** (2 cr.; A-F only; Periodic Fall) This course will take a comparative law approach in discussing the development of legal discourse, and the ever increasing influence of Western jurisprudence, in modern and contemporary China. We will discuss at length the formation of Rule by Law? as a grand narrative? in its historical context, the controversy around different interpretations of Human Rights, and the emergence of civil rights movements in the Mainland.

**LAW 6892. Comparative Criminal Procedure.** (3 cr.; A-F only; Periodic Spring) This course will study systems in several foreign countries for the investigation, adjudication, and punishment of criminal violations. Primary emphasis will be on civil law? systems in Germany and France, but some attention will also be given to requirements imposed under the European human rights conventions. The seminar will analyze the major similarities and differences between American and foreign systems, with emphasis on differing foreign procedures which might be adaptable to the American context, to address some of the perceived shortcomings of our system of criminal justice. Reading knowledge of a foreign language is helpful, but is not required; all course materials will be in English.

**LAW 6893. Transitional Justice.** (2 cr.; A-F only; Periodic Fall) This seminar explores many of the real-life dilemmas negotiated around the world in countries emerging from dictatorship and conflict.

**LAW 6894. Seminar: Sentencing Guidelines.** (2 cr.; A-F only; Every Fall) Sentencing purposes, structures (e.g., guidelines), and alternative forms of punishment. Emphasizes need to find effective but less costly alternatives to prison sentences.

**LAW 6895. Seminar: Offenses and Defenses.** (1-3 cr.; A-F only; Periodic Spring) Distinguishing offenses from defenses. Examine several existing criminal defenses.

**LAW 6896. Law and Artificial Intelligence.** (2 cr.; A-F only; Periodic Fall & Spring) Increasingly the world, and even the law, is being run by self-learning algorithms, autonomous robots, and other technologies that have replaced tasks historically performed by human beings. Brain-machine interface is also on the rise, creating real-life cyborgs. This seminar will explore the many legal implications of this rise in algorithms, artificial intelligence (AI), robots, and brain-machine interface. Through assigned readings, weekly discussion, and engagement with local experts in AI, robotics, and neural engineering, students will explore the many promises and perils of AI. The course will include modules on: how AI is transforming legal practice in areas such as e-discovery; labor market impact of AI; the possibility of non-human adjudication of cases; use of AI to understand legal language; whether robots should have rights; legal and ethical dimensions of brain-machine interface; transhumanism; regulation of self-driving cars and drones; governance of autonomous weapons systems; and how law should address the rise of predictive analytics in determining liability.

**LAW 6897. Game Theory.** (2 cr.; A-F only; Periodic Fall & Spring) Game theory, the analysis of the logic of strategic behavior within interpersonal interactions, offers useful insights into how legal rules affect the way people behave. This seminar introduces what constitutes a game, payoffs, and basic solution concepts, such as the Nash Equilibrium. The seminar focuses on how various models, particularly the prisoner’s dilemma, coordination games, and the chicken, can be used to study problems that arise in an array of legal fields, including but not limited to tort, contract, antitrust, bankruptcy, and environmental law.

**LAW 6898. International Bankruptcy.** (2 cr.; A-F only; Periodic Fall) Today’s bankruptcy practice seldom centers on one debtor filing one case in a United States bankruptcy court. Most corporations of any size have operations and assets in more than one country. In addition, many troubled corporations are part of a corporate group that includes affiliated entities operating in numerous countries, many of which will file their own insolvency proceedings in their countries of incorporation. The most obvious example of this trend is the Lehman Brothers group of companies: approximately 80 Lehman affiliates commenced insolvency proceedings in 16 countries. International Bankruptcy is a course designed to deal with this world of multi-jurisdictional insolvency. The course consists of two modules, Comparative Insolvency Law
and Managing Cross-Border Cases. The first module covers six class sessions. After an introductory session explaining the role of insolvency law in national economies and setting out the framework for comparative insolvency law, we will survey the insolvency laws of Canada, Brazil and Mexico, Japan and China, England and Western Europe. Common topics include prerequisites that must be satisfied before an insolvency case can be filed, whether an automatic stay of collection and other proceedings exists, how the case is administered (judicial, administrative or other), and whether the system is focused on liquidation or reorganization. We will then turn to ?Managing Cross-Border Cases.? We will devote two sessions to the European Union?s insolvency regulation that co-ordinates insolvency proceedings pending in EU nations. Four sessions will analyze chapter 15 of the U.S. Bankruptcy Code. Chapter 15 facilitates cooperation among courts in countries in which related insolvency proceedings are pending. Our final session will focus on the use of chapter 11 by foreign entities.

**LAW 6904. Legal Scholarship for Equal Justice.** (3 cr.; A-F only; Every Spring) The Minnesota Justice Foundation (MJF) offers this seminar on applied research designed to address broad legal issues and problems of current importance to poverty lawyers and clients.

**LAW 6905. Military Law and Advocacy.** (2 cr.; A-F only; Periodic Spring) Gain practical knowledge in advocacy, argument and legal writing for civil law practice through application of federal law and regulation to selected military based client scenarios. Topics include Servicemembers Civil Relief Act (SCRA) protections, board of military corrections appeals, military line of duty determinations and appeals, special victims counsel program and client advocacy role. The course is highly practical and will include a number of drafting assignments. Military experience is not required to take this course.

**LAW 6906. Seminar: Public Law Workshop.** (2 cr.; A-F only; Periodic Fall) Public law workshop issues. Focuses on many different areas of public law.


**LAW 6910. Seminar: Islamic Law.** (2-3 cr.; A-F only; Periodic Fall) Islamic law if one of the oldest system in the contemporary age. This course introduces the students to Islamic law. The origins of Islamic law, its sources, and major schools of jurisprudence.

**LAW 6911. International Commercial Arbitration.** (2 cr.; A-F only; Periodic Fall) International commercial arbitration is an increasingly important and common means of resolving disputes arising from contracts between citizens or companies from different countries. This course introduces students to the history, philosophy, advantages, process, and ethics of international commercial arbitration, with an emphasis on real cases and practical applications. The course covers differences between international arbitration and domestic arbitration/litigation, national arbitration statutes, agreements to arbitrate, arbitral jurisdiction, procedural rules, discovery/disclosure, hearings, evidence, arbitral awards, enforcement of awards, and ethical issues arising for both arbitrators and advocates in international commercial arbitration.

**LAW 6912. Law Firm Practice and Management.** (2 cr.; A-F only; Periodic Fall) The practice of law is a business as well as a profession. This seminar course provides an introduction to some of the important and developing issues in the business of practicing law, whether as a solo practitioner or in a larger law firm. The topics of study will include developing and retaining clients, finances and financial controls, trends in the legal profession, conflicts of interest and ethical compliance, case handling and administration, insurance and risk management, hiring and supervision of employees, business formation, and law firm governance. Prominent lawyers and law firm managers will serve as guest lecturers and panelists in presenting certain topics.

**LAW 6913. Seminar: Tribal Courts in the United States, an Introduction to Indigenous Peoples Law.** (2 cr.; A-F only; Periodic Summer) Facets of tribal courts in the United States, including their use of diverse legal justifications/sources.


**LAW 6918. Rule of Law.** (2 cr.; A-F only; Periodic Spring) This seminar will examine the concepts and core principles of the Rule of Law. Seminar sessions will be devoted to identifying the meaning of the terms "rule of law" and ? independence of the judiciary. ? The importance of a strong and independent legal profession to the rule of law will be discussed. Seminar sessions will focus on such issues as the problem of corruption and the rule of law, the relationship between human rights law and the rule of law, and the challenges of war crimes and genocide. The seminar will explore the relationship between the rule of law and economic development and alleviation of poverty. The seminar will include a discussion of the responsibility of lawyers to support and promote the rule of law within their own country and in other developing countries.

**LAW 6919. Health Care Fraud and Abuse.** (2 cr.; A-F only; Periodic Spring) Federal, state and local governments are projected to spend $2.4 trillion on health care in 2021. Total public and private healthcare expenditures currently represent approximately 17% of the US GDP. With such high spending levels, opportunities and concerns about health care fraud and abuse are understandably rampant. This course brings practitioner and academic perspectives together to focus on the major civil, administrative and criminal laws that have been used to contain health care fraud and abuse, broadly defined as actions by health care providers (e.g., physicians and physician practices, medical device and pharmaceutical manufacturers and their agents, clinical laboratories) that are inconsistent with accepted business and medical practices. These laws include the federal civil False Claims Act, the Stark Act, the federal Anti-kickback Statute and the remedies and civil and criminal penalties available to governmental entities and civil litigants. The seminar will also will consider related compliance strategies and the practical compliance issues faced by healthcare providers.

**LAW 6921. Refugee and Asylum Law.** (2 cr.; A-F only; Periodic Spring) This course will introduce and explore the main concepts, laws, institutions and policies that form the international regime for the protection of refugees. In 2014 the United Nations High Commissioner for Refugees (UNHCR) estimated that there were 51.2 million forcibly displaced persons, including 16.7 million refugees and 33.3 million internally displaced persons (IDPs), a significant increase from 2013. The refugee crisis in Europe, which began in mid-2015 and continues unabated in 2016, has only increased those numbers. Human displacement continues to be one of the most important and intractable human rights issues facing the international community. The course objectives are to: - examine the assumptions, origins and evolution of refugee law and the refugee regime; - understand who is protected from serious harm by international, regional and domestic law; - explore the rights afforded refugees and other categories of forced migrants; - investigate various legal and policy impediments to asylum-seeking; - assess the scope, limits and potential of international co-operation regarding refugees. Overall, the course will examine the relationship between refugee law, international human rights law and domestic law, and will provide students with an understanding of how this relationship affects state obligations towards refugees, asylum-seekers and internally displaced persons. prereq: recommended Law 6011/6071 International Law and Law 6886 Intl Human Rights Law

**LAW 6922. Business Law Concentration.** (1 cr.; P-F only; Every Fall) This seminar is intended as an introduction and overview for students interested in completing the Business Law Concentration; students in the concentration are encouraged to take the seminar. The course will explore the careers, social roles, and professional obligations of business lawyers in a variety of specialties
LAW 6923. Federal Reserve System - Legal and Policy Perspectives. (2 cr.; A-F only; Periodic Fall)
The course will cover legal underpinnings of the Federal Reserve System’s core responsibilities in monetary policy, supervision and regulation, financial services, and financial stability. The instructors, both lawyers from the Federal Reserve Bank of Minneapolis, will also invite senior officials and policymakers from the Federal Reserve in each of these areas to provide students current perspectives on these mission-critical functions of our central bank. The course will include review of the Federal Reserve Act, the Dodd Frank Act, and related matters, educating students on the nature and extent of Federal Reserve System authority, both as originally conceived and as it has evolved through the 100 years of the Federal Reserve’s existence. There will be a particular emphasis on Federal Reserve actions taken in response to the financial crisis of 2007–08 and its aftermath. Following the course, students will have a strong understanding of the nature and extent of the Federal Reserve’s authority and an enhanced perspective on banking and the national economy.

LAW 6924. Creating Effective Legal Arguments in Litigation. (2 cr.; A-F only; Periodic Fall)
For most attorneys, the practice of law will involve the structuring of legal arguments. This course is intended to give participants the tools to receive legal arguments by deconstructing the process through which legal arguments are developed and providing an understanding of the logical relationship between the law and the facts.

LAW 6925. Patent Law Proseminar. (1 cr.; S-N only; Every Spring)
The field of patent law extends across the boundaries of business, technology, innovation, and law. In this course, students will be introduced to current topics and compelling issues in patent law presented by leading patent and intellectual property law professionals. Students will gain real-world insights from in-house and private practice attorneys and agents, with a focus on patent prosecution and patent litigation.

LAW 6926. Intellectual Property and Technology Proseminar. (1 cr.; S-N only; Every Fall)
The field of intellectual property extends across the boundaries of business, technology, innovation, and law. In this course, students will be introduced to a broad range of IP related topics presented by leading practitioners working at the intersection of law and technology. Topics may include trade secrets, copyrights, trademarks, patents, IP transactions, IP litigation, emerging technologies, intellectual asset management, IP valuation and commercialization. Lecturers may include corporate general counsel, firm lawyers, transactional lawyers, litigators, consultants, tech transfer officers, R&D Leaders, and CTO.

LAW 6927. New Developments in Trust Law. (2 cr.; A-F only; Periodic Spring)
The traditional area of trust law has experienced a number of new and major developments in the last couple of years and the changes are continuing. The seminar will examine and analyze the effect of these new developments in traditional trust law, including: the New Minnesota Trust Code; the Uniform Trust Decanting Act; a Uniform Divided Trusteeships Act; the Uniform Fiduciary Access to Digital Assets Act; and the Interjurisdictional Recognition of Substitute Decision-Making Documents. This seminar will enable students who intend to have an estate planning practice or a general practice that includes the drafting of wills and trusts to have an in-depth understanding of these new developments.

LAW 6928. Cooperative Lawyering and Problem Solving Courts: Lawyers as Peacemakers. (2 cr.; F-P only; Periodic Spring)
This is a non-traditional seminar for students who are interested in exploring a manner of practicing law broader than the win/lose paradigm of the adversary system. The instructor is a Hennepin County judge with extensive experience in problem solving courts and with the benefits of collaborative law and restorative justice. The course will explore peacemaking opportunities for lawyers at several levels. Practicing lawyers engaged in several varieties of cooperative lawyering will make class presentations. In addition, because effective peacemaking requires personal awareness and self-control, the course will provide an introduction to mindfulness, a fundamental tool for peace of mind, as well as instruction in basic skills in peaceful communication. The course will examine how some of the lessons about peacemaking apply to political and religious conflict. The early class sessions will introduce students to some of the developments in neuroscience and evolutionary psychology that help explain the dynamics of human conflict. In addition to background reading to prepare for class sessions, students in this seminar should be prepared to spend 10-15 minutes each day in mindfulness exercises, to observe two out-of-class peacemaking activities, and to participate in experiential exercises in class. Short written assignments are designed to promote growth of the student’s peacemaking skills. The class requires an open mind and a willingness to share personal thoughts and experiences.

LAW 6929. Social Enterprises. (2 cr.; A-F only; Periodic Spring)
Social enterprise? is a relatively new concept to describe organizations that sit somewhere between the extremes on a continuum between non-profit organizations and for-profit business corporations. The founders and investors in social enterprises seek both to earn financial returns and also to advance particular social purposes. Many have argued that traditional legal forms of association, especially the business corporation and the non-profit corporation, do not provide good fits for the purpose of this emerging form. A variety of new legal forms are being developed, including the low-profit limited liability company (L3C), the benefit corporation, and the social purpose corporation. This course explores the challenges facing social enterprises, and how both traditional and new forms of legal associations respond to those challenges.

LAW 6948. Sports Concussions and the Law: Neuroscience and Liability. (2 cr.; A-F only; Periodic Spring)
As scientific knowledge about the effects of trauma to the brain has increased, the legal context surrounding brain injury in professional and youth sports has changed dramatically over the past decade. Legal action includes multiple federal class action lawsuits, new sports concussion statutes in all fifty states, new regulations in college and high school, new insurance markets, and a myriad of tort law suits in state and federal court. Many policy recommendations have been proposed, and many reforms have been enacted by sports leagues. The evolving legal landscape for sports concussions thus provides an exciting opportunity to see how law responds in response to scientific advances. This seminar? the first in the country to focus specifically on legal liability and sports concussions? will examine the emerging science, law, and policy of sports concussions. The seminar will feature a number of guest speakers, and will place an emphasis on developing students? legal research and writing skills. Students will be required to complete a 20 page research paper, and no prior knowledge of brain science or sports is required or presumed.

LAW 6949. Biotechnology and Patent Law. (2 cr.; A-F only; Periodic Spring)
This course emphasizes patent law principles and doctrines as applied to biotechnology, including pharmaceutical, patents. Although there will be some coverage of United States Patent and Trademark Office policies as well as biotechnology patent principles in non-U.S. jurisdictions, the focus will be on U.S. Federal Circuit and Supreme Court case law developments. Topics include patent eligibility of biotechnological inventions including diagnostics and ?natural? products such as genes, claim strategies, written description, enablement, utility, best mode including requirements for biological deposits, inventorship, inherent anticipation, obviousness, infringement, and the intersection of patent and FDA regimes for small molecules and biologics.

LAW 6960. Judicial Writing. (3 cr.; A-F only; Every Spring)
This course focuses on developing the writing abilities and practical knowledge of prospective judicial law clerks. The class will center around six writing assignments, which will include
a bench memo, jury instructions, trial court order, and several appellate opinions. Only one writing assignment will require a work product exceeding 7 double-spaced pages. Most of the reading for the class will consist of materials relating to these six writing assignments, including attorneys’ briefs, briefing, relevant portions of the record, key precedents, and samples of past materials. Class will also provide students with practical information about how to be an effective law clerk, drawing heavily on guest talks from local federal and state judges and law clerks. Topics will include how to rely on the case record, the importance of understanding local procedural rules, and the centrality of the standard of review.

LAW 6999. Transfer. (1-50 cr. [max 100 cr.]; P-F only; Every Fall, Spring & Summer)
Credits received from another law school.

LAW 7000. CL: Civil Practice. (3-4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
The Civil Practice Clinic offers second and third year students an opportunity to gain both practical lawyering experience and the satisfaction of representing real clients. The clinic introduces students to the practice of lawyering through a combination of instructional methods. Classroom sessions explore topics such as interviewing, negotiation, counseling, and motion practice. Simulated exercises allow students to apply classroom learning in a life-like setting. Each student handles approximately three cases involving topics such as family, employment, consumer, and administrative law. These cases provide student attorneys with the opportunity to participate in almost all aspects of the lawyering process, including court and administrative hearing appearances. The clinic course is a two semester program. The classroom portion is completed during the first semester. Students earn a total of seven credits allocated between the two semesters.

LAW 7001. CL: Civil Practice Director. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Director for civil practice clinic; prereq: dept consent

LAW 7003. Seminar: Student Legal Writing Instructor. (2 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Legal writing instructors for the first-year legal writing students.

LAW 7004. Seminar: Structured Study Group Instructors. (2 cr. [max 8 cr.]; S-N only; Every Fall & Spring)
Instructors are assigned to work with single first-year class.

LAW 7006. ABA Negotiation Competition Team. (1-2 cr.; P-F only; Every Fall)
ABA Negotiation team participants receive credit for participation in regional competition and one more credit if they advance to national competition.

LAW 7007. International Humphrey Student Instructors. (1 cr.; A-F only; Every Fall)
Student instructors help with Law School Humphrey Fellows.

LAW 7008. CL: Insurance Law. (2-3 cr. [max 6 cr.]; A-F only; Every Fall)
The Insurance Law Clinic offers students an excellent opportunity to learn litigation skills and insurance basics while effectively and confidently representing individuals during all stages of an insurance claim and/or dispute with an insurer. Work includes investigating, preparing and tendering an insurance claim, writing demand letters to insurers, drafting litigation pleadings, including complaints, discovery documents, motions, briefs, settlement agreements and other court documents, dealing with clients and opposing counsel, and courtroom litigation and ADR. The clinic’s coverage cases deal with many types of insurance, including: auto liability, homeowner’s property, health and disability, life, and commercial general liability (CGL). Through classroom instruction and case supervision, students learn the basic concepts and legal principles involved in property and liability insurance, and they will gain experience in a broad range of practice skills, such as negotiation, legal writing, case investigation, mediation, client counseling, and state court practice.

LAW 7009. CL: Insurance Law Directors. (2-3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Students work with Insurance Law Clinic

LAW 7010. CL: Innocence. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Students work side-by-side with staff attorneys from the Innocence Project of Minnesota (IPMN) as they investigate and litigate inmates’ claims of actual innocence. These investigations go to the heart of current issues in the criminal justice system, such as the reliability of eyewitness identification, the problem of false confessions, the use of snitches and informants, government misconduct, ineffective assistance of counsel, and forensic sciences including DNA testing. Class time is devoted to training and case work. Students are assigned cases and expected to gather source materials such as police reports and transcripts. They will organize and summarize those materials. After educating themselves about their cases, students will design and implement an investigative plan with their supervisor and pursue that investigation. This may include locating evidence, experts and witnesses. If proof of innocence is developed they may draft post-conviction motions. Interested students may also participate in policy work. This clinic puts students on the cutting edge of the practice of law in the criminal justice system.

LAW 7011. CL: Innocence Project Director. (3 cr. [max 6 cr.]; A-F or Audit; Every Fall) Student director for Innocence Clinic.

LAW 7012. CL: Environment and Energy Law. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
The Environmental Law Clinic is a client-driven course based on representation of nongovernmental organizations. This Clinic will improve your skills in analyzing problems in environmental law and policy, and allow you to work directly with advocates on environmental issues. Our clients are typically nonprofits or other nongovernmental entities seeking legal advice on advocacy in the legislative or regulatory arenas related to a wide range of environmental issues, including clean water, renewable energy, utilities law and concentrated animal feeding operations. This year-long Clinic engages in projects related to achieving environmental and energy sustainability through the management of land, water and energy resources. Projects often include the following: (1) providing advice to local NGOs; (2) representation of NGOs before an administrative state body; (3) production of legal research reports; (4) support organizations participating in regulatory decision-making processes, such as the Public Utilities Commission; and (5) education or advocacy presentations to citizens and elected or appointed decision-makers. Client management skills and legal research methods are honed throughout the year-long projects.

LAW 7013. CL: Environment and Energy Law Directors. (2-3 cr. [max 6 cr.]; A-F only; Periodic Fall)
Directors for environment and energy law clinic.

LAW 7015. CL: Employment Law. (2 cr. [max 3 cr.]; A-F only; Every Fall & Spring)
The Employment Law Clinic provides student attorneys with a unique look at both sides of the employment relationship through litigation representation of individual employees and transactional counseling of nonprofit employers. Student attorneys are introduced to the employee’s perspective through litigating unemployment insurance (UI) appeals. These appeals require full representation, including client interviewing, counseling, preparation and execution of direct and cross examination, as well as closing statements. Student attorneys interface with the DEED website on behalf of the client, represent the client in the telephonic appeal hearing, and manage every aspect of the lawyer/client relationship with the assistance of a supervising attorney well-versed in the management of these cases. Recommended course: Law 6632 Employment Law

LAW 7016. CL: Employment Law Directors. (2 cr.; A-F only; Periodic Fall & Spring)
Student directors with Employment Law Clinic and their cases.

LAW 7017. International Humphrey Fellow Student Instructor. (2 cr.; A-F only; Every Fall & Spring)
Facilitate collaboration between international human rights professionals/U.S. law students. Provide students with human rights research, writing, networking. Humphrey Research Fellows assist twelve Hubert H. Humphrey Fellows hosted by University of Minnesota Law School/Human Rights Center.

LAW 7018. Intercollegiate Trial Team. (2 cr.; A-F only; Every Spring)
Students compete in trial teams. prereq: Trial practice
LAW 7025. NAAC/ABA Competition Team. (; 1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
The ABA/NAAC competition team is composed of four to six 3Ls chosen from the participants in the
Civil Rights/Civil Liberties Moot Court, based on performance in the Maynard Pirsig Honors Tournament. The ABA/NAAC holds regional competitions across the country and the
national finals are in New York City.

LAW 7026. NAAC/ABA Competition Director. (; 1-2 cr. [max 4 cr.]; A-F only; Every Fall & Spring)
Director for NAAC/ABA moot court competition. prereq: dept consent

LAW 7027. ABA Moot Court Competition Managing Director. (; 1-2 cr. [max 3 cr.]; A-F only; Every Fall & Spring)
Managing director for ABA moot court. prereq: dept consent

LAW 7028. Thurgood Marshall Competition Team. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
The Civil Rights/Civil Liberties Moot Court (formerly Maynard Pirsig) focuses on practical
writing and oral argument exercises common in modern litigation. In the fall, students work
on portions of, and then a full, appellate brief. This work is followed by an oral argument.
In the spring, students continue to work with the same law and facts in an appellate venue.
The fall clinic requires one round of written work in a panel of skilled Twin Cities attorneys. Recent topics have included
First Amendment rights in public schools, a gay-straight alliance's ability to organize
under the Equal Access Act, constitutionality of law school affirmative action programs
under the Fourteenth Amendment, and search and seizure of student cellphones. Students work in five to eight small sections of about
8-10 students, each taught by an experienced attorney and a third-year student director. After participants complete the required writing
and oral arguments (usually by the first week in March), directors nominate the "Best Brief" for each section for the best brief tournament.
Similarly, the "Best Oralist" is selected from each section for the Maynard Pirsig Honors Oral Competition, a bracket tournament that
accumulates in a final oral argument in front of justices of the Minnesota Supreme Court. The
Thurgood Marshall Moot Court competition team is composed of two 3Ls and two 2Ls,
chosen from the participants in the Maynard Pirsig Moot Court. The 2L participants are
selected during the fall of their second year; the 3L participants are selected during the
spring. The 2L participants compete on the team during their second year and then direct the
Competition Team in their third year. The 3L team competes in the spring of their third year.
The Thurgood Marshall Moot Court is unique in that every round takes place in a
courtroom in Washington D.C., and it coincides with the midyear meeting of the Federal Bar
Association. prereq: Students must be enrolled in LAW 7055 Civil Rights/Civil Liberties Moot Court.

LAW 7030. CL: Consumer Protection. (; 3-4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
The Consumer Protection Clinic represents individuals who are victims of marketplace fraud or who have disputes regarding
consumer credit, debt collection, motor vehicle fraud, predatory lending or similar matters. The Clinic also assists legislators, regulators, and
advocacy groups in policy matters, such as drafting consumer protection legislation. The Clinic participates in impact legislation
by initiating and acting as co-counsel in class action or related matters.

LAW 7031. CL: Consumer Protection Directors. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Student instructors for consumer protection clinic.

LAW 7035. Environmental Law Moot Court. (; 1 cr. [max 2 cr.]; A-F only; Every Fall)
Introduction to appellate advocacy. Current topics in environmental law. Intramural
competition leads to selection of team to represent University in intercollegiate
environmental law moot court competition. prereq: dept consent

LAW 7036. Environmental Law Moot Court Director. (; 1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Director for environmental law moot court. prereq: dept consent

LAW 7037. Jeffrey G. Miller National Environmental Moot Court Competition. (; 1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Environmental law moot court competition team member. prereq: dept consent

LAW 7038. Environmental Law Moot Court Managing Director. (; 1-2 cr. [max 3 cr.]; A-F only; Every Fall & Spring)
Environmental law moot court managing director. prereq: dept consent

LAW 7040. CL: Community Mediation. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
The Community Mediation Clinic offers 2Ls
and 3Ls the opportunity to learn from mediation
practitioners and participate as civil mediators
in community and court cases, to serve as
facilitators in restorative justice conferences and create and present trainings in
community conflict resolution education programs. The U is one of only a handful of the
nation's top law schools presently offering this type of clinical program. Conflict Resolution
Center (CRC), one of Minnesota's oldest non-profit mediation organizations, offers a
comprehensive mediation clinic. Students who successfully complete the Fall course will
be eligible for the Minnesota Rule 114 Roster of Qualified Neutrals and enroll in the
Spring clinic. This course features classroom instruction and interactive exercises. It
emphasizes the facilitative model of mediation
while providing a survey of other mediation
styles and models. Topics covered include:
conflict theory, styles of conflict resolution, statutes and rules governing mediation, ethical
considerations, cultural considerations in mediation and the applicability of facilitative
mediation in housing, family, and harassment
courts, schools, businesses, and employment
work. Classroom time is split between lecture,
discussion and interactive role plays and exercises with coach/instructor feedback.

LAW 7041. CL: Community Mediation Directors. (2-3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Student directors for Mediation Clinic. Fall 3 cr; Spring 2 cr.

LAW 7042. CL: Federal Immigration Litigation. (; 3-4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
The Federal Immigration Litigation Clinic is part of the James H. Binger Center for New Americans and will teach second and third
year students to efectively represent clients in federal impact immigration litigation. The clinic lasts a full academic year. Cases may include appellate litigation before the U.S.
Circuit Courts of Appeals, U.S. Supreme Court, and Board of Immigration Appeals, as well as litigation before U.S. District Courts and immigration courts. Cases may deal with asylum and related issues, challenges to the unlawful detention of immigrants, as well as the intersection of immigration and
criminal law. Students will also learn about the substance and process of immigration policy making, at both the legislative and
administrative levels, and may engage in immigration policy outreach and advocacy
projects that advance the Binger Center's priorities for systemic change in immigration
law. Through classroom instruction and case
supervision, and working in case teams, students will learn substantive immigration law,
administrative and federal rules of procedure, and a broad range of skills important to the
effective representation of clients in federal immigration litigation, including: client contact
and communication, case management, legal writing and drafting, oral advocacy,
courtroom skills, legal ethics, communications
and negotiations with opposing counsel, case analysis / vehicle selection, and case strategy /
coordination with co-counsel, allies, amici, and
media.

LAW 7043. CL: Federal Immigration Litigation Director. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Director for Federal Immigration Litigation Clinic.

LAW 7045. ABA Journal of Labor and Employment Law Editors. (; 2 cr. [max 4 cr.]; S-N only; Every Fall & Spring)
Intensive instruction in brief writing, appellate advocacy in context of labor/employment law. Students direct work of second-year students and participate in national competition held annually in New York. prereq: 3rd yr, dept
consent

LAW 7046. ABA Journal of Labor & Employment Law: Research & Writing. (; 1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
This course provides an opportunity to research and write a journal note under faculty
supervision. Each student will write an outline
and at least three drafts, and will also orally
present and answer questions about their note. The course is required for and open only to staff members of ABA Journal of Labor & Employment Law.

**LAW 7047. Wagner Moot Court Competition Team.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
National Wagner Moot Court competition in New York Law School.

**LAW 7055. Civil Rights/Civil Liberties Moot Court.** (1 cr. [max 2 cr.]; A-F only; Every Fall)
Students prepare memoranda, briefs, and arguments in a moot court case. Tutorial instruction in legal analysis, legal writing, and oral argument. Intramural moot court competition judged by prominent members of bench/bar. Team of students selected to represent the University in ABA Moot Court Competition. prerequisite: JD student

**LAW 7056. Civil Rights/Civil Liberties Moot Court Directors.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Director for Civil Rights/Civil Liberties Moot Court. prerequisite: dept consent

**LAW 7057. Civil Rights/Civil Liberties Moot Court Research Director.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Research director for Civil Rights/Civil Liberties moot court. prerequisite: dept consent

**LAW 7058. Civil Rights/Civil Liberties Moot Court Managing Director.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Director of Civil Rights/Civil Liberties moot court.

**LAW 7065. National Moot Court.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Preparation, substantial editing, and rewriting of appellate brief. Oral advocacy training with coaches. Intramural oral competition leads to selection of team to represent the University in National Moot Court Competition. prerequisite: dept consent

**LAW 7066. National Moot Court Director.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Director for national moot court. prerequisite: dept consent

**LAW 7067. National Moot Court Administrative Director.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Administrative director for national moot court. prerequisite: dept consent

**LAW 7068. National Moot Court Competition Team.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
The competition team is a group of six 3Ls selected from the second year program. Team members research and write two briefs, and prepare oral arguments. They compete at the regional competition, and if successful they go on to the nationals in New York City in January. prerequisite: Law 6002/6003 and students must have completed or be enrolled in Law 7065

**LAW 7075. International Moot Court.** (1 cr. [max 2 cr.]; A-F only; Every Fall)

**LAW 7077. International Moot Court Administrative Director.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Administrative director for international moot court. prerequisite: dept consent

**LAW 7078. Philip C. Jessup International Moot Court Competition Team.** (1 cr. [max 2 cr.]; A-F only; Every Spring)
Each year, one to three students carry over from the previous year's Jessup team and one to two students are added from the previous year's U-M International Moot Court competition to form the core of the current year's Jessup team. Additional positions on the Jessup team are filled at the end of week five of the first semester. Prior to the finalization of the Jessup team, IMC students complete a legal memorandum on a matter with international legal implications and participate in two nights of oral arguments. Selection to the Jessup team is based, in large part, on student performance in these exercises. prerequisite: Law 6002/6003 and students must have completed or be enrolled in Law 7085

**LAW 7079. International Moot Court Competition Team.** (1 cr. [max 2 cr.]; A-F only; Every Fall)
Each year, the Law School fields a competition team that travels abroad. Competitions vary annually.

**LAW 7085. Intellectual Property Moot Court.** (1 cr. [max 2 cr.]; A-F only; Every Fall)
Preparation, substantial editing, and rewriting of an appellate brief on a case involving patents, copyrights, or trademarks. Preparation of oral arguments. Leads to participation on a University team in the Giles Sutherland Rich Intellectual Property Moot Court Competition. prerequisite: dept consent

**LAW 7086. Intellectual Property Moot Court Competition Team.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
The I.P. Moot Court Competition Team is composed of the two student directors who help run the I.P. Moot Court program. Students are selected based on their overall performance during their second year as well as a written statement as to why they want to be a director and on the competition team. They write the team briefs and attend the regional competition, usually in the third week of March. The top two teams at the regional competitions qualify for nationals in Washington, D.C., usually held in early April. The team also participates in the Minnesota Intellectual Property Law Association Cup Competition. prerequisite: Law 6002/6003 and students must have completed or be enrolled in Law 7085

**LAW 7087. Intellectual Property Moot Court Director.** (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Director for intellectual property moot court. prerequisite: dept consent

**LAW 7088. CL: Intellectual Property and Entrepreneurship.** (2 cr.; A-F only; Every Fall)
The IP and Entrepreneurship Clinic is a one-semester course (Fall Semester - 2 Credits). Students will attend class weekly and each class session involves a mixture of lecture, interviewing and counseling exercises, and writing exercises. The lectures cover core legal topics and questions frequently encountered in an IP and entrepreneurship related legal practice in order to prepare students for interactions with clients. At least three classes consist of drop-in workshops where student attorneys interview limited-representation clients, and engage in problem solving and counseling during the course of each workshop. Each workshop will be followed by in-class roundtable discussions of intellectual property issues encountered and the counseling given. Evaluation of student performance turns on courtroom engagement, participation, performance in oral and written exercises, and attendance at workshops. The clinic will not take on cases or establish ongoing client relationships. Instead, students will meet with clients at workshops where the clients will sign an Acknowledgement of Limited Representation. Most of the work will occur at the workshop. Depending on the complexity of the matters presented, clients may opt to return to a later workshop, or they may be referred elsewhere for representation. prerequisite: previous or concurrent registration in 6224, or 6603, or 6608, or 6613.

**LAW 7092. CL: Bankruptcy Clinic.** (3 cr.; max 6 cr. A-F only; Every Fall & Spring)
This clinic is grounded in the development of practical skills necessary to effectively advise and represent individuals in serious financial difficulty. The Bankruptcy Clinic includes a classroom component, which prepares the students to counsel clients about consumer bankruptcy, introduces important portions of the Bankruptcy Code and Rules, and discusses the students’ cases in a group setting. This classroom component also features guest speakers, such as bankruptcy judges, panel trustees, and location practitioners. Students will receive training from Bankruptcy Court staff in electronic filing. Students in the Bankruptcy Clinic can expect to be advising clients of their options, communicating with their creditors, filing Chapter 7 bankruptcy cases, and representing clients at the meeting of creditors. Students may also have the opportunity to represent clients in adversary proceedings, including discovery and trial as well as settlement negotiations with both creditors and the U.S. Trustee. Occasionally, students represent individual creditors as well.
LAW 7093. CL: Bankruptcy Clinic Director. (2-3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Director for bankruptcy clinic. prereq: dept consent

LAW 7095. Civil Rights Moot Court Administrative Director. (1-2 cr.; A-F only; Every Fall & Spring)
Administrative director for civil rights moot court program.

LAW 7097. William McGee Civil Rights Moot Court Competition Team. (1 cr. [max 4 cr.]; A-F only; Every Fall & Spring)
The Law School reserves places on the McGee moot court competition team(s) for students on a law journal. Tryouts are typically held during the first week of school. Team members are selected on the basis of a writing sample, an oral argument tryout, and a recommendation from a writing instructor. The McGee coaches and the legal writing director will field up to two McGee teams of two or three students each (for a total of 6 students). We aim to select four 2L staffers and two 3L editors.

LAW 7098. CL: Indian Child Welfare Act. (2 cr. [max 4 cr.]; A-F only; Every Fall)
The Indian Child Welfare Act Clinic (the "ICWA Clinic") is a full academic year, four credit program beginning in the fall semester. The casework focuses on litigation involving the Indian Child Welfare Act (ICWA) and Tribal Code. During the fall semester, class sessions will focus on the historical context, present day application and future implications of ICWA. This will include a focus on understanding ICWA in the broader context of Indian Law. Classes will include guest lecturers, who are leaders in the American Indian Community. The class will include guided discussion and analysis of the historical context and role of courts in the lives of American Indian families. The class will provide a context to consider the effectiveness and equity of the child protection system in the lives of American Indian families today. Students will learn Juvenile Court and Tribal Court procedure and advocacy skills to provide direct representation to families. Classes will not meet in the spring semester.

LAW 7099. CL: Indian Child Welfare Clinic Director. (2 cr. [max 4 cr.]; A-F only; Every Fall)
Director for Indian child welfare clinic. prereq: dept consent

LAW 7100. Law Review Editors. (2 cr. [max 12 cr.]; S-N only; Every Fall & Spring)
Credit given without grade for satisfactory participation. prereq: instr consent

LAW 7101. Law Review Associate Editors. (3 cr. [max 6 cr.]; S-N only; Every Fall & Spring)
Associate editor for Minnesota Law Review.

LAW 7102. Law Review: Research & Writing. (1 cr. [max 2 cr.]; P-F only; Every Fall & Spring)
This course provides an opportunity to research and write a journal note under faculty supervision. Each student will write an outline and at least three drafts, and will also orally present and answer questions about their note. The course is required for and open only to staff members of Minnesota Law Review.

LAW 7117. CL: Civil Rights Enforcement. (2-3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
The Civil Rights Enforcement Clinic offers students the opportunity to enforce the civil rights laws of the US by assisting in the investigation and litigation of cases in the US Attorney's Office for the District of Minnesota in Minneapolis. The clinic includes both classroom seminars and fieldwork. Classroom instruction focuses on the Civil Rights Act, the Fair Housing Act, the Americans with Disabilities Act, the Equal Educational Opportunities Act, the Uniformed Service Members Employment and Reemployment Rights Act and the Matthew Shepard and James Byrd, Jr. Hate Crimes Prevention Act, along with statutory interpretation and federal investigation techniques and procedure. Following the initial class instruction in the fall, students will be assigned in the spring pending federal civil rights investigations and cases. They will work closely with assistant US attorneys, investigators and paralegals on investigation tactics, evidence gathering, pleading drafting, deposition preparation, document review, legal research, litigation strategy, and settlement negotiations.

LAW 7200. Law and Inequality Journal Editor. (2 cr. [max 8 cr.]; S-N only; Every Fall & Spring)
Credit given without grade for satisfactory participation. prereq: instr consent

LAW 7201. Law and Inequality Journal Associate Editor. (2 cr. [max 4 cr.]; S-N only; Every Fall & Spring)
Associate editor for Law and Inequality Journal.

LAW 7202. Law & Inequality Journal: Research & Writing. (1 cr. [max 2 cr.]; P-F only; Every Fall & Spring)
This course provides an opportunity to research and write a journal note under faculty supervision. Each student will write an outline and at least three drafts, and will also orally present and answer questions about their note. The course is required for and open only to staff members of Law and Inequality: A Journal of Theory and Practice.

LAW 7246. CL: Housing Law. (3 cr.; A-F only; Every Fall & Spring)
The Housing Law Clinic is a one-semester clinic on landlord-tenant law. Housing attorneys from Mid-Minnesota Legal Aid supervise students in representing tenants facing housing repair problems, utility shutoff and lockouts, and eviction cases in their rental history in Hennepin County Housing Court. The clinic provides an opportunity to handle cases from beginning to end. The cases may include interviewing, investigation, drafting pleadings, discovery, motion and trial practice, and appeals. Some cases may involve the delicate act of advising a client that does not have a good case. Each student may handle two to five cases during the semester. The classroom component includes interviewing, clinic computer network training, professional responsibility, housing law topics concerning the types of actions handled in the clinic, and case simulations patterned after real housing cases. Students convene for staff meetings and round table discussions to discuss issues and cases, as well as for meetings with student directors and the supervising attorneys in preparation for cases.

LAW 7247. CL: Housing Clinic Director. (1-4 cr.; A-F only; Every Fall & Spring)
Director for housing clinic. prereq: dept consent

LAW 7300. Minnesota Journal of International Law Editor. (2 cr. [max 8 cr.]; S-N only; Every Fall & Spring)
By selection only. Credit given without grade for satisfactory participation.

LAW 7302. Journal of International Law: Research & Writing. (1 cr. [max 2 cr.]; P-F only; Every Fall & Spring)
This course provides an opportunity to research and write a journal note under faculty supervision. Each student will write an outline and at least three drafts, and will also orally present and answer questions about their note. The course is required for and open only to staff members of Minnesota Journal of International Law.

LAW 7400. CL: Human Rights Litigation and International Legal Advocacy. (3-4 cr. [max 8 cr.]; A-F only; Every Fall)
This clinic provides students with experience in human rights advocacy which may include litigation in federal or state courts and advocacy before the United Nations, the federal and state legislative and executive branches, and working in coalitions of nongovernmental organizations. The clinic provides participation in clinical projects and skill-building exercises. The process will facilitate discussion of the pros and cons of various advocacy mechanisms, possible conflicting strategies among stakeholders, and how particular strategies are chosen and implemented. The clinic's class component includes core lawyering skills such as interviewing, counseling, negotiation, and legal ethics in practice, and subjects such as how to practice before international human rights systems, how to use international law sources in legal arguments before U.S. courts, working with clients with Post-Traumatic Stress Syndrome, the different types of oral advocacy and writing in human rights advocacy, and the use of education, outreach, and the media in advancing a strategy.

LAW 7401. CL: Human Rights Litigation and International Legal Advocacy Directors. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Directors for Human Rights Litigation/International Legal Advocacy Clinic. prereq: dept consent

LAW 7420. CL: Family Law. (3-4 cr. [max 8 cr.]; A-F only; Every Fall)
This clinic is grounded in the development of practical skills necessary to effectively develop and move family law cases from initial client interview to Judgment and Decree.
LAW 7550. CL: Criminal Defense. (2 cr.; A-F only; Every Fall)
In the Criminal Defense Clinic, you will have a challenging and rewarding experience working as a student attorney representing clients in Hennepin County District Court. Through your classroom and courtroom work, you will develop client-centered trial skills that will serve you well as you embark on your career as a lawyer. You will also be challenged to think critically and creatively about the criminal justice system, the role of defense lawyers, legal ethics, and criminal law and procedure. The course will involve a combination of classroom work and supervised student representation of clients charged with petty misdemeanor offenses in Hennepin County District Court. Student lawyers will represent clients at all stages of the criminal process, including arraignments, pretrial conferences, and trials. The focus of the course will be to develop the skills to provide client-centered representation in criminal cases. Prereq: Law 6219

LAW 7501. CL: Criminal Defense Directors. (2 cr.; max 4 cr.; A-F only; Every Fall & Spring)
Director for criminal defense clinic. prereq: dept consent

LAW 7551. CL: Criminal Justice. (3 cr.; max 6 cr.; A-F only; Every Fall & Spring)
The Criminal Justice Clinic is a year-long clinic in which students will have the unique opportunity to prosecute criminal cases during the fall semester and serve as a criminal defense attorney during the spring semester. Students in the Criminal Justice Clinic will have a challenging and rewarding experience working as student-attorneys practicing law in courts throughout the metro area. Through classroom and courtroom work, students will develop the fundamental litigation and legal skills that will serve them well as they embark on their careers as practicing attorneys. They will also be challenged to think critically and creatively about the criminal justice system, the role of prosecutors and defense attorneys, legal ethics, and criminal law and procedure.

LAW 7570. CL: Federal Prosecution. (2-3 cr.; A-F only; Periodic Fall & Spring)
Students assist in prosecution of federal criminal cases under supervision of assistant U.S. attorneys and faculty supervisor.

LAW 7571. CL: Federal Prosecution Clinic Director. (2-3 cr.; A-F only; Periodic Fall & Spring)
Director for federal prosecution clinic.

LAW 7572. CL: Federal Defense. (3 cr.; A-F only; Every Spring)
In this clinical seminar, students assist in the defense of indigent persons charged with federal crimes, under the supervision of the Federal Public Defender for the District of Minnesota and assistant federal public defenders. Fieldwork includes assignments such as research and writing of Eighth Circuit appeal briefs, memoranda in support of or response to motions, and legal research on a wide variety of topics. When cases are available, students may also be given various second-chair assignments in the preparation for and conduct of court and jury trials. If consistent with assignment deadlines, students are encouraged to observe other trials and federal criminal court proceedings. In addition to regular conferences, students work about twelve hours per week on clinic assignments. Each student will arrange a regular weekly schedule for their clinic work at the Federal Public Defenders Office in Minneapolis. prereq: LAW 6085 Criminal Procedure (formerly LAW 6218) and LAW 6009 Criminal Law and LAW 6219 Evidence. LAW 6219 Evidence may be taken concurrently. NOTE: This course requires certification pursuant to the student practice rule and is open to JD students only.

LAW 7608. Minnesota Journal of Law, Science, and Technology Editor. (2 cr.; max 8 cr.; S-N only; Every Fall & Spring)
Scholarly publication addressing legal issues that arise from emerging technologies in areas such as copyrights, trademarks, patents.

LAW 7602. Journal of Law, Science & Technology: Research & Writing. (1 cr.; max 2 cr.; P-F only; Every Fall & Spring)
This course provides an opportunity to research and write a journal note under faculty supervision. Each student will write an outline and at least three drafts, and will also orally present and answer questions about their note.

The course is required for and open only to staff members of Minnesota Journal of Law, Science & Technology.

LAW 7606. Independent Research and Writing. (1-2 cr.; max 8 cr.; A-F only; Every Fall, Spring & Summer)
Note: Law 7606 and 7608 both provide credit for independent writing projects; the difference is that 7606 satisfies the J.D. Upper Division Writing Requirement, while 7608 does not (except on a case-by-case basis before fall 2016). The registrar will assign students to 7606 or 7608 based on whether the student seeks, and the supervisor approves, upper division writing credit. Students may earn 1 or 2 credits (and in exceptional circumstances, 3 credits) for researching and writing a note, article, memo, or other paper on a legal topic. At least 5,000 words are required for one credit, at least 7,500 for two credits, and at least 11,250 for three credits. Students must consult with their faculty supervisor on their topic and research plan and receive feedback from their supervisor on the drafting process. To register, the student should confer with a supervising faculty member, draft a description of the proposed project, and complete the online Independent Research form. prereq: Law student. Non-law students may enroll in LAW 5908 or LAW 7608.

LAW 7607. Independent Field Placement - Experiential. (1-3 cr.; P-F only; Every Fall, Spring & Summer)
Note: Law 7607 and 7609 both provide credit for independent field placements; the difference is that 7607 satisfies the Experiential Learning Requirement, while 7608 does not. The Registrar will assign students to 7607 or 7609 based on whether the student seeks and the advisor approves experiential learning credit. Students may earn a maximum of three credits in one semester for unpaid work in a legal practice setting under the supervision of a qualified field supervisor and a faculty advisor. At least 50 hours of law-related activities are required per credit. The student is responsible for identifying a field placement setting and supervisor, finding a faculty advisor, and completing the Independent Field Placement Enrollment and Independent Field Placement Supervisor Forms. The signed forms must be submitted by email to lawcurr@umn.edu for approval by the Associate Dean of Academic Affairs prior to enrollment.

LAW 7608. Independent Research and Writing. (1-2 cr.; max 8 cr.; A-F only; Every Fall, Spring & Summer)
Law 7606 and 7608 provide credit for independent writing projects; the difference is that 7606 satisfies the J.D. upper division writing requirement, while 7608 does not (except on a case-by-case basis before fall 2016). The registrar will assign students to 7606 or 7608 based on whether the student seeks and the supervisor approves upper division writing credit. Students may earn 1 or 2 credits (and in exceptional circumstances, 3 credits) for researching and writing a note, article, memo, or other paper on a legal topic. At least 3,750 words are required for one credit, at least 5,000 for two credits, and at least 7,500 for three credits. Students must consult with their faculty supervisor on their topic and research plan and receive feedback from their supervisor on the drafting process. To register, the student should confer with a supervising faculty member, draft a description of the proposed project, and complete the online Independent Research form. prereq: Law student. Non-law students may enroll in LAW 5908 or LAW 7608.
credit, at least 7.500 for two credits, and at least 11.250 for three credits. To register, the student should confer with a supervising faculty member, draft a description of the proposed project, and complete the online Independent Research form.

**LAW 7609. Independent Field Placement.** (1-3 cr. ; S-N only; Every Fall, Spring & Summer)

Note: Law 7607 and 7609 both provide credit for independent field placements; the difference is that 7607 satisfies the Experiential Learning Requirement, while 7609 does not. The registrar will assign students to 7607 or 7609 based on whether the student seeks and the advisor approves experiential learning credit. Students may earn up to three credits in a semester for unpaid work in a legal practice setting under the supervision of a qualified field supervisor and a faculty advisor. At least 50 hours of law-related activities are required per credit. The student is responsible for identifying a field placement setting and supervisor, finding a faculty advisor, and completing the Independent Field Placement Enrollment and Independent Field Placement Supervisor Forms. The signed forms must be submitted by email to lawcur@umn.edu for approval by the Associate Dean of Academic Affairs prior to enrollment.

**LAW 7620. Field Work: Clemency Project.** (2-3 cr. ; P-F only; Periodic Fall, Spring & Summer)

In early 2014, President Obama announced an initiative to grant clemency to long-term federal inmates meeting certain criteria: they had served at least 10 years in prison, their offense was low-level and non-violent, they had no history of violence or ties to organized crime, their conduct in prison was good, and their sentence would be lower today by operation of law or policy. He called on lawyers and law students across the country to volunteer to represent these inmates in preparing their applications under this tailored program. In this class, students will visit individual inmates, determine their eligibility for the program, obtain all necessary documents and records, develop the inmate's release plan, collect letters of support, and write up memoranda detailing how the inmate meets the criteria. The class is taught by Professor JaneAnne Murray, who is counsel of record for the inmate clients and a member of the steering committee of Clemency Project 2014 - a consortium of defense organizations which coordinates the recruitment and training of volunteer clemency lawyers.

**LAW 7621. Immigration Law Field Placement.** (1-3 cr. ; S-N only; Periodic Fall & Spring)

This course provides an opportunity for students interested in Immigration Law to work alongside practitioners. The instructor and student will work together to find an appropriate placement that matches the student's interests and host's needs. Due to the limited number of placements available and the need to match students with available hosts, enrollment will occur through an application outside of the lottery process. If you are interested in applying, please contact the instructor. In some cases HP/P/PL/P grading may be possible. Previously taking LAW 6872 Immigration Law is not required, but preferred.

**LAW 7623. Public Interest Field Placement.** (2 cr. ; P-F only; Every Fall)

This course provides an opportunity for students to work with and learn from lawyers in government agencies, nonprofit organizations, and public interest law firms. The instructor and student will work together to find an appropriate placement that matches the student's interests and host's needs. Students who have already secured field placements in the public interest can also enroll.

**LAW 7632. Human Rights Law Field Placement.** (2 cr. ; max 3 cr.; P-F only; Every Fall & Spring)

This course allows students to learn about human rights law in practice by working directly with organizations and practitioners in the field. In addition to the supervised placement work, students in this course will meet periodically throughout the semester to share and assess the experience. Prior to enrolling, students should consult with the director directly to identify a potential host organization that would fit the student's background and interests. Recommended Prerequisite: Law 6886 International Human Rights Law or Law 6011/6071 International Law.

**LAW 7640. Remote Semester Field Placement.** (10 cr. ; P-F only; Every Fall & Spring)

The Remote Semester Program gives students the opportunity to gain valuable experience in the legal profession and in public service while earning credits toward their law degree. Students will work for a government or nonprofit organization and earn 10 credits (H/PLP/F) for work performed. Extremhours and assignments must be completed between the semester's first day of classes and the last day of final exams. Students will also be required to earn 2 additional credits by enrolling in the Independent Research & Writing Paper.

**LAW 7675. CL: Child Advocacy and Juvenile Justice.** (3-4 cr. ; max 8 cr. ; A-F only; Every Fall)

The Child Advocacy and Juvenile Justice Clinic (the 'CAC') is a full academic year, seven-credit program beginning in the fall semester in which students represent indigent clients in juvenile delinquency and child welfare matters before the Hennepin County Juvenile Court and custody cases before the Hennepin County Family Court. Students have previously been actively involved in two cutting edge areas of the law: they have represented adults seeking custody of unaccompanied immigrant minors under the Special Immigrant Juvenile Status federal statute, and they have represented inmates serving life without parole (LWOP) in Minnesota prisons for offenses they committed as juveniles. In connection with their LWOP cases, students have represented clients in extensive proceedings before state and federal courts, including the District of Minnesota and the Eighth Circuit.

**LAW 7676. CL: Child Advocacy Director.** (3 cr. ; max 6 cr. ; A-F only; Every Fall & Spring)

Director for child advocacy clinic. prereq: dept consent

**LAW 7700. Off-Campus Legal Studies—Beijing, China.** (5 cr. ; A-F or Audit; Every Summer)

Students attend Renmin University of China Law School in Beijing, China.

**LAW 7702. Off-Campus Legal Studies in Europe: Barcelona, Florence, London or Paris.** (4-6 cr. ; P-F only; Every Summer)

Law School/University of San Diego have partnered to offer summer program in Barcelona, Florence, London or Paris.

**LAW 7750. CL: Community Legal Partnership for Health.** (2-3 cr. ; max 6 cr. ; A-F only; Every Fall)

Students in this clinic will provide legal services at the Phillips Neighborhood Clinic, the Community University Health Care Clinic and Hope Lodge to help current and future patients resolve legal issues affecting patients care and wellbeing. Students will develop skills that can be used in any number of practice settings, including interviewing and counseling, case management, problem-solving, persuasive fact analysis, legal drafting, negotiation, effective oral communication, and interdisciplinary collaboration. Through participation in this course, students will be given the opportunity to change clients' lives by helping them assert their rights and obtain necessary benefits and services. Students will learn about legal issues that affect people with health issues, the complex intersection of law and health, the medical-legal partnership (MLP) model of legal services delivery, and client-centered and holistic approaches to the lawyer-client relationship. Students will learn their own style of lawyering and ways to improve time management, client management, and communication and advocacy skills.

**LAW 7751. CL: Community Legal Partnership for Health Directors.** (2-3 cr. ; max 6 cr. ; A-F only; Every Fall)

Students in this clinic will work with various health service students at the Phillips Neighborhood Clinic to identify and resolve legal issues affecting patients care and wellbeing. Students will develop skills that can be used in any number of practice settings, including interviewing and counseling, case management, problem-solving, persuasive fact analysis, legal drafting, negotiation, effective oral communication, and interdisciplinary collaboration. Through participation in this course, students will be given the opportunity to change clients' lives by helping them assert their rights and obtain necessary benefits and services. Students will learn about legal issues that affect people with health issues, the complex intersection of law and health, the medical-legal partnership (MLP) model of
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

LEAD 1961W. Personal Leadership in the University. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer) Examine personal views of leadership, differences between personal/positional leadership, leadership ethics/values, personal leadership strengths/ skills.

LEAD 3961. Leadership, You, and Your Community. (3 cr.; A-F only; Every Fall & Spring) A course designed to develop personal leadership skills through a structured leadership education program. The course will focus on a theoretical examination of leadership concepts and an experience-based application of those concepts. The course will also provide a forum for leadership development and reflection.

LEAD 3971. Leadership Minor: Field Experience. (3 cr.; A-F only; Every Fall & Spring) Open to students at the University of Minnesota who have completed the Leadership Minor. Students will apply the skills and knowledge gained in the Leadership Minor to a field experience. Students will work with a mentor to design and implement an individualized leadership experience. The experience will involve leadership development, critical thinking, and application of theoretical knowledge.

LEAD 3972. Field Experience: Intercultural Internship. (3 cr.; A-F only; Every Summer) Internship-based course focused on leadership principles and intercultural values that impact the work environment. Possible internship locations include New York City, San Francisco, and Minneapolis. For students in the undergraduate Leadership Minor, this is the opportunity to apply what they
have learned in a real-life setting. Prior to departure for the on-site internship in the city location, students spend a week in class at the University studying the theoretical frameworks that will provide the foundation for the 6-week internship, reflection process, and living experience. The composition of the class cohort will include international and domestic students, which provides the opportunity to experience and reflect upon the internship and the designated city living experience through an intercultural lens. Upon completion of the internship, the class cohort will return to the University to complete a final week of class on campus.

LEAD 4482. Leadership and Social Change in Panama. (GP; 3 cr. : A-F only; Every Fall) On the surface, Isla Bastimentos is a beautiful island, located in a marine park near the Costa Rican border with picturesque beaches including Red Frog Beach. But under the surface, there is a complex story. Students will learn about leadership and social change by examining the local commitment to eco-tourism and biodiversity, indigenous communities that inhabit the island, local organizations started by ordinary individuals that are trying to fulfill community needs, and the real-life story of the journey to build the Red Frog Beach Resort. In addition to analyzing leadership and social change in the context of Isla Bastimentos and Bocas Del Toro, Panama, students will simultaneously reflect on their own capacities for leadership and cultural competence, and the role that they might play in a social issue when they return to the U.S.

LEAD 4484. Cross-Cultural Leadership Bali. (3 cr. [max 9 cr.] ; A-F only; Every Summer) This 4000-level study abroad course explores leadership development as related to global citizenship. It is designed for students who are interested in exploring topics and themes of leadership, globalization and happiness in a different cultural context. Specifically, this course will take students to Bali, Indonesia, and utilize the history, sites, people and agencies of Tabanan, Ubud, Bedulu, and Denpasar, to explore and learn about those communities as well as how culture affects leadership and the social constructs of happiness. Students will use their knowledge of leadership?particularly the notions of community, intercultural leadership, and social constructs of happiness?to examine the current opportunities and challenges in the Balinese context. Students will interact with local community leaders who are working to make change, as well as citizens in the community. In this course, students will: 1. Understand the ways in which different cultural norms and values can change the manner in which leadership skills and initiatives are utilized to create change. 2. Explore the role that particular social, environmental, and spiritual belief systems can play in the practice of community leadership. 3. Gain knowledge about global issues in Bali and, more specifically, how different individuals can use their experiences, knowledge, and practice to make a difference. 4. Continue personal development growth through awareness of the history of Bali, as well as the cultural context of Tabanan, Ubud, Bedulu, and Denpasar, its people, and its surrounding areas. 5. Explore the intersections of culture and happiness in the Balinese context and contrast that with their own cultural understanding of happiness.

LEAD 4961W. Leadership for Global Citizenship. (GP; WI; 3 cr. : A-F only; Every Fall & Spring) In this final, writing intensive capstone course, students pull together the threads of leadership theory and practice worked with over the course of the Leadership Minor. In addition, students gain experience working with diverse leaders from around the world, mapping political contexts, and planning their own global leadership path within their specific field.

LEAD 4971. Directed Study. Leadership Minor. (1-4 cr. [max 12 cr.] ; A-F only; Every Fall, Spring & Summer) Design/carry out study project under direction of leadership minor instructors/faculty. To apply, please create a contract here: https://goo.gl/forms/K8s9ZhrY6Vp5oRGf2 Please note: The UMN's Credit policy can be found here: https://policy.umn.edu/education/studentwork. One credit represents, for the average University undergraduate student, three hours of academic work per week, averaged over the semester, in order to complete the work of the course to achieve an average grade. One credit equals 42 to 45 hours of work over the course of the semester (1 credit x 3 hours of work per week x 14 or 15 weeks in a semester equals 42 to 45 hours of academic work). Students should keep the above policy in mind while determining their project and the amount of credits for enrollment. The amount of enrolled credits also proportionally influences the amount of instructor contact hours/week.

LEAD 4972. Directed Research, Leadership Minor. (1-4 cr. [max 12 cr.] ; A-F only; Every Fall, Spring & Summer) Students complete individually arranged research project with Leadership Minor instructor. Contact Leadership Minor office for registration requirements. *Please note - The University of Minnesota's Credit policy can be found here: https://policy.umn.edu/education/studentwork. One credit represents, for the average University undergraduate student, three hours of academic work per week, averaged over the semester, in order to complete the work of the course to achieve an average grade. One credit equals 42 to 45 hours of work over the course of the semester (1 credit x 3 hours of work per week x 14 or 15 weeks in a semester equals 42 to 45 hours of academic work). Students should keep the above policy in mind while determining their project and the amount of credits for enrollment. The amount of enrolled credits also proportionally influences the amount of instructor contact hours/week.

LASK 1001. Mastering Skills for College Success. (2 cr. ; Student Option; Every Fall & Spring) Practical assistance to students in developing efficient and effective learning and academic performance skills, improving reading speed and comprehension, increasing memorization and test-taking skills, managing test anxiety, identifying academic and career goals, and using advanced technology in university learning. Students identify individual academic strengths and weaknesses and formulate a plan for skill development through individualized learning projects. Addresses student learning styles, attitudes and motivations and their relation to successful academic performance. Class focuses on transition to college, a good option for first year, transfer, international, and returning students.

LASK 1101. Academic Refresher. (1 cr. ; S-N or Audit; Every Fall & Spring) Identifying factors interfering with academic performance, selecting strategies, and establishing a plan to promote academic success. Learning-style, educational goals, life management skills, motivation, attitude. Class intended to support students who are experiencing academic barriers during the first half of the semester. prereq: instr consent

LASK 1102. Academic Success. (2 cr. [max 4 cr.] ; S-N only; Every Fall & Spring) Assistance in identifying barriers in academic performance and developing plans for effective scholarship. Skill development, performance enhancement. Objectives achieved through didactic instruction, assignments, behavioral monitoring. Course designed for students who are on academic probation, returning from suspension, or have experienced significant academic barriers.

Liberal Studies (LS)

LS S100. Liberal Studies Seminar. (1-4 cr. [max 96 cr.] ; A-F or Audit; Every Fall, Spring & Summer) Interdisciplinary topics. prereq: dept consent

LS S125. Field Experience. (1-8 cr. ; A-F or Audit; Every Fall, Spring & Summer) Off-campus observation, experience, and evaluation in interdisciplinary field of study. prereq: MLS student or instr consent

LS S150. Special Topics. (1-4 cr. [max 12 cr.] ; A-F or Audit; Every Fall, Spring & Summer) Guided individual reading or study. prereq: Grad student, dept consent

LS S194. Directed Research. (1-4 cr. [max 15 cr.] ; Student Option; Every Fall, Spring & Summer) Tutorial for qualified graduate students. prereq: instr consent

LS S201. Introduction to Interdisciplinary Inquiry. (3 cr. ; A-F or Audit; Every Fall, Spring & Summer)
LING 1701. Language and Society. (DSJ; 4 cr.; Student Option; Every Fall & Spring) Role of language in human social interaction; linguistic indicators of social status and attitudes; language and sex roles; linguistic ecology; language planning for multicultural communities; implications for education and public policy.

LING 1800. Topics in Linguistics. (1-4 cr. [max 5 cr.]; A-F or Audit; Every Spring) Topics vary. See Class Schedule.

LING 1911W. Linguistics and Biology. (WI; 3 cr.; Student Option No Audit; Periodic Fall & Spring) Before the Chomskyan revolution in linguistics in the early 1960s, the connection between linguistics and biology was largely restricted to the study of the anatomical properties of the human vocal tract involved in the articulation of speech sounds. In recent decades, however, the relation between linguistics and biology has begun to focus on the biological basis of human language, including connections between evolution of language and that of the human brain, and possible existence of "language genes." In this seminar, we will examine the connection and relations between linguistics and biology over time, with specific focus on how this reflects development of the field of linguistics as well as more generally the nature of interdisciplinary.

LING 1912. Invented Languages. (3 cr.; Student Option; Every Fall) As far back as we can tell, there have been thousands of natural languages spoken by humans the world over,?102 today, according to a recent authoritative count. So why are there also hundreds of hundreds of invented languages? What niche are they intended to fill? And why did so few of them make it out of the works of their inventors? In this seminar we will approach these questions by looking at languages invented by philosophical taxonomists during the Enlightenment, by internationalists in the late 1800s, by simulationists in the 1900s; we will take a look at online communities of language inventors to understand what makes them tick, and see how invented languages and their inventors are portrayed in the media. To get the most out of all this we will also have to talk about the properties of natural languages: how they are structured, how they are used, how they change over time, and why there are so many of them.

LING 3001. Introduction to Linguistics. (SOCS; 4 cr.; Student Option; Every Fall, Spring & Summer) Scientific study of human language. Methods, questions, findings, and perspectives of modern linguistics. Components of the language system (phonetics/phonology, syntax, semantics/pragmatics); language acquisition; language/social variables; language/cognition; language change; language processing; language/public policy.

LING 3001H. Honors: Introduction to Linguistics. (SOCS; 4 cr.; A-F only; Every Spring) Scientific study of human language. Methods, questions, findings, and perspectives of modern linguistics. Components of the language system (phonetics/phonology, syntax, semantics/pragmatics); language acquisition; language/social variables; language/cognition; language change; language processing; language/public policy. prereq: Honors student or instr consent

LING 3051H. Honors: Thesis. (3 cr.; A-F only; Every Fall & Spring) Supervised planning and research for honors thesis to be completed in 3052. prereq: Linguistics honors candidate, instr consent

LING 3052. Honors: Thesis. (WI; 3 cr.; A-F only; Every Spring) Supervised research, writing, and revision for honors thesis begun in LING 3051H.

LING 3101W. Languages of the World. (WI; 3 cr.; Student Option; Every Fall) Survey of language families of the world. Classifying languages genetically/typologically.

LING 3601. Historical Linguistics. (3 cr.; Student Option; Every Spring) Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages. prereq: 3001 or instr consent

LING 3900. Topics in Linguistics. (1-4 cr. [max 20 cr.]; Student Option; Periodic Fall & Spring) Topics vary. See Class Schedule.

LING 4201. Syntax I. (3 cr.; Student Option; Every Spring) How words are organized into phrases/sentences. Basic units of a sentence. How these units are structured. How languages may be the same, or different, in syntax. prereq: 3001 or 3001H or 5001 or instr consent

LING 4202. Syntax II. (3 cr.; Student Option; Every Fall) Syntactic theory. Principles and Parameters (P&P) approach to grammar. Focus on Minimalist Program (MP). prereq: 4201 or 5201

LING 4302W. Phonology I. (WI; 3 cr.; Student Option; Every Spring) How sounds are organized/patterned in human languages. Foundation in phonological theory/problem-solving for advanced work in phonology and other fields in linguistics. Analyzing data, presenting written solutions. prereq: 3001 or 3001H or 5001 or instr consent

LING 4303. Phonology II. (3 cr.; Student Option; Every Fall) Continues work of LING 4302W with emphasis on critical reading of current phonological literature. Phonological phenomena in the context of new developments in the field. Optimality Theory and the phonology-morphology interface. prereq: LING 4302W

LING 4901W. Capstone Seminar in Linguistics. (WI; 3 cr.; S-N only; Every Fall & Spring) Revision/expansion of a paper completed for a linguistics course. prereq: LING major, [jr or sr]

LING 5001. Introduction to Linguistics. (4 cr.; Student Option; Every Fall, Spring & Summer) Scientific study of human language. Methods, questions, findings, and perspectives of modern linguistics. Components of the language system (phonetics/phonology, syntax, semantics/pragmatics); language acquisition; language/social variables; language and cognition; language change; language processing; language and public policy; language and cognition.

LING 5105. Field Methods in Linguistics I. (4 cr.; Student Option; Every Fall) Techniques for obtaining/analyzing linguistic data from unfamiliar languages through direct interaction with native speaker. prereq: [4201 or 5201], [4302W or 5302] or instr consent

LING 5106. Field Methods in Linguistics II. (4 cr.; Student Option; Every Spring) Techniques for obtaining/analyzing linguistic data from unfamiliar languages through direct interaction with native speaker. prereq: [4201 or 5201], [4302W or 5302] or instr consent
interaction with a native speaker. prereq: [5105, grad major] or instr consent

LING 5201. Syntactic Theory I. (3 cr.; Student Option; Every Fall)
Concepts/issues in current syntactic theory. prereq: 5001 or honors student or instr consent

LING 5202. Syntactic Theory II. (3 cr.; Student Option; Every Spring)
Modern syntactic theory. Syntactic phenomena in various languages. Syntactic argumentation, development of constraints on grammar formalisms. prereq: 5201 or instructor consent. LING 5201 is directed towards honors students and graduate students.

LING 5205. Semantics. (3 cr.; Student Option; Every Fall & Spring)
Analysis of sentence meaning. Semantic properties. Relations such as analytically, entailment, quantification, and genericity. Philosophical background, formal techniques of semantic analysis, how sentence meaning depends on word meaning, syntax, and context. The role of semantics in grammatical theory. prereq: [4201 or 5201] or instr consent

LING 5206. Linguistic Pragmatics. (3 cr.; Student Option; Every Spring)
Analysis of linguistic phenomena in relation to beliefs and intentions of language users; speech act theory, conversational implicature, presupposition, information structure, relevance theory, discourse coherence. prereq: [4201 or 5201] or instr consent

LING 5302. Phonological Theory I. (3 cr.; Student Option; Every Fall)
How sounds are organized/patterned in human languages. Phonological theory/problem-solving for advanced work in in linguistics. Analyzing data. Presenting written solutions to problem sets. prereq: 5001 or honors student or instructor consent. LING 5302 is directed towards honors students and graduate students.

LING 5303. Phonological Theory II. (3 cr.; Student Option; Every Spring)
Phonology of human languages. Reading papers in the literature. Doing research in phonology. prereq: 5302 or instr consent. LING 5303 is directed towards honors and graduate students.

LING 5461. Conversation Analysis. (3 cr.; Student Option; Periodic Fall)
Coursework. Application of concepts through conversation analysis. prereq: 3001 or 3001H or 5001 or instr consent

LING 5462. Field Research in Spoken Language. (3 cr.; Student Option; Periodic Spring)
Transcribing/analyzing talk and movement related to talk. Applying concepts to recorded conversations. prereq: 3001 or 3001H or 5001 or instr consent

LING 5501. Historical Linguistics. (3 cr.; Student Option; Every Spring)
Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages. prereq: 3001 or 3011H or 5001

LING 5801. Introduction to Computational Linguistics. (3 cr.; Student Option; Spring Odd Year)
Methods/issues in computer understanding of natural language. Programming languages, their linguistic applications. Lab projects. prereq: [4201 or 5201] or programming experience or instr consent

LING 5900. Topics in Linguistics. (1-4 cr.; Student Option; Every Fall & Spring)
Topics vary. See Class Schedule.

LING 5993. Directed Study. (1-3 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Directed study for Linguistics. Prereq instr consent, dept consent, college consent.

LING 8005. Research Paper Workshop. (3 cr. [max 12 cr.]; S-N or Audit; Every Spring)
Workshop on research methodological/writing in linguistics. prereq: [5105, 5202, 5205, [4302W or 5302]} or [instr consent, grad ling maj]

LING 8105. Field Methods in Linguistics I. (4 cr. [max 8 cr.]; Student Option; Every Fall)
Techniques and practice in obtaining/analyzing linguistic data from an unfamiliar language through direct interaction with a native speaker. Study of a language by elicitation of speech samples/analysis of patterns that emerge. prereq: [5001, 5201, 5302, grad linguistics major] or instr consent

LING 8106. Field Methods in Linguistics II. (4 cr. [max 8 cr.]; Student Option; Every Spring)
Continued analysis through work with a native speaker of language begun in 8105. Greater emphasis on analysis of recorded texts of various kinds. Some grammars of the language/contents compared with field notes from previous quarter. prereq: 8105 (taken in same academic yr)

LING 8200. Topics in Syntax and Semantics. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Syntax and semantics of natural language, with particular emphasis on the interface between the two. prereq: 5202, 5205 or instr consent

LING 8210. Seminar in Syntax. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Current issues in syntactic theory. Topics vary. prereq: 5202, 5205 or instr consent

LING 8300. Topics in Phonetics and Phonology. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
N/A prereq: 5303 or instr consent

LING 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

LING 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

LING 8500. Topics in Second Language Acquisition. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
tbd prereq: 5001, 5505

LING 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

LING 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

LING 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
A means for students to make progress on the dissertation in a structured setting. Brings together students writing on related topics. Credits are applied to doctoral thesis credits. Contact instructor for description. prereq: Doctoral student who has passed oral prelims

LING 8890. Seminar: Topics in Linguistics. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring)
Topics vary. See Class Schedule. prereq: instr consent

LING 8921. Seminar in Language and Cognition. (3 cr. [max 6 cr.]; Student Option; Every Fall)
Language-related issues in cognitive science from a linguistic perspective. Serves as elective for cognitive science minor, but only for linguistics nonmajors. prereq: instr consent

LING 8991. Independent Study. (1-4 cr. [max 15 cr.]; Student Option; Every Fall & Spring)
Independent Study prereq: instr consent

Logistics Management (LM)

LM 8892. Readings in Logistics Management. (1-8 cr. [max 16 cr.]; Student Option; Every Fall & Spring)
Readings useful to student's individual program or objectives that are not available in regular courses. prereq: Adviser consent or instr consent

LM 8894. Graduate Research in Logistics Management. (1-8 cr. [max 16 cr.]; Student Option; Every Fall & Spring)
Individual research on an approved topic appropriate to student's program and objectives. prereq: Adviser consent or instr consent

MN Studies in Intl Devel Prog (MSID)
MSID 1001. Beginning Hindi. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 1004. Intermediate French. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 1221. Beginning Swahili I. (4 cr. [max 8 cr.]; Student Option; Every Fall & Spring)
Study abroad course.

MSID 1222. Beginning Swahili II. (4 cr. [max 8 cr.]; Student Option; Every Fall & Spring)
Study abroad course.

MSID 3001. Beginning Wolof. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 3004. Beginning Hindi. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 3005. Intermediate Hindi. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 3008. Advanced Hindi. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 3015. MSID Intensive Spanish Language Pre-Session. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 3021. Advanced Spanish. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 3025. Intensive French Language. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 3225. Intermediate Swahili I. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 3226. Intermediate Swahili II. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 3231. Advanced Swahili. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MSID 4001. International Development: Critical Perspectives on Theory and Practice. (4 cr.; Student Option; Every Fall & Spring)
Explore a wide variety of perspectives on international development, with the host country as a case study. This course begins with 20 hours of common discussion on international development. The remaining course is divided into sections, and you select from the following sections in order to prepare for your internship or research project: (see track descriptions in syllabus for more information).

MSID 4002. MSID Country Analysis. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 4003. Community Engagement in the Global South. (4 cr.; Student Option; Every Fall & Spring)
An internships or research project with a host-country development agency or project provides an unparalleled opportunity to study community characteristics, development strategies and problems, organizational structure and culture, and cross-cultural communication issues. The length of the internship or research project is 6 weeks during the first semester. You typically spend approximately 25 to 30 hours each week at your internship or research site, although this may vary depending on the specific site and project. A list of sample past internships and research projects is available. Written assignments help link experiences to theories and issues raised in the classroom. A program faculty member or the on-site director visits you at least once at your internship or research site during the internship/research period. At the end of each semester, you gather in the host city or a retreat site for a seminar, which helps integrate your experiences and newly acquired knowledge. 12 contact hours of this course are incorporated into the classroom phase and provide specific training on research methodology to prepare students for their research or internship project.

MSID 4004. Case Studies in International Development. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 4005. Advanced International Development Internship. (4 cr. [max 8 cr.]; Student Option; Every Fall & Spring)
Engage in an extended internship with a nongovernmental organization throughout spring semester in order to gain practical hands-on experience in a grassroots community setting.

MSID 4006. Applied Field Methods. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 4007. MSID Directed Research. (4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5001. International Development: Critical Perspectives on Theory and Practice. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5002. MSID Country Analysis. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5003. Community Engagement in the Global South. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5004. Case Studies in International Development. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5005. Advanced International Development Internship. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5006. Applied Field Methods. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID 5007. MSID Directed Research. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

MSID Program in Thailand (THAI)

THAI 1001. Beginning Thai I. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

THAI 1002. Beginning Thai II. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

THAI 3001. Intermediate Thai I. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

THAI 3002. Intermediate Thai II. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

Madrid Learning Abroad Program (MADR)

MADR 1002. Beginning Spanish. (5 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 1003. Intermediate Spanish III. (5 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 1004. Intermediate Spanish IV. (5 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 3001. Financial Management. (3 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 3002. Ecology of Spain. (3 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 3003. Philosophy of Religion. (3 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 3004. Management and Organizational Behavior. (3 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 3005. Management and Ethics in a Cross-Cultural Context. (3 cr.; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MADR 3006. Word Religions. (3 cr.; Student Option; Every Fall, Spring & Summer)
and groups to interpret reality. From that basis, this course examines the set of conflicts currently underway both within Western societies—as seen, for instance, in the ?Culture Wars? as well as in the latest US presidential election—as well as the tensions between the Western and non-Western cultures—such as those of India, China, and the Arab worlds—with an emphasis in the role played by the media and the cultural industries.

MADR 3021. Art at the Prado Museum. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
The aim of this course is to make students familiar with the most relevant and internationally outstanding Spanish and European artists within the Prado Museum Permanent Collections. The course will help students to fully understand and assimilate art history fundamental concepts and movements such as Renaissance, Baroque, and Neoclassicism, with a specific concentration on Spanish masters such as El Greco, Velázquez, and Goya. Simultaneously, it will help students confront Spain's and Europe most controversial history: from the dark Medieval Ages to the beginning of the 19th Century. Two observations will be fundamental to our investigations. The first is that art history involves the study not simply of formal concepts. A work of art has a physical presence that is offered by the artist but his/her ideas, convictions, and claims are shaped in large measure by specific social circumstances. The relevance of the latter are those that turn an artwork into a masterpiece. Thus, techniques and styles of representation are just the beginning of art history research. The second observation has to do with the relationship between art and culture: Art does not simply (or passively) reflect a given culture, but rather actively participates in its formation and development. A work of art, then, is the deepest expression of a social, religious, political, as well as intellectual context. Thus, thorough the artworks study, analysis, students will develop critical and intellectual thinking by the means of observation, research, and interpretation.

MADR 3022. Spanish Civilization - ENG. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
This course aims to offer a general view of Spanish culture and society through readings, lectures, and cultural activities. This semester will focus on a few topics portraying the transformations experienced in the country during the last years: the political system, social and economic problems, multi-ethnic society, new role of women, new family models, and present image of Spain. We will combine lectures, PowerPoint presentations, videos, discussions of required readings, and group debates. Being in Spain gives you a great opportunity to widen your approach to culture through language, and one of the aims of this class is to help you achieve this goal. All students are expected to come to all sessions prepared for them. All indicated assignments completed beforehand.

MADR 3023. Spanish Civilization. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
This course aims to offer a general view of Spanish culture and society through readings, lectures, and cultural activities. This semester will focus on a few topics portraying the transformations experienced in the country during the last years: the political system, social and economic problems, multi-ethnic society, new role of women, new family models, and present image of Spain. We will combine lectures, PowerPoint presentations, videos, discussions of required readings, and group debates. Being in Spain gives you a great opportunity to widen your approach to culture through language, and one of the aims of this class is to help you achieve this goal. All students are expected to come to all sessions prepared for them. All indicated assignments completed beforehand.

MADR 3024. Corporate Social Responsibility. 
(3 cr.; max 6 cr.; Student Option: Every Fall, Spring & Summer) 
Study abroad course

MADR 3025. Modern Masters: Goya, Picasso, Miro and Dali. 
(3 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) 
Study abroad course

MADR 3032. Learning and Behavior. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
This course will cover methods and findings of research on learning and behavioral change. Additionally, students will learn about twentieth-century theoretical perspectives, including contemporary models. There will be an emphasis on animal learning behavior and behavioral psychology.

MADR 3206. Health Psychology. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
Recent advances in psychological, medical, and physiological research have led to a new way of thinking about health and illness and understanding that our health is not only the product of biological processes but also of psychological, behavioral and social processes. Health psychology is a relatively young field of study that examines the relationship between psychology and health. The course highlights differences between health psychology and the biomedical model and examines the kinds of questions asked by health psychologists like: How our personality may affect our health? What does stress do to our health? What psychological and social factors cause people to behave in unhealthy ways? What can psychologists do to help cure illness? Are there ethnic and gender variations in health? Does it matter how your doctor talks to you?

MADR 3301. Cross-Cultural Psychology. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
This course's aim is to understand how cultural factors influence human behavior and development. Additionally, the course may discuss interaction between different cultures and how to solve the difficulties that may arise during the acculturation process. The course studies the vision and treatment of mental disorders in different cultures, especially the differences and similarities between Spanish and North American cultures. It will also analyze and compare mental health systems of both countries.

MADR 3604. Introduction to Abnormal Psychology. 
(3 cr.; Student Option; Every Fall, Spring & Summer) 
The purpose of this course is to give the student an opportunity to explore current issues in understanding and treating abnormal
behavior. The course will provide an initial overview of history, perspectives, assessment (DSM), diagnosis, and treatment, followed by an in-depth look at several disorders from a combined biological, developmental, and cultural approach. The focus will be to achieve an understanding of the various ways that human behavior can be compromised and the various factors that affect our ability to adapt.

MADR 4901. Research Laboratory in Psychology. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

Management (MGMT)

MGMT 1001. Contemporary Management. (3 cr.; A-F only; Every Fall & Spring) How/why organizations differ in form/purpose in complex environments/technologies. Managerial challenges related to international management, social responsibility. Models of effective leadership/teambuilding. prerequisite Carlson School of Business.

MGMT 1001H. Honors: Contemporary Management. (3 cr.; A-F only; Every Fall & Spring) How/why organizations differ in their forms/purposes in relation to complex/changing environments/technologies. Challenges related to international management and social responsibility. Models of effective leadership/teambuilding. prerequisite: Carlson School student.

MGMT 1005. Corporate Responsibility and Ethics. (CIV; 3 cr.; A-F only; Every Fall & Spring) Identify/apply ethical principles to resolution of moral challenges in management. Understanding place of business/corporation in society. prerequisite: Carlson School major.

MGMT 1005H. Corporate Responsibility and Ethics. (CIV; 3 cr.; A-F only; Every Spring) Identify/apply ethical principles to resolution of moral challenges in management. Understanding place of business/corporation in society. prerequisite: Honors student.

MGMT 1910W. When it Hits the Fan: Business, Crisis Communication, and Social Media in a Risky World. (WI; 3 cr.; A-F only; Every Fall) Effective crisis communication is increasingly important in a world of expanding technological dependence, sociopolitical instability, and daunting environmental challenges. Crises can be broadcast around the world in minutes via social media, creating negative headlines for months. In addition, complex, world-wide problems like climate change, religious fundamentalism, cyber security, health care, population growth, urbanization, and terrorism require effective communications to lessen the consequences of a crisis on an organization's activities, reputation, and stakeholders. We will examine a variety of current international and national case studies to examine what went wrong and consider how businesses can better prepare for, prevent, and respond to global crises.

MGMT 3001. Fundamentals of Management. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Aspects/characteristics of organizations, their members. Why people/groups feel/behave as they do. Processes/methods that improve behavior/attitudes/effectiveness of members. Member/manager skills. Guest speakers, group presentations, films.

MGMT 3004. Business Strategy. (3 cr.; A-F only; Every Fall & Spring) Business strategy. How business firms set and pursue their goals. Key categories of strategic issues and concepts/frameworks managers use to analyze and address those issues. Attention to specific firms and situations. prerequisite: CSOM, soph or jr.

MGMT 3010. Introduction to Entrepreneurship. (4 cr.; A-F or Audit; Every Fall & Spring) Fundamentals of entrepreneurship. Career paths, including new business start-ups, franchising, acquisitions (including family business succession), corporate venturing, and entre-preneurial services. Legal structures for new business formation. Aspects of business law/ethics.

MGMT 3033W. Business Communication. (WII; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Written/oral communication skills for effective participation in contemporary organizations. From basic principles to communication strategy. Communication technology. Cases, simulations of "real-world" situations. Students small groups meet with instructor three times per semester. prerequisite: Fr composition, CSOM major. upper-division at least 60 cr.

MGMT 3040. Understanding the International Environment of Firms: International Business. (3 cr.; A-F or Audit; Every Fall & Spring) Theories, frameworks, tools, and facts for understanding the environment of firms in international competition. Main world-level economic flows (trade, investment, finance). How country-/industry-level economic, political, and sociocultural factors influence behavior/functions of firms in international competition. prerequisite: 1001 or 1001H or 3001.

MGMT 3603. Topics: Environmental Issues. (3 cr.; A-F only; Every Fall) Concepts/issues relating to inventory, subsequent analysis of production systems. Production systems from holistic point of view, using term commonly used in industrial ecology: "metabolic system." prerequisite: MATH 1142 or [MATH 1271, MATH 1272], [APEC 1101 or ECON 1101 or 3261W].

MGMT 3900. International Business Communication. (GP; 3 cr.; A-F only; Every Spring) Course will help students understand the impact of culture and communication on business interactions around the world. Cultural studies and cross-cultural communication is a complex, multidisciplinary field. Students will be asked to reflect on the meaning of ethics and corruption in a multicultural environment and to consider how our understanding of other cultures influences business practices. This course should help students to develop an empathetic understanding of other cultures, see through the eyes of others, understand how different cultural values can impact business practices, and think ethically about important global societal change and engage in difficult debates around moral, legal, and ethical issues.

MGMT 4000. Social Venturing in Action. (4 cr.; A-F only; Every Spring) Capstone course. Students choose project with nonprofit organizations in local community. Readings/discussions tie managerial theory to experiences. Issues that involve intersection of for-profit/not-for-profit economies. Primarily undergraduate class. Opportunities for selected grad students. prerequisite: Sr nonprofit major or instr consent.

MGMT 4002. Managerial Psychology. (4 cr.; A-F or Audit; Every Fall, Spring & Summer) Behavioral principles, methods, and skills that underlie and compose dimensions of managerial competence and contribute to managers’ effectiveness in preventing and solving problems within and between individuals and groups; development of human resource skills management needs based partially on experiential exercises.

MGMT 4008. Entrepreneurial Management. (4 cr.; A-F only; Every Fall & Spring) Management of a new venture after founding. Internal/external challenges of managing a startup organization. Working with resource constraints and understanding how business models may change over time. prerequisite: concurrent registration is required (or allowed) in [3010 or IBUS 3010].

MGMT 4040. Negotiation Strategies. (4 cr.; A-F only; Every Fall & Summer) Securing agreements between two or more parties who are interdependent and seeking to maximize their own outcomes. Behavior of individuals, groups, and organizations in competitive situations.

MGMT 4050. Managing Innovation and Change in Action. (2 cr.; A-F or Audit; Every Fall & Spring) This course focuses on how entrepreneurs create new businesses and how organizations innovate and change. Special emphasis is given to understanding the sequences of events that typically unfold in individuals, groups, organizations, and industries as innovations develop from concept to implementation. The course relies heavily on the concepts and findings from the Minnesota Innovation Research Program, as well as other studies. The course focuses on how the innovation journey unfolds in the creation of a wide variety of new businesses, technologies, products, programs, and services, and what paths along this journey are likely to lead to success and failure. The course emphasizes building diagnostic skills and developing useful principles that may increase the odds.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
of maneuvering organizational innovation and change journeys. prereq: Mgmt 1001, 3001 or 3010

MGMT 4080W. Applied Technology Entrepreneurship. (WI; 4 cr.; Student Option; Every Spring)
Team projects based on commercializable technologies or innovations. Teams present their ideas to investors and industry professionals. Students are encouraged to submit their business plans to Minnesota Cup.

MGMT 4100. Topics in Management. (4-2 cr. [max 8 cr.]; A-F only; Periodic Fall & Spring)
Topics vary for each offering.

MGMT 4101. Independent Study in Strategic Management and Organization. (1-4 cr. [max 8 cr.]; Student Option; Periodic Fall & Spring)
Students contract with faculty on independent studies. prereq: instr consent or dept consent

MGMT 4170W. New Business Feasibility and Planning. (WI; 4 cr.; A-F only; Every Fall & Spring)
New-business-opportunity identification/development. Students conduct feasibility analysis, create formal business plan, gather feasibility data, and contact potential customers, suppliers, and other primary sources. prereq: 3010

MGMT 4171W. Entrepreneurship in Action I. (WI; 4 cr.; A-F only; Every Fall)
Two-semester course. In fall, students identify a business opportunity, develop concept, determine resources required, and launch the business. In spring, students implement business plan, manage business, and determine exit strategy. prereq: 3010, 4008 or concurrent registration is required (or allowed) in 4008, completed coursework in business core, CSOM upper division, approved application

MGMT 4172. Entrepreneurship in Action II. (4 cr.; A-F only; Every Spring)
Second of two-semester sequence. In fall, students identify business opportunity, develop concept, determine resources required, and launch business. In spring, students implement business plan, manage business, and determine exit strategy. prereq: 4171

MGMT 4500. Senior Seminar in International Business. (2 cr.; A-F only; Every Fall & Spring)
International business capstone. Topics related to doing business globally. Opportunity to integrate study abroad/courseswork experiences. prereq: CSOM sr., completed semester abroad, IB major or minor

MGMT 5102. StartUp: Customer Development and Testing. (2 cr.; A-F only; Every Fall & Spring)
Provides a structured process with faculty and mentor oversight for students at any level and from any college at the University to learn the initial process of customer development by testing market acceptance of a specific new business concept. Students primarily take this course individually and must have an idea or technology that they are interested in pursuing. The goal of the course is to teach the process to quickly and efficiently test the value and market fit for a new concept.

MGMT 5480. Topics in Natural Resources. (3 cr.; A-F only; Periodic Spring)
Specific topic for each offering.

MGMT 6004. Negotiation Strategies. (2 cr.; A-F only; Every Fall, Spring & Summer)
Art/science of securing agreements between two or more parties who are interdependent and seek to maximize their own outcomes. Individual, group, organizational behavior. Theory/process of negotiations applied to problems faced by managers/professionals. prereq: MBA student

MGMT 6031. Industry Analysis and Competitive Strategy. (4 cr.; A-F only; Every Fall, Spring & Summer)
Processes by which firms maximize long-term returns in face of competition, uncertainty, changing market/technological conditions. Resource commitments to gain sustainable advantage. Choices to leverage resources. prereq: MBA 6300, MBA student

MGMT 6032. Strategic Alliances. (2 cr.; A-F only; Periodic Fall & Spring)

MGMT 6033. Managing the Strategy Process. (2 cr.; A-F only; Periodic Fall & Spring)
How successful strategy is shaped/implemented throughout organization. Leadership challenge of continually renewing strategy/leading change to meet competitive challenges. prereq: MBA student

MGMT 6034. Strategic Leadership. (2 cr.; A-F or Audit; Periodic Spring)
Role of leadership in making strategy a reality while maintaining learning/adaptive organization capable of meeting competitive challenges. Students prepare project set in an organization. Advanced materials, complex cases. prereq: 6033, MBA student

MGMT 6035. Complex and Cross-Cultural Negotiations. (2 cr.; A-F or Audit; Periodic Fall & Spring)
Principles, role play of multi-party-issue, team-based negotiations/conflicts. How to structure ambiguous situations, bridge national/organizational cultures (e.g., alliances, mergers), functions (R&D, finance), and institutional contexts (regulators, interest groups). prereq: [6004, MBA student] or instr consent

MGMT 6040. International Strategy and Organization. (2 cr.; A-F only; Every Fall & Spring)
dealing with enormous complexity in competitive environment, in strategy, and in organizations. Focuses on strategic/organizational issues in managing across borders. prereq: MBA student

MGMT 6050. Management of Innovation and Change. (2 cr.; A-F only; Periodic Fall & Spring)
How organizations innovate/change. Focuses on innovation in wide variety of new technologies, products, programs, and services. What paths likely to lead to success/failure. prereq: MBA student

MGMT 6051. Managing Organizational Innovation and Change. (2 cr.; A-F or Audit; Periodic Fall)
How innovation typically unfolds in wide variety of new technologies, products, programs, and services. What paths are likely to lead to success/failure. Diagnostic skills/principles. prereq: Credit will not be granted if credit has been received for: 5051, 6050

MGMT 6070. Technology Strategy. (2 cr.; A-F only; Periodic Spring)
Evaluating short/long term competitive effects of e-business models using frameworks drawn from strategy, information economics. Strategies to establish, grow, manage e-business. Evaluating strategies of different firms. Lectures, cases, hands-on learning from Web. Grade based on written analyses of two cases, class participation, group project evaluating an existing or new e-business idea.

MGMT 6082. New Business Development. (4 cr.; A-F only;)
Understanding how to develop a new business; analyzing the opportunities and managing the constraints; structuring the venture, obtaining the resources, and writing a business plan. Course covers main factors needed to start a successful business—the key operations, marketing, financial, legal, and competitive issues; topics covered are relevant to buyouts, franchises, and the family firm.

MGMT 6083. Consulting. (4 cr.; A-F only; Periodic Fall)
Management consulting. Engaging the client. Problem definition, proposal formulation. Establishing project schedules, work plans. Coordinating work. Writing reports, doing presentations. Evaluating the product. Professional learning, career development, balancing work/family. Field projects. prereq: MBA student

MGMT 6084. Management of Groups. (2 cr.; A-F only; Every Fall, Spring & Summer)
Factors that influence performance and well-being of groups in organizations. Group dynamics, norms, culture, structure, leadership, decision-making, and problem-solving. Managing dynamics, learning, performance, and creativity of groups. Intergroup relations, incentives, and effect of environment.

MGMT 6085. Corporate Strategy. (4 cr.; A-F only; Periodic Fall)
MGMT 6086. Technology and Strategy. (4 cr. ; A-F only; Periodic Fall) Limitations/strengths of various strategy models in different technology contexts. Innovation vs. imitation. Vertical/horizontal integration in high tech industries. Aligning technology strategy with business strategy. Renewing, sharing, leveraging corporate technology competencies across business units. Roles of CEO/CTO in technology intensive businesses. prereq: MBA student

MGMT 6100. Topics in Management. (; 2-4 cr. ; max 8 cr. ; A-F only; Periodic Fall & Summer) Topics vary. prereq: CSOM grad student or instr consent

MGMT 6101. Independent Study in Strategic Management and Organization. (1-8 cr. ; max 16 cr. ; A-F or Audit; Every Fall, Spring & Summer) Students contract with faculty on independent studies. prereq: instr consent or dept consent

MGMT 6110. Managing People and Organizations. (; 2 cr. ; A-F only; Every Fall & Summer) Behavioral science theory of employee behavior in organizations. Theory applied to practical situations. Motivation, cultural differences in management, ethical dilemmas, decision-making, leadership, timing, prereq: MBA student

MGMT 6305. The International Environment of Business. (; 4 cr. ; A-F only; Every Fall, Spring & Summer) Introduction to international trade/finance theory and political economy. Institutional governance of international trade/monetary policy, differences in political-economic/sociocultural systems, implications for managerial decision-making. prereq: MBA student

MGMT 6310. Cross-Cultural Management: Developing Intercultural Competence. (2 cr. ; A-F only; Every Spring) The emphasis of this course is on people-related (i.e., psychological and behavioral) issues that arise when managing across cultures. Through the use of cases and interactive experiential activities, this course will develop your intellectual ability to critically examine, analyze, and deal with cross-cultural problems in business contexts, while also cultivating a tolerance for ambiguity that is necessary in the global workplace. The combination of materials and experiences will allow you to evaluate your cross-cultural savvy, understand and appreciate the nuances of cultural identities and the impact these have on work relationships, and create a plan to increase your intercultural competence.

MGMT 6402. Integrative Leadership: From Theory to Practice. (3 cr. ; A-F only; Every Spring) Seminar. Strategic challenges linking business, government, and society locally/globally. Co-led by faculty from Carlson and Humphrey Schools. International network of leaders/organizations participate. Case studies as part of capstone projects. prereq: MBA student

MGMT 6410. Corporate Responsibility. (2 cr. ; A-F only; Every Fall) Managing with appreciation for corporate responsibility. Corporate responsibility/how executives think about it. Factors that make assessing corporate responsibility complex. Need for business leaders to understand/make choices with respect to corporate responsibility issues. prereq: MBA 6300, CSOM grad student

MGMT 8101. Theory Building and Research Design. (; 4 cr. ; Student Option; Periodic Spring) Problem formulation, conceptual modeling, theory building, and research design in the social and behavioral sciences. prereq: Business admin PhD student or instr consent

MGMT 8202. Seminar in International Management. (4 cr. ; Student Option; Periodic Fall & Spring) Overview of the field of international management research. prereq: Business admin PhD student or instr consent

MGMT 8301. Seminar in Organizational Behavior. (; 4 cr. ; Student Option; Periodic Fall & Spring) Major theories and current research on individual behavior and group processes in organizations from a micro perspective. prereq: Business admin PhD student or instr consent

MGMT 8302. Seminar in Organizations Theory. (; 4 cr. ; Student Option; Periodic Fall & Spring) Major theories and current research on organizational and interorganizational topics from a macro perspective. prereq: Business admin PhD student or instr consent

MGMT 8304. Topics in Organizations I. (; 2 cr. ; A-F or Audit; Periodic Fall & Spring) Topics vary. prereq: PhD student or instr consent

MGMT 8305. Topics in Organizations II. (; 2 cr. ; A-F or Audit; Periodic Fall & Spring) Topics vary. prereq: PhD student or instr consent

MGMT 8401. Seminar in Strategy Content. (; 2-4 cr. ; Student Option; Periodic Fall & Spring) Review of research in strategy formulation. prereq: Business admin PhD student or instr consent

MGMT 8402. Seminar in Behavioral Strategy. (; 2-4 cr. ; Student Option; Periodic Fall & Spring) Designed to help doctoral students interpret and conduct research on strategic management. Will focus on research that reflects a behavioral approach to strategy. prereq: Business admin PhD student or instr consent

MGMT 8403. Strategy Seminar. (; 4 cr. ; Student Option; Every Fall & Spring) Strategic management. Topics vary. prereq: Business admin PhD student or instr consent

MGMT 8404. Topics in Strategy 1. (; 2-4 cr. ; Student Option; Periodic Fall & Spring) Topics will vary with each offering. prereq: Business admin PhD student or instr consent

MGMT 8405. Topics in Strategy II. (; 2-4 cr. ; max 8 cr. ; A-F or Audit; Spring Even Year) Topics vary. prereq: PhD student or instr consent

MGMT 8501. Seminar in Entrepreneurship. (4 cr. ; A-F only; Spring Even Year) This seminar provides a broad introduction to the field of entrepreneurship. It helps students develop the skills and knowledge needed to conduct their own research within this domain. It introduces them to the theoretical and empirical foundations of the field of entrepreneurship as a scholarly discipline. It will familiarize students with key debates in the field. It will also sharpen students’ conceptual and analytical skills, and help them develop their research agenda.

MGMT 8892. Readings in Management Theory and Administration. (1-8 cr. ; max 16 cr. ; Student Option; Every Fall & Spring) Intensive research on a management topic; major term paper. prereq: Business admin PhD student or instr consent, adviser consent

MGMT 8894. Graduate Research in Management Theory and Administration. (1-8 cr. ; max 16 cr. ; Student Option; Every Fall, Spring & Summer) Research project on a management problem of interest to student; may be completed in cooperation with a business firm. prereq: Business admin PhD student or instr consent, adviser consent

Management of Technology (MOT)

MOT 4001. Leadership, Professionalism and Business Basics for Engineers. (2 cr. ; A-F only; Every Fall & Spring) Elements of business, environment in which technology/business operate. Classes of 15 to 20 students.

MOT 4010. Management of Science and Technology in the Middle East, Global Seminar. (GP; 3 cr. ; A-F only; Every Spring) Middle East global seminar, including 8 weeks of classroom learning prior to May departure. Technology areas such as solar energy, water desalination, security technology, alternative fuels, and biomedical devices.

MOT 4020. Special Topics in Management of Technology. (; 2 cr. ; S-N only; Every Fall) Special Topics in Management of Technology

MOT 5001. Technological Business Fundamentals. (2 cr. ; A-F only; Every Fall) Basics of operations, strategy, decision-making in technology-driven business. Market opportunity assessment, finance/financial decision-making, organizational roles. Work in teams to analyze aspects of business opportunity. prereq: Degree seeking or non-degree graduate students

MOT 5002. Creating Technological Innovation. (2 cr. ; A-F only; Every Spring) Course provides students with techniques to create new ideas, and lead an organization to bring them successfully to market. It will include examples of the dynamics of technological industries, and technology strategies. Topics
include effective practices to generate ideas, processes to move them to market, and intellectual property. Students will work in teams to develop a strategy to commercialize a new technology. prerequisite: Degree seeking or non-degree graduate students.

MOT 5003. Technological Business Planning Workshop. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring) Provides hands-on experience to the student’s choosing, possibly thesis topic. Aspects of strategic technology plan or business plan, culminating in presentation of plan. Must be taken in parallel with 5001 or 5002. prerequisite: Degree seeking or non-degree graduate students. Student must also enroll for MOT 5001 or MOT 5002.

MOT 5991. MOT Independent Study. (1-3 cr. [max 1 cr.]; S-N or Audit; Periodic Fall) Independent study in MOT-related topic. prerequisite: MOT grad student

MOT 8111. Marketing Management for Technology-based Organizations. (2 cr.; A-F or Audit; Every Fall & Spring) Emphasizes marketing industrial products. Issues in product strategy, including pricing, promotion, product mix, and sales/distribution decisions. prerequisite: Grad MOT major

MOT 8112. Accounting for Decision Making. (1.5 cr. [max 2 cr.]; A-F or Audit; Every Fall) Introduces to methods for estimating/analyzing product costs and for using cost information to make product mix and pricing decisions. Cases from technology-oriented firms illustrate principles of activity-based costing. Uses of cost data in managerial decision making, budgeting/control, and financial statement analysis. prerequisite: Grad MOT major

MOT 8113. Operations Management for Competitive Advantage. (1.5 cr. [max 2 cr.]; A-F or Audit; Every Spring) Overview of operations functions. Impact of operation management on a firm’s competitiveness and network of trading partners. Key relationships between operations and other value chain functions. Integrating operations decisions to achieve objectives. Product-process design, quality management, supply chain management, technology management, work force issues. prerequisite: Grad MOT major

MOT 8114. Strategic Technology Analysis. (1.5 cr. [max 2 cr.]; A-F only; Every Fall) Technology, its creation, history, and dynamics/interaction with economics, industry, and society. Role of technology in business and management. Tools/techniques for analysis of technologies. Emerging technologies, their significance, prerequisite: Grad MOT major

MOT 8121. Managing Organizations in a Technological Environment. (2 cr.; A-F or Audit; Every Fall & Spring) General management principles for organizations, people, and business systems in technology-intensive industries. Application of managerial approaches to project, business, and corporate levels of organizations and to demands entrepreneurial/established technology firms. prerequisite: Grad MOT major

MOT 8122. Financial Management for Technology-based Organizations. (2 cr.; A-F or Audit; Every Spring) CREATING value within the organization. Financial methods important to managers of technology-based organizations. Budgeting capital, projecting financial needs, and managing working capital. prerequisite: Grad MOT major

MOT 8133. Managerial Communication for Technological Leaders: Persuasive Writing and Speaking. (2 cr.; A-F or Audit; Every Fall & Spring) Oral and written communication. Introductory and specialized workshops on topics such as presentation skills, memo and report writing, listening skills, and visual aid design and integration. prerequisite: Grad MOT major

MOT 8212. Developing New Technology Products. (2 cr.; A-F or Audit; Every Fall & Spring) Review of methods and organizational strategies for development of new technology products. Product development strategy. Necessary organizational interactions between research/development, operations, marketing, and intellectual property strategy in design/delivery. prerequisite: Grad MOT major

MOT 8213. Macroevironment of Technology. (1.5 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring) Development of scenarios of anticipated social, political, governmental, and economic forces affecting technological change. Use of scenarios to respond to industry threats, opportunities, and uncertainties. Corporate strategies, including building alliances for global competitiveness. prerequisite: Grad MOT major

MOT 8214. Technology Foresight and Forecasting. (2 cr.; A-F only; Every Fall) Methods/techniques for technology forecasting, assessment, and strategic foresight for decision making in business/government. Technology dynamics, R&D strategy, portfolio management, resource allocation. prerequisite: Grad MOT major

MOT 8221. Project and Knowledge Management. (1.5 cr. [max 2 cr.]; A-F or Audit; Every Spring) Survey/application of project and knowledge management in management of technology. Business/engineering project/knowledge management. Planning, scheduling, controlling, budgeting, staffing, task/cost control. Communicating with, motivating, leading, and managing conflict among team members. Cross-functional development of concepts/ processes. prerequisite: Grad MOT major

MOT 8224. Pivotal Technologies. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall) Technologies expected to play pivotal roles in future industrial development. State-of-the-art for each technology. Barriers/opportunities for commercialization. Guest expert lectures. prerequisite: Grad MOT major

MOT 8231. Managing Information Resources in Technology-based Organizations. (1 cr.; A-F or Audit; Every Fall & Spring) Managing information resources/technology in an organization where technology is a critical part of value chain. Database management systems, electronic commerce. Managerial issues: strategic planning for IT/IS, infrastructure, outsourcing, competitive value, implementation. prerequisite: Grad MOT major

MOT 8232. Managing Technological Innovation. (2 cr.; A-F or Audit; Every Spring) How technological innovation is important to business success, can be managed, and may drive business strategy. Organizational dynamics of innovation, how it may be enhanced. Bringing innovations to marketplace in existing businesses and new ventures.

MOT 8233. Strategic Management of Technology. (2 cr.; A-F or Audit; Every Fall & Spring) Identifying key issues, formulating strategies for situations involving business/technology. Industry dynamics, competitive challenges for improving corporate performance and leveraging technological competence. prerequisite: Grad MOT major

MOT 8234. Capstone Project. (0.5-2.5 cr.; A-F or Audit; Every Fall, Spring & Summer) Applied research activity, specifically related to management of technology, in cooperation with participant’s home organization. Working with a faculty adviser and work mentor, students address an industry-based management of technology project, venture, process, or challenge. Formal presentation to capstone committee is required. prerequisite: Completion of two semesters, grad MOT major

MOT 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall & Summer) (No description) prerequisite: Master’s student, adviser and DGS consent

MOT 8500. Innovation Leadership and Organizational Effectiveness. (0.5-2 cr.; A-F only; Every Fall & Spring) Made up of four credit units that unfold over four semesters of MOT program. Building talent, organizational capability, culture needed to execute innovation strategy. prerequisite: MOT major

MOT 8501. Leading Individual & Team Performance. (1.5 cr.; A-F only; Every Fall) Develop the context and capability innovation for improving corporate performance and leveraging technological competence. prerequisite: Grad MOT major

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
MOT 8502. Innovation Leadership and Organizational Effectiveness. (1 cr.; A-F only; Every Spring)
The MOT 8501 and 8502 sequence provides emerging and mid-career technology professionals with the leadership mindset, tool set, and skill set needed to focus, align, and engage multi-disciplinary individuals and teams in translating technology assets and foresight into customer solutions that generate profitable growth. MOT 8502 explores the role of outstanding leaders as developers of innovation strategy and architects of the organizational capability and team commitment needed to execute strategic choices. Emphasis is placed on principles and practices that help leaders focus on the right strategies, build the organizational capability required to execute a strategy, foster continuous improvement in individual and business performance, and lead change initiatives to sustain commitment versus compliance across diverse stakeholders. Students will practice improving their team effectiveness and develop a change leadership plan to support implementation of a key business initiative.

MOT 8900. Conflict Management. (.05 cr.; Student Option; Every Fall)
Theory and methods for applying conflict management techniques in organizations. Cooperative and competitive models of conflict, basics of bargaining, conflict strategies, communication styles, listening skills, dispute resolution, third-party mediation, and use of computers for conflict mediation. prereq: Grad MOT major

MOT 8910. Corporate Responsibility. (.1 cr.; A-F or Audit; Every Fall & Spring)
Principles of stakeholder management. Ethical framework for responsible management of investors, employees, suppliers, customers, and external community. Moral leadership, trust in organizations, and quality control. New metaphors and techniques for managing the socially responsible organization. prereq: Grad MOT major

MOT 8920. Science and Technology Policy. (.15 cr.; A-F or Audit; Every Fall)

MOT 8921. Global Management of Technology. (.05 cr.; A-F only; Every Spring)
Global management of technology. prereq: MOT student

MOT 8930. Topics in Emerging Technologies. (.05 cr.; S-N or Audit; Every Spring)
Invited speakers give half- or full-day seminars on special topics in emerging technologies (e.g., energy systems, tissue engineering, thermal spray coating technology). prereq: MOT grad student

MOT 8940. Managing Intellectual Property. (0.5-1 cr.; A-F only; Every Spring)
Characteristics of Intellectual Property (IP), its role in technology enterprises. Law of patents, trade secrets, trademarks, copyrights, know-how and other IP. Effect of IP rights acquisition and asset valuation on company competitiveness. IP protection/licensing strategy. prereq: MOT grad student

MOT 8950. International Management of Technology Project. (.2 cr.; A-F or Audit; Every Spring)
On-site residency in international locations for up to two weeks. Visits to local, technology-intensive companies. Lectures/discussions with company executives, government officials, and university faculty. Comparative analysis of management of technology concepts/issues in an international business context: social, economic, cultural, and governmental perspectives. Written assignment required. prereq: MOT grad student

MOT 8960. Seminars in Management of Technology (MOT) and Innovation. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Seminars on emerging topics in technology management and innovation. prereq: MOT grad major

Managerial Communications (MCOM)

MCOM 5400. Managerial Communications for the HR Professional. (.2 cr.; A-F only; Every Fall & Spring)
Memo writing, oral presentations, and team communication required of HR professional. Emphasizes hands-on, experiential learning, including videotaping. prereq: HRIR student

MCOM 5500. Enhancing Your Executive Image in Business Communications. (2 cr. [max 4 cr.]; A-F only; Every Fall)
Techniques to project executive presence in all business communications. prereq: MBA student

MCOM 5510. Persuasive Writing in Business. (.2 cr.; A-F only; Periodic Fall)
Writing to motivate/affect change. Form/content. Techniques of persuasion. Producing polished text. Writing with power. prereq: MBA student

MCOM 5530. Strategies and Skills for Managerial Presentations. (.2 cr.; A-F only; Periodic Fall)
Delivering key messages with clarity/confidence, regardless of audience or setting. Maximizing impact as a speaker, seated/standing. Personal communication style and audience. Tailoring message. Handling questions/answers. Using audio/visual tools. Presenting as a team. prereq: MBA student

Manufacturing Operations Mgmt (MM)

MM 3001W. Manufacturing in the Global Economy. (WI; 3 cr.; A-F or Audit; Every Fall & Spring)
Manufacturing operations in today’s rapidly changing global economy should function at the intersection of three important dimensions to achieve sustainable profitability: leadership, product quality, and innovation. Additional topics include systems, process improvement, supply chain management, regulatory affairs, and technology to manage change. Because clear, professional communication is essential to operate in the “high-performance zone,” the course also focuses on the role of writing and the writing process.

MM 3205. Engineering for Manufacturing Operations. (.3 cr.; A-F or Audit; Every Fall & Spring)
Foundational mechanical, electrical, industrial, and manufacturing engineering concepts/techniques essential to manufacturing operations management. Collaborating with other functional departments in enterprise to develop and maintain effective/efficient manufacturing operations. Production strategies for quality, safety, and time/cost efficiency. Allocation of resources, productivity, cost analysis. prereq: 30 cr

MM 3305. 3D Printing and Additive Manufacturing. (3 cr.; A-F or Audit; Every Fall & Spring)
Overview of different types of 3D printing technology/operational requirements for setting up/running innovative manufacturing program using additive manufacturing (3D printing) rather than traditional subtractive manufacturing. Basics of process.

MM 4011. Design of Manufacturing Systems and Simulations. (.3 cr.; A-F or Audit; Every Spring)
Flow lines, assembly systems, cellular manufacturing, flexible manufacturing, automated systems. Facility layout, scheduling, batch sizing, group technology, bottleneck management. Modeling/analysis tools, including computer simulation/operations. prereq: 3001 or manufacturing experience

MM 4012. Manufacturing Processes and Technology. (.3 cr.; A-F or Audit; Every Spring)
Overview and modeling of commonly used core manufacturing processes. Process descriptions, process capabilities and performance, process models relating process parameters to part/process characteristics, process and quality control methods consistent with ISO9001 requirements. prereq: 3001 or manufacturing experience

MM 4035. Global Supply Chain Management. (.3 cr.; A-F or Audit; Every Fall)
Technology and processes to manage operations and quality accurately and in real time in the global business environment. Supplier selection, costs of procurement, risk, time management, outsourcing. Current issues and trends. prereq: MM 4102 (strongly recommended) or professional experience

MM 4039. Manufacturing Outsourcing Decisions. (.3 cr.; A-F or Audit; Every Spring)
Establishing a sourcing strategy and make-buy decisions. Supplier selection. Management of an outsourcing manufacturer relationship,
including contracts and performance metrics. Management of risk and key supply chain factors for quality and value. Prerequisites: MM 3001W or equivalent manufacturing experience.

**MM 4045. Regulated Industry Compliance.** (3 cr. ; A-F or Audit; Every Spring)
High tech industry compliance with government regulations, using the medical tech sector: agencies; regulations and standards; compliance strategy; challenges, processes, and controls; costs/risk/ethics; and tracking, analysis, and reporting. Product development and compliance systems for design, regulatory, quality, facilities and equipment, materials, packaging and labeling. Focuses on FDA and International Medical Device regulations as they relate to developing and commercializing a product, providing a framework to apply the core concepts to all other regulated industries. prereq: 3001 or manufacturing experience

**MM 4012. Manufacturing Operations.** (3 cr. ; A-F or Audit; Every Fall)
Concepts/principles related to management of operations functions. Operations strategy, process, design, just-in-time inventory management, forecasting, scheduling, quality improvement. Relationships between operations and environment. prereq: 3001, 45 cr

**MM 4201. Quality Engineering and Process Improvement.** (3 cr. ; A-F or Audit; Every Fall)
Principles and historical foundations of total quality. Best practices of high-performing quality organizations. Role of leadership and strategic planning. How to implement continuous improvement in manufacturing processes. Baldrige criteria, ISO 9000 standards, Lean Six Sigma. prereq: Statistics, 45 cr

**MM 4311. Sustainable Lean Manufacturing.** (3 cr. ; A-F or Audit; Every Spring)

**MM 4501. Capstone.** (3 cr. ; A-F or Audit; Every Spring)
Capstone project in consultation with faculty adviser/instructor. Independent investigation of manufacturing subject/challenge. prereq: MM major or minor or certificate or instr consent

**MM 4596. Internship.** (1-4 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Internship project in consultation with faculty adviser. Internship is hands-on learning experience in professional manufacturing setting. prereq: [MM major or minor or certificate or instr consent], dept consent

### Manufacturing Technology (MT)

**MT 3111. Elements of Microelectronic Manufacturing.** (3 cr. ; A-F only; Every Spring)
Common micro fabrication processes, how they are applied to CMOS manufacturing. prereq: Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr

**MT 3112. Elements of Micro and Nano Manufacturing Laboratory.** (1 cr. ; A-F only; Every Spring)
Basic process steps to make top-down micro-/nano-scaled structures. Oxidation, photolithography, electron beam lithography, chemical vapor deposition, etching, rapid thermal annealing, wet chemical/plasma etching. Students build test chip containing various micro-mechanical structures. prereq: concurrent registration is required (or allowed) in 3111

**MM 3121. Thin Films Deposition.** (3 cr. ; A-F only; Every Spring & Summer)
Thin film materials such as metals/oxides. Photolithography, methods of deposition. HV/UHV range. Vacuum evaporation, sputtering, chemical vapor deposition. prereq: Physics, chemistry, [college algebra or precalculus], 45 cr

**MT 3131. Introduction to Materials Characterization.** (4 cr. ; A-F only; Every Spring)
Four methods: electron beam microscopy, optical microscopy/FTIR, proximal probe techniques, x-ray/ion beam scattering. Principles for, and information from, each method. prereq: Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr

**MT 3141. Principles and Applications of Bionanotechnology.** (4 cr. ; A-F only; Every Spring)
Introduction to protein, lipid, and nucleic biochemistry. Biomolecule design, production using recombinant DNA technology. Use in nanodevices and nano-materials. Applications of biological molecules in bionanotechnology. Effects of Brownian motion. Molecular surfaces forces. Biomolecule structure alterations due to molecular interaction. Self-assembly. prereq: Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr

**MT 3142. Nanoparticle Technology and Engineering Laboratory.** (1 cr. ; A-F only; Every Spring)
Overview of challenges and tools for measuring properties of nanoaerosols. Optical particle counters, condensation particle counters, differential mobility analysis, electrospays, atomizers, single-particle mass spectrometers. prereq: Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr

### Marketing (MKTG)

**MKTG 3001. Principles of Marketing.** (3 cr. ; A-F or Audit; Every Spring)
Introduction to terms, concepts, and skills for analyzing marketing problems. Factors outside the organization affecting its product, pricing, promotion, and distribution decisions. Cases from actual organizations. prereq: ECON 1101

**MKTG 3001H. Honors:Principles of Marketing.** (3 cr. ; A-F or Audit; Every Spring)
Honors: Introduction to terms, concepts, and skills for analyzing marketing problems. Factors outside the organization affecting its product, pricing, promotion, and distribution decisions. Cases from actual organizations. prereq: ECON 1101, Honors Student

**MKTG 3005. Introduction to Applying Analytical Tools for Solving Business Problems.** (2 cr. ; A-F only; Every Fall)
The ability to make intelligent business decisions based on large data and information is becoming increasingly important for businesses and managers. This course provides a practitioner-oriented introduction of applying analytical tools in business setting. This class entails hands-on computer exercises on real data sets to apply various analytical techniques in common business applications. This course assumes that students have knowledge of fundamental analytical tools and statistical methods. The class emphasizes understanding model assumptions to help students with appropriate model selection; interpreting results in order to make optimal business decisions; designing experiments in a business setting and analyzing the experimental data to advance business objectives. prereq: SCO 2550 or equivalent statistics course

**MKTG 3010. Marketing Research.** (4 cr. ; A-F or Audit; Every Fall & Spring)
Methods for collecting/analyzing data to solve marketing problems. Research design, secondary/primary data collection, sample design, data analysis. prereq: 3001, [SCO 2550 or equiv statistics course]

**MKTG 3040. Buyer Behavior.** (4 cr. ; A-F or Audit; Every Fall & Spring)
Application of behavioral sciences to buyer behavior. Perception, attitudes, learning, persuasion, motivation, decision-making, social/cultural influences, managerial implications. prereq: 3001

**MKTG 4030. Sales Management.** (4 cr. ; A-F or Audit; Every Fall & Spring)
Hiring, motivating, performance enhancement. Customer relationship management, data analysis, quantitative methods. Developing metrics to evaluate individual/group performance in attaining an organization's strategic goals. prereq: MKTG 3040

**MKTG 4050. Advertising and Promotion.** (4 cr. ; A-F or Audit; Every Fall & Spring)

**MKTG 4060. Marketing Channels.** (4 cr. ; A-F or Audit; Every Fall & Spring)
Design/management of channels of distribution in consumer/industrial settings.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Interrelationships between marketing institutions in channels of distribution. Logistics, supply chain strategies. prereq: 3001, 3010, 3040

MKTG 4072. Marketing-in-Action: Marketing Practicum. (4 cr.; A-F or Audit; Every Fall) This course focuses on what marketers do in real-life. Each week begins with guidance on approaching a typical task, then developing recommendations by working in groups during class with ongoing feedback from the instructor, and concluding with a short presentation. Weekly topics may include identifying marketing challenges (ala Shark Tank), segmenting customers, pricing a product, and developing an advertising plan. The course concludes with a multi-week, interactive simulation in which students compete in groups as they manage a product. prereq: MKTG 3001 and SCO 2550 or equivalent statistics course; OR CSOM Major OR NonMajor OR Acct Cert, Housing Studies, Retail Merch, Bio Prod (Mktg subplan), OR Journalism

MKTG 4074A. Data-Driven Marketing. (4 cr.; A-F only; Every Spring) This course emphasizes various analytical techniques and statistical models with hands-on applications of marketing data and software tool kits. The course will cover classic marketing topics such as segmentation, positioning, new product development, advertising, and pricing. It will focus on how to choose and apply the most effective statistical tool to analyze questions on marketing topics and then translate the information from analysis into data-driven decisions. The goal is to increase students’ comfort level of analyzing large marketing databases and help understand how a scientific approach can enhance marketing decision making by converting data into insights. prereq: MKtg 3001 and Mkgt 3010.

MKTG 4080W. Marketing Strategy. (WI; 4 cr.; A-F or Audit; Every Fall & Spring) Determining product markets where organizations should compete based on ability to create/maintain competitive advantage. External environment of business. Constructing/evaluating global marketing strategies. Largely case-based. prereq: 3001, 3010, 3040, 12 cr in marketing, sr

MKTG 4082W. Brand Management. (WI; 4 cr.; A-F only; Every Fall & Spring) Brand asset management. Measuring brand knowledge. Building and leveraging brands. Managing brands globally. prereq: MKTG 3010 and MKTG 3040

MKTG 4085. Harnessing Consumer Irrationality. (2 cr.; A-F only; Every Spring) People do surprising and funny things. Business leaders, policy makers, and scientists long have been interested in why people do what they do, and for a long time that interest has fallen under the rubric of a “rational man” model. It is now clear that the rational model is imperfect, at best. This course takes a look at the least rational side of life, studying the shortcuts, the low road, and the error-prone processes that enable people to feel, decide, and act efficiently—despite costs to rationality. For most of the past 200 years, most of what organizations, politicians, and well-meaning people did in order to make consumers change their behavior consisted of what might be called “shoves”—heavy-handed, choice-restricting, highly-incentivized, information-dense treatments that basically told consumers what to do (or else!). Those, by and large, do not work. Not only do they not work, they are costly and can even make the unwanted behavior emerge even more than before the shove by creating boomerang or counterproductive effects. Prerequisite: MKTG 3001

MKTG 4090. Marketing Topics. (2-4 cr.; [max 8 cr.]; A-F or Audit; Every Spring) Selected topics and problems of current interest considered in depth. Class discussion and course projects.

MKTG 4092. Marketing Research Methods. (2 cr.; A-F only; Every Spring) Analyzes flow of physical product through channels of distribution. Linkages between process of controlling physical flows, major functions of firm (e.g., finance, marketing, operations). Managing logistical interactions between firms to develop integrative supply chain management strategy. Simulation exercise. prereq: MBA 6210, MBA student

MKTG 6020. Advanced Logistics and Supply Chain Management. (2 cr.; A-F only; Every Fall & Spring) Emphasizes profitability. Customer persuasion, with marketing through the Internet. Measuring brand equity. Constructing/evaluating global/ culturally adjusted marketing strategies. prereq: MBA 6210, MBA student

MKTG 6025. Buyer Behavior. (4 cr.; A-F only; Every Fall & Spring) Application of behavioral sciences to understanding buyer behavior. Perceptions, memory, affect, learning, persuasion, motivation, behavioral decision theory, social/cultural influences, managerial implications. Emphasizes class discussion. prereq: MBA 6210, MBA student

MKTG 6040. Marketing Channels. (2 cr.; [max 4 cr.]; A-F only; Every Fall) This class focuses on designing go-to-market routes that align with customer purchase journeys, including the selection of channel partners, and fashioning the right channel incentives. We will pay particular attention to contemporary challenges arising from channel fragmentation and addition of online routes-to-market. prereq: MBA 6210, MBA student

MKTG 6045. Strategic Supply Chain Management. (2 cr.; A-F only; Every Spring) Internal/inter-organizational design, strategic sourcing, alliances/partnerships, impact of technology on supply chain effectiveness. Managing flows, creating/sharing customer value, measuring competitive impact from supply chain excellence. prereq: [6060 or OMS 6056, or IDSc 6442 or IDSc 6423], 2nd yr MBA student


MKTG 6073. Marketing in High Tech Settings. (2 cr.; A-F only; Every Fall) This class will focus on contemporary markets where the products and services are built on a significant base of intellectual property. Using cases and readings, we will examine major issues such as a) diffusion of multiple generations (e.g., iPhone 7 & 10, etc.), b) backwards and forward compatibility choices (e.g., Windows XP, 7 and 10), c) revenue model decisions (e.g., license a drug patent versus launching the realized drug) and d) user-centered design (e.g., Nest versus Honeywell thermostats). prereq: [(MBA 6210 or equiv), MBA student] or dept consent

MKTG 6075. Pricing Strategy. (4 cr.; A-F only; Every Fall & Spring) Framework for assessing pricing decisions. Pricing in business-to-business markets, consumer goods markets, services, and not-for-profit companies. prereq: MBA 6210, MBA student

MKTG 6078. Advertising & Promotion. (4 cr.; A-F only; Every Fall & Spring) Managing communication. Advertising, sales promotion, public relations, direct marketing. Setting communications objectives and budgets, media selection, creative strategy, sales promotion techniques. prereq: MBA 6210

MKTG 6080. Internet Marketing. (2 cr.; A-F only; Every Fall) Concepts, processes, decisions associated with marketing through the Internet. Emphasizes profitability. Customer persuasion, building a customer base digitally, pricing, customer retention, channel/distribution issues. prereq: MBA 6210, MBA student


MKTG 6084. Persuasion and Influence. (2 cr.; A-F only; Every Summer) Successful marketers, leaders and communicators must not only make the right decisions—they must also influence others.
Successfully managing other people depends on managing the influence process. Doing this effectively requires understanding the psychology of persuasion. This course is about the science of influence & persuasion. Through deeper understanding of human psychology, you will learn scientifically-tested and practical tools to become more influential in your dealings with consumers, clients, coworkers, & managers. Through a mix of lecture, discussion, reading, reflection, and experiential exercises, you will master the tools to be able to mobilize others by strategically crafting your communications. prereq: MBA 6210, MBA student

MKTG 6085. Harnessing Consumer Irrationality. (2 cr.; A-F only; Periodic Fall, Spring & Summer) People do surprising and funny things. Business leaders, policy makers, and scientists long have been interested in why people do what they do, and for a long time that interest has fallen under the rubric of a "rational man" model. It is now clear that the rational model is imperfect, at best. This course takes a look at the less rational side of life, studying the shortcuts, the low road, and the error-prone processes that enable people to feel, decide, and act efficiently despite costs to rationality. For most of the past 200 years, most of what organizations, politicians, and well-meaning people did in order to make consumers change their behavior consisted of what might be called "shoveling" heavy-handed, choice-restricting, highly-incentivized, information-dense treatments that basically told consumers what to do (or else!). Those, by and large, do not work. Not only do they not work, they are costly and can even make the unwanted behavior emerge even more than before the shove by creating boomerang or counterproductive effects.

MKTG 6086. Digital Marketing. (2 cr.; A-F only; Periodic Fall & Spring) Marketing practices have dramatically shifted with the rise of social media and the proliferation of devices, platforms, and applications. This rapidly changing environment presents new opportunities and challenges for marketers. Through a combination of case studies, best practice examples, current news items, and assignments, students learn how the elements of a digital strategy work together with traditional media to attract prospective customers. Specifically, students learn best practices for social media marketing, content marketing, organic and paid search, search engine optimization, e-mail marketing, landing pages and display advertising. Students discuss strategies for reputation management in a world where information is disseminated virally and discover how social media monitoring and data analysis can be used to improve marketing and product development activities. The importance of establishing digital marketing goals and analytics is covered as well as how to measure return on investment for digital activities.

MKTG 6088. Strategic Marketing. (2 cr.; A-F only; Every Fall, Spring & Summer) Determining product-markets where organization should compete. Sustainable competitive advantage. Matching marketing strategy with environment. Coordinating marketing, other business functions. Organizing marketing function/management. prereq: MBA 6210, MBA student

MKTG 6090. Marketing Topics. (1-4 cr; [max 8 cr.]; A-F only; Every Fall, Spring & Summer) Selected topics/problems of current interest considered in depth. prereq: MBA 6210, MBA students

MKTG 6101. Independent Study. (1-4 cr; [max 8 cr.]; A-F only; Periodic Fall & Spring) Independent directed reading/research. prereq: MBA 6210, MBA student

MKTG 6801. Independent Study. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer)

MKTG 8809. Consumer Behavior Research Methods. (2 cr.; A-F or Audit; Periodic Fall & Spring) Seminar. Topics related to conceptual theories/arguments about experimental design and statistical analysis of experiments. How to design experimental research for testing hypotheses and drawing conclusions. prereq: Doctoral student or [masters program student, instr consent]

MKTG 8810. Consumer Behavior Special Topics. (2 cr.; [max 8 cr.]; A-F or Audit; Periodic Fall & Spring) Theories of consumer categorization. Literature on brand categories, category measurement, brand extensions/dilution/affection. Readings from branding literature. Theoretical analysis. prereq: Doctoral student or [masters program student, instr consent]

MKTG 8811. Consumer Attitudes and Persuasion I. (2 cr.; Student Option; Fall Odd, Spring Even Year) Reading, discussing, and evaluating theories of consumer attitudes and persuasion. Theoretical analysis, rather than practitioner focus. prereq: [MBA 6210 or equiv], business admin PhD student or instr consent

MKTG 8812. Consumer Attitudes and Persuasion II. (2 cr.; A-F or Audit; Fall Odd, Spring Even Year) Science of persuasion. Principles of stickiness--universal principles that lead messages to succeed rather than fail. Principles of influence--universal psychological principles that motivate a person to say "yes." prereq: Doctoral student or instr consent

MKTG 8813. Consumer Judgment and Decision Making I. (2 cr.; A-F or Audit; Periodic Fall & Spring) Different theoretical approaches taken in judgment and decision-making research. Heuristics/biases, affect in decision making, judgments/decisions over time. prereq: Doctoral student or [masters program student, instr consent]

MKTG 8814. Consumer Judgment and Decision Making II. (2 cr.; A-F or Audit; Periodic Fall & Spring) Draws from work on prospect theory and its derivatives. Anomalous choice. Emphasizes on applications to Marketing theory, from inter-temporal choice to regret and counterfactual thinking in consumers/managers. prereq: Doctoral student or [masters program student, instr consent]

MKTG 8831. Seminar: Inter-Organizational Relations. (4 cr.; Student Option; Periodic Fall & Spring) From an efficiency perspective, inter-organizational networks involved task of moving goods and services from point of production to point of consumption. Literature covering the functional, institutional, analytical, and methodological traditions, as well as the behavioral school of thought and transaction cost and relational contracting. prereq: MBA 6210 or equiv, business admin PhD student or instr consent

MKTG 8842. Quantitative Modeling I. (2-4 cr. [max 8 cr.]; A-F or Audit; Periodic Fall & Spring) Advanced readings seminar. Quantitative research in marketing. Topics from theoretical/empirical research in marketing, econometrics, and industrial organization. Classic/contemporary articles. prereq: Doctoral student or [masters program student, instr consent]

MKTG 8843. Quantitative Modeling II. (2 cr.; A-F or Audit; Periodic Fall & Spring) Advanced readings seminar. Quantitative research in marketing. Topics from theoretical/empirical research streams in marketing, econometrics, and industrial organization. Classic/contemporary articles. prereq: Doctoral student or [masters program student, instr consent]

MKTG 8851. Seminar: Marketing Management and Strategy I. (2 cr.; Student Option; Periodic Fall & Spring) Topics in marketing management and formulation and implementation of marketing strategies. Diversity of thought, within marketing and strategic management literature. prereq: [MBA 6210 or equiv], business admin PhD student or instr consent

MKTG 8852. Marketing Management & Strategy II. (2 cr.; Student Option; Periodic Fall & Spring) PhD seminar. Role of branding within the organization, its business strategy, and its success. Brand management, Critically evaluate fundamental ideas and more recent developments. prereq: Business admin PhD student or instr consent

MKTG 8890. Seminar: Marketing Topics. (1-4 cr. [max 8 cr.]; Student Option; Periodic Fall & Spring) Current topics and problems of interest considered in depth. Topics vary with each offering. prereq: Business admin PhD student or instr consent

MKTG 8892. Readings in Marketing. (1-8 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Readings useful to student's individual program and objectives that are not available in regular courses. prereq: MBA 6210 or equiv, business admin PhD student or instr consent
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Lectures, assignments, modules. Hands-on real-money experience through Golden Gopher Growth Fund. prereq: MBA student or [applied to or accepted in] spring of 1st yr; [6031, ACCT 6100, ACCT 6160, MBA student, emphasis in finance mgmt] recommended

MBA 6502. Carlson Funds Enterprise: Fixed Income. (; 1.4 cr.; max 12 cr.); A-F only; Every Fall & Spring)
Lectures, assignments, modules. Hands-on real-money experience through Golden Gopher Fixed Income Fund, prereq; [Applied to or accepted in] spring-A of 1st yr to begin in spring-B; [6031, ACCT 6100, ACCT 6160, MBA student, emphasis in finance mgmt] recommended

MBA 6503. Carlson Ventures Enterprise. (; 2.4 cr.; max 12 cr.); Student Option No Audit; Every Fall & Spring)
Modeled after early-stage venture capital funds. Due diligence process. Starting/growing high-growth ventures. Exposure to University-based technologies, start-up companies, and experts. Business analysis/development. Assistance to non-university-based start-up companies seeking initial equity capital. prereq: MBA student, approved application, interview

MBA 6504. Carlson Consulting Enterprise. (; 2.4 cr.; max 12 cr.); Student Option No Audit; Every Fall & Spring)
Connects cutting-edge ideas/technologies from classroom to real problems presented by clients. Students work collaboratively with clients to integrate strategy/technology. How to lead complex change initiatives. prereq: MBA student, approved application, interview

MBA 6505. Carlson Brand Enterprise. (; 2.4 cr.; max 12 cr.); Student Option No Audit; Every Fall & Spring)
Students assist companies/organizations with marketing/brand challenges; apply theory, industry best practices. Work collaboratively in real-world environment. Critical thinking, applied marketing skills. prereq: MBA student, approved application, interview

MBA 6990. MBA Topics. (; 2 cr.; max 8 cr.); A-F only; Periodic Fall, Spring & Summer)
Various topics.

Master of Business Taxation (MBT)

MBT 5200. Tax Accounting Methods I. (; 2 cr.; A-F or Audit; Every Spring)
This course covers the federal income tax rules for when income and expense should be recognized. The purpose of this course is to provide students the statutory and regulatory framework for analyzing and explaining the federal income tax consequences of special tax accounting methods and periods issues. prereq: ACCT 5135, MBT student

MBT 5201. Tax Accounting Methods II. (2 cr.; A-F or Audit; Every Spring)
This course covers special topics within the tax accounting methods area, including changes in accounting methods, accounting periods, installment sales and inventory concepts. The purpose of this course is to provide

MBT 5220. Tax Research, Communication, and Practice. (; 4 cr.; A-F or Audit; Every Fall)

MBT 5222. Tax-exempt Organizations. (2 cr.; A-F or Audit; Spring Odd Year)
Tax law/issues concerning Section 501(c)(3) and other tax-exempt organizations. Qualification, procedures. Unrelated business income, private foundations (including intermediate sanctions), joint ventures. prereq: ACCT 5135

MBT 5226. Negotiation Techniques in Taxation. (; 2 cr.; A-F or Audit; Every Summer)
Hands-on approach. Applications from facilitating business sales, mergers, and acquisitions, to representing a client's position before IRS, to controlling TV remote. Negotiation process: planning, pre-negotiation preparation, strategy development.

MBT 5230. Corporate Taxation I. (; 2 cr.; A-F or Audit; Every Fall & Spring)

MBT 5323. Mergers and Acquisitions I. (; 2 cr.; A-F or Audit; Every Spring)
Different types of acquisitions, disposessions, reorganizations, and spins-off involving C corporations. Tax consequences of acquisition to corporations/shareholders involved. Use of 338 elections, limitations on acquired net operating losses/credits, use of covenants not to compete, consulting agreements, deferred payment terms, treatment of transaction costs. prereq: MBT 5230

MBT 5333. Tax Aspects of Consolidated Returns. (; 2 cr.; A-F or Audit; Every Summer)

MBT 5335. Taxation of the Small Business Corporation. (; 2 cr.; A-F or Audit; Every Summer)
Federal income taxation of S corporations. Election eligibility; termination of status; treatment of income and deduction items; distributions, basis of stock and debt. Compensation arrangements in closely held corporations; fiscal year issues; personal service corporations; advantages of C corporations vs. S corporations; corporation liquidation and redemption rules; S corporation's built-in gains tax. prereq: 5230

MBT 5340. Taxation of Partners and Partnerships. (; 2 cr.; A-F or Audit; Every Spring)
Reviews tax consequences associated with formation, operation, and dissolution of a partnership. prereq: Acct 5135

MBT 5346. ASC 740 Computations and Analysis. (; 2 cr.; A-F or Audit; Every Fall & Spring)

MBT 5347. Tax Technology and Analytics Fundamentals. (; 2 cr.; A-F or Audit; Every Spring)
Tax technology is transforming the way tax departments are doing business in many amazing ways. Both public accounting firms and businesses are investing in people, process, data, and technology at a rapid pace. This course provides the student with relevant background on current technologies and associated challenges, managerial approaches, systems design, process, data challenges and risk assessment methods that are specific to the tax technology arena. Additionally, it will focus on the fundamental concepts of project management, business requirements, data analytics, implementation choices, and the necessary business cases that are being conducted in both the public and private sector. prereq: ACCT 5135

MBT 5348. Advanced ASC 740 Concepts. (2 cr.; A-F or Audit; Spring Even Year)
Examination of topics under ASC 740 Accounting for Income Taxes. Share-based awards, uncertain tax positions, valuation allowances, business combinations, foreign operations, interim period tax calculations. Process design/ perspective of stakeholders of income tax accounting. prereq: 5346

MBT 5350. Wealth Transfer I (Estates and Gifts). (; 2 cr.; A-F or Audit; Summer Even Year)

MBT 5353. Trusts and Estates. (; 2 cr.; A-F or Audit; Summer Odd Year)
Terminations. Excess distributions. prereq: ACCT 5135

MBT 5360. State and Local Taxation. (2 cr. ; A-F or Audit; Every Spring) Examines state levying of individual income, corporate income, property, sales, and excise taxes. Tax problems of businesses with multistate operations. prereq: ACCT 5135, MBT student

MBT 5363. Compensation and Benefits. (2 cr. ; A-F or Audit; Every Fall) Federal income taxation of executive compensation, relevant fringe benefit programs. Benefit programs other than qualified retirement plans. Salary continuation, stock options, non-profit organization plans, health/welfare plans. prereq: ACCT 5135

MBT 5370. Taxation of Property Transactions. (2 cr. ; A-F or Audit; Every Fall) Determining realized gain or loss and recognized gain or loss, and tax treatment of that gain or loss on property dispositions. Consequences of property transactions including depreciation, depletion, basis, and capital gains problems. prereq: ACCT 5135

MBT 5380. Tax Aspects of International Business I. (2 cr. ; A-F or Audit; Every Fall) Multinational business operations/transactions involving foreign income. Tax consequences of transactions with/by foreign organizations/companies. prereq: 5230

MBT 5381. Tax Aspects of International Business II. (2 cr. ; A-F or Audit; Spring Even Year) Foreign tax credit, Subpart F planning opportunities, international structuring (joint ventures, use of entity classification regulations), Transfer pricing, foreign currency. Legislative, regulatory, and judicial developments. prereq: MBT 5380

MBT 5382. Transfer Pricing. (2 cr. ; A-F or Audit; Spring Odd Year) Transfer pricing requirements facing multinational companies. Tax requirements of the United States and other countries that have adopted the "arm's-length standard" or the transfer pricing guidelines adopted by the Organization for Economic Cooperation and Development. Regulations, methods, economic models, pricing policies, transaction accounting, and management of audits of managing transfer prices within a multinational company. prereq: ACCT 5135

MBT 5420. Current Topics in Taxation. (1-4 cr. ; A-F or Audit; Every Fall, Spring & Summer) Tax research/compliance, other tasks. Students submit summary paper. prereq: ACCT 5135, MBT student


MBT 8333. FTE: Master's. (1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

Master of Development Practice (MDP)

MDP 5001. Ways of Knowing for Sustainable Development. (2 cr. ; A-F or Audit; Every Fall) Complexities of interdisciplinary study of development and a range of ways of knowing the field of development studies and sustainability. Approaches practiced by physical, biological, social science, and humanities scholars. "Ways of knowing" in different cultures/groups and from a variety of situated perspectives. Key issues and concepts and key methodological challenges facing us as we engage in interdisciplinary and international development study and practice. Sustainable livelihoods. Team taught when possible by faculty from biological, social sciences, and humanities, or at minimum will include guest lecturers who can offer a range of disciplinary perspectives on questions of development. prereq: Grad MDP major or instr consent

MDP 5002. Program Development Workshop. (3 cr. [max 4 cr.] ; A-F only; Every Spring) Research/writing skills to support work in international development. Discussion of basic qualitative research methods/data analysis. Qualitative/quantitative data, collaborative research/analysis. Relationship between research/policy. prereq: MDP grad student or instr consent

MDP 5004. International Field Experience. (3 cr. ; S-N or Audit; Every Summer) International field experience. prereq: MDP grad student or instr consent

MDP 5005. Qualitative Methods for Development Practice. (3 cr. ; A-F only; Every Spring) Course introduces students to qualitative inquiry and analysis in the field of international and/or sustainable development practice. It provides students with first hand experience in research design for development practice applications, including data collection and analysis. The course includes lectures, discussions, presentations, and project based learning. It is considered introductory as a single semester is insufficient to introduce, design, and conduct a comprehensive qualitative inquiry and analysis.

MDP 5100. Post-Field / Pre-Capstone Seminar. (1 cr. ; A-F only; Every Fall) This project-focused seminar meets once at the beginning of the fall semester to collect observations, reflections and insights from the summer field placements. Then, throughout the fall semester, the seminar will meet periodically to stage the spring capstone course. Staging includes a capstone overview session, presentation of projects, team selection process and initial client engagements, the latter being particularly important for teams aspiring to travel during the winter or spring breaks.

MDP 5200. Capstone Workshop in Development Practice. (3 cr. [max 6 cr.] ; A-F or Audit; Every Fall & Spring) Learning from field experiences. Analytical/practical skills developed in academic training. Apply skill/experiences to "real world" problem provided by local or international development-focused organization. Reflective practice. prereq: MDP grad student or instr consent

Master of Healthcare Admin (MHA)

MHA 8763. External Forces Affecting Health Services Delivery. (2 cr. ; A-F or Audit; Periodic Fall) Guidance in development of concepts, models, and principles of financing, social policy making, and organizing and human resource development for health services delivery. Written paper and teaching presentation required. prereq: PhD student

MHA 8782. Research Practicum. (2 cr. ; A-F or Audit; Every Fall & Spring) Field experience in healthcare research. Supervised independent and team research on selected topics and problems. prereq: PhD student

Master of Science in Finance (MSF)

MSF 6021. Communications for Finance. (2 cr. ; A-F only; Every Fall) This course covers guidelines and practical skill development for writing well-organized, professional documents and delivering confident, credible, and dynamic presentations. Students will practice designing and delivering effective messages including reader-friendly documents and PowerPoint using a professional writing style and document design. Through discussion and practice, students will also learn to deliver poised, formal and informal presentations to small and large groups both individually and in teams. prereq: Summer Cohort Completion

MSF 6022. Financial Statement Analysis. (2 cr. ; A-F only; Every Fall) This course teaches how to analyze financial statements, and it covers the following topics: overview of business activities and financial statements; profitability analysis and interpretation; credit risk analysis and interpretation; revenue recognition and operating income; asset recognition and operating assets; and inter-enterprise entities. prereq: Summer Cohort Completion

MSF 6031. Financial Accounting. (3 cr. ; A-F only; Every Summer) This course provides students with a deep understanding of financial accounting fundamentals so that they can make decisions based on reported financials. Students will learn how a firm's operating activities, its investments, and financing transactions are recorded in the income statement, balance sheet, and statement of cash flows. Students
MSF 6211. Fixed Income and Securities. (2 cr.; A-F only; Every Fall)
This class provides an introduction to fixed income markets. Topics include the price/yield relation, no-arbitrage pricing of stripped coupon bonds, the duration/convexity approximation, the term structure of interest rates, defaultable bonds, mortgage securities, inflation protected securities, bonds with embedded options, swap rates, the Fed Funds rate, repurchase agreements, and attribution analysis. prereq: Fall A Cohort Completion

MSF 6221. Fundamentals of Finance I. (2 cr.; A-F only; Every Summer)
This course is the first course in a three-course sequence to introduce the ideas of corporate finance. This course will focus on an overview of corporate finance in the firm, the valuation principle, the time value of money, interest rates, valuing bonds, risk and return, and estimating the cost of capital.

MSF 6222. Fundamentals of Finance II. (2 cr.; A-F only; Every Fall)
This course is the second course in a three-course sequence to introduce the ideas of corporate finance. Section I will introduce capital budgeting. Students will use the cost of capital learned at the end of the first course in conjunction with an introduction to the calculation of cash flows and the use of decision rules for project selection. Section II will move into stock valuation and company valuation based upon the dividend discount model and enterprise model of valuation; students will also be exposed to other valuation methods. Section III will introduce the effect of capital structure on company valuation, starting with perfect markets and introducing the opposing effects of taxation and financial distress on valuation. Students will complete a case to demonstrate understanding of the core concepts from the first three sections; the case is a continuing case with each week building on the prior week's work. Section IV will provide an introduction to financial options and option valuation.

MSF 6223. Fundamentals of Finance III. (2 cr.; A-F only; Every Fall)
This course is the last of a three-course sequence that introduces the ideas of corporate finance. It focuses on the three major decisions of a firm: the financing decision, the capital structure decision, and the payout decision. There is also an introduction to corporate valuation. This course uses a balanced mix of lectures and case studies, and emphasizes the use of real world data. prereq: Summer Cohort Completion

MSF 6224. Corporate Finance Analysis and Decisions. (2 cr.; A-F only; Every Spring)
Theoretical/applied understanding of corporate financial decisions. Adjusted present value, economic value added options. Impact of financing decisions on real asset valuation, managerial incentives, corporate strategy.

MSF 6321. Quantitative Portfolio Analysis. (2 cr.; A-F only; Every Spring)
This course develops and examines models for portfolio decisions by investors and the pricing of securities in capital markets. We will develop portfolio theory along the way and also study the extensive empirical work that characterizes movements in security prices and evaluates alternative asset pricing models. Topics include the mean variance portfolio analysis, the capital asset pricing model, arbitrage pricing theory, the empirical performance of asset pricing model (market anomalies), multi-factor asset pricing models, time varying risk and returns, and portfolio performance evaluation, including style and attribution analysis. Extensive use of the computer will be required. prereq: Fall A Cohort Completion

MSF 6322. Corporate Valuation and Modeling. (2 cr.; A-F only; Every Fall)
This course develops the financial modeling principles and tools needed to build, operate, and understand the standard business performance, M&A, equity, and credit models that have become central to modern financial decision making. The course develops a deep understanding of financial models so they can be used to analyze a wide range of financial issues. Finance concepts introduced in other courses are reinforced by having students build them into models and by having students interpret the results produced by those models. Students build a financial model on their own, learn to use a fully developed financial model and use models repeatedly to evaluate and plan performance, to estimate value added from projects, operating strategies and financing proposals and to estimate the value of securities. This course extensively uses VBA macros, sensitivity tables and scenario analyses. prereq: Fall A Cohort Completion

MSF 6421. Computing for Finance: Excel/ VBA I & II. (2 cr. [max 4 cr.]; A-F only; Every Summer)
This course first introduces students to specific software (e.g., Excel VBA, ModelRisk Monte Carlo simulator) and databases (e.g., Bloomberg, Factset, CRSP, Compustat) that will be used throughout the MS program. It then focuses on the use of Excel for many topics in finance, including modern portfolio theory, optimal portfolio analysis and binomial option pricing. This course often takes the material being learned in the "Fundamentals of Finance" course to motivate specific examples.

MSF 6422. Financial Econometrics and Computational Methods I. (2 cr.; A-F only; Every Fall)
This course provides an introduction to the methods used in empirical finance. A review of statistics is followed by intensive instruction on matrix algebra that culminates in a fundamental understanding of linear regression, the basic empirical tool. Asset pricing theories are discussed and developed and then methods are derived to test them. The course will emphasize estimation and inference using computer-based applications. prereq: Summer Cohort Completion

MSF 6423. Financial Econometrics and Computational Methods II. (2 cr.; A-F only; Every Fall)
This course builds on Financial Econometrics I and provides instruction on the econometrics used in empirical finance. Topics will include time series analysis, parametric models of volatility, evaluation of asset pricing theories, and models for risk management. The course will emphasize estimation and inference using computer-based applications. prereq: Fall A Cohort Completion

MSF 6522. Derivatives and Risk Management. (2 cr.; A-F only; Every Spring)
This class provides an introduction to derivatives markets. This course is designed to achieve two main objectives. First, provide students with a rigorous framework used in valuing derivative contracts. This will include an in-depth treatment on the two work horses of the binomial model and the Black-Sholes-Merton model. Second, apply the framework to understand a wide variety of issues related to risk management and investment decisions. prereq: Fall A Cohort Completion

MSF 6621. Finance within the Macroeconomy. (2 cr.; A-F only; Every Fall)
This course is intended to provide you with an understanding of modern macroeconomics. We are particularly interested in how financial markets and institutions fit into the overall macro system. By the time that the term is over you will have a much stronger sense of the ongoing macroeconomic news and policy discussion. Having a sense of this material is often helpful in job interviews as well. prereq: Fall A Cohort Completion

MSF 6801. Finance Independent Study Masters Program. (1-6 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Independent Study. prereq: instr consent

MSF 6821. Experiential Learning. (4 cr.; A-F only; Every Spring)
This course is the first half of the experiential learning segment of this program. Students will be partitioned into groups to investigate a particular project. The students will identify the most crucial issues associated with the project, collect the necessary data that will be used to analyze the issue at hand, and determine the quantitative tools that will be required to analyze the relevant issues. prereq: completion of Fall Cohort.

MSF 6920. Introduction to Python. (2 cr.; A-F only; Every Summer)
This course is focused on analyzing economic and financial data using Python. You will learn how to access powerful and popular libraries for data access, analysis, and visualization. We will spend most of our class time completing practical, hands-on exercises.

Masters of Business Analytics (MSBA)

MSBA 6120. Introduction to Statistics for Data Scientists. (3 cr.; A-F only; Every Summer)
This course is designed to develop statistical thinking, i.e., understanding variation and using data to identify possible sources of variation.
Specific techniques include basic descriptive and inferential procedures and regression modeling. The emphasis is on understanding such analysis for their relevance to decision making.

**MSBA 6250. Analytics for Competitive Advantage II.** (3 cr.; A-F only; Every Summer)
Case/discussion-based introduction to variety of analytics related to issues/ examples in business. Business value, impact, benefits/ limitations, as well as ethical, legal, privacy issues. Use of case studies, examples, guest speakers.

**MSBA 6255. Analytics for Competitive Advantage I.** (3 cr.; A-F only; Every Fall & Summer)
Quantitative problem solving formulation and solving skills.

**MSBA 6310. Programming for Data Science.** (3 cr.; A-F only; Every Fall)
According to recent industry surveys, Python is one of the most popular tools used by organizations data analysis. We will explore the emerging popularity of Python for tasks such as general purpose computing, data analysis, website scraping, and data visualization. You will first learn the basics of the Python language. Participants will then learn how to apply functionality from powerful and popular data science-focused libraries. In addition, we will learn advanced programming techniques such as lambda functions and closures. We will spend most of our class time completing practical hands-on exercises.

**MSBA 6320. Data Management, Databases, and Data Warehousing.** (3 cr.; A-F only; Every Fall)

**MSBA 6330. Big Data Analytics.** (3 cr.; A-F only; Every Fall)
Big data infrastructure and ecosystem, ingesting and managing big data, analytics with big data; Hadoop, MapReduce, R, sqoop, Pig, Hive, spark, SQL for Big Data, Machine Learning for Big Data, Real-time Streaming for Big Data; cloud computing and other recent developments in big data.

**MSBA 6345. Project Management of Analytics Projects.** (1.5 cr.; A-F only; Every Fall)
Project Management of full-stack analytics projects: identifying deliverables and a methodology; gathering requirements (use cases, user stories); estimating and staffing the project; monitoring project status (earned value and visual methods); team roles in an agile project. prereq: MSBA student

**MSBA 6355. Building and Managing Teams.** (0-1.5 cr.; A-F only; Every Fall)
Examine individual, group and organizational aspects of team effectiveness; learn and practice basic skills central to team management; develop appreciation for team leadership function; learn the tools for effective team decision making and conflict management; develop general diagnostic skills for assessment of team issues within and across organizations and national boundaries.

**MSBA 6410. Exploratory Data Analytics and Visualization.** (3 cr.; A-F only; Every Fall)

**MSBA 6420. Predictive Analytics.** (3 cr.; A-F only; Every Fall)
Fundamentals of predictive modeling and data mining, assessing performance of predictive models, machine learning and statistical classification and prediction, logistic regression, decision trees, naïve Bayesian classifiers, support vector machine, ensemble learning, deep neural networks, and their applications in structured and unstructured data.

**MSBA 6430. Advanced Issues in Business Analytics.** (3 cr.; A-F only; Every Spring)

**MSBA 6440. Data-Driven Experimentation and Measurement.** (3 cr.; A-F only; Every Spring)
Controlled experiments in business settings, experiment design, A/B testing. Specialized statistical methodologies. Fundamentals of econometrics, instrument variable regression, propensity score matching.

**MSBA 6450. Modeling and Heuristics for Decision Making and Support.** (3 cr.; A-F only; Every Spring)
Fundamentals of decision analysis, optimization, linear/integer programming, risk analysis, heuristics, simulation, decision technologies.

**MSBA 6510. Business Analytics Experiential Learning.** (6 cr.; A-F only; Every Spring)
This course involves hands-on application of the analytics methodologies, techniques, and tools learned throughout the program to a real-world problem (such as consulting for a real-world business client in the area of marketing, strategy, operations/supply chain, information technology, finance, accounting, or human resources) as well as the development and presentation of results, interpretations, insights, and recommendations.

**MSBA 6515. Capstone Project in Analytics.** (0-3 cr.; A-F only; Every Spring)
Hands-on, integrative application of analytics methodologies, techniques, and tools learned throughout the program in the context of a specific analytics problem. Experience with the entire data analytics cycle, starting from business and data understanding as well as data cleaning and integration and ending with the development and presentation of results, interpretations, insights, and recommendations.

**MATS 1001. Advances in Chemical Engineering and Materials Science.** (; 1 cr.; S-N or Audit; Every Fall)
Introduction to chemical engineering, materials science/engineering. Practical examples of important advances in both fields. Design problems, career opportunities. Lectures, demonstrations, interactive exercises. prereq: Credit will not be granted if credit has been received for: CHEM 1001; Recommended for [chemical engineering, materials science/engineering] majors

**MATS 2002. Introduction to the Science of Engineering Materials Laboratory.** (; 1 cr.; A-F only; Every Fall, Spring & Summer)
Lab experiments dealing with mechanical properties of engineering materials. Elastic modulus, tensile strength, creep, impact strength, fracture. prereq: [2001 or concurrent registration is required (or allowed) in 2001], IT student

**MATS 3001. Thermodynamics of Materials.** (; 3 cr.; A-F or Audit; Every Fall)

**MATS 3002. Mass Transport and Kinetics.** (; 3 cr.; A-F or Audit; Every Fall)

**MATS 3011. Introduction to Materials Science and Engineering.** (3 cr.; Student Option; Every Fall & Spring)
Builds progressively from electrons to atoms to bonding to crystal structures. Defects, X-ray diffraction, phase diagrams. Microstructure as basis for understanding mechanical/electrical properties. Metals, polymers, ceramics, semiconductors, composites. prereq: CHEM 1061, CHEM 1065, [MATH 1272 or MATH 1372], PHYS 1301W, CSE student

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
MATS 3012. Metals and Alloys. (3 cr.; A-F or Audit; Every Fall) Structure of metals/alloys. Crystal structure/defects (point defects, dislocations, grain boundaries), Microstructure. Properties of metals, especially mechanical properties. prereq: [3011, MatS or ChEn upper div] or dept consent


MATS 3041. Industrial Assignment I. (2 cr.; A-F only; Every Fall, Spring & Summer) Industrial work assignment in engineering co-op program. Formal report on technical project related to industrial work. prereq: MatS upper div, completion of required courses in MatS program through fall sem of 3rd yr, GPA of at least 2.80, regis in co-op program

MATS 3045. Materials Science and Engineering Industrial Internship. (1cr. [max 2 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Industrial internship, three to eight months. Formal report on technical project related to industrial work. prereq: MatS Upper Division. GPA of at least 2.8.

MATS 3141. Numerical Methods for Material Science. (3 cr.; A-F only; Every Spring) Mathematics and numerical/computation methods for Materials Science. Example problems include: diffusion problems; coupled diffusion/kinetics problems; nucleation, growth and crystallization; quantum mechanics/electrostatic problems relevant to electronic/magnetic/optical devices. The use of MatLab will be emphasized. prereq: concurrent registration in MATS 3002 recommended

MATS 3801. Structural Characterization Lab. (.4 cr.; A-F only; Every Fall) Characterization of structure of engineering materials by optical/electron microscopy, atomic force microscopy, x-ray diffraction, spectroscopic method, related methods, Crystallography, defects, microstructure, macromolecular structure. Specimen preparation, data collection/analysis, maintaining laboratory notebook. prereq: [3011, MatS upper div] or dept consent

MATS 3851W. Materials Properties Lab. (WI; 4 cr.; A-F or Audit; Every Spring) Characterization of properties of engineering materials. Mechanical, electrical, optical, magnetic, and thermal properties. Relationship between properties and materials structure. Specimen preparation. Data collection and analysis, including statistical analysis. Laboratory notebook and report writing. prereq: [3801, 3013, MatS upper div] or dept consent

MATS 4041. Industrial Assignment II. (2 cr.; A-F only; Every Fall, Spring & Summer) Industrial assignment in engineering co-op program. Application of materials science principles to engineering design problems in an industrial work environment. Formal written report and presentation. prereq: 3041, GPA of at least 2.80, registration in co-op program

MATS 4212. Ceramics. (3 cr.; A-F or Audit; Every Fall) Crystal structures, non-crystalline (glass) structures, microstructure. Ceramic phase relationships: binary/ternary diagrams. Ceramic properties: thermal, mechanical, electrical, magnetic, optical. Computer applications. prereq: [3011, [3001 or CHEN 3101]], [MatS or ChEn upper div] or instr consent

MATS 4214. Polymers. (.3 cr.; A-F or Audit; Every Spring) Polymer structure-property relations: structure/morphology of crystalline/amorphous state. Crystalization kinetics. Vitrification and glass transition. Mechanical properties, failure, permeability, optical/electrical properties, polymer composites, effect of processing on properties. prereq: [3011, [3001 or CHEN 3101]], [upper div MatS or ChEn] or instr consent

MATS 4221. Materials Performance. (4 cr.; A-F only; Every Fall) Thermal/mechanical processing to control properties/other applications. Analysis of costs/performance, failure in metallurgical structures by use of fracture mechanics methodology. prereq: 3012, AEM 3031, Upper div MatS

MATS 4223W. Polymer Laboratory. (WI; 2 cr.; Student Option; Every Spring) Synthesis, characterization, and physical properties of polymers. Free radical, condensation, emulsion, anionic polymerization. Infrared spectroscopy/gel permeation chromatography. Viscoelasticity, rubber elasticity, crystallization.

MATS 4301W. Materials Processing. (WI; 4 cr.; A-F only; Every Spring) Casting, solidification and plastic forming of metals. Powder processing, forming operations, sintering of ceramics. Processing of thermoplastic/thermoset polymers. Computer applications of data collection/reduction. prereq: 4212, [4214 or concurrent registration is required (or allowed) in 4214] Upper Div MatS

MATS 4400. Senior Design Project. (.3 cr.; A-F only; Every Spring) Work in teams to apply expertise in materials science/engineering toward a specific project. With mentor from industry or faculty member guidance, each team defines a problem/follows design steps that culminate in a product design. prereq: Sr MatS major

MATS 4401. Senior Design Thesis I. (.2 cr.; A-F only; Every Fall) First semester of a 2-semester thesis project. Research and design work directed by faculty member in Department of Chemical Engineering and Materials Science. Written reports are due at midterm and end of semester. At least one research presentation must be given. prereq: Credit will not be granted if credit has been received for: : 4400; MatS senior, dept consent, GPA of at least 3.00, project approval by faculty adviser


MATS 4591. Independent Study in Materials Science. (.1-3 cr.; [max 6 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Library, theoretical, laboratory or design studies of scientific or engineering topics in materials science for an individual student. Course content and credits by arrangement with professor. May be used for upper division Honors Program experience if arranged with professor. prereq: Upper div mat sci

MATS 4593. Directed Study in Materials Science. (.1-4 cr.; [max 6 cr.]; A-F only; Every Fall, Spring & Summer) This course can take two forms: (a) Library, theoretical or design studies of scientific or engineering topics in materials science for an individual or a small group of students. Course content and credits by arrangement with professor. Design credits available if arranged with professor. (b) Special topics course offered only once, e.g., by a visiting professor. prereq: Upper div MatS

MATS 4594. Directed Research in Materials Science. (.1-3 cr.; [max 6 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Research studies of scientific or engineering topics in materials science for an individual or small group of students. Course content and credits by arrangement with professor. Design credits available if arranged with professor. May be used for upper division Honors Program experience if arranged with professor. prereq: Upper div mat sci

MATS 4594H. Directed Research - Honors. (.1-4 cr.; [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Independent lab research under faculty supervision for upper division students wanting honors experience. prereq: Instr and DUGS consent, upper div honor MatS major

MATS 5353. Electron Microprobe Theory and Practice. (.3 cr.; Student Option; Periodic Spring) Characterizing solid materials with electron beam instrumentation, including reduction of X-ray data to chemical compositions. prereq: [One yr chem, one yr physics] or instr consent

MATS 5517. Electron Microscopy. (.3 cr.; A-F or Audit; Periodic Spring) Transmission electron microscope, scattering and diffraction, electron sources, lenses, apertures and resolution, specimen preparation, diffraction patterns, kikuchi diffraction, planar defects, strain fields, high resolution imaging, X-ray spectrometry.

MATS 5531. Electrochemical Engineering. (.3 cr.; Student Option; Periodic Fall)
Fundamentals of electrochemical engineering. Topics include electrochemical mass transfer, electrokinetics, thermodynamics of cells, modern sensors, formation of thin films and microstructured materials. Computer-based problems will be assigned. prereq: Math 3011 or instr consent, upper div CSE or grad

MATS 5771. Colloids and Dispersions. (3 cr.; A-F or Audit; Every Fall) Preparation, stability, coagulation kinetics, or colloidal solutions. DLVO theory, electrokinetic phenomena. Properties of micelles, other microstructures. prereq: Physical chemistry

MATS 8001. Structure and Symmetry of Materials. (3 cr.; Student Option; Every Fall) Comprehensive description of structure of materials, including metals, semiconductors, organic crystals, polymers, and liquid crystals. Atomic and molecular ordering, influence of intermolecular forces on symmetry and structure. Principles of scattering and use of X-ray, neutron, and electron diffraction. prereq: Math and Chem majors must take this course for a grade

MATS 8002. Thermodynamics and Kinetics. (3 cr.; A-F or Audit; Every Fall) First three laws of thermodynamics, free energy, equilibrium constants, fugacity and activity relationships, solution models, order-disorder transitions, phase transitions. Elementary statistical mechanics. Applications to materials systems, including surface energies, multicomponent equilibria, reaction kinetics, mass transport, diffusion.


MATS 8004. Mechanical Properties. (3 cr.; A-F or Audit; Every Spring) Defects in crystalline materials, including point defects, dislocations, and grain boundaries. Structure and movement of defects related to mechanical behavior of materials. Tools used to understand crystals and crystallography.

MATS 8201. Applied Math. (3 cr.; A-F or Audit; Every Fall) Integrated approach to solving linear mathematical problems. Linear algebraic equations. Linear ordinary and partial differential equations using theoretical/numerical analysis based on linear operator theory. prereq: Materials science grad student or instructor consent.

MATS 8204. Computational Methods and Applications to Problems in Materials Science and Engineering. (2 cr.; A-F or Audit; Every Spring) Implementation of computational methods/applications to numerical problems in materials science and engineering. Emphasizes implementation to applications, prereq: Grad student, knowledge of programming languages such as Fortran

MATS 8211. Physical Chemistry of Polymers. (4 cr.; Student Option; Every Spring) Introduction to polymer physical chemistry. Chain conformations; thermodynamics of polymer solutions, blends, and copolymers; light, neutron, and X-ray scattering; dynamics in dilute solutions and polymer characterization; dynamics of melts and viscoelasticity; rubber elasticity, networks, and gels; glass transitions; crystallization. prereq: Undergrad physical chem or instr consent

MATS 8221. Synthetic Polymer Chemistry. (4 cr.; A-F or Audit; Every Fall) Condensation, radical, ionic, emulsion, ring-opening, metal-catalyzed polymerizations. Chain conformation, solution thermodynamics, molecular weight characterization, physical properties. prereq: [Undergrad organic chemistry course, undergrad physical chemistry course] or instr consent


MATS 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

MATS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

MATS 8555. MatS Teaching Practicum. (1-6 cr. [max 24 cr.]; S-N only; Every Fall, Spring & Summer) Experience in instruction including grading of student work, holding of office hours, and in special cases, lecturing. Students will work with and receive feedback from a faculty member in OEMS. prereq: Grad MATS or ChemEn major and DGS permission

MATS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

MATS 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

MATH 1001. Excursions in Mathematics. (MATH; 3 cr.; Student Option; Every Fall & Spring) Introduction to the breadth and nature of mathematics and the power of abstract reasoning, with applications to topics that are relevant to the modern world, such as voting, fair division of assets, patterns of growth, and opinion polls. prereq: 3 yrs high school math or placement exam or [grade of at least C- in PSTL 731 or 732]

MATH 1031. College Algebra and Probability. (MATH; 3 cr.; Student Option; Every Fall, Spring & Summer) Graphs of equations and functions, transformations of graphs; linear, quadratic, polynomial, and rational functions, with applications; inverses and compositions of functions; exponential and logarithmic functions with applications; basic probability rules, conditional probabilities, binomial probabilities. prereq: 3 yrs high school math or satisfactory score on placement exam or grade of at least C- in [PSTL 731 or PSTL 732 or CI 0832]

MATH 1038. College Algebra and Probability Submodule. (1 cr.; A-F or Audit; Every Fall, Spring & Summer) For students who need probability/permutations/combinations portion of 1031. Meets with 1031, has same grade/work requirements. prereq: 1051 or 1151 or 1155

MATH 1042. Mathematics of Design. (MATH; 4 cr.; Student Option; Every Fall) A tour of mathematics relevant to principles of design that support the “making” of things: from objects to buildings. Project-based problem solving. Systems of equations, trigonometry, vectors, analytic geometry, conic sections, transformations, approximation of length, area, and volume. Prereq: Satisfactory score on placement test or grade of at least C- [in 1031 or 1051]

MATH 1051. Pre-calculus I. (MATH; 3 cr.; Student Option; Every Fall, Spring & Summer) Graphs of equations and functions, transformations of graphs; linear, quadratic, polynomial, and rational functions with applications; zeros of polynomials; inverses and compositions of functions; exponential and logarithmic functions with applications; coverage beyond that found in the usual 3 years of high school math; prereq: 3 yrs of high
MATH 1142. Short Calculus. (MATH; 4 cr.; Student Option; Every Fall, Spring & Summer) A streamlined one-semester tour of differential and integral calculus in one variable, and differential calculus in two variables. No trigonometry/does not have the same depth as MATH 1271-1272. Formulas and their interpretation and use in applications. prereq: Satisfactory score on placement test or grade of at least C- in [1031 or 1051]

MATH 1151. Precalculus II. (MATH; 3 cr.; Student Option; Every Fall, Spring & Summer) Properties of trigonometric functions and their inverses, including graphs and identities, with applications; polar coordinates, equations, graphs; complex numbers, complex plane, DeMoivre's Theorem; conic sections; systems of linear equations and inequalities, with applications; arithmetic and geometric sequences and series. prereq: Satisfactory score on placement exam or grade of at least C- in [1031 or 1051]

MATH 1155. Intensive Precalculus. (MATH; 5 cr.; Student Option; Every Fall & Spring) Graphs of equations and functions; polynomial and rational functions; inverses and composition of functions; exponentials and logarithms; trig functions, graphs, identities; polar coordinates; complex numbers; systems of linear equations; arithmetic, geometric sequences, series; applications. prereq: 3 yrs high school math or satisfactory score on placement exam or grade of at least C- in [PSTL 731 or PSTL 732]

MATH 1241. Calculus and Dynamical Systems in Biology. (MATH; 4 cr.; Student Option; Every Fall & Spring) Differential/integral calculus with biological applications. Discrete/continuous dynamical systems. Models from fields such as ecology/evolution, epidemiology, physiology, genetic networks, neuroscience, and biochemistry. prereq: [4 yrs high school math including trig or satisfactory score on placement test or grade of at least C- in [1151 or 1155]], CBS student

MATH 1271. CSE Calculus I. (MATH; 4 cr.; Student Option; Every Fall & Spring) Differentiation of single-variable functions, basics of integration of single-variable functions. Applications: max-min, related rates, area, curve-sketching. Use of calculator, cooperative learning, prereq: CSE or pre-bioprod concurrent registration is required (or allowed) in biosys engn (PRE), background in [precalculus, geometry, visualization of functions/graphs], instr consent; familiarity with graphing calculators recommended

MATH 1272. CSE Calculus II. (MATH; 4 cr.; Student Option; Every Spring) Techniques of integration. Calculus involving transcendental functions, polar coordinates, Taylor polynomials, vectors/curves in space, cylindrical/spherical coordinates. Use of calculators, cooperative learning, prereq: Grade of at least C- in [1371 or equiv], CSE or pre-BioProd/Biosys Engr

MATH 1741. UM Talented Youth Mathematics Program--Calculus I, First Semester. (MATH; 2 cr. [max 4 cr.] ; A-F or Audit; Every Fall) Accelerated honors-level sequence for selected mathematically talented high school students. Single variable calculus through differentiation and its applications.

MATH 1742. UM Talented Youth Mathematics Program--Calculus I, Second Semester. (MATH; 2 cr. [max 4 cr.] ; A-F or Audit; Every Spring) Accelerated honors sequence for selected mathematically talented high school students. Integration and its applications.

MATH 1743. UM Talented Youth Mathematics Program--Calculus II, First Semester. (MATH; 4 cr. ; A-F or Audit; Every Fall) Accelerated honors sequence for selected mathematically talented high school students. Sequences and series, differential equations, 3D analytical geometry, and methods of proof.

MATH 1474. Honors Calculus III for Secondary Students. (3 cr.; Student Option; Every Spring) Accelerated honors sequence. Linear Algebra from geometric viewpoint. First-order systems of differential equations. prereq: 1473H

MATH 1571H. Honors Calculus I. (MATH; 4 cr.; A-F only; Every Fall) Differential/integral calculus of functions of a single variable. Emphasizes hard problem-solving rather than theory. prereq: Honors student and permission of University Honors Program

MATH 1572H. Honors Calculus II. (MATH; 4 cr.; A-F only; Every Spring) Continuation of 1571. Infinite series, differential calculus of several variables, introduction to linear algebra. prereq: 1571H, honors student, permission of University Honors Program

MATH 2066. Elementary Differential Equations. (1-4 cr.; Student Option;) Not taught: merely provides credit for transfer students who have taken a sophomore-level differential equations class that does not contain enough linear algebra to qualify for credit for 2243.

MATH 2142. Elementary Linear Algebra. (1-4 cr. [max 1 cr.]; A-F or Audit;) Not taught: merely provides credit for transfer students who have taken a sophomore-level linear algebra course that does not contain enough differential equations to qualify for credit for 2243.

MATH 2241. Mathematical Modeling of Biological Systems. (3 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Development, analysis and simulation of models for the dynamics of biological systems. Mathematical topics include discrete and continuous dynamical systems, linear algebra, and probability. Models from fields such as ecology, epidemiology, physiology, genetics, neuroscience, and biochemistry. prereq: 1241 or 1271 or 1371 w/grade of at least C-

MATH 2243. Linear Algebra and Differential Equations. (4 cr.; Student Option; Every Fall, Spring & Summer) Linear algebra: basis, dimension, matrices, eigenvalues/eigenvectors. Differential equations: first-order linear, separable; second-order linear with constant coefficients; linear systems with constant coefficients. prereq: [1272 or 1282 or 1372 or 1572] w/grade of at least C-

MATH 2263. Multivariable Calculus. (4 cr.; Student Option; Every Fall, Spring & Summer) Derivative as linear map. Differential/integral calculus of functions of several variables, including change of coordinates using Jacobians. Line/ surface integrals. Gauss, Green, Stokes Theorems. prereq: [1272 or 1372 or 1572] w/grade of at least C-

MATH 2283. Sequences, Series, and Foundations. (3 cr.; Student Option; Every Fall & Spring) Mathematical reasoning. Elements of logic. Mathematical induction. Real number system. General, monotone, recursively defined sequences. Convergence of infinite series/sequences. Taylor's series. Power series with applications to differential equations. Newton's method. prereq: (or allowed) in 2243 or concurrent registration is required (or allowed) in 2263 or concurrent registration is required (or allowed) in 2373 or concurrent registration is required (or allowed) in 2374 w/grade of at least C-

MATH 2373. CSE Linear Algebra and Differential Equations. (4 cr.; Student Option; Every Fall & Spring) Linear algebra: basis, dimension, eigenvalues/eigenvectors. Differential equations: linear equations/systems, phase space, forcing/resonance, qualitative/numerical analysis of nonlinear systems, Laplace transforms. Use of computer technology. prereq: [1272 or 1282 or 1372 or 1572] w/grade of at least C-, CSE or pre-Bio Prod/Biosys Engr

MATH 2374. CSE Multivariable Calculus and Vector Analysis. (4 cr.; Student Option; Every Fall & Spring)
Derivative as linear map. Differential/integral calculus of functions of several variables, including change of coordinates using Jacobians. Line/surface integrals. Gauss, Green, Stokes theorems. Use of computer technology. prereq: [1272 or 1282 or 1372 or 1572] w/grade of at least C-, CSE or pre-Bioprod/Biosys Engr

MATH 2471. UM Talented Youth Mathematics Program—Calculus II, Second Semester. (MATH; 2 cr. [max 4 cr.] ; A-F or Audit; Every Spring) Accelerated honors sequence for selected mathematically talented high school students. Theoretical and geometric linear algebra.

MATH 2472. UM Talented Youth Mathematics Program—Calculus III, First Semester. (MATH; 2 cr. [max 4 cr.] ; A-F or Audit; Every Fall) Accelerated honors sequence for selected mathematically talented high school students. Geometry of surfaces and curves in R^n. Multivariable calculus through differentiation using linear algebra.

MATH 2473. UM Talented Youth Mathematics Program—Calculus III, Second Semester. (MATH; 2 cr. [max 4 cr.] ; A-F or Audit; Every Spring) Accelerated honors sequence for selected mathematically talented high school students. Multivariable integration and classical vector analysis.

MATH 2474. Advanced Topics for Secondary Students. (3 cr. ; Student Option; Every Spring) Topics may include linear algebra, combinatorics, advanced differential equations, probability/statistics, numerical analysis, dynamical systems, topology/geometry. Emphasizes concepts/explorations. prereq: 2473H

MATH 2573H. Honors Calculus III. (4 cr. ; A-F only; Every Fall) Integral calculus of several variables. Vector analysis, including theorems of Gauss, Green, Stokes. prereq: Math 1572H or Math 2574H, honors student and permission of University Honors Program

MATH 2574H. Honors Calculus IV. (4 cr. ; A-F only; Every Spring) Advanced linear algebra, differential equations. Additional topics as time permits. prereq: Math 1572H or Math 2573H, honors student and permission of University Honors Program

MATH 2999. Special Exam. (5 cr. ; Student Option;) Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

MATH 3283W. Sequences, Series, and Foundations: Writing Intensive. (WI; 4 cr. ; Student Option; Every Fall & Spring) Introduction to reasoning used in advanced mathematics courses. Logic, mathematical induction, real number system, general/monotone/recursively defined sequences, convergence of infinite series/sequences, Taylor's series, power series with applications to differential equations, Newton's method. Writing-intensive component. prereq:

[concurrent registration is required (or allowed) in 2243 or concurrent registration is required (or allowed) in 2263 or concurrent registration is required (or allowed) in 2373 or concurrent registration is required (or allowed) in 2374] w/grade of at least C-

MATH 3584H. Honors Calculus IV: Advanced Placement. (5 cr. ; Student Option; Periodic Fall) Advanced linear algebra, differential equations, introduction to complex analysis. prereq: [2583 or equiv], IT Honors office approval

MATH 3592H. Honors Mathematics I. (5 cr. ; A-F only; Every Fall) First semester of three-semester sequence. Focuses on multivariable calculus at deeper level than regular calculus offerings. Rigorous introduction to sequences/series. Theoretical treatment of multivariable calculus. Strong introduction to linear algebra. prereq: dept consent; for students with mathematical talent

MATH 3593H. Honors Mathematics II. (5 cr. ; A-F or Audit; Every Spring) Second semester of three-semester sequence. Focuses on multivariable calculus at deeper level than regular calculus offerings. Rigorous introduction to sequences/series. Theoretical treatment of multivariable calculus. Strong introduction to linear algebra. prereq: 3592H or instr consent

MATH 4065. Theory of Interest. (4 cr. ; A-F only; Every Fall & Spring) Time value of money, compound interest and general annuities, loans, bonds, general cash flows, basic financial derivatives and their valuation. Primarily for students who are interested in actuarial mathematics. prereq: 1272 or 1372 or 1572

MATH 4067W. Actuarial Mathematics in Practice. (WI; 3 cr. ; A-F only; Every Spring) Real world actuarial problems that require integration of mathematical skills with knowledge from other disciplines such as economics, statistics, and finance. Communication and interpersonal skills are enhanced by teamwork/presentations to the practitioner actuaries who co-instruct. prereq: 4065, ACCT 2050, ECON 1101, ECON 1102


MATH 4115. Elementary Set Theory. (3 cr. ; Student Option; Every Fall) Basic properties of sets, operations on sets, cardinal numbers, simply and well-ordered sets, ordinal numbers, axiom of choice, axiomatics. prereq: One soph math course or instr consent

MATH 4152. Elementary Mathematical Logic. (3 cr. ; Student Option; Every Spring) Propositional logic. Predicate logic: notion of a first order language, a deductive system for first order logic, first order structures, Godel's completeness theorem, axiom systems, models of formal theories. prereq: One soph math course or instr consent

MATH 4242. Applied Linear Algebra. (4 cr. ; Student Option; Every Fall, Spring & Summer) Systems of linear equations, vector spaces, subspaces, bases, linear transformations, matrices, determinants, eigenvalues, canonical forms, quadratic forms, applications. prereq:

2243 or 2373 or 2573

MATH 4281. Introduction to Modern Algebra. (4 cr. ; Student Option; Periodic Fall) Equivalence relations, greatest common divisor, prime decomposition, modular arithmetic, groups, rings, fields, Chinese remainder theorem, matrices over commutative rings, polynomials over fields. prereq: 2283 or 3283 or instr consent

MATH 4428. Mathematical Modeling. (4 cr. ; Student Option; Every Spring) Modeling techniques for analysis/decision-making in industry. Optimization (sensitivity analysis, Lagrange multipliers, linear programming). Dynamical modeling (steady-states, stability analysis, eigenvalue methods, phase portraits, simulation). Probabilistic methods (probability/statistical models, Markov chains, linear regression, simulation). prereq:

2243 or 2373 or 2573

MATH 4512. Differential Equations with Applications. (3 cr. ; Student Option; Every Fall & Spring) Laplace transforms, series solutions, systems, numerical methods, plane autonomous systems, stability. prereq: 2243 or 2373 or 2573

MATH 4587. Applied Fourier Analysis. (4 cr. ; Student Option; Every Fall & Spring) Fourier series, integral/transform. Convergence. Fourier series, transform in complex form. Solution of wave, heat, Laplace equations by separation of variables. Sturm-Liouville systems, finite Fourier, fast Fourier transform. Applications. Other topics as time permits. prereq: 2243 or 2373 or 2573

MATH 4603. Advanced Calculus I. (4 cr. ; Student Option; Every Fall, Spring & Summer) Axioms for the real numbers. Techniques of proof for limits, continuity, uniform convergence. Rigorous treatment of differential/integral calculus for single-variable functions. prereq: [(2243 or 2373), [2263 or 2374]] or 2574 or instr consent

MATH 4604. Advanced Calculus II. (4 cr. ; Student Option; Every Spring) Sequel to MATH 4603. Topology of n-dimensional Euclidean space. Rigorous treatment of multivariable differentiation and integration, including chain rule, Taylor's Theorem, implicit function theorem, Fubini's Theorem, change of variables, Stokes' Theorem. prereq: 4603 or 5615 or instr consent

MATH 4653. Elementary Probability. (4 cr. ; Student Option; Every Fall & Spring) Probability spaces, distributions of discrete/continuous random variables, conditioning. Basic theorems, calculational methodology. Examples of random sequences. Emphasizes problem-solving. prereq: [2263 or 2374 or 2573]; [2283 or 2574 or 3283] recommended

MATH 4707. Introduction to Combinatorics and Graph Theory. (4 cr. ; Student Option; Every Fall & Spring) Existence, enumeration, construction, algorithms, optimization. Pigeonhole principle,
MATH 4990. Topics in Mathematics. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

MATH 4991. Independent Study. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

MATH 4992. Directed Reading. (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

MATH 4999. Directed Study. (4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

MATH 4997W. Senior Project (Writing Intensive). (WI; 1 cr. [max 2 cr.]; A-F or Audit; Every Fall, Spring & Summer) Directed study. May consist of paper on specialized area of math or original computer program or other approved project. Covers some math that is new to student. Scope/topic vary with instructor. prereq: 2 sem of upper div math, dept consent

MATH 5067. Mathematics of Options, Futures, and Derivative Securities II. (4 cr.; A-F; Every Spring) Mathematical background such as partial differential equations, Fourier series, computational methods, Black-Scholes theory, numerical methods (including Monte Carlo simulation), interest-rate derivative securities, exotic options, risk theory. prereq: 5075

MATH 5165. Mathematical Logic I. (4 cr.; Student Option; Every Fall) Theory of computability: notion of algorithm, Turing machines, primitive recursive functions, recursive functions, Kleene normal form, recursion theorem. Propositional logic. prereq: 2283 or 3283 or Phil 5201 or CSci course in theory of algorithms or instr consent

MATH 5166. Mathematical Logic II. (4 cr.; Student Option; Every Spring) First-order logic: provability/truth in formal systems, models of axiom systems, Godel's incompleteness theorem. Godel's incompleteness theorem: decidable theories, representability of recursive functions in formal theories, undecidable theories, models of arithmetic. prereq: 5165


MATH 5285H. Honors: Fundamental Structures of Algebra I. (4 cr.; Student Option; Every Fall) Review of matrix theory, linear algebra. Vector spaces, linear transformations over abstract fields. Group theory, including normal subgroups, quotient groups, homomorphisms, class equation, Sylow's theorems. Specific examples: permutation groups, symmetry groups of geometric figures, matrix groups. prereq: [2243 or 2373 or 2573], [2283 or 2574 or 3283]

MATH 5286H. Honors: Fundamental Structures of Algebra II. (4 cr.; Student Option; Every Fall & Spring) Ring/module theory, including ideals, quotients, homomorphisms, domains (unique factorization, euclidean, principal ideal), fundamental theorem for finitely generated modules over euclidean domains, Jordan canonical form. Introduction to field theory, including finite fields, algebraic/transcendental extensions, Galois theory. prereq: 5285

MATH 5325. Geometry I. (4 cr.; Student Option; Every Fall) Advanced two-dimensional Euclidean geometry from a vector viewpoint. Theorems/problems about triangles/circles, isometries, connections with Euclid's axioms. Hyperbolic geometry, how it compares with Euclidean geometry. prereq: [2243 or 2373 or 2573], [2283 or 2574 or 3283] [concurrent registration is required (or allowed) in 2263 or concurrent registration is required (or allowed) in 2374 or concurrent registration is required (or allowed) in 2574]

MATH 5326. Geometry II. (4 cr.; Student Option; Every Spring) Projective geometry, including: relation to Euclidean geometry, finite geometries, fundamental theorem of projective geometry. N-dimensional Euclidean geometry from a vector viewpoint. Emphasizes N=3, including: polyhedra, spheres, isometries. prereq: 5335

MATH 5345H. Honors: Introduction to Topology. (4 cr.; A-F only; Every Fall) Rigorous introduction to general topology. Set theory, Euclidean/metric spaces, compactness/connectedness. May include Urysohn metrization, Tychonoff theorem or fundamental group/covering spaces. prereq: [2283 or 2374 or 2573], [2283 or 2574 or 3283] [concurrent registration is required (or allowed) in 2263 or concurrent registration is required (or allowed) in 2374 or concurrent registration is required (or allowed) in 3283]

MATH 5378. Differential Geometry. (4 cr.; Student Option; Every Spring) Basic geometry of curves in plane and in space, including Frenet formula, theory of surfaces, differential forms, Riemannian geometry. prereq: [2243 or 2374 or 2573], [2243 or 2373 or 2574], [2283 or 3283] recommended

MATH 5385. Introduction to Computational Algebraic Geometry. (4 cr.; Student Option; Every Fall) Geometry of curves/surfaces defined by polynomial equations. Emphasizes concrete computations with polynomials using computer packages, interplay between algebra and geometry. Abstract algebra presented as needed. prereq: [2263 or 2374 or 2573], [2243 or 2373 or 2574], [2283 or 3283]


MATH 5447. Theoretical Neuroscience. (4 cr.; Student Option; Every Fall) Nonlinear dynamical system models of neurons and neuronal networks. Computation by excitatory/inhibitory networks. Neural oscillations, adaptation, bursting, synchrony. Memory systems. prereq: 2243 or 2373 or 2574
MATH 5467. Introduction to the Mathematics of Image and Data Analysis. (4 cr.; Student Option; Every Spring) Background theory/experience in wavelets. Inner product spaces, operator theory. Fourier transforms applied to Gabor transforms, multi-scale analysis, discrete wavelets, self-similarity. Computing techniques. Prereq: [2243 or 2373 or 2573], [2283 or 2574 or 3283 or inst consent]; [2263 or 2374 or 2574]

MATH 5485. Introduction to Numerical Methods I. (4 cr.; Student Option; Every Fall) Solution of nonlinear equations in one variable. Interpolation, polynomial approximation. Methods for solving linear systems, eigenvalue problems, systems of nonlinear equations. Prereq: [2243 or 2373 or 2573], familiarity with some programming language


MATH 5490. Topics in Applied Mathematics. (4 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) Topics vary by instructor. See class schedule.

MATH 5525. Introduction to Ordinary Differential Equations. (4 cr.; Student Option; Periodic Fall & Spring) Ordinary differential equations, solution of linear systems, qualitative/numerical methods for nonlinear systems. Linear algebra background, fundamental matrix solutions, variation of parameters, existence/uniqueness theorems, phase space. Rest points, their stability. Periodic orbits. Poincare-Bendixon theory, strange attractors. Prereq: [2243 or 2373 or 2573], [2283 or 2574 or 3283]

MATH 5535. Dynamical Systems and Chaos. (4 cr.; Student Option; Every Fall & Spring) Dynamical systems theory. Emphasizes iteration of one-dimensional mappings. Fixed points, periodic points, stability, bifurcations, symbolic dynamics, chaos, fractals, Julia/Mandelbrot sets. Prereq: [2243 or 2373 or 2573], [2283 or 2574 or 3283]

MATH 5583. Complex Analysis. (4 cr.; Student Option; Every Fall, Spring & Summer) Algebra, geometry of complex numbers. Linear fractional transformations. Conformal mappings. Holomorphic functions. Theorems of Abel/Cauchy/Goursat; power series, Schwarz/lemma. Complex exponential, trig functions. Entire functions, theorems of Liouville/Morera. Reflection principle. Singularities, Laurent series. Residues. Prereq: 2 sems soph math including [2263 or 2374 or 2573], [2283 or 3283] recommended

MATH 5587. Elementary Partial Differential Equations I. (4 cr.; Student Option; Every Fall) Emphasizes partial differential equations w/physical applications, including heat, wave, Laplace's equations. Interpretations of boundary conditions. Characteristics, Fourier series, transforms, Green's functions, images, computational methods. Applications include wave propagation, diffusions, electrostatics, shocks. Prereq: [2243 or 2373 or 2573], [2263 or 2374 or 2574]

MATH 5588. Elementary Partial Differential Equations II. (4 cr.; A-F or Audit; Every Spring) Heat, wave, Laplace's equations in higher dimensions. Green's functions, Fourier series, transforms. Asymptotic methods, boundary layer theory, bifurcation theory for linear/nonlinear PDEs. Variational methods. Free boundary problems. Additional topics as time permits. Prereq: [2243 or 2373 or 2573], [2263 or 2374 or 2574], 5587 or instr consent

MATH 5615H. Honors: Introduction to Analysis I. (4 cr.; Student Option; Every Fall) Axiomatic treatment of real/complex number systems. Introduction to metric spaces: convergence, connectedness, compactness. Convergence of sequences/series of real/complex numbers, Cauchy criterion, root/ratio tests. Continuity in metric spaces. Rigorous treatment of differentiation of single-variable functions, Taylor's Theorem. Prereq: [2243 or 2373], [2263 or 2374], [2283 or 3283] or 2574


MATH 5651. Basic Theory of Probability and Statistics. (4 cr.; Student Option; Every Fall & Spring) Logical development of probability, basic issues in statistics. Probability spaces, random variables, their distributions/expected values. Law of large numbers, central limit theorem, generating functions, sampling, sufficiency, estimation. Prereq: [2263 or 2374 or 2573], [2243 or 2373]; [2283 or 3283] recommended.

MATH 5652. Introduction to Stochastic Processes. (4 cr.; Student Option; Every Fall & Spring) Random walks, Markov chains, branching processes, martingales, queuing theory. Brownian motion. Prereq: 5651 or Stat 5101


MATH 5705. Enumerative Combinatorics. (4 cr.; Student Option; Every Fall & Spring) Basic enumeration, bijections, inclusion-exclusion, recurrence relations, ordinary/ exponential generating functions, partitions, Polya theory. Optional topics include trees, asymptotics, listing algorithms, root theory, involutions, tableaux, permutation statistics. Prereq: [2243 or 2373 or 2573], [2263 or 2283 or 2374 or 2574 or 3283]

MATH 5707. Graph Theory and Non-Enumerative Combinatorics. (4 cr.; Student Option; Every Fall & Spring) Basic topics in graph theory: connectedness, Eulerian/Hamiltonian properties, trees, colorings, planar graphs, matchings, flows in networks. Optional topics include graph algorithms, Latin squares, block designs, Ramsey theory. Prereq: [2243 or 2373 or 2573], [2263 or 2374 or 2574]; [2283 or 3283 or experience in writing proofs] highly recommended. Credit will not be granted if credit has been received for: 4707

MATH 5711. Linear Programming and Combinatorial Optimization. (4 cr.; Student Option; Every Fall & Spring) Simplex method, connections to geometry, duality theory, sensitivity analysis. Applications to cutting stock, allocation of resources, scheduling problems. Flows, matching/transportation problems, spanning trees, distance in graphs, integer programs, branch/bound, cutting planes, heuristics. Applications to traveling salesman, knapsack problems. Prereq: 2 sems soph math [including 2243 or 2373 or 2573]

MATH 5900. Tutorial in Advanced Mathematics. (1-6 cr. [max 120 cr.]; A-F or Audit; Every Fall, Spring & Summer) Individually directed study.

MATH 5950. Topics in Mathematics. (3-4 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topics vary by instructor. See class schedule.

MATH 8141. Applied Logic. (3 cr.; A-F or Audit; Periodic Fall & Spring) Applying techniques of mathematical logic to other areas of mathematics and computer science. Sample topics: complexity of computation, computable analysis, unsolvability of diophantine problems, program verification, database theory.

MATH 8142. Applied Logic. (3 cr.; A-F or Audit; Periodic Spring) Applying techniques of mathematical logic to other areas of mathematics, computer science. Complexity of computation, computable analysis, unsolvability of diophantine problems, program verification, database theory.

MATH 8151. Axiomatic Set Theory. (3 cr.; A-F or Audit; Periodic Fall & Spring) Program verification, database theory.
MATH 8152. Axiomatic Set Theory. (3 cr.; A-F or Audit; Periodic Fall)
Notion of forcing, generic extensions, forcing with finite partial functions, independence of continuum hypothesis, forcing with partial functions of infinite cardinalities, relationship between partial orderings and Boolean algebras, Boolean-valued models, independence of axiom of choice. prerequisite: 8151 or instructor consent

MATH 8166. Recursion Theory. (3 cr.; A-F or Audit; Periodic Fall)
Analysis of concept of computability, including various equivalent definitions. Primitive recursive, recursive, partial recursive functions. Oracle Turing machines. Kleene Normal Form Theorem. Recursively enumerable sets. Degrees of unsolvability. Arithmetic hierarchy. prerequisite: Math grad student or instructor consent

MATH 8167. Model Theory. (3 cr.; A-F or Audit; Periodic Fall)
Interplay of formal theories, their models. Elementary equivalence, elementary extensions, partial isomorphisms. Lowenheim-Skolem theorems, compactness theorems, preservation theorems. Ultraproducts. prerequisite: Math grad student or instructor consent

MATH 8172. Model Theory. (3 cr.; A-F or Audit; Periodic Fall)
Types of elements. Prime models, homogeneity, saturation, categoricity in power. Forking. prerequisite: 8172 or instructor consent

MATH 8190. Topics in Logic. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring)
Offered for one year or one semester as circumstances warrant.

MATH 8201. General Algebra. (3 cr.; A-F or Audit; Every Fall)
Groups through Sylow, Jordan-Holder theorems, structure of finitely generated Abelian groups. Rings and algebras, including Gauss theory of factorization. Modules, including projective and injective modules, chain conditions, Hilbert basis theorem, and structure of modules over principal ideal domains.

MATH 8202. General Algebra. (3 cr.; A-F or Audit; Every Spring)
Classical field theory through Galois theory, including solvable equations. Symmetric, Hermitian, orthogonal, and unitary form. Tensor and exterior algebras. Basic Wedderburn theory of rings; basic representation theory of groups. prerequisite: 8201 or instructor consent

MATH 8207. Theory of Modular Forms and L-Functions. (3 cr.; A-F or Audit; every Fall)
Zeta and L-functions, prime number theorem, Dirichlet's theorem on primes in arithmetic progressions, class number formulas; Riemann hypothesis; modular forms and associated L-function; Eisenstein series; Hecke operators; Poincare series; Euler products; Ramanujan conjectures; Theta series and quadratic forms; waveforms and L-functions.

MATH 8208. Theory of Modular Forms and L-Functions. (3 cr.; A-F or Audit; Periodic Fall)
Applications of Eisenstein series: special values and analytic continuation and functional equations of L-functions. Trace formulas. Applications of representation theory. Computations. prerequisite: 8207 or instructor consent

MATH 8211. Commutative and Homological Algebra. (3 cr.; A-F or Audit; Periodic Fall)
Selected topics. prerequisite: 8202 or instructor consent

MATH 8212. Commutative and Homological Algebra. (3 cr.; A-F or Audit; every Fall)
Permutations, Sylow's theorems, representations of groups on groups, semidirect products, solvable and nilpotent groups, generalization of subgroups, p-groups, cocycle action on p-groups. prerequisite: 8202 or instructor consent

MATH 8245. Group Theory. (3 cr.; A-F or Audit; Every Fall)
Representation and character theory, simple groups, free groups and products, presentations, extensions, Schur multipliers. prerequisite: 8245 or instructor consent

MATH 8251. Algebraic Number Theory. (3 cr.; A-F or Audit; Periodic Fall)
Algebraic number fields and algebraic curves. Basic commutative algebra. Completions: p-adic fields, formal power series, Puiseux series. Ramification, discriminant, different. Finiteness of class number and units theorem. prerequisite: 8202 or instructor consent

MATH 8252. Algebraic Number Theory. (3 cr.; A-F or Audit; Periodic Fall)
Zeta and L-functions of global fields, Artin L-functions, Hasse-Weil L-functions, Tate cohomology density, local and global class field theory. Reciprocity laws. Finiteness theory of cyclotomic fields. prerequisite: 8251 or instructor consent

MATH 8253. Algebraic Geometry. (3 cr.; A-F or Audit; Periodic Fall)

MATH 8254. Algebraic Geometry. (3 cr.; A-F or Audit; Periodic Spring)

MATH 8270. Topics in Algebraic Geometry. (1-3 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring)
N/A prerequisite: Math 8201, Math 8202; offered for one year or one semester as circumstances warrant

MATH 8271. Lie Groups and Lie Algebras. (3 cr.; A-F or Audit; Periodic Fall)
Definitions and basic properties of Lie groups and Lie algebras; classical matrix Lie groups; Lie subgroups and their corresponding Lie subalgebras; covering groups; Maurer-Cartan forms; exponential map; correspondence between Lie algebras and simply connected Lie groups; Baker-Campbell-Hausdorff formula; homogeneous spaces. prerequisite: 8302 or instructor consent

MATH 8272. Lie Groups and Lie Algebras. (3 cr.; A-F or Audit; Periodic Fall)
Solvable and nilpotent Lie algebras and Lie groups; Lie's and Engel's theorems; semisimple Lie algebras; cohomology of Lie algebras; Whitehead's lemmas and Levi's theorem; classification of complex semisimple Lie algebras and compact Lie groups; representation theory. prerequisite: 8271 or instructor consent

MATH 8280. Topics in Number Theory. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring)
Various topics in Number Theory.

MATH 8300. Topics in Algebra. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring)
Selected topics. prerequisite: Grad math major or instructor consent; offered as one yr or one semester as circumstances warrant

MATH 8301. Manifolds and Topology. (3 cr.; A-F or Audit; Every Fall)
Classification of compact surfaces, fundamental group/covering spaces, Homology group, basic cohomology. Application to degree of a map, invariance of domain/dimension. prerequisite: [Some point-set topology, algebra] or instructor consent

MATH 8302. Manifolds and Topology. (3 cr.; A-F or Audit; Every Spring)

MATH 8306. Algebraic Topology. (3 cr.; A-F or Audit; Periodic Fall)
Singular homology, cohomology theory with coefficients. Eilenberg-Steenrod axioms, Mayer-Vietoris theorem. prerequisite: 8301 or instructor consent

MATH 8307. Algebraic Topology. (3 cr.; A-F or Audit; )
Basic homotopy theory, cohomology rings with applications. Time permitting: fibre spaces, cohomology operations, extra-ordinary cohomology theories. prerequisite: 8306 or instructor consent

MATH 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
MATH 8360. Topics in Topology. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Selected topics. prereq: 8301 or instr consent; offered as one yr or one sem as circumstances warrant

MATH 8365. Riemannian Geometry. (3 cr.; A-F or Audit; Every Fall) Riemannian metrics, curvature, Bianchi identities, Gauss-Bonnet theorem, Meyers's theorem, Cartan-Hadamard theorem. prereq: 8301 or basic point-set topology or instr consent

MATH 8366. Riemannian Geometry. (3 cr.; A-F or Audit; Every Fall) Gauss, Codazzi equations. Tensor calculus, Hodge theory, spinors, global differential geometry, applications. prereq: 8365 or instr consent

MATH 8370. Topics in Differential Geometry. (1-3 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Current research in Differential Geometry. prereq: 8301 or 8365; offered for one yr or one sem as circumstances warrant

MATH 8380. Topics in Advanced Geometry. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Current research. prereq: 8301, 8365


MATH 8386. Calculus of Variations and Minimal Surfaces. (3 cr.; A-F or Audit; Periodic Fall) Theory of multiple integrals. Geometrical differential equations, i.e., theory of minimal surfaces and related structures (surfaces of constant or prescribed mean curvature, solutions to variational integrals involving surface curvatures), all extremals for variational problems of current interest as models for interfaces in real materials. prereq: 8555 or instr consent

MATH 8387. Mathematical Modeling of Continuum Mechanics. (3 cr.; A-F or Audit; Periodic Fall) Specific computation for models arising in industrial problems. prereq: 8597 or instr consent

MATH 8389. Topics in Mathematical Physics. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall) Current research. prereq: 8601; offered for one yr or one sem as circumstances warrant

MATH 8401. Mathematical Modeling and Methods of Applied Mathematics. (3 cr.; A-F or Audit; Every Fall) Dimension analysis, similarity solutions, linearization, stability theory, well-posedness, and characterization of type. Fourier series and integrals, wavelets, Green's functions, weak solutions and distributions. prereq: 4xxx numerical analysis and applied linear algebra or instr consent

MATH 8402. Mathematical Modeling and Methods of Applied Mathematics. (3 cr.; A-F or Audit; Every Spring) Calculus of variations, integral equations, eigenvalue problems, spectral theory. Perturbation, asymptotic methods. Artificial boundary conditions, conformal mapping, coordinate transformations. Applications to specific modeling problems. prereq: 8401 or instr consent


MATH 8432. Mathematical Fluid Mechanics. (3 cr.; Student Option; Periodic Fall) Plane flow of gas, characteristic method, hodograph method. Singular surfaces, shock waves, shock layers. Viscous flow, Navier-Stokes equations, exact solutions. Uniqueness, stability, existence theorems. prereq: 8431 or instr consent


MATH 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

MATH 8445. Numerical Analysis of Differential Equations. (3 cr.; A-F or Audit; Every Fall) Finite element and finite difference methods for elliptic boundary value problems (e.g., Laplace's equation) and solution of resulting linear systems by direct and iterative methods. prereq: 4xxx numerical analysis, 4xxx partial differential equations or instr consent

MATH 8446. Numerical Analysis of Differential Equations. (3 cr.; A-F or Audit; Every Spring) Numerical methods for parabolic equations (e.g., heat equations). Methods for elasticity, fluid mechanics, electromagnetics. Applications to specific computations. prereq: 8445 or instr consent

MATH 8450. Topics in Numerical Analysis. (1-3 cr. [max 12 cr.]; A-F or Audit; Every Fall & Spring) Selected topics. prereq: Grad math major or instr consent; offered as one year or one semester course as circumstances warrant

MATH 8470. Topics in Mathematical Theory of Continuum Mechanics. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Offered for one year or one semester as circumstances warrant

MATH 8501. Differential Equations and Dynamical Systems I. (3 cr.; A-F or Audit; Every Fall) Existence, uniqueness, continuity, and differentiability of solutions. Linear theory and hyperbolicity. Basics of dynamical systems. Local behavior near a fixed point, a periodic orbit, and a homoclinic or heteroclinic orbit. Perturbation theory. prereq: 4xxx ODE or instr consent


MATH 8504. Applied Dynamical Systems and Bifurcation Theory I. (3 cr.; A-F or Audit; Periodic Fall) Static-Hopf bifurcations, invariant manifold theory, normal forms, averaging. Hopf bifurcation in maps, forced oscillations, coupled oscillators, chaotic dynamics, co-dimension 2 bifurcations. Emphasizes computational aspects/applications from biology, chemistry, engineering, physics. prereq: 5525 or 8502 or instr consent

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
MATH 8506. Applied Dynamical Systems and Bifurcation Theory II. (3 cr.; A-F or Audit; Periodic Fall) Background on analysis in Banach spaces, linear operator theory, Lyapunov-Schmidt reduction, static bifurcation, stability at a simple eigenvalue, Hopf bifurcation in infinite dimensions invariant manifold theory. Applications to hydrodynamic stability problems, reaction-diffusion equations, pattern formation, and elasticity. prereq: 5587 or instr consent

MATH 8520. Topics in Dynamical Systems. (1-3 cr.; max 12 cr.; A-F or Audit; Periodic Fall & Spring) Current research. prereq: 8502

MATH 8530. Topics in Ordinary Differential Equations. (1-3 cr.; A-F or Audit; Periodic Fall & Spring) Offered for one year or one semester as circumstances warrant. prereq: 8502

MATH 8540. Topics in Mathematical Biology. (1-3 cr.; max 12 cr.; A-F or Audit; Every Fall & Spring) Offered for one year or one semester as circumstances warrant.

MATH 8571. Theory of Evolutionary Equations. (3 cr.; A-F or Audit; Every Fall) Infinite dimensional dynamical systems, global attractors, existence and robustness. Linear semigroups, analytic semigroups. Linear and nonlinear reaction diffusion equations, strong and weak solutions, well-posedness of solutions. prereq: 8502 or instr consent

MATH 8572. Theory of Evolutionary Equations. (1-3 cr.; A-F or Audit; Periodic Spring) Dynamics of Navier-Stokes equations, strong/weak solutions, global attractors. Chemically reacting fluid flows. Dynamics in infinite dimensions, unstable manifolds, center manifolds perturbation theory. Inertial manifolds, finite dimensional structures. Dynamical theories of turbulence. prereq: 8571 or instr consent

MATH 8580. Topics in Evolutionary Equations. (1-3 cr.; max 12 cr.; A-F or Audit; Periodic Fall) N/A prereq: 8572 or instr consent; offered for one yr or one semester as circumstances warrant

MATH 8581. Applications of Linear Operator Theory. (3 cr.; A-F or Audit; Periodic Fall) Metric spaces, continuity, completeness, contraction mappings, compactness. Normed linear spaces, continuous linear transformations. Hilbert spaces, orthogonality, projections. prereq: 4xxx applied mathematics or instr consent

MATH 8582. Applications of Linear Operator Theory. (3 cr.; A-F or Audit; Periodic Fall) Fourier theory. Self-adjoint, compact, unbounded linear operators. Spectral analysis, eigenvalue-eigenvector problem, spectral theorem, operational calculus. prereq: 8581 or instr consent

MATH 8583. Theory of Partial Differential Equations. (3 cr.; A-F or Audit; Every Fall) Classification of partial differential equations/characteristics. Laplace, wave, heat equations. Some mixed problems. prereq: [Some 5xxx PDE, 8601] or instr consent

MATH 8584. Theory of Partial Differential Equations. (3 cr.; A-F or Audit; Every Spring) Fundamental solutions/distributions, Sobolev spaces, regularity. Advanced elliptic theory (Schauder estimates, Garding's inequality). Hyperbolic systems. prereq: 8583 or instr consent

MATH 8590. Topics in Partial Differential Equations. (1-3 cr.; A-F or Audit; Every Fall & Spring) Research topics. prereq: 8602; offered for one yr or one sem as circumstances warrant

MATH 8600. Topics in Advanced Applied Mathematics. (3 cr.; max 12 cr.; Student Option; Every Fall & Spring) Offered for one yr or one semester as circumstances warrant. Topics vary. For details, contact instructor.

MATH 8601. Real Analysis. (3 cr.; A-F or Audit; Every Fall) Set theory/foundamentals. Axiom of choice, measures, measure spaces, Borel/Lebesgue measure, integration, fundamental convergence theorems, Riesz representation.


MATH 8640. Topics in Real Analysis. (3 cr.; A-F or Audit; Every Fall & Spring) Offered for one year or one semester as circumstances warrant.

MATH 8641. Spatial Ecology. (3 cr.; S-N or Audit; Periodic Fall) Introduction: role of space in population dynamics and interspecific interaction; includes single species and multispecies models, deterministic and stochastic theory, different modeling approaches, effects of implicit/explicit space on competition, pattern formation, stability diversity and invasion. Recent literature. Computer lab. prereq: Two semesters calculus, theoretical population ecology or four semesters more robust calculus, course in statistics or probability or instr consent


MATH 8652. Theory of Probability Including Measure Theory. (3 cr.; A-F or Audit; Every Spring) Conditional distributions and expectations, convergence of sequences of distributions on real line and on Polish spaces, central limit theorem and related limit theorems, Brownian motion, martingales and introduction to other stochastic processes. prereq: 8651 or instr consent

MATH 8654. Fundamentals of Probability Theory and Stochastic Processes. (3 cr.; Student Option; Periodic Spring) Review of basic theorems of probability for independent random variables; introductions to Brownian motion process, Poisson process, conditioning, Markov processes, stationary processes, martingales, super- and sub-martingales, Doob-Meyer decomposition. prereq: 8651 or 8602 or instr consent

MATH 8655. Stochastic Calculus with Applications. (3 cr.; Student Option; Every Fall) Stochastic integration with respect to martingales, Ito's formula, applications to business models, filtering, and stochastic control theory. prereq: 8654 or 8659 or instr consent

MATH 8659. Stochastic Processes. (3 cr.; Student Option; Every Fall) In-depth coverage of various stochastic processes and related concepts, such as Markov sequences and processes, renewal sequences, exchangeable sequences, stationary sequences, Poisson point processes, Levy processes, interacting particle systems, diffusions, and stochastic integrals. prereq: 8652 or instr consent

MATH 8660. Topics in Probability. (1-3 cr.; max 12 cr.; Student Option; Every Fall & Spring) Offered for one year or one semester as circumstances warrant.

MATH 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

MATH 8668. Combinatorial Theory. (3 cr.; A-F or Audit; Periodic Fall) Basic enumeration, including sets and multisets, permutation statistics, inclusion-exclusion, integer/set partitions, involutions and Polya theory. Partially ordered sets, including lattices, incidence algebras, and Mobius inversion. Generating functions.

MATH 8669. Combinatorial Theory. (3 cr.; A-F or Audit; Spring Every Year) Further topics in enumeration, including symmetric functions, Schensted correspondence, and standard tableaux; non-enumerative combinatorics, including graph theory and coloring, matching theory, connectivity, flows in networks, codes, and extremal set theory. prereq: 8668 or instr consent
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<th>Course Code</th>
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<tr>
<td>MATH 8680</td>
<td>Topics in Combinatorics. (1-3 cr. [max 12 cr.]; A-F or Audit; Every Fall &amp; Spring)</td>
<td>Selected topics, prereq: Grad math major or instr consent; offered as one yr or one sem cr as circumstances warrant</td>
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<td>MATH 8777</td>
<td>Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring &amp; Summer)</td>
<td>(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]</td>
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<tr>
<td>MATH 8790</td>
<td>Topics in Complex Analysis. (1-3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall)</td>
<td>Current research. prereq: 8702 or instr consent; offered for one yr or one sem as circumstances warrant</td>
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<tr>
<td>MATH 8801</td>
<td>Functional Analysis. (3 cr.; A-F or Audit; Every Fall)</td>
<td>Motivation in terms of specific problems (e.g., Fourier series, eigenfunctions). Theory of compact operators. Basic theory of Banach spaces (Hahn-Banach, open mapping, closed graph theorems). Frechet spaces, prereq: 8602 or instr consent</td>
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<tr>
<td>MATH 8802</td>
<td>Functional Analysis. (3 cr.; A-F or Audit; Periodic Spring)</td>
<td>Spectral theory of operators, theory of distributions (generalized functions), Fourier transformations and applications. Sobolev spaces and pseudo-differential operators. C-star algebras (Gelfand-Naimark theory) and introduction to von Neumann algebras. prereq: 8801 or instr consent</td>
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<tr>
<td>MATH 8888</td>
<td>Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall &amp; Spring)</td>
<td>(No description) prereq: Max 18 cr per semester or summer; 24 cr required</td>
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<tr>
<td>MATH 8990</td>
<td>Topics in Mathematics. (1-6 cr. [max 24 cr.]; S-N or Audit; Every Fall &amp; Spring)</td>
<td>Readings, research. prereq: instr consent</td>
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<td>MATH 8991</td>
<td>Independent Study. (1-6 cr. [max 24 cr.]; Student Option; Every Fall, Spring &amp; Summer)</td>
<td>Individually directed study. prereq: instr consent</td>
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<td>MATH 8992</td>
<td>Directed Reading. (1-6 cr. [max 24 cr.]; S-N or Audit; Every Fall &amp; Spring)</td>
<td>Individually directed reading. prereq: instr consent</td>
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<tr>
<td>MATH 8993</td>
<td>Directed Study. (1-6 cr. [max 24 cr.]; S-N or Audit; Every Spring)</td>
<td>Individually directed study. prereq: instr consent</td>
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<td>MATH 8994</td>
<td>Topics at the IMA. (1-3 cr. [max 6 cr.]; Student Option; Every Fall &amp; Spring)</td>
<td>Current research at IMA.</td>
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<td>MTHE 3101</td>
<td>Mathematics and Pedagogy for Elementary Teachers I. (3 cr.; A-F only; Every Fall, Spring &amp; Summer)</td>
<td>Math content knowledge of K-6 in an environment modeling pedagogy for future implementation. Integrated content/methods. Problem solving, connections, communication, reasoning, representation. Functions, proportionality, number, numerator, prereq. [College algebra, elementary FDE student, jr status or above] or instr consent</td>
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<tr>
<td>MTHE 3102</td>
<td>Mathematics and Pedagogy for Elementary Teachers II. (3 cr.; A-F only; Every Fall, Spring &amp; Summer)</td>
<td>Math content knowledge of K-6 in an environment modeling pedagogy for future implementation. Integrated content/methods. Problem solving, connections, communication, reasoning, representation. Geometry, measurement, probability, statistics. prereq: 3101, college algebra</td>
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<td>MTHE 5011</td>
<td>Arithmetic Structures in School Mathematics. (3 cr.; Student Option; Every Summer)</td>
<td>Pedagogy, content, and instructional strategies for teaching arithmetic. Content and issues relevant to the K-8 mathematics curriculum. Instructional materials and technology appropriate for elementary or middle school arithmetic. Credit hours and targeted level vary with particular classes, prereq: Enrollment in math initial licensure program or tchg exper</td>
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<tr>
<td>MTHE 5021</td>
<td>Algebraic Structures in School Mathematics. (3 cr.; Student Option; Every Fall)</td>
<td>Pedagogy, content, and instructional strategies for teaching arithmetic. Content and issues relevant to the algebra curriculum. Instructional materials and technology appropriate for arithmetic. Each offering of the course will focus on either elementary/middle or middle/secondary grade levels, prereq: Tchg exper or instr consent</td>
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<tr>
<td>MTHE 5031</td>
<td>Geometric Structures in School Mathematics. (3 cr.; Student Option; Every Spring)</td>
<td>Pedagogy, content, and instructional strategies for teaching school geometry. Content and issues relevant to the geometry curriculum. Instructional materials and technology appropriate for geometry. Each offering will focus on either elementary/middle or middle/secondary grade levels, prereq: Enrollment in math initial licensure program</td>
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<td>MTHE 5100</td>
<td>Topics in Mathematics Education. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring &amp; Summer)</td>
<td>Issues, materials, and instructional techniques focusing on a single current topic of particular relevance to secondary school and college mathematics teachers.</td>
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<td>MTHE 5115</td>
<td>Applications of Teaching Mathematics. (3 cr.; A-F only; Every Fall)</td>
<td>The purpose of this course is to examine mathematics teaching in diverse school settings and help you inquire and reflect about your own teaching practice and its impact on you, and the students you will meet. Throughout this course we will collaboratively inquire about teaching and learning, observe and analyze instruction, and reflect on your own and each other's teaching. We will develop and integrate technological knowledge that works together with pedagogical and content knowledge to make math teaching more effective, prereq: You must be enrolled in the Mathematics initial licensure program to take this course.</td>
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<td>MTHE 5155</td>
<td>Rational Number Concepts and Proportionality. (3 cr.; Student Option; Fall Even Year)</td>
<td>The relationship between the development of rational number concepts and proportional reasoning skills. Examination of how newer school curricula treat these concepts. Application of materials in the classroom and analysis of results. Reading and responding to current research, prereq: Educ student or instr consent</td>
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<td>MTHE 5171</td>
<td>Teaching Problem Solving. (3 cr.; Student Option; Periodic Spring &amp; Summer)</td>
<td>Investigation of fundamental concepts and principles of problem solving, reasoning, and proof. Emphasis on activities and applications appropriate for junior and senior high classes. Pedagogical experiences to prepare teachers to teach problem solving, reasoning, and proof in classrooms.</td>
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<tr>
<td>MTHE 5172</td>
<td>Teaching Probability and Statistics. (3 cr.; Student Option; Fall Odd Year)</td>
<td>Investigation of fundamental concepts and principles of probability and statistics. Emphasis on activities and applications appropriate for junior and senior high school classes. Pedagogical experiences to prepare teachers to integrate quantitative literacy accurately and effectively in classrooms.</td>
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<td>MTHE 5305</td>
<td>Middle School Mathematics Methods. (2 cr.; A-F only; Every Fall)</td>
<td>The unique needs of middle school students in the mathematics classroom. Mathematics content and pedagogical skills. Adolescent development/psychology. Field placement in a middle school mathematics classroom, prereq: Elem ed licensure student</td>
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<tr>
<td>MTHE 5314</td>
<td>Teaching and Learning Mathematics. (3 cr.; Student Option; Every Fall)</td>
<td>Methods, materials, and curriculum development. Principles of learning. Review</td>
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of research. Preparation/evaluation of tests, units, and materials of instruction. Recent developments in mathematics curriculum and in instructional alternatives. Issues in teaching/learning. Program planning/evaluation. prereq: Math Ed or MEd or CI MEd or grad student or instr consent

MTHE 5366. Technology-Assisted Mathematics Instruction. (3 cr.; Student Option; Every Spring) Technology—including computers, programmable and graphing calculators, and video—as instructional tools in mathematics; design and evaluation of technology-based mathematics lessons; the effect of technology on the mathematics curriculum; managing the technology-enriched classroom.

MTHE 5569. Student Teaching in Mathematics. (1-8 cr.; S-N only; Every Spring) Student teaching in secondary school mathematics classes. prereq: MEd/initial licensure student or instr consent

MTHE 5993. Directed Studies in Mathematics Education. (2 cr.; S-N or Audit; Every Fall, Spring & Summer) Secondary school classroom teaching project to improve specific teaching skills, planned by student, approved/directed by student’s adviser. prereq: Math ed MEd student, instr consent

MTHE 8561. School Mathematics Curricula - 1850 to Present. (1-3 cr.; A-F only; Every Fall) Historical antecedents of present day school mathematics curricula. Examine primary source materials by reviewing early mathematics texts from curriculum library.

MTHE 8571. Research in Mathematics Education. (3 cr.; Student Option; Periodic Fall) Designed for advanced graduate students in mathematics education. Presentation and discussion of Ph.D. thesis proposals and other contemporary research. prereq: 5531, 8501

MTHE 8591. Seminar: Mathematics Education. (1-3 cr.; Student Option; Fall Even Year) Problems in mathematics instruction from kindergarten through junior college; opportunity to develop proposals and design models for empirical research. prereq: Math educ PhD student

MTHE 8995. Problems: Mathematics Education. (1-6 cr.; maximum 18 cr.; Student Option; Every Fall, Spring & Summer) Students survey most recent literature and design and prepare research reports on special topics.

Mechanical Engineering (ME)

ME 2011. Introduction to Engineering. (4 cr.; A-F or Audit; Every Fall) Skills critical for practicing engineers. Mechanical engineering, engineering design. Visual, written, and oral communication forms. Computer-based design tools. Substantial design projects, including prototype construction. prereq: CSE lower div

ME 3041. Industrial Assignment I. (2 cr.; A-F only; Every Fall, Spring & Summer) Industrial work assignment in engineering intern program. Evaluation based on student’s formal written report covering the quarter’s work assignment. prereq: ME upper div, enrolled in ME co-op program

ME 3080. Topics in Mechanical Engineering. (1-4 cr.; max 16 cr.; Student Option; Periodic Fall & Spring) Specialized topics within various areas of mechanical engineering. Topics vary each semester. prereq: dept consent


ME 3222. Mechanisms & Machine Design. (4 cr.; A-F or Audit; Every Fall, Spring & Summer) Selection of standard mechanical components such as bearings, gears, and fasteners. Analysis and synthesis of motion in machines. Displacement, velocity, and acceleration of mechanisms. Machine design project: Apply lecture topics to develop new machines that fulfill customer specifications. prereq: [3221 or concurrent registration is required (or allowed)] in 3221. [CSci 1113 or equiv]

ME 3281. System Dynamics and Control. (4 cr.; A-F or Audit; Every Fall, Spring & Summer) Dynamics of mechanical, electrical, thermal, fluid, and hybrid systems. System response using Laplace transform and numerical integration. Fourier transform and convolution. Transfer functions and frequency response. Introduction to classical control. prereq: AEM 2021, [Math 2243 or Math 2373], ME upper div


ME 3331. Thermodynamics. (3 cr.; A-F only; Every Fall, Spring & Summer) Properties, equations of state, processes, cycles for reversible and irreversible thermodynamic systems. Modes of energy transfer. Equations for conservation of mass, energy, entropy balances. Application of thermodynamic principles to modern engineering systems. prereq: Chem 1061, Chem 1065, Phys 1301

ME 3332. Fluid Mechanics. (3 cr.; A-F only; Every Fall, Spring & Summer) Mass, momentum conservation principles. Fluid statics, Bernoulli equation. Control volume analysis, dimensional analysis, internal and external viscous flow. Momentum and energy considerations. Introduction to boundary layers. prereq: Math 2243 or Math 2373, 3331

ME 3333. Heat Transfer. (3 cr.; A-F only; Every Fall, Spring & Summer) Mechanisms of heat transfer. Conduction, convection, radiation. Boundary layer analysis using momentum and energy equations. Applications such as fins, heat exchangers, electronics cooling, bioheat transfer, energy conversion technologies, phase change energy storage and boiling. prereq: 3332

ME 3990. Curricular Practical Training. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Industrial work assignment involving advanced mechanical engineering technology. Reviewed by faculty member. Final report covering work assignment. prereq: ME major

ME 4031W. Basic Mechanical Measurements Laboratory. (WI; 4 cr.; A-F or Audit; Every Fall, Spring & Summer) Experimental methods, statistical estimates of experimental uncertainty, calibration, signal conditioning, selected transducers for mechanical measurements, data acquisition/processing. Temperature, pressure, humidity, strain-stress, force, velocity, flow/radiative properties. prereq: IE 4521, upper div ME

ME 4043W. Industrial Assignment II. (WI; 4 cr.; A-F only; Every Fall, Spring & Summer) Solution of system design problems that require developing criteria, evaluating alternatives, and generating a preliminary design. Final report emphasizes design communication and describes design decision process, analysis, and final recommendations. prereq: 3041

ME 4044. Industrial Assignment III. (2 cr.; A-F only; Every Fall, Spring & Summer) Industrial work assignment in engineering co-op program. Evaluation based on student’s formal written report covering semester work assignment. prereq: ME upper div, registration in ME co-op program

ME 4053. Mechanical Engineering Modeling. (4 cr.; Student Option; Every Fall & Spring) This course is aimed at teaching undergraduate students mechanical engineering modeling, technical analysis and technical design capabilities from a non-compartmentalized perspective. The course focuses on, (i) modeling complex, multi-disciplinary mechanical engineering problems by identifying critical elements of a problem, (ii) design and development of analysis tools using analytical and numerical techniques and (iii) developing optimized solutions/designs to problems/challenges. PREREQ: ME 3221, ME 3222, ME 3281, ME 3331, ME 3332, ME 3333

ME 4054W. Design Projects. (WI; 4 cr.; A-F or Audit; Every Fall, Spring & Summer) Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
and zeros; transient responses; Nyquist and Bode diagrams; root locus; lead-lag and PID compensators, Nichols-Ziegler design method. Digital implementation aliasing; computer-aided design and analysis of control system. prereq: 3281

ME 5286. Robotics. (4 cr.; A-F or Audit; Every Spring) The course deals with two major components: robot manipulators (more commonly known as the robot arm) and image processing. Lecture topics covered under robot manipulators include their forward and inverse kinematics, the mathematics of homogeneous transformations and coordinate frames, the Jacobian and velocity control, task programming, computational issues related to robot control, determining path trajectories, reaction forces, manipulator dynamics and control. Topics under computer vision include: image sensors, digitization, preprocessing, thresholding, edge detection, segmentation, feature extraction, and classification techniques. A weekly 2 hr. laboratory lasting for 8-9 weeks, will provide students with practical experience using and programming robots; students will work in pairs and perform a series of experiments using a collaborative robot. prereq: [3281 or equiv.]


ME 5322. New Product Design and Business Development I. (4 cr.; A-F or Audit; Every Fall) Students and faculty work with company representatives to develop a product concept, a working physical prototype, and an extensive business plan. Concept design, detail design, manufacturing, marketing, introduction strategy, and profit forecasting. Sponsoring company intends to bring product to market. Must be taken in sequence with 8221 the same year. prereq: CSE grad student, some design experience

ME 5446. Introduction to Combustion. (4 cr.; A-F or Audit; Every Fall) Thermodynamics, kinetics, energy and mass transport, pollutants in reacting systems. Reactors, laminar and turbulent flames. Ignition, quenching, and flame stability. Diffusion flames. Combustion in reciprocating engines, furnaces, and turbines, with emphasis on internal combustion engine performance and emissions. prereq: 3331, 3332, 3333, CSE upper div or grad student

ME 5462. Gas Turbines. (4 cr.; A-F or Audit; Periodic Fall & Spring) Gas turbine cycles, regeneration, recuperation, reheat, intercooling, combined cycle plants, and thermochemical regeneration. Axial and radial flow compressors and turbines; combustor designs, energy analysis, emissions, and noise. Turbojet, fanjet, turboprop engine performance. Stationary power plants, vehicular propulsion, hybrid vehicles. prereq: 3331, 3332, 3333, CSE upper div or grad student

ME 5666. Modern Thermodynamics. (4 cr.; A-F only; Every Fall & Spring) Applications of thermodynamics to natural phenomena. Multiscale approach. Student group projects, with undergrads and grad students in same group. Three hours/week classroom instruction, one hour/week project discussion. Project presentations at weeks 8 and 14 are webcast. prereq: 3331 or equiv

ME 8228. Finite Element Methods for Computational Mechanics: Transient/Dynamic Problems. (4 cr.; A-F or Audit; Every Spring) Computational mechanics involving transient or dynamic situations; development and analysis of computational algorithms. Stability and accuracy of algorithms, convergence issues; linear/nonlinear situations. Implicit, explicit, mixed, and variable time discretization approaches; modal-based methods for engineering problems prereq: 5228 or equiv, 5341, AEM 3031, CSci 1113


Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
ME 8254. Fundamentals of Microelectromechanical Systems (MEMS). (4 cr.; A-F only; Every Spring) Major classes, components, and applications of MEMS. Principles behind operation of MEMS devices/ systems. Standard microfabrication techniques. Unique requirements, environments, and applications of MEMS. Students apply microfabrication techniques/applications to design/manufacture of a MEMS device or microsystem.

ME 8255. Introduction to Nanotechnology. (3 cr.; A-F or Audit; Every Fall) This course covers a broad range of subjects introducing students to the science and technology of nanoscale materials. This includes from fundamental principles, to synthesizing and characterizing nanomaterials, to incorporating them into advanced manufacturing processes and hybrid nano-bio systems. Indeed, establishing a critical scientific understanding of properties at the nanoscale will ultimately enable a variety of next-generation devices. The focus of this course thus is on the fundamental techniques necessary for investigations at small dimensions, and the very latest research developments in this rapidly evolving field.

ME 8262. Topics in Modeling and Analysis of Manufacturing Processes. (4 cr.; max. 12 cr.; 4 cr.; A-F or Audit; Periodic Fall & Spring) Advanced topics in Manufacturing. Analytical/numerical modeling of manufacturing processes. Use of computer-based modeling tools and computer controlled manufacturing machines. Comparison of predictions/measurements of process variables and part characteristics. Part production/testing. Processes, technologies, and topics vary with each offering. prereq: 3221, AEM 3016


ME 8283. Design of Mechatronic Products. (4 cr.; A-F or Audit; Fall Odd Year) The purpose of this course is for advanced mechanical engineering students to gain additional mechatronic skills by learning how to use microcontrollers to implement control systems in the context of a practical product or device. Embedded microcontrollers are ubiquitous in modern products from washing machines to cell phones to automobiles to space rockets. Knowing how to design and program microcontrollers, how to interface microcontrollers to sensors and actuators, and how to implement control algorithms on a microcontroller is an important skill for the modern control system design engineer. The course is hands-on and follows a learn-by-doing approach. Students spend 1/3 the course in a microcontroller boot camp and 2/3 on a substantial microcontroller project. The lectures cover didactic material related to microcontrollers, sensors, actuators, electronics circuit design and fabrication and control algorithm implementation. prereq: An introductory system dynamics and controls course or permission of instructor.

ME 8285. Advanced Control System Design, with Applications to Smart Vehicles. (3 cr.; A-F or Audit; Every Fall) This course focuses on a study of several advanced control design techniques and their applications to smart vehicles. The control system topics studied include lead and lag compensator design, loop shaping, analysis of system norms, H2-optimal control, feedback linearization, sliding surface control, and observer design. The vehicle application topics studied include cruise control, adaptive cruise control, automated lane keeping, automated highway systems, yaw stability control, active rollover prevention, engine control, and active and semi-active suspensions. In each application, a dynamic model is first developed that is simple enough for control system design, but at the same time, rich enough for capturing the essential features of the dynamics. The control design for each application is studied in-depth during lecture and further analyzed during hands-on homework. prereq: 5281 or EE 5231 or equiv

ME 8287. Topics in Dynamics and Control. (2-4 cr.; max. 12 cr.; A-F or Audit; Periodic Fall & Spring) Topics Course in Dynamics and Control

ME 8332. Advanced Fluid Dynamics in Mechanical Engineering. (3 cr.; A-F or Audit; Every Spring) Advanced fluid dynamics course addressing the theory and applications of fluid flows pertinent to mechanical engineering. The course focuses on the physical phenomena, mathematical formulations, and advanced problem-solving techniques for flows ranging from microscale flows to turbulence, with examples from mechanical engineering practice. Prerequisite an intermediate fluid mechanics course or permission of instructor.

ME 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

ME 8337. Experimental Methods in the Thermal Sciences. (3 cr.; A-F or Audit; Periodic Fall) The course will provide fundamentals on optics theory and optical instruments for students to understand and implement cutting-edge optical diagnostic tools, and to design optical methods for measurements in fluid and thermal sciences. The course will cover commonly used optical measurement techniques including particle image velocimetry, laser induced fluorescence, Schlieren photography, and digital holography.

ME 8341. Conduction. (3 cr.; A-F or Audit; Every Fall) Advanced understanding/application of conduction/diffusion to heat/mass transfer problems. Solving ordinary/partial differential equations related to physics of diffusion. Special topics in numerical microscale heat transfer. prereq: Undergrad class in heat transfer or instr consent

ME 8342. Convection. (3 cr.; A-F or Audit; Every Spring) Heat transfer in fluids flowing around bodies and in tubes/ducts. Forced/natural convection. Laminar/turbulent flow regimes. Turbulent transport and modeling. High-speed flows, viscous dissipation, variable property effects. Application to heat exchange devices. Conective mass transfer. Grad level course on fundamentals of fluid mechanics that has a substantial component on viscous flows or instr consent


ME 8362. Introduction to Plasma Technology. (3 cr.; A-F or Audit; Periodic Spring)

ME 8381. Bioheat and Mass Transfer. (3 cr.; Student Option; Periodic Summer) Analytical/numerical tools to analyze heat/mass transfer phenomenon in cryobiological, hyperthermic, other biomedically relevant applications. prereq: CSE grad student, upper-division transport/fluids course; [physics, biology] recommended

ME 8390. Advanced Topics in the Thermal Sciences. (1-3 cr.; max 18 cr.; A-F or Audit; Every Spring) Topics vary according to instructor.

ME 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

ME 8446. Advanced Combustion. (3 cr.; A-F or Audit; Periodic Fall) Fundamental understanding of linkage between thermodynamics, chemical kinetics, and transport phenomena in combustion systems. Heat release rate, flame stability, and emissions. How those issues arise in furnaces, internal combustion engines, and rockets. prereq: Undergrad courses in thermodynamics, fluid mechanics, heat transfer, IT grad student; 5446 or 8641 highly recommended

ME 8462. Turbomachinery. (3 cr.; A-F or Audit; Periodic Summer) Thermodynamic analysis of energy transfer between fluid and rotor; dimensional analysis; principles of axial, mixed, and radial flow pumps, fans, compressors, and turbines; cascade performance; computer flow simulations; applications to propulsion systems and power plants. prereq: CSE grad student, 3321, 3322 or equiv or instr consent

ME 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

ME 8772. Advanced Transportation Technologies Seminar. (1 cr.; S-N or Audit; Every Fall) Advanced technologies specifically related to transportation. Topics draw from core science/technology areas of human factors, intelligent vehicles, traffic modeling/management, sensing, communications, and controls.

ME 8773. Graduate Seminar. (1 cr.; S-N or Audit; Every Fall & Spring) Recent developments. prereq: CSE grad student

ME 8774. Graduate Seminar. (1 cr.; S-N or Audit; Every Fall & Spring)
MDI 5013. Medical Device Center Practicum I. (2 cr.; A-F only; Every Fall, Spring & Summer) First of three part series of practicum courses for MDI program. Focus on teaching innovation steps/process using known/pre-assigned clinical needs as examples in collaboration with Medical Device Center. Essential steps in BioDesign process. Apply knowledge to specific real-world examples. prereq: Grad MDI student

MDI 5014. Medical Device Center Practicum II. (2 cr.; A-F only; Every Fall, Spring & Summer) Second of three part series of practicum courses for MDI program. Clinical environment, including research tools/methods, filtering/ translating needs, ideation/prototype development, communication with functional managers, corporate executives/investors. prereq: Grad MDI student

MDI 5015. Medical Device Center Practicum III. (2 cr.; A-F only; Every Spring) Medical Device Innovation Practicum III is the third of a three part series. Students will gain a high-level understanding of essential steps in the BioDesign process related to ideation. The steps of the ideation process will include brainstorming and prototyping of potential solutions, risk assessment, and business strategy development. Students will prepare and present a technical evaluation that articulates the value of their new technology or device to functional managers, corporate executives, and/or investors. prereq: Grad MDI student

MDI 5020. Medical Device Innovation Capstone. (1-2 cr.; A-F only; Every Spring & Summer) The MDI capstone is an independent, original, and applied investigation on a relevant subject, problem, or issue in areas of medical device technologies, policy, business, and innovation. All students in the MDI program are required to complete a capstone project as part of the program. Registration is open to MDI students only.

MDI 5050. Interpersonal & Team Effectiveness. (1 cr.; A-F only; Every Summer) MDI 5050 builds the context and capability innovation leaders need to manage effective interpersonal relationships and develop high performance teams. Emphasis is placed on foundational principles and practices that help leaders self-manage, engage and influence key stakeholders, and generate shared commitment for team and project success. Students will increase their self-awareness through self and peer feedback and develop an action plan to enhance their leadership effectiveness in both their current work role and their MDI practicum teams. prereq: Grad MDI student

MDI 5051. Leading Innovation & Change. (1 cr.; A-F only; Every Fall) MDI 5051 explores the role and differentiating capabilities of outstanding innovation leaders in complex and dynamic environments. Emphasis is placed on principles and practices that help leaders focus on the right strategies, build the organizational capability required to execute a strategy, lead change initiatives and sustain commitment versus compliance among diverse stakeholders. Students will practice improving their team effectiveness and develop a change leadership plan to support implementation of either a current work initiative or their upcoming Capstone Project. prereq: Grad MDI Student and completion of MDI 5050.

MDI 5060. MDI Independent Study. (1-3 cr.; A-F only; Periodic Fall, Spring & Summer) Independent study in MDI-related topic. prereq: MDI grad student

Medical Industry Leadership Inst (MILI)

MILI 5585. The Healthcare Marketplace. (2 cr. [max 3 cr.]; A-F only; Every Fall & Spring) The healthcare marketplace constitutes nearly three trillion dollars in the United States and several trillion spent throughout the world. With growing demand for medical technology and the aging of the population, the scale and complexity of the healthcare supply chain is expected to dramatically increase over the next two decades. The healthcare sector is comprised of several markets for goods and services, including physician services, hospital services, insurance, pharmaceuticals and medical devices, and information technology. This course aims to provide a survey of the health sector to understand the scale, market opportunities, as well as barriers to this expanding and global industry.

MILI 5589. Medical Technology Evaluation and Market Research. (2 cr.; A-F only; Every Spring) Hands-on experience in creating a value proposition for new medical technologies. Leadership pathways in medical technology, insurance, and delivery industries. Personal input from industry leaders United Health Group, Medtronic, and Mayo Clinic. prereq: MBA student

MILI 5595. Medical Industry Valuation Laboratory. (2 cr.; A-F only; Every Fall, Spring & Summer) Interdisciplinary student teams create rapid production market analysis of promising medical technologies/services to determine potential for success in market. Exposure to University innovations, venture firms, inventors. prereq: instr consent

MILI 5999. Independent Study. (1-8 cr. [max 16 cr.]; A-F only; Every Fall, Spring & Summer) Independent study.

MILI 6235. Pharmaceutical Industry: Business and Policy. (2 cr.; A-F only; Every Spring) Business/policy issues specific to pharmaceutical industry. Interdisciplinary perspectives, active involvement by industry leaders.

MILI 6421. Healthcare Law: Strategic and Business Implications. (2 cr.; A-F only; Every Fall) This course will survey fundamental healthcare laws that apply to a wide variety of healthcare businesses, and will examine their impact on business strategy and operations. The goal is to enable current and prospective managers and leaders in the healthcare space to understand compliance requirements and how healthcare law impacts business strategy and decisions. In the end, healthcare law can be a competitive advantage. In addition, the course will address key current healthcare policy challenges and how these impact business environment and strategy.

This course will survey fundamental healthcare laws that apply to a wide variety of healthcare businesses, and will examine their impact on business strategy and operations. The goal is to enable current and prospective managers and leaders in the healthcare space to understand compliance requirements and how healthcare law impacts business strategy and decisions. In the end, healthcare law can be a competitive advantage. In addition, the course will address key current healthcare policy challenges and how these impact business environment and strategy.

MILI 6562. Information Technology in Health Care. (2 cr.; A-F only; Every Fall) Theoretical/conceptual base for health care information technology. Applications of current/developing health IT. Approaches to evaluate effectiveness of health IT systems. Information technology, computer technology, and data structures commonly found in health care information systems. System design/evaluation. prereq: MBA student

MILI 6589. Medical Technology Evaluation and Market Research. (2 cr.; A-F only; Every Spring) Hands-on experience in creating a value proposition for new medical technologies. Leadership pathways in medical technology, insurance, and delivery industries. Personal input from industry leaders United Health Group, Medtronic, and Mayo Clinic. prereq: MBA student

MILI 6726. Medical Device Industry: Business and Public Policy. (2 cr.; A-F only; Every Fall) This course, with the insight of industry leaders, addresses public-private sector intersections and the business, public policy, regulatory, and technology management issues that concern medical device and biotechnology companies.

MILI 6963. Healthcare Analytics. (2 cr.; A-F only; Every Spring) This course prepares students to analyze large health care databases with a focus on advanced applications with health insurance claims data. The course is designed to be a STEM offering with the use of statistical programming languages including R, Tableau and SAS. This course is designed to appeal to students with an interest in developing data science as core skill and already have knowledge of some programming tools, and experience with data manipulation in Excel, SQL or Access.

MILI 6990. The Health Care Marketplace. (2 cr.; A-F only; Every Fall & Spring) Survey of trillion dollar medical industry. Physician/hospital services, insurance, pharmaceuticals, medical devices, information technology. Scale, interactions, inter-relationships, market opportunities, barriers. prereq: MBA student

MILI 6991. Anatomy and Physiology for Managers. (2 cr.; A-F only; Every Spring) Overview of medical vocabulary/physiology of major body systems. Understanding current clinical practice. Market opportunities of major body systems, Medical technology innovation.

MILI 6995. Medical Industry Valuation Laboratory. (2 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Interdisciplinary student teams create rapid production market analysis of promising medical technologies/services to determine potential for success in market. Exposure to University innovations, venture firms, inventors. preq: Grad student

MILI 6996. Medical Industry Valuation Laboratory II. (2-4 cr. [max 10 cr.]; A-F only; Every Fall & Spring) Interdisciplinary student teams create rapid production market analysis of promising medical technologies/services to determine potential for success in market. Exposure to University innovations, venture firms, inventors. preq: Approved application

MILI 6997. MILI Global Valuation Lab. (4 cr. [max 12 cr.]; A-F only; Periodic Summer) Global version of medical industry leadership institute valuation lab. Assess value of proprietary inventions.

MILI 6998. MILI Fellows. (0-2 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Fellows will apply the knowledge they have acquired in the MILI Valuation Lab course to assess the commercial viability of innovations developed by the Medical Device Center’s Innovation Fellows.

MILI 6999. Independent Study. (0-8 cr. [max 16 cr.]; A-F only; Every Fall, Spring & Summer) Independent study.

Medical Laboratory Sciences Pr (MLSP)

MLSP 1010. Introduction to Medical Laboratory Science. (1 cr.; S-N only; Every Fall, Spring & Summer) Introduction to medical laboratory sciences. Primary disciplines in field/areas of specialty practice. Career pathways explored in hospital laboratories, public health, research.

MLSP 5011W. Professional Issues in the Health Care Community. (WI; 2 cr.; A-F only; Every Fall & Spring) Current literature and written discussion to explore the laboratory profession: healthcare systems, professional scope of practice, regulatory and licensure issues, medical ethics, Interprofessional practice models and current topics impacting health care delivery. Focus is on the medical laboratory’s crucial role in patient care.

MLSP 5012. Foundations in Interprofessional Communication and Collaboration. (1 cr.; A-F only; Every Fall) Interprofessional approach to health care. Online discussion topics. Directed group activities. Personal/professional image, teamwork, self/peer assessment, health professions, professional identity and integrity, relationships between professions and those they serve. Introduction to basic education theory, instructional design for laboratory practitioners. preq: Admission into MLS Program

MLSP 5013. Scholarly Inquiry and Analysis in Medical Laboratory Sciences. (1 cr.; A-F only; Every Fall & Summer) Review concepts of scientific inquiry. Major steps of research project. How to select topics, evaluate literature, and construct and test working hypothesis. Analyze and interpret data, report results. Quantitative, qualitative, and mixed methods research designs.

MLSP 5014W. Laboratory Operations and Management in Health Care Systems. (WI; 2 cr.; A-F only; Every Fall & Summer) Theory/practice of fiscal/personnel management for laboratory professionals. Includes introduction to laboratory information systems, legal aspects of test reporting. Government regulatory, certification, licensure, medical ethics of health care, accreditation policies. preq: Admission into MLS program or instr consent

MLSP 5111. Concepts of Diagnostic Microbiology. (3 cr.; A-F only; Every Fall) Presentation of medically significant human bacterial and yeast diseases. Epidemiology, physiology, and pathogenic interactions between man and microorganism. Laboratory regulations, morphological characteristics, laboratory testing, and mechanisms of antimicrobial therapy and resistance. preq: [MICB 3301 or equivalent], [BIOL 3021 Biochemistry or equivalent] or instr consent

MLSP 5112. Application of Diagnostic Microbiology Principles. (2 cr.; A-F only; Every Fall) Application in identification and treatment of microorganisms causing human diseases. Emphasis on aerobic and anaerobic bacteria, mycobacteria, and yeast from various body sites. Specimen processing, culture workup, conventional microscopy, and molecular and immunological techniques.

MLSP 5113. Advanced Concepts in Diagnostic Microbiology. (3 cr.; A-F only; Every Spring) Physiology and pathogenic interactions between man and microorganism. Epidemiology, prevention, recovery, conventional, immunological, molecular identification, and methods and treatment of microorganisms involved in human diseases. preq: 5111 or instr consent

MLSP 5211. Fundamentals in Hematology and Hemostasis. (3 cr.; A-F only; Every Fall) Anatomy and physiology of hematopoietic and coagulation systems. Basic blood cell morphology and common hematology and hemostasis tests. Clinical implications for health and disease. preq: PHLS 3051 or instr consent

MLSP 5212. Application of Hematology & Hemostasis Principles. (1 cr.; A-F only; Every Fall) Theory, performance, and application of common hematologic and hemostatic diagnostic procedures. Interpretation and correlation of laboratory findings. Venipuncture, cell counting, white blood cell differential, red and white blood cell morphology interpretation, and coagulation studies. preq; concurrent registration is required (or allowed) in 5211

MLSP 5213. Diagnostic Hematology. (3 cr.; A-F only; Every Spring) Blood and bone marrow in assessment of hematologic function and disease. Major focus on normal development and differentiation, abnormal changes found in disease. Cytochemical stains, flow cytometry, cytogentic, molecular diagnostics. preq: 5211, 5212 or instr consent

MLSP 5214. Advanced Hematology Morphology. (1 cr.; A-F only; Every Spring) Blood and bone marrow in assessment of hematologic function and presence of disease. Major focus on normal development and differentiation, abnormal changes in pathologic conditions. Cytochemical stains, flow cytometry, cytogentic, molecular diagnostics. preq: 5211, 5212, concurrent registration is required (or allowed) in 5213 or instr consent

MLSP 5311. Fundamental Biomedical Laboratory Techniques. (4 cr.; A-F only; Every Spring & Summer) Principles of good laboratory practice, experimental design/standard operating procedures, laboratory technical skills, safety, process control. Analytical techniques include colorimetry, chromatography, electrochemical, immunologic, nucleic acid techniques. preq: 6 credits General Chemistry, 6 credits Organic Chemistry, 3 credits Biochemistry

MLSP 5312. Body Fluid Analysis. (2 cr.; A-F only; Every Spring) Formation of urine and body fluids, changes that occur in disease, testing used for diagnosis and treatment. Correlation of test results with clinical information discussed. Laboratory skills in body fluid analysis introduced. preq: 8 credits General Chemistry, 6 credits Organic Chemistry, 3 credits Biochemistry, Successful completion of MLSP 5311 with grade of C or higher

MLSP 5313. Chemical Analysis in Health and Disease. (3 cr.; A-F only; Every Fall) Pathophysiology of organ systems and metabolic disorders. Liver, heart, kidney, lungs, diabetes. Health and disease states evaluated in context of clinical chemistry. preq: 8 credits General Chemistry, 6 credits Organic Chemistry, 3 credits Biochemistry

MLSP 5511. Principles of Immunobiology. (3 cr.; A-F only; Every Fall & Summer) Immune system function, immunologic and serologic testing. Immunologic techniques utilized in various clinical laboratory settings. preq: PHLS 3051 or instr consent

MLSP 5513. Transfusion Medicine Principles and Methods. (3 cr.; A-F only; Every Spring) Didactic material covering genetics, detection, significance of human blood group antigens
and antibodies. Donor and compatibility testing. Component therapy, transfusion reactions. Hemolytic disease of fetus and newborn. Immune hemolytic anemias. Qualify systems. Alternate technologies. prereq: [5511, upper level genetics course] instr consent

MLSP 5514. Application of Transfusion Medicine Principles. (2 cr.; A-F only; Every Spring)

MLSP 5701. Clinical Experience in Microbiology. (2 cr.; S-N only; Every Fall, Spring & Summer)
Gain practical experience, apply technical competencies learned on campus to microbiology laboratory. Develop entry-level competencies and assist in making transition to clinical practitioner. Guided by clinical preceptors and university faculty. prereq: Advanced standing in MLS program

MLSP 5702. Clinical Experience in Hematology and Hemostasis. (2 cr.; S-N only; Every Fall, Spring & Summer)
Gain practical experience and apply technical competencies learned on campus to hematology laboratory. Designed to develop entry-level competencies and assist in making transition to clinical practitioner. Course guided by clinical preceptors and university faculty. prereq: Advanced standing in MLS program

MLSP 5703. Clinical Experience in Clinical Chemistry and Urinalysis. (2 cr.; S-N only; Every Fall, Spring & Summer)
Gain practical experience and apply technical competencies learned on campus to Chemistry laboratory. Designed to develop entry-level competencies and assist in making transition to clinical practitioner. Course guided by clinical preceptors and university faculty. prereq: Advanced standing in MLS program

MLSP 5704. Clinical Experience in Transfusion Medicine. (2 cr.; S-N only; Every Fall, Spring & Summer)
Gain practical experience and apply technical competencies learned on campus to transfusion medicine lab. Designed to develop entry-level competencies and assist in making transition to clinical practitioner. Course guided by clinical preceptors and university faculty. prereq: Advanced standing in MLS program

MLSP 5801. Advanced Practicum Experience in Specialty Disciplines. (1 cr.; S-N only; Every Fall, Spring & Summer)
Advanced practicum experience. Restricted enrollment. Students can select variety of specialty sub-disciplines of MLS including cytogenetics, flow cytometry, molecular diagnostics, toxicology, virology, education, management, research, public health, bone marrow tissue transplantation. prereq: Advanced standing in MLS program

MLSP 6024. Advanced Laboratory Operations and Management. (3 cr.; A-F only; Every Fall, Spring & Summer)
Principles of quality management, process improvement in laboratory and health care systems. Project based application of human resources and financial management, informatics, leadership, marketing and quality improvement. Includes professional development, ethics, and strategic planning.

MLSP 6111. Concepts in Diagnostic Microbiology. (3 cr.; A-F only; Every Fall)
Presentation of medically significant bacteria and yeast - normal and pathogenic flora in the human body. Includes clinical presentation, pathophysiology, medical diagnosis, laboratory regulations, morphological characteristics, laboratory testing, and mechanisms of antimicrobial therapy and resistance. Case study and journal discussions.

MLSP 6113. Advanced Diagnostic Microbiology. (3 cr.; A-F only; Every Spring)
Epidemiology, prevention, recovery, conventional, immunological, molecular identification, and methods and treatment of microorganisms involved in human disease. Emphasis on fungal, parasitic, and viral diseases including specimen processing, detection, identification, and therapy. Case studies and journal reviews included.

MLSP 6211. Advanced Principles in Hematology and Hemostasis. (3 cr.; A-F only; Every Fall)
This course introduces anatomy and physiology of the hematopoietic and coagulation systems including basic blood cell morphology, common hematology and hemostasis tests, non-malignant alterations and their etiologies, current therapeutic regimens, and their clinical implications for health and disease.

MLSP 6213. Advanced Diagnostic Hematology. (3 cr.; A-F only; Every Spring)
This course explores blood and bone marrow in the assessment of hematologic function and disease. Major focus is on normal development and differentiation and abnormal changes found in disease. Cytochemical stains, flow cytometry, cytogenetics, and molecular diagnostics, along with their clinical implications for health and disease are discussed.

MLSP 6313. Advanced Chemical Analysis in Health and Disease. (3 cr.; A-F only; Every Fall)
Pathophysiology of organ systems and metabolic disorders. Liver, heart, kidney, lungs, and diabetes. Advanced concepts in special chemistry, laboratory methods, quality assurance and clinical chemistry research will be discussed.

MLSP 6401. Fundamentals of Molecular Diagnostics. (3 cr.; A-F only; Every Fall)
Fundamental concepts of molecular science as it relates to molecular diagnostics. Principles of molecular technologies used for diagnostic purposes. Students will be introduced to the unique operation considerations applicable to molecular diagnostic methods and laboratories including design, quality assurance and regulatory issues.

MLSP 6402. Application of Molecular Diagnostics Techniques. (2 cr.; A-F only; Every Fall, Spring & Summer)
Fundamental techniques in molecular science related to molecular diagnostics. Principles of molecular technologies used for diagnostic purposes and obtain the technical skills to perform those techniques. Unique operational considerations applicable to a molecular diagnostics laboratory including design, quality assurance and regulatory issues.

MLSP 6410. Diagnostic Molecular Science Laboratory. (2 cr.; A-F only; Every Fall, Spring & Summer)
This course presents the role of genetics in medicine and related molecular testing methodologies, and highlights the importance of genetics by linking disease diagnosis, prognosis, prevention and treatment with molecular testing applications. Specimen procurement, patient education, quality assurance, ethics and consent are discussed.

MLSP 6411. Diagnostic Molecular Science Laboratory. (2 cr.; A-F only; Every Fall, Spring & Summer)
Presentation of the role of genetics in medicine with emphasis on related molecular testing methodologies. Addresses performance of laboratory techniques in genetics, cancer medicine and microbiology. Focus on topics unique to molecular diagnostics in specimen procurement, patient education, quality assurance, ethics and consent.

MLSP 6413. Advanced Principles in Transfusion Medicine. (3 cr.; A-F only; Every Spring)
Topics covered in this course include detection of human blood group antigens, donor selection, hemolytic diseases, platelet and granulocyte immunology and stem cell transplantation. Application of quality assurance, process controls, alternate technologies and molecular techniques to the practice of transfusion medicine will be discussed.

MLSP 6610. Integrated Concepts in Medical Laboratory Science. (3 cr.; A-F only; Every Fall, Spring & Summer)
Interpretation of routine laboratory testing ordered for patient care. Case study discussions, reference ranges and common laboratory tests performed for health assessment, diabetes, cholesterol, anemia, urinalysis, cardiac function, blood typing, common infections and more. Course supports preparation for the Board of Certification exam.

MLSP 6620. Advanced Concepts in Medical Laboratory Science. (3 cr.; A-F only; Every Fall, Spring & Summer)
Case studies and journal exploration of advanced diagnostic testing, method development and validation, pathophysiology, and future directions of the field of laboratory medicine. Relationships among research, theory/theoretical formulations, and practice.

MLSP 6801. Advanced Practicum in Medical Laboratory Science. (2 cr. [max 6 cr.]; S-N only; Every Fall, Spring & Summer)
Advanced practicum experience. Students can select variety of specially sub-disciplines of MLS including cytogenetics, flow cytometry, molecular diagnostics, toxicology, virology, education, management, research, public health, bone marrow tissue transplantation.

MLSP 6905. Research Methods and Capstone Project. (3 cr.; A-F only; Every Fall, Spring & Summer)
Overview of important concepts of research design, data collection, statistical and interpretative analysis, and final report presentation. The course will develop ability to use the following tasks: Development of a hypothesis, outlining the research problem, related questions, quantitative, qualitative, and mixed methods designs.

Medical Physics (MPHY)

MPHY 5040. Introduction to Medical Physics. (3 cr.; A-F only; Every Spring)
Interactions and energy deposition by ionizing radiation in matter; medical imaging; radiation therapy physics and related safety topics.

MPHY 5138. Research Seminar. (1-5 cr.; S-N or Audit; Every Fall)

MPHY 5139. Seminar and Journal Club. (1 cr.; max 2 cr.; S-N or Audit; Every Spring)
Current research/topics related to goals/methods of biophysical sciences and medical physics. Lectures/discussions.

MPHY 5160. Advanced Radiation Physics and Dosimetry. (3 cr.; A-F only; Every Fall)
Interactions and energy deposition by ionizing radiation in matter; concepts, quantities and units in radiological physics; principles and methods of radiation dosimetry.

MPHY 5170. Basic Radiological Physics. (3 cr.; Student Option; Every Fall)
Theoretical/experimental aspects of radiological physics. Physical properties of various ionizing radiations, interactions of ionizing radiations with matter, methods of radiation dose measurement. prereq: instr consent

MPHY 5171. Medical and Health Physics of Imaging I. (3 cr.; Student Option; Every Fall)
Physics of diagnostic imaging: specification/quantification of image quality, X-ray production, image receptors, magnetic resonance imaging, radiation exposure and protection. Special imaging techniques, including mammography, computed tomography, and direct digital image capture. prereq: 5170 or instr consent

MPHY 5172. Radiation Biology. (3 cr.; Student Option; Every Fall & Spring)
effects of ionizing radiation on cells, tissues, and organisms. Biochemical/physiological bases of radiation effects. Biological rationale for radiation therapy practices. prereq: 5170 or instr consent

MPHY 5173. Medical and Health Physics of Radiation Therapy. (3 cr.; Student Option; Every Spring)
Measurements of radiation quality, output, and depth dose distributions for clinical use. Treatment parameter calculation. Beam modification and shaping. Treatment planning for fixed field and rotational therapy external beam, intracavitary, and interstitial therapy. Computer applications in treatment planning. Principles/criteria for radiation protection. prereq: 5170 or instr consent

MPHY 5174. Medical and Health Physics of Imaging II. (3 cr.; Student Option; Every Spring)
Physics of diagnostic imaging. Ultrasound, theoretical/experimental applications of radionuclides in medicine and biology. Counting statistics and imaging systems associated with radiopharmaceuticals, radiation dosimetry, and safety in nuclear medicine. prereq: 5170 or instr consent

MPHY 5177. Radiation Therapy Physics Lab: Radiation Physics Basics. (3 cr.; A-F only; Every Spring)
This course provides students hands-on experience with hardware/software used in radiation therapy clinic for physics measurements. prereq: 5170 or concurrent registration is required (or allowed) in 5173 or instr consent

MPHY 5178. Physical Principles of Magnetic Resonance Imaging. (3 cr.; A-F only; Spring Even Year)
Magnetic resonance imaging physics, spatial selection and encoding, imaging hardware and system engineering. Imaging sequences, signal-to-noise, and contrast.

MPHY 8148. Advanced Digital Imaging Science. (3 cr.; Student Option; Every Fall & Spring)
Role of digital image science in medical imaging. Measurement of image quality, digital radiography. Image reconstruction for CT, SPECT, PET, and MRI. 3D image processing, image registration/visualization. Picture archiving, communications systems. prereq: 5174 or instr consent

MPHY 8149. Advanced Topics in Radiation Therapy Physics. (2 cr.; A-F only; Every Fall)
Special procedures. Total body irradiation, intensity-modulated radiation therapy, stereotactic radiosurgery/radiotherapy, image-guided radiation therapy. Treatment planning algorithms/techniques. Brachytherapy. prereq: [5170, 5173] or instr consent

MPHY 8293. Directed Study in Biophysical Sciences and Medical Physics. (1-12 cr.; Student Option; Every Fall, Spring & Summer)
Individualized study under faculty direction. prereq: instr consent

MPHY 8294. Directed Research in Biophysical Sciences and Medical Physics. (1-12 cr.; Student Option; Every Fall, Spring & Summer)
Individualized research under faculty direction. prereq: instr consent

MLSP 6866. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

MPHY 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

MPHY 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Max 18 cr per semester or summer; 24 cr required

Medicinal Chemistry (MEDC)

MEDC 5185. Principles of Biomolecular Simulation. (3 cr.; Student Option; Periodic Fall)
Molecular simulation for students in medicinal chemistry, pharmaceutics, biochemistry, and chemical physics prereq: Chem 3502 or instr consent

MEDC 5245. Introduction to Drug Design. (3 cr.; A-F or Audit; Every Fall)
Concepts that govern design/discovery of drugs. Physical, bioorganic, medicinal chemical principles applied to explain rational design, mechanism of action drugs. prereq: Chem

MEDC 5494. Advanced Methods in Quantitative Drug Analysis. (2 cr.; A-F or Audit; Periodic Fall & Spring)
Quantitative methods (HPLC, GC, TLC, immunoassays) for analysis of drugs/metabolites in biological fluids. Advanced techniques such as capillary electrophoresis, supercritical fluid chromatography, GC-MS, LC-MS, tandem mass spectrometry. Chromatographic theory/statistical approaches to method validation.

MEDC 5495. Vistas in Medicinal Chemistry Research. (1 cr.; S-N or Audit; Every Fall)
Selected topics of contemporary interest in medicinal chemistry

MEDC 5710. General Principles of Medicinal Chemistry. (; 2 cr.; A-F or Audit; Periodic Fall) Fundamental principles of enzyme inhibitors, combinatorial chemistry and library design, drug receptor interactions and signal transduction mechanisms, and molecular modeling. prereq: MedC grad student or instr consent

MEDC 8001. General Principles of Medicinal Chemistry. (; 3 cr.; A-F or Audit; Every Fall) Fundamental principles of molecular recognition, physicochemical properties of drugs, drug metabolism and disposition, interaction of molecules with DNA/RNA. prereq: Med chem grad student or instr consent

MEDC 8002. General Principles of Medicinal Chemistry. (; 3 cr.; A-F or Audit; Every Spring) Didactic instruction in foundational principles of physical and mechanistic organic chemistry. Recitation component in which students actively solve organic chemistry reaction mechanisms and related problems in organic and medicinal chemistry during course meeting times with faculty guidance. prereq: First-year Medicinal Chemistry grad students or by permission.

MEDC 8070. The Chemistry and Biology of Infectious Diseases. (3 cr.; A-F only; Periodic Fall & Spring) The objectives of this course are to provide a comprehensive overview of antimicrobial agents used in infectious diseases with an emphasis on the underlying foundational principles in chemistry and biology. Antibiotic, antifungal, and antiprotozoal agents will be covered. For each antimicrobial agent, the history, discovery, synthesis, structure-activity relationships, spectrum of activity, clinical uses, mechanism(s) of action, resistance, drug disposition properties, and adverse reactions will be discussed in great detail.

MEDC 8100. Medicinal Chemistry Seminar. (1 cr. [max 6 cr.]; A-F only; Every Fall & Spring) Current topics. prereq: Grad major or instr consent

MEDC 8333. FTE: Master’s. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

MEDC 8413. Chemistry of Nucleic Acids. (; 4 cr.; A-F only; Spring Even Year) Chemical aspects of nucleic acid structure and function, synthesis, and functional variants. prereq: [Medicinal chem or chem or biochem] grad student

MEDC 8420. Natural Products Chemistry. (; 3 cr.; A-F only; Spring Odd Year) Biosynthesis of natural products with an emphasis on how these biochemical principles can be used in drug discovery and design through metabolic engineering and combinatorial biosynthesis. Natural product isolation, structure determination, target identification, and the role of synthetic organic chemistry, prereq: [CHEM 8321, biochemistry] or equiv or course director approval

MEDC 8435. BioAssay & Data Analysis. (1 cr.; A-F or Audit; Spring Even Year) Emphasis is an intro to bioassay & rodent experimental design approaches, data analysis & basic statistical analysis of corresponding data. Concepts of what instrumentation resources are available within the Department of Medicinal Chemistry & the Institute for Therapeutics Discovery & Development (ITDD), what the corresponding bioassays that can be measured on those resources, considerations & criteria for the development of a new bioassay, how to design basic rodent (mouse & rat) animal experiments including power-analysis (how to predict the number of animals needed for the experiment), as well as data analysis [mean, standard error of the mean (SEM), standard deviation of the mean (SD) & statistical analysis [student t-test, one-way Anova, two-way Anova, & appropriate post-hoc tests]. prereq: MEDC 8001 or instructor permission.

MEDC 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

MEDC 8461. Design of Cancer Immunotherapeutics. (3 cr.; A-F only; Spring Even Year) Cancer immunotherapy is one of the fastest growing and most exciting areas in anti-cancer drug design today. The emphasis in this course will be to familiarize the student with the basic concepts of the immune system and to survey current advanced approaches for the development and design of small molecule, protein and cell based immunotherapies for the treatment of cancer.

MEDC 8471. High Throughput Drug Discovery. (3 cr.; A-F only; Spring Even Year) Combinatorial chemistry, multi-compound based technologies, their use in screening bioassays to discover lead compounds. Solidphase synthesis, designing compound libraries, pharmacological assay design, data interpretation, biological target selection, compound lead optimization. prereq: Undergraduate [chemistry or biochemistry] or instr consent

MEDC 8500. Design of Chemotherapeutic Agents. (; 2 cr.; A-F or Audit; Periodic Fall) Modern aspects of designing chemotherapeutic agents. Strategies for enzyme inhibition and metabolic blocks in development of anticancer, antimicrobial, and antiviral agents. prereq: 5600 or instr consent

MEDC 8600. Chemical Aspects of Drug Metabolism and Bioactivation. (; 2 cr.; A-F or Audit; Periodic Fall) Chemical and enzymatic mechanisms of biotransformation and bioactivation of drugs and other xenobiotics. Reactivity and fate of bioactivated metabolites. prereq: 5600 or instr consent

MEDC 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr.; max 12 cr.); No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

MEDC 8700. Advanced Concepts in Drug Design. (; 2 cr.; A-F or Audit; Periodic Spring) Current approaches to rational design of drugs. prereq: 5600 or instr consent

MEDC 8753. MOLECULAR TARGETS OF DRUG DISCOVERY. (; 3 cr.; A-F only; Fall Even Year) Structure of biological macromolecules that are targets of drugs. Techniques to accelerate directed drug discovery. Protein structure/interactions. Popular target classes. Computational tools for visualizing/analyzing protein-ligand and protein-protein interactions. Structural characterization at a level sufficient to underpin critical data evaluation. Biophysical techniques to assess weak ligand binding and suitable for fragment-based lead discovery. prereq: 5710 or 8002 or CHEM 5412 or structural biochemistry or instr consent

MEDC 8760. Design of Peptidomimetics. (; 2 cr.; A-F or Audit; Periodic Fall) Current approaches to design and synthesis of mimetics of biologically active peptides. Structural and conformational rationale used in peptidomimetic design. prereq: 5600 or instr consent

MEDC 8777. Thesis Credits: Master’s. (; 1-18 cr.; max 50 cr.); No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

MEDC 8800. Medicinal Chemistry Laboratory Techniques. (; 1-2 cr.; max 4 cr.); S-N or Audit; Every Fall & Spring) Experiential rotations in medicinal chemistry research laboratories. prereq: Grad med chem major or instr consent

MEDC 8888. Thesis Credit: Doctoral. (; 1-24 cr.; max 100 cr.); No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

MEDC 8900. Research in Medicinal Chemistry. (; 1-4 cr.; max 8 cr.); A-F or Audit; Every Fall & Spring)
The student plans and executes a research project under the supervision of a faculty member in the section of diabetes, endocrinology, and metabolism.

**MED 7521. Infectious Disease.** (4 cr.; H-N only; Every Fall, Spring & Summer)

The student functions as integral member of the clinical infectious diseases team during this elective. They will evaluate patients, participate in all discussions, and explore the literature on problems relating to patients they have seen.

**MED 7522. Gastroenterology.** (4 cr.; H-N only; Every Fall, Spring & Summer)

The student, as a member of the G.I. consult team, does work up and attends teaching rounds on patients with gastrointestinal disease, attends gastrointestinal conferences (clinical, x-ray, pathology), gain outpatient clinical experience, and becomes familiar with specific diagnostic techniques, such as endoscopy, liver biopsy, and small intestinal biopsy. Night call is not required.

**MED 7523. Diabetes, Endocrinology, & Metabolism.** (4 cr.; H-N only; Every Fall, Spring & Summer)

This elective rotation is four (4) week introductory, structured clinical experience under direct supervision designed to provide the student experience diagnosing, treating, and caring for patients with endocrine disorders.

**MED 7525. Cardiovascular Medicine.** (4 cr.; H-N only; Every Fall, Spring & Summer)

The student participates in the evaluation and management of the acute and chronic cardiovascular disease problems as they occur in both the inpatient consultation service and the outpatient setting. Supervised electrocardiographic interpretation sessions are available to allow development of skills in electrocardiography. The student attends cardiovascular clinical conferences as well as informal didactic teaching conferences. Prereq: Med Student Yr 3 or 4 at least one other medicine elective

**MED 7526. Oncology.** (4 cr.; H-N or Audit; Every Fall, Spring & Summer)

As members of the oncology clinic team, students will do patient evaluations and followups in the oncology clinics, and participate in oncology conferences. Emphasis is on the clinical evaluation and management of new cancer patients.

**MED 7528. Hematology.** (4 cr.; H-N only; Every Fall, Spring & Summer)

This rotation will involve the opportunity to directly learn about diagnosis and management of classical and malignant hematologic disorders in both inpatient and outpatient setting. The student will act as a subintern with initial responsibility to conduct history and physical exams on hospitalized patients for whom hematologic consultations have been requested.

**MED 7531. Rheumatology.** (4 cr.; H-N only; Every Fall, Spring & Summer)

Musculoskeletal complaints are among the most common problems that present to primary care physicians and arthritis and related diseases are a major cause of disability and loss of work in our society. It is thus essential that physicians involved in primary care develop skill in recognition and treatment of common rheumatologic diseases and ability to recognize and refer rare or more complicated problems.

**MED 7532. Pulmonary Disease.** (4 cr.; H-N only; Every Fall, Spring & Summer)

This elective is designed to expand students’ understanding of respiratory pathophysiology as they acquire new skills in the diagnosis and management of pulmonary diseases.

**MED 7533. Clinical Allergy.** (3-6 cr.; H-N or Audit; Every Fall, Spring & Summer)

Practical aspects of allergic/immunologic work ups, treatments. Content modified depending upon individual student needs; special programs (e.g., laboratory methods) arranged depending upon student needs.

**MED 7534. Research in Allergy.** (6 cr.; H-N or Audit; Periodic Fall)

The student works with a staff member. He/she is expected to participate in ongoing research within our program or in an original investigative project of the student’s design. He/she is expected to review the subject area of the investigation as well as plan, perform, interpret his/her studies, and make a presentation as well as a written report on the project.

**MED 7535. Clinical Allergy, Asthma and Immunology Elective Rotation.** (3 cr.; H-N or Audit; Every Fall & Summer)

Manage adults/children with atopic dermatitis, contact dermatitis, urticaria, angioedema, food allergies, asthma, chronic cough, dysfunctional breathing, hypersensitivity pneumonias, allergic bronchopulmonary aspergillosis allergic rhinoconjunctivitis, nonallergic rhinitis, nasal polyps, sinusitis, eosinophilic esophagitis, gastritis, food protein intolerances, anaphylaxis, recurrent infections, venom allergy, prereq: It is recommended but not required that third and fourth year medical students should have at least one primary care rotation finished. Knowledge of how to perform full medical history and exam is required.

**MED 7548. Clinical Genetics.** (6 cr.; H-N or Audit; Every Fall, Spring & Summer)

Designed for students interested in clinical pediatrics and medicine as well as academic genetics. The student builds basic genetic skills by participating as a member of the combined medicine/pediatrics clinical genetics group at the Fairview-University Medical Center. The activities include weekly hospital rounds, genetics clinic and genetics conference, and hospital consultations when requested. The student evaluates patients with different types of genetic problems and discusses these cases fully. During the second three weeks of the rotation, the student is expected to prepare one topic for genetics conference.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
MED 7555. Medicine Rural Ambulatory Elective. (3-4 cr. [max 8 cr.]; H-N only; Every Fall, Spring & Summer) Out-patient practice of primary care internal medicine.

MED 7556. Renal Consultation. (4 cr.; H-N only; Every Fall, Spring & Summer) The course offers a unique opportunity to see a large number of acutely ill patients with disturbed renal function. There will be ample opportunities for study of the physiological impact of severe renal failure in both medical and surgical patients. Students will be part of the consultation service, where the nephrology consult team and the primary service physician manage patients with severe electrolyte problems and renal failure.

MED 7561. Outpatient & Clinical Nephrology. (4 cr.; H-N only; Every Fall, Spring & Summer) Focus is on renal problems common to a community clinic and hospital practice. Renal clinics are held four days a week. Inpatient consultation is done daily. Didactic lectures are given. This experience is appropriate for the student interested in primary care.

MED 7562. Nephrology. (4 cr.; H-N only; Every Fall, Spring & Summer) The student spends four weeks on the renal consult service. They attend the departmental teaching conferences, including the renal pathology and clinical nephrology conferences held every week. They work closely with the medicine residents and fellows. They are expected to present the cases for their patients, including clinical and lab data, and assessment of problems to the attending physician on rounds.

MED 7573. Acute Care Internal Medicine. (2-4 cr.; H-N or Audit; Every Fall & Spring) This course provides an opportunity to acquire skills in the diagnosis and treatment of acute conditions encountered in internal medicine. The student works with attending physicians and medical residents to evaluate patients (including many with undiagnosed illnesses) in both the ER and urgent care on Monday through Friday (8:30 A.M. to 5:00 PM). Learning is enhanced by a daily didactic curriculum. prereq: 7500, Med 7501

MED 7579. Critical Care/MICU. (4 cr.; H-N or Audit; Every Fall, Spring & Summer) Evaluation of performance is based on abilities to present, patient relationship, interaction with faculty and residents in occupational health law and policy through conferences include a review of common pathologies and pediatric nephrology conferences held every week. They work closely with the medicine residents and fellows. They are expected to present the cases for their patients, including clinical and lab data, and assessment of problems to the attending physician on rounds.

MED 7595. Musculoskeletal Problems in Primary Care Practice. (3 cr.; H-N or Audit; Every Fall, Spring & Summer) The focus of this course is on the evaluation of various common musculoskeletal problems likely to be encountered in a primary care practice. Emphasis is placed on the proper musculoskeletal examination, basic joint aspiration and injection techniques, as well as developing better interpretive skills in reviewing laboratory values and bone/joint radiographs. In addition to attending patient clinics daily, the student is part of interactive conferences and didactic sessions covering various rheumatologic/medical orthopedic topics. Teaching methods include the use of patient instructors, videotapes, polarized microscopy, labeled skeleton, and computer teaching programs. The student works with full-time staff including Drs. Thomas Bloss, David Rhude, Peter Schlesinger, and the course director, Tom Stillman. prereq: 7500

MED 7596. Occupational Health. (3-6 cr.; H-N or Audit; Every Fall, Spring & Summer) This course consists of conferences, clinical experience in occupational health, and optional visits to local workplaces. The conferences include a review of common occupational diseases and an introduction to occupational health law and policy through case presentations by students, and discussion with faculty and residents in occupational medicine.

MED 7598. Bioethics Theory. (3-6 cr.; H-N or Audit; Every Fall & Spring) In this independent study course, the student is expected to attend interdisciplinary seminars on basic issues in bioethics, and to write one substantive paper on a bioethical problem. prereq: Students must meet with instructor prior to enrolling in course.

MED 7600. Palliative Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer) This hospital-based elective offers the opportunity to learn the scope of practice of Internal Medicine's newest subspecialty: palliative medicine. The student will function as a sub-intern under the direct supervision of board-certified hospice and palliative medicine physicians, caring for the broad range of problems managed by palliative medicine consultants.

MED 7604. Hospitalist and Palliative Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer) Students function as sub-interns under supervision of experienced hospitalists in caring for problems as primary caregiver/consultant. Care of hospitalized patients with broad mix of medical problems, in ICU/non-ICU settings. Students work with palliative medicine consult team in managing patients with advanced illness, care focused on pain management and complex medical decision making. Faculty present core topics in hospitalist/palliative medicine. Periodic topic presentations by students.

MED 7605. Regions Hospital Hospital Medicine Elective. (4-8 cr.; H-N only; Every Fall, Spring & Summer) Students work alongside staff. Students choose from medicine inpatient service, surgical co-management service, hospital medicine palliative care team, progressive care unit, and evening admission team. prereq: 7500


MED 7666. Medicine Pediatrics Ambulatory Elective. (3-4 cr.; [max 8 cr.]; H-N or Audit; Every Fall, Spring & Summer) Out-patient practice of primary care internal medicine and pediatrics.

MED 7700. Primary Care Selective - Medicine. (4 cr.; P-N only; Every Fall, Spring & Summer) Four-week ambulatory experience. Focuses on both specialty-specific areas and process-of-care in ambulatory setting.

MED 7701. Primary Care Selective - Medicine/Pediatrics. (4 cr.; P-N only; Every Fall, Spring & Summer) Four-week ambulatory experience. Focuses on both specialty-specific areas and process-of-care in ambulatory setting.
MED 7703. Patient Safety. (2 cr.; H-N only; Every Fall, Spring & Summer) Two-week long elective incorporating reading, case analysis, consultation, simulation, and presentation projects in patient safety. Educate medical students at University of Minnesota in multidisciplinary patient safety principles/practices.

MED 7800. Internal Medicine: Primary Care and Beyond. (4 cr.; GP; Every Fall, Spring & Summer) The Internal Medicine-Primary Care and Beyond "PCB? elective centers around 4 main areas: Patient Care, Quality Improvement, Advocacy and Self-Reflection. PCB offers students the opportunity to hone their clinical skills via direct patient encounters in the outpatient setting.

MED 7900. Sub-internship in Critical Care. (4 cr.; H-N only; Every Fall, Spring & Summer) Second part of the required 12 weeks of experience in internal medicine started in Medicine 7500. Medicine 7900 is a "sub-internship" in which the student takes direct responsibility for patient care. Therapeutic decision making and care planning are emphasized. The student is part of a patient care team and assumes responsibility for the evaluation and care of three new patients per week. Acute care tutorials with learning objectives and suggested readings are an important part of the course. Self-directed learning tools are available.

MED 7910. Internal Medicine Residency. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Internal medicine residency.

MED 7920. Medicine-Pediatric Residency. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Medicine-pediatric residency.

MED 7930. Internal Medicine Fellowship. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Internal medicine fellowship.

Medieval Studies (MEST)

MEST 1002. Medieval Tales and their Modern Echoes. (GP; LITR; 3 cr.; Student Option; Every Spring) Knights of the Round Table, dragon-slayers, magic djinn, pilgrims in Hell. How these stories have been retold in modern fiction, film, and the arts. Texts from Europe and other regions of the globe.

MEST 3011. Survey of Medieval English Literature. (3 cr.; A-F or Audit; Periodic Fall & Spring) Major/representative Medieval English works, including Chaucer's Canterbury Tales, Piers Plowman, Book of Margery Kempe, Julian of Norwich's Revelations, and Malory's Morte D'Arthur.

MEST 3012. Chaucer. (3 cr.; A-F or Audit; Every Fall & Spring) Major/representative works written by Chaucer, including The Canterbury Tales, Troilus and Criseyde, and the dream visions. Historical, intellectual, and cultural background of the poems. Language, poetic theory, form.

MEST 3010. Topics in Medieval Studies. (3-4 cr. [max 24 cr.]; Student Option; Every Fall & Spring) Fall of Rome through end of Middle Ages (ca. 300-1500 A.D.). Topics specified in Class Schedule.

MEST 3611. Medieval Cities of Europe: 500-1500. (GP; HIS; 3 cr.; Student Option; Every Fall & Spring) Evolution of Western European cities from the late Roman town to the early Renaissance city-state.

MEST 3613. History of the Crusades. (GP; HIS; 3 cr.; Student Option; Every Fall, Spring & Summer) Crusading spirit in Europe. Results of classic medieval crusades ca 1095-1285. States established by crusaders in Near East.
“Beowulf” has been the object of intensive scholarly study; we will delve into the debates over the poem’s date, genesis, manuscript and historical context and critical interpretation. Spending an entire semester studying one complex work can be an invaluable experience. Please contact the instructor for any questions concerning the prerequisite.

MEST 5610. Advanced Topics in Medieval Studies. (. 3-4 cr. [max 15 cr.]; Student Option: Every Fall & Spring) From late antiquity through end of Middle Ages (circa 300-1500 A.D.). Topics specified in Class Schedule. prereq: One yr work in some area of Middle Ages, reading knowledge of appropriate language, instr consent

MEST 5993. Directed Studies in Medieval Studies. (. 1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Directed study with one of the core faculty of medieval studies program. prereq: One yr work in some area of Middle Ages, reading knowledge of appropriate language, instr consent

MEST 8010. Medieval Studies Colloquium. (; 3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Lectures by and discussions with faculty and visiting speakers.

MEST 8110. Seminar in Medieval Studies. (. 3-4 cr. [max 48 cr.]; A-F or Audit; Every Fall & Spring) Offered when feasible. prereq: Appropriate language, instr consent

MICE 5035. Personal Microbiome Analysis. (3 cr.; Student Option; Every Spring) Personal Microbiome Analysis, an introduction to the computational exploration and analysis of your inner microbial community, also known as your microbiome. In this course, you will have the opportunity to explore your own microbiome using visualization and analysis tools. Sequencing your own microbiome is encouraged but not required for the course. Introductory biology or genetics is recommended: BIOL 1009, GCD 3022 or BIOL 4003.

MICE 5355. Advanced Fermentation and Biocatalysis Laboratory. (1 cr.; S-N only; Every Spring) Methods in industrial microbiology, lab, and pilot scale fermentation/biocatalysis engineering. Lab experiments carried out in fermentation pilot plant. Operation of bench/pilot scale bioreactors. Designing bioreactors. Process optimization, monitoring, and control. Scale-up experiments, data analysis, prereq: [3301 or BIOL 3301]; [grad student in microbial engineering or upper-div major in [microbiology or chem engineering or biochemistry]]; instr consent

MICE 8333. FTE: Master’s. (. 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

MICE 8777. Thesis Credits: Master’s. (. 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

MICE 8920. Teaching Practicum. (. 1 cr. [max 4 cr.]; Student Option; Every Fall, Spring & Summer) Supervised experience in classroom, laboratory, and/or recitation instruction; develops skills in effective use of instructional techniques, materials, tests, and measurements. prereq: Grad MIE major

MICE 8990. Biotechnology Seminar. (. 1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Student presentations of thesis research and presentations by invited speakers. prereq: Prereq-First-yr MICE students enroll S-N, as they do not make a presentation. Second-yr MICE students enroll A-F, as they present a seminar; fall, spring, every year). Student presentations of thesis research and presentations by invited speakers or designated lecturers.

Microbiol/Immun/Cancer Biology (MICA)

MICA 5000. Practicum: Teaching. (; 0 cr.; No Grade Associated; Every Fall & Spring) Supervised experience in lab instruction. Use of instructional materials, tests/measurement.

MICA 8002. Structure, Function, and Genetics of Bacteria and Viruses. (. 4 cr.; A-F or Audit; Every Fall) Structure, function, and metabolism of microorganisms. Microbial genetics. Molecular virology. prereq: [One undergrad or grad course each in [microbiology, genetics, biochemistry]] or instr consent

MICA 8003. Immunity and Immunopathology. (. 4 cr.; Student Option; Every Fall) Lymphocyte activation, signal transduction in lymphocytes, antigen receptor genetics, antigen presentation, lymphoid anatomy, adaptive immune responses to microbes, immunodeficiency, immunopathology, cytokines, transplantation, autoimmunity. prereq: Upper level undergrad immunology course or instr consent

MICA 8004. Cellular and Cancer Biology. (. 4 cr.; A-F or Audit; Every Spring) Fundamental concepts in cellular, molecular, and genetic basis of disease. Molecular basis of inflammation and cancer metastasis. Genetic basis for inherited disorders and gene therapy. Molecular mechanisms of pathogenesis. prereq: [One undergrad or grad course each in [biochemistry, cell biology]] or instr consent

MICA 8005. Topics in Microbiology, Immunology, and Cancer Biology. (. 1-4 cr.; A-F or Audit; Every Fall & Spring) Colloquium format. Readings/discussion on specialized topic. prereq: 8012, [8002 or 8003 or 8004] or instr consent

MICA 8006. Protein Sequence Analysis. (. 3 cr.; Student Option; Fall Even Year) DNA and protein sequence and protein structure databases; protein sequence analysis; methods for display of sequence comparison and prediction results; Genetics Computer Group (GCG) sequence analysis programs; and current literature and research problems. prereq: Biochem course, knowledge of UNIX operating system recommended

MICA 8007. Cell Biology and Biochemistry of the Extracellular Matrix. (. 3 cr.; A-F or Audit; Every Fall & Spring) Concepts in cell adhesion and tissue composition and importance of cell adhesion in tissue function and disease. Topics range from structure/function/assembly of tissue components to cellular adhesion mechanisms. prereq: 8002 or 8004 or instr consent

MICA 8009. Biochemical Aspects of Normal and Abnormal Cell Growth and Cell Death. (. 2 cr.; Student Option; Every Spring) Aspects of mechanisms involved in growth control at level of nuclear function. Neoplasia in hormonal cancers (such as prostate cancer) and role of protein phosphorylation in normal and abnormal growth. Mechanisms of cell death via apoptosis and its implications in normal and abnormal proliferation. prereq: 8004 or [BioC 3021, Biol 4004] or instr consent

MICA 8010. Microbial Pathogenesis. (. 3 cr.; A-F or Audit; Fall Even Year) Molecular mechanisms of bacterial/viral pathogenesis. Strategies of disease causation/interaction with host, regulation of virulence factors, mechanism of virulence factor transmission to other microbes. prereq: MICA grad student or instr

MICA 8011. Current Topics in Immunology. (. 3 cr.; A-F or Audit; Every Spring) Colloquium format. In-depth reading, discussion prereq: MICA 8003 or instr consent

MICA 8012. Writing and Reviewing a Research Proposal. (. 2 cr.; A-F only; Every Fall) Assist first/second year graduate students to prepare research proposals for funding. prereq: First or second year MICA grad student

MICA 8013. Translational Cancer Research. (. 2 cr.; A-F or Audit; Every Spring) Clinical issues in cancer research. Discuss translational research projects as they pertain to a variety of cancers. prereq: 8004 or instr consent

MICA 8014. Small RNA Biology. (. 2 cr.; A-F or Audit; Every Spring) Small RNAs as major regulators of gene/protein expression. MicroRNAs and their potential use in diagnosis/prognosis of various disease conditions, including cancers. Biology of small RNAs and their role in health and disease. prereq: BIOC 8002 or MICA 8004 or equiv or instr consent

MICA 8094. Research in Microbiology, Immunology, and Cancer Biology. (. 1 cr. [max 5 cr.]; S-N or Audit; Every Fall, Spring & Summer)
One-on-one research training from faculty adviser during laboratory rotation. prereq: 1st yr MICA grad student

**MICA 8320. Readings in Neurobiology. (WI; 1-4 cr.; Student Option; Every Fall)**
Topics in neurobiology and neurophysiology.

**MICA 8333. FTE: Master’s. (WI; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)**
No description) prereq: Master’s student, adviser and DGS consent

**MICA 8371. Mucosal Immunobiology. (WI; 3 cr.; A-F or Audit; Fall Odd Year)**
Host immune processes at body surfaces. Innate/adaptive immunity at mucosal surfaces, interactions/responses of various mucosal tissues to pathogens, current approaches being used to target protective vaccination to mucosal tissues. Lectures, journal club format.
prereq: 8001 or instr consent

**MICA 8444. FTE: Doctoral. (WI; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)**
No description) prereq: Doctoral student, adviser and DGS consent

**MICA 8666. Doctoral Pre-Thesis Credits. (WI; 1-6 cr.; Max 12 cr.; No Grade Associated; Every Fall, Spring & Summer)**
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**MICA 8777. Thesis Credits: Master’s. (WI; 1-18 cr.; Max 50 cr.; No Grade Associated; Every Fall, Spring & Summer)**
No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**MICA 8888. Thesis Credit: Doctoral. (WI; 1-24 cr.; Max 100 cr.; No Grade Associated; Every Fall, Spring & Summer)**
Thesis credit: doctoral. prereq: MICA PhD student, adviser consent

**MICA 8910. Seminar: Faculty Research Topics. (WI; 0 cr.; No Grade Associated; Every Fall & Spring)**
State-of-the-art information presented by scientific experts within/outside the University.
prereq: MICA grad student

**MICA 8920. Seminar: Student Research Topics. (WI; 0 cr.; No Grade Associated; Every Fall & Spring)**
Current thesis topics and other aspects of microbiology, immunology, and cancer biology.
prereq: MICA grad student or instr consent

**Microbiology (MICB)****

**MICB 3301. Biology of Microorganisms. (5 cr.; A-F or Audit; Every Spring)**
Taxonomy, anatomy, physiology, biochemistry, pathogenesis, immunology, ecology of microbes. Molecular structure in relation to bacterial function/disease. Includes lab. prereq: BIOL 3020 or BIOL 3021 or GCD 3022 or instructor consent [biochemistry/molecular biology background coursework]

**MICB 3303. Biology of Microorganisms. (3 cr.; A-F only; Every Fall, Spring & Summer)**
Taxonomy, anatomy, physiology, biochemistry, pathogenesis, infectious disease, immunology, ecology of microbes. Molecular structure in relation to function of bacteria, fungi, protozoa, viruses, prereq: BIOL 3020 or Biochemistry (BioC 3021) or instructor consent

**MICB 4131. Immunology. (3 cr.; Student Option; Every Fall)**
Molecular, genetic and cellular basis for innate and adaptive immune responses. The immune systems role in; transplantation, autoimmune disease, cancer immunotherapy, vaccinology, acquired and genetic immunodeficiencies. recommended prereqs: microbiology, biochemistry, cell biology

**MICB 4151. Molecular and Genetic Bases for Microbial Diseases. (3 cr.; Student Option; Every Spring)**
Genetic basis of microbial pathogenesis. Effect of gene transfer and regulation on evolution of microbial pathogens and capacity to colonize, induce disease. Biochemical and cellular interactions between bacteria and human hosts. prereq: MICB 4131 and BioC 3021 advised

**MICB 4161W. Eukaryotic Microbiology. (WI; 3 cr.; A-F only; Every Fall)**
Cell biology of higher eukaryotes, animal/plant pathogenesis, evolution, industrial microbiology. Trypanosoma/Chlamydomonas, Paramecium/Toxoplasma/Aspergillus/Neurospora. prereq: 301, [GCD 3022 or Biol 4003]

**MICB 4171. Biology, Genetics, and Pathogenesis of Viruses. (3 cr.; A-F only; Every Spring)**
Structure, attachment, entry. Genome replication/mRNA production by RNA viruses. Reverse transcription. DNA virus templates. Replication of DNA virus genomes. Processing of viral pre-mRNA. Translational and control. Assembly, host defense, tumor viruses, pathogenesis, HIV. antivirals, prereq: [Biol 3020 or BIOL 3021 and BIOL 4003] AND [MICB 3301 or BIOL 4004] or instr consent; seats are prioritized for CBS majors (others who meet the course prerequisites can contact the instructor for permission)

**MICB 4215. Advanced Laboratory: Microbial Physiology and Diversity. (3 cr.; A-F or Audit; Every Fall)**
Isolation/cultivation of wide variety of bacteria. Physiological experiments illustrate characteristic features of microorganisms.
prereq: 301 or Biol 2032 or VBS 2032 or intro microbiology course with lab

**MICB 4225W. Advanced Laboratory: Microbial Genetics. (WI; 3 cr.; A-F only; Every Fall)**
Yeast is used as a model organism for microbial molecular genetic principles and methods such as ultraviolet mutagenesis, isolation and creation of mutant strains, plasmid design and construction, PCR, Sanger sequencing, gene replacement and bioinformatics. Students will design and execute their own independent research project using hands-on experimentation with advanced molecular methods prereq: 3301, BIOL 4003

**MICB 4235. Advanced Laboratory: Virology, Immunology, and Microbial Genetics. (3 cr.; Student Option; Every Spring)**
Techniques, experimental methods in microbial genetics, immunology. Virology used to study microbes/interactions with host. prereq: 3301, 4131, BIOC 3021, [completed or concurrent registration is required in MicB 4141W/4171]; access from a wait list

**MICB 4793W. Directed Studies: Writing Intensive. (WI; 1-7 cr.; S-N or Audit; Every Fall, Spring & Summer)**
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. prereq: instr consent, dept consent; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements

**MICB 4794W. Directed Research: Writing Intensive. (WI; 1-7 cr.; Max 15 cr.; S-N or Audit; Every Fall, Spring & Summer)**
Laboratory or field investigation of selected areas of research. prereq: instr consent, dept consent; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements

**MICB 4993. Directed Studies. (WI; 1-6 cr.; Max 36 cr.; S-N only; Every Fall, Spring & Summer)**
Individual study on selected topics or problems. Emphasizes selected readings, scientific literature. prereq: 3301, dept consent

**MICB 4994. Directed Research. (1-7 cr.; Max 28 cr.; S-N or Audit; Every Fall, Spring & Summer)**
Lab or field investigation of selected areas of research. prereq: 3301, instr consent

**Military Science (MIL)**

**MIL 103. MS I Zero Credit Lead Lab. (0 cr.; A-F only; Every Fall)**
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1101

**MIL 104. MS I Zero Credit Lead Lab. (0 cr.; A-F only; Every Spring)**
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1102

**MIL 203. MS II Zero Credit Lead Lab. (0 cr.; A-F only; Every Fall)**
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1201

**MIL 204. MS II Zero Credit Lead Lab. (0 cr.; A-F only; Every Spring)**
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1202

**MIL 303. MS III Zero Credit Lead Lab. (0 cr.; A-F only; Every Fall)**
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3301
MIL 304. MS III Zero Credit Lead Lab. (; 0 cr. ; A-F only; Every Spring)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3302

MIL 403. MS IV Zero Credit Lead Lab. (; 0 cr. ; A-F only; Every Fall)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3401

MIL 404. MS IV Zero Credit Lead Lab. (; 0 cr. ; A-F only; Every Spring)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3402

MIL 1003. Military Science I Leadership Lab. (1 cr. ; A-F only; Every Fall)
Basic skills. Preview advanced course. Team-building leadership skills, prereq: concurrent registration is required (or allowed) in 1201

MIL 1101. Introduction to the Army and Critical Thinking. (; 1 cr. ; A-F only; Every Fall)
Introduces cadets to the personal challenges and competencies that are critical for effective leadership. Cadets learn how the personal development of life skills such as critical thinking, goal setting, time management, physical fitness, and stress management relate to leadership, officership, and the Army profession.

MIL 1102. Introduction to the Profession of Arms. (; 1 cr. ; A-F only; Every Spring)
Leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Cadets explore dimensions of leadership attributes and core leader competencies in the context of practical, hands-on, and interactive exercises.

MIL 1104. MS I One Credit Lead Lab. (; 1 cr. ; A-F only; Every Spring)
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1102

MIL 1201. Leadership and Decision Making. (; 2 cr. ; A-F only; Every Fall)
The outcomes of MIL 1201 are demonstrated through Critical and Creative Thinking and the ability to apply Troop Leading Procedures. Comprehension of the officer's role in leading change by applying innovative solutions to problems in concert with the principles of mission command. The Army profession is also stressed through leadership forum and a leadership self-assessment, prereq: concurrent registration is required (or allowed) in lab

MIL 1202. Army Doctrine and Team Development. (; 2 cr. ; A-F only; Every Spring)
MIL 1202 begins the journey to understand and demonstrate cross-cultural competencies as they relate to Army doctrine and how they apply in a combatant commander? s engagement strategies. Army values, teamwork, and Warrior Ethos and their relationship to the Law of Land Warfare and philosophy of military service are also stressed. The ability to lead and follow is also covered through team building exercises in small units up to squadron level. prereq: Must enroll in lab.

MIL 1203. MS II One Credit Lead Lab. (; 1 cr. ; A-F only; Every Fall)
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1201

MIL 1204. MS II One Credit Lead Lab. (; 1 cr. ; A-F only; Every Spring)
Army ROTC leadership and personal development lab. prereq: concurrent registration is required (or allowed) in 1201

MIL 3301. Training Management and Warfighting Functions. (; 3 cr. ; A-F only; Every Fall)
MIL 3301 includes introduction to squad/platoon tactical operations using troop leading procedures and battle drills to achieve the assigned mission within the commander's intent. Through the introduction of the leadership lab practicum the cadets learn to plan, resource, and execute training of subordinates within the leadership labs. This experience gives the cadet the opportunity to work on their teamwork and leadership skills in a hands-on performance-oriented environment. prereq: Two yrs of ROTC or equiv established by U.S. Army, must see Army ROTC dept officials, concurrent registration is required (or allowed) in lab

MIL 3302. Applied Leadership in Small Unit Operations. (; 3 cr. ; A-F only; Every Spring)
MIL 3302 balances adaptability and professional competence building on the tactical lessons introduced in MIL 3301. Adaptability concepts introduced include analysis of complex problems, creating solutions that exhibit agile and adaptive thinking, analysis of the environment and formulation of solutions to tactical and organizational problems. prereq: Two yrs of ROTC or equiv established by U.S. Army, must see Army ROTC dept officials, concurrent registration is required (or allowed) in lab

MIL 3303. MS III One Credit Lead Lab. (; 1 cr. ; A-F only; Every Fall)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3301

MIL 3304. MS III One Credit Lead Lab. (; 1 cr. ; A-F only; Every Spring)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3302

MIL 3401. The Army Officer. (; 3 cr. ; A-F only; Every Fall)
MIL 3401 places primary emphasis on officership with the MS IV cadets, who are the educational main effort within the Battalion. MIL 3401 and 3402 together refine and ultimately complete the cadet-to-commissioned officer transition. Mission command and ethics are stressed to assist the cadet in further embracing their role as a future army officer. prereq: Completed all other military courses or Army equiv, concurrent registration is required (or allowed) in lab

MIL 3402. Company Grade Leadership. (; 3 cr. ; A-F only; Every Spring)
MIL 3402 is the culmination of a four-year sequential, progressive, challenging developmental leadership experience. It is during this final semester that the cadet is undergoing final preparation for the duties and responsibilities of a commissioned officer along with their integration into the army. Emphasis is placed on critical knowledge, skills, abilities and competency skills newly commissioned officers will need to succeed in their first unit of assignment, and the modern operating environment where they will be expected to plan, prepare, execute, and assess platoon-level training strategies and more to enable mission accomplishment. prereq: Completion of all other military courses or Army equiv, concurrent registration is required (or allowed) in lab

MIL 3403. MS IV One Credit Lead Lab. (; 1 cr. ; A-F only; Every Fall)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3401

MIL 3404. MS IV One Credit Lead Lab. (; 1 cr. ; A-F only; Every Spring)
Army ROTC leadership and personal development lab. prereq: Completion of basic courses, concurrent registration is required (or allowed) in 3402

MIL 3501. Marksmanship Training Programs. (; 2 cr. ; A-F only; Every Fall & Spring)
Uses a laser-simulated Army rifle to train on how to fire weapons accurately. Students learn how to operate the computer-based simulation system as well as practical exercises of firing at targets on a video screen.

MIL 3502. Marksmanship Training Programs. (; 2 cr. ; A-F only; Every Fall & Spring)
Basic rifle marksmanship skills. Students instruct/train other students.

MIL 3555. Applied Military Learning. (; 0-3 cr. [max 6 cr. ] ; A-F only; Periodic Fall)
This course is only offered to Military Science level 5 with special permission. This course allows you the opportunity to apply the tactical and technical skills you have learned throughout your Military Science classes and Military Experience to assist in the duties of the cadre. prereq: Must successfully complete or receive constructive credit for all Military Science classes: MIL 1101, MIL 1102, MIL 1201, MIL 1202, MIL 3301, MIL 3302, MIL 3401, MIL 3402

MIL 3970. Military History. (; 3 cr. ; A-F only; Every Fall & Spring)
General overview of all wars fought by United States from the 18th century Revolutionary War to today's War on Terror. Military tactics as well as war's impact on society. Two exams, two papers to write, readings.
Mol Cell Devlmental Biol/Gene (MCDG)

MCDG 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)

MCDG 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)

MCDG 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; No Grade Associated; Every Fall, Spring & Summer)

MCDG 8777. Thesis Credits: Master’s. (1-18 cr.; Max 50 cr.; No Grade Associated; Every Fall, Spring & Summer)

MCDG 8888. Thesis Credit: Doctoral. (1-24 cr.; Max 100 cr.; No Grade Associated; Every Fall, Spring & Summer)

MCDG 8900. Student Research Seminar. (1 cr.; Max 10 cr.; S-N or Audit; Every Fall & Spring)

MCDG 8910. Journal Presentations. (1 cr.; Max 2 cr.; S-N or Audit; Every Fall & Spring)

MCDG 8920. Special Topics. (1-4 cr.; Max 8 cr.; Student Option; Every Fall)

MCDG 8950. Teaching Practicum. (1 cr.; Max 2 cr.; S-N or Audit; Every Fall & Spring)

MCDG 8993. Directed Studies. (1-5 cr.; Max 15 cr.; Student Option; Every Fall & Spring)

MCDG 8994. Research. (1-5 cr.; Max 10 cr.; S-N or Audit; Every Fall & Spring)

Mortuary Science (MORT)

MORT 3012W. Organization and Management of Funeral Business. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer)

MORT 3014. Funeral Service Rules and Regulations. (2 cr.; A-F only; Every Fall, Spring & Summer)

MORT 3016. Funeral Service Marketing and Merchandising. (3 cr.; A-F or Audit; Every Fall & Spring)

MORT 3018. Funeral Service Practice I. (3 cr.; A-F only; Every Fall)

MORT 3019. History & Practice of Funeral Directing II: 1851 - Present. (3 cr.; A-F only; Every Fall & Spring)

MORT 3021W. Funeral Service Psychology and Arrangements Theory. (WI; 3 cr.; A-F only; Every Fall & Spring)

MORT 3025. Business Law. (3 cr.; A-F only; Every Fall)

MORT 3030. Funeral Service Law. (2 cr.; A-F only; Every Spring)

MORT 3048. Microbiology and Pathology for Funeral Service. (4 cr.; A-F only; Every Fall, Spring & Summer)

MORT 3051. Restorative Art. (2 cr.; A-F only; Every Fall & Spring)

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
proper placement guides for the restoration of damaged structures and/or missing features; treatments and techniques for both general and specific injuries; color theory, and cosmetology related to the funeral profession. prereq: MORT 3171, concurrent registration is required (or allowed) in 3151,3061,3161, mortuary science major

MORT 3061. Embalming Theory. (3 cr.; A-F only; Every Fall & Spring)
This is an introductory course which covers the phenomenon of death of the human body, and the fundamental procedures associated with the practice of the art and science of embalming. Embalming is the process of chemically treating the dead human body in order to: (1) reduce the presence and growth of microorganisms; (2) retard organic decomposition; and (3) restore an acceptable physical appearance to the decedent. The semester begins with such topics as personal and public health considerations, and government regulations that are applicable to the embalming process and the fundamentals of embalming. Next are the topics of terminology and identification of embalming instruments, the importance of embalming analysis, and the completion of embalming reports. We advance to vessel location and selection, and procedures for preparing the body before the embalming process begins. We move on to the subject of embalming chemicals, with our lectures and discussions focusing on the reasons why we use various quantities and types of chemicals for each individual case. The course continues with presentations focusing on treatments for embalming difficult cases, including discussion of traumatic and pathological conditions, infections, communicable diseases, autopsied bodies, organ and tissue donors, and other various conditions. prereq: MORT 3171, concurrent registration is required (or allowed) in 3051, 3151 and 3161, mortuary science major

MORT 3065. Embalming Chemistry. (2 cr.; A-F only; Every Fall, Spring & Summer)

MORT 3090. Independent Study Project. (1-15 cr.; max 30 cr.; Student Option; Every Fall, Spring & Summer)
Independent study conducted between instructor, program director, and student. prereq: Mortuary science major

MORT 3091W. Independent Study in Funeral Service. (WI; 1-4 cr.; Student Option; Every Fall, Spring & Summer)
Students complete a project supervised by a faculty member. Credit(s) is negotiated with the faculty member based on the size and scope of the project. Students must demonstrate that the project has value within the major. prereq: Mortuary science major

MORT 3151. Restorative Art Laboratory. (1 cr. max 2 cr.; A-F only; Every Fall & Spring)
Principles/techniques for restorative art. Modeling facial features with clay or wax. Use of restorative techniques. Cosmetic application on human remains. prereq: MORT 3171, concurrent registration is required (or allowed) in 3051, mortuary science major

MORT 3161. Embalming Laboratory. (1 cr. [max 2 cr.; A-F only; Every Fall & Spring)
Practices/procedures of chemically preserving/restoring human remains. prereq: MORT 3171, concurrent registration is required (or allowed) in 3061, mortuary science major

MORT 3171. Human Anatomy Laboratory. (2 cr.; A-F for Audit; Every Fall)
Study of gross human anatomy using cadavers. Anatomical structures, post-mortem examination, embalming, pathology, restorative art, forensic science. Lab sessions meet once a week for 2 hours. prereq: 3 cr of human anatomy

MORT 3371. Death and Dying Across Cultures and Religions. (3 cr.; A-F only; Every Fall)
Death, Dying and Bereavement across Cultures and Religions will explore a variety of cultures and religions as their beliefs, practices, customs and traditions around the issue of death, grief and funeral/burial rituals. prereq: Mortuary science major OR any student with department consent

MORT 3379. Clinical Funeral Service Rotation. (1-6 cr. [max 18 cr.]; A-F only; Every Fall, Spring & Summer)
Practical experience working in clinical settings related to funeral service. What it means to be a funeral director in contemporary American society. prereq: 3014, 3021W, 3051, 3061, 3151, 3161, 3171, 3370, mortuary science major

Moving Image Studies (MIMS)

MIMS 5910. Topics in Moving Image Studies. (2-4 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Special topics in moving image studies.

MIMS 8001. Theories of the Moving Image. (3 cr.; A-F only; Every Fall)
Study of the moving image as the intersection between critical media studies and film studies. Not a historical overview, but rather current discussions in these areas contextualized with relevant readings in classical film and media theory.

MIMS 8003. Historiography of the Moving Image. (3 cr.; A-F only; Every Spring)
Genealogies of the moving image. "Crisis" of film in debates about "old" and "new" media; Hollywood's role in defining commercial and oppositional forms of moving images; approaches to the writing of history in relation to media historiography.

Multi-Inst Cross Registration (MULT)

MULT 1. Multi-Institution Cross Registration. (0 cr.; No Grade Associated;)

Multidisciplinary Studies (MDS)

MDS 3001W. Introduction to Multidisciplinary Studies. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer)
University study at a major research institution, its history/theory and expectations/outcomes. Students design their degree and select areas/courses. Institutional/student perspectives. prereq: Admitted to multidisciplinary studies

MDS 3093. Directed Study. (1-15 cr.; A-F only; Every Fall, Spring & Summer)
Independent, directed study. prereq: instr consent

MDS 3101. Project Development. (1 cr. [max 5 cr.]; A-F only; Every Fall, Spring & Summer)
Development, completion, approval of MDS project proposal. Steps/skills of academic project design/development including academic research/writing. Library data base searching methods/citation styles. prereq: 3001W, MDS major, adviser referral, permission number, basic computer/internet skills

MDS 3201. Project Registration 1. (3 cr.; A-F only; Every Fall, Spring & Summer)
Complete project developed in MDS 3101 by conducting research, accomplishing project outcome(s), securing narrative evaluation from project adviser/evaluator. prereq: 3001W, MDS major, C- or above in 3101, approved project proposal, permission number, basic computer and internet skills

MDS 3202. Project Registration 2. (3 cr.; A-F only; Every Fall, Spring & Summer)
Complete project developed in MDS 3101 by conducting research, accomplishing project outcome(s), securing narrative evaluation from project adviser/evaluator. prereq: 3001W, MDS major, C- or above in 3101, approved project proposal, permission number, basic computer/internet skills

MDS 3203. Project Registration 3. (3 cr.; A-F only; Every Fall, Spring & Summer)
Complete project developed in MDS 3101 by conducting research, accomplishing project outcome(s), securing narrative evaluation from project adviser/evaluator. prereq: 3001W, MDS major, C- or above in 3101, approved project proposal, permission number, basic computer/internet skills

Museum Studies (MST)

MST 5011. Museum History and Philosophy. (3 cr.; A-F or Audit; Every Fall)
Historical and philosophical roots of museums and emerging philosophical issues faced by museums today - art, history, science, and youth to living collections, living history sites, and historic houses. Field trips to area museums.

MST 5012. Museum Practices. (3 cr.; A-F or Audit; Every Spring)
Practical aspects of museum work. Standards, practices, responsibilities, issues, all set in greater museum context. Curatorial/educational

MUS 1021. Introduction to Music. (AH; 3 cr.; Student Option; Every Fall, Spring & Summer) Survey of European/American "art," "popular" music in context of those cultures. Aural analyses of musical styles/forms.

MUS 1051. Class Piano for Nonmusic Majors I. (2 cr.; Student Option No Audit; Every Fall, Spring & Summer) For nonmusic majors with little or no keyboard background. Functional skills such as reading, harmonizing, playing by ear and improvising, along with basic technique and study of elementary solo and ensemble repertoire.

MUS 1052. Class Piano for Non Music Majors II. (2 cr.; Student Option No Audit; Every Fall & Spring) For nonmusic majors with little or no keyboard background. Functional skills such as reading, harmonizing, playing by ear and improvising, along with basic technique and study of elementary solo and ensemble repertoire.

MUS 1501. Theory and Analysis of Tonal Music I. (2 cr.; A-F or Audit; Every Fall) Develop basic music vocabulary. Chromatic harmonic, contrapuntal and voice leading principles in common-practice music (Corelli to Brahms). Analyze chromatic progressions/contrapuntal functions in variety of textures and styles. Proficiency in keyboard skills. prereq: [1501, 1511 with grade of at least C-] or diagnostic test administered by School of Music

MUS 1511. Ear-Training and Sight-Singing I. (1 cr.; A-F or Audit; Every Fall) Introduction to foundations of ear-training/sight-singing. prereq: dept consent

MUS 1512. Ear-Training and Sight-Singing II. (1 cr.; A-F or Audit; Every Spring) Develop basic music vocabulary. Chromatic harmonic, contrapuntal/voice leading principles in common-practice music (Corelli to Brahms). Analyze chromatic progressions/contrapuntal functions in variety of textures/styles. Proficiency in keyboard skills. prereq: [1501, 1511 with grade of at least C-] or diagnostic exam administered by School of Music, [music major or instr consent]

MUS 1801W. Music, Society, and Cultures. (AH,WI,GP; 3 cr.; A-F or Audit; Every Fall) Study rural, urban, tribal musics throughout world with interdisciplinary methods of humanities/social sciences. World-wide distribution of musical creativity with audio/video documentation. prereq: Registration for this course is open until the first day of class, at which point instructor consent will be required.

MUS 1804. World Music. (AH,GP; 3 cr.; Student Option; Every Fall & Spring) Musical practice/meaning around the world and in our backyard. World music styles/ perspectives in cultural context. Lectures, in-class music making, guest artists, videos, listening. prereq: Registration for this course is open until the first day of class, at which point instructor consent will be required.

MUS 1914W. Music in Nazi Germany. (CIV,Wi; 3 cr.; Student Option No Audit; Periodic Fall & Spring) Apart from an explicit message in the lyrics, title, or dedication, can music itself be political? Often, the political message comes from the interpreter, not just the composer or performer.
MUS 1915. The Color of Music. (; 3 cr.; Student Option No Audit; Periodic Fall & Spring) How are sounds depicted? How are colors sounded? How do the worlds of music and fine arts intersect and construct meaning that is both specific to each and shared by both? How does each help us experience the world around us in different yet complementary ways? In this seminar you are invited to join a semester-long journey which seeks some answers to these questions through immersion in the sounds, shapes, and colors of Western European art across many centuries. We will be looking at art and listening to music, while learning how to express what we perceive to be interesting, beautiful, and meaningful about their relationship and our reaction to them.

MUS 3021. Introduction to Music. (AH; 3 cr.; Student Option; Every Fall, Spring & Summer) Survey of European and American art and popular music in the context of those cultures; aural analyses of musical styles and forms.

MUS 3029. American Music Cultures. (AH;DSJ; 3 cr.; Student Option; Every Fall) Explore folk, country, gospel, blues, polka, klezmer, powwow, mariachi, and salsa to understand the ways in which ethnic identities coalesce and find expression in sound. Music cultures of nationally prominent European-, African-, Asian-, and Latin-American ethnic groups, and local communities in the Twin Cities metropolitan area.

MUS 3200. Campus Singers. (; 2 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Campus Singers is a non-auditioned ensemble and open to all members of the University community, including students, faculty, staff, and alumni. The Campus Singers sing diverse repertoire from various periods/cultures.

MUS 3230. chorus. (; 1-2 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Includes the University Women's Chorus, Men's Chorus, Concert Choir, and Choral Union. Choirs participate in a variety of programs exploring both Western and non-Western repertoire from the Middle Ages through the 20th century. Concerts include touring, collaborative campus and community performances. prereq: Choral and/or instrumental music background, audition, instr consent

MUS 3241. Vocal Literature (German Lieder) and Pedagogy. (1 cr.; A-F or Audit; Periodic Fall) German Lied: its origins, composers, and development. Musical/textual analysis of representative works. Poetry that serves as song text. Poets in German Romantic period. Topics/issues associated with voice in speech/singing. Vocal anatomy/physiology, process/methods/techniques, care. Listening assignments. prereq: Vocal performance or accompanying major, 2 yrs music theory/history

MUS 3242. Vocal Literature (French Melodie) and Pedagogy. (; 1 cr.; A-F or Audit; Periodic Spring) French M?lodie: its origins, composers, and development. Musical/textual analysis of representative works. Poetry that serves as song text. French symbolist poets. Listening assignments, prereq: Vocal music or accompanying major, 2 yrs of music theory/history

MUS 3261. Italian Diction for Singers. (1 cr.; A-F or Audit; Every Fall) The sounds and symbols of the International Phonetic Alphabet, rules for correct Italian lyric diction, rudimentary Italian grammar, the meanings of Italian musical expressive markings, and Italian words most commonly found in song texts. prereq: Voice or choral music major, concurrent registration is required (or allowed) in applied voice

MUS 3262. English Diction for Singers. (1 cr.; A-F or Audit; Every Spring) English lyric diction for performance of classical vocal music. Use International Phonetic Alphabet for standard transcriptions of song texts, compile a discography of British/American art songs, perform songs in class, and prepare poetry for oral presentation and improvisation. prereq: Voice or choral music major, concurrent registration is required (or allowed) in applied voice

MUS 3263. German Diction for Singers. (1 cr.; A-F or Audit; Every Fall) Principles and practice of German lyric diction for classical vocal music. Transcriptions of German Lieder into International Phonetic Alphabet, elementary German grammar and common song vocabulary, 4 to 5 German songs performed in class for critique, and rules for pronunciation. prereq: Voice or choral music major, concurrent registration is required (or allowed) in applied voice

MUS 3264. French Diction for Singers. (; 1 cr.; A-F or Audit; Every Spring) Principles and practice of French lyric diction for classical vocal music. Transcriptions of French m?lodie into International Phonetic Alphabet, elementary French grammar and common song vocabulary, 4 to 5 French songs performed in class for critique, and rules for pronunciation. prereq: Voice or choral music major, concurrent enrollment in a voice class

MUS 3271. Benvenuto a Milano: The City of Music, Art and Fashion. (AH;GP; 3 cr.; Student Option No Audit; Periodic Summer) This global seminar will feature a three-week stay experiencing some of the world’s greatest visual art, architecture, music and fashion in the magnificent cosmopolitan city of Milan, Italy. While in Milan, you will explore the origins of the Renaissance Movement through the Contemporary Period and trace the social and political events that influenced Italian artists and composers through these eras. Known as the “Risorgimento” (resurgence) movement, students will discover how 18th century opera, with an emphasis on Giuseppe Verdi, helped influence and unify the individual peninsula states into a grand Italian kingdom and help shape modern day Italy.

MUS 3331. Jazz Improvisation I. (; 2 cr.; A-F or Audit; Periodic Fall) Rudiments; analysis; improvisation on blues in three major keys and standard American popular jazz compositions from swing era to early bebop; applications of major and minor scales; ear training. prereq: Music major or instr consent

MUS 3340. Jazz Ensemble. (; 1 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium. prereq: Audition, instr consent

MUS 3350. Jazz Combo. (; 1 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) A performance laboratory class with emphasis on improvisation and learning the jazz vocabulary. A minimum of two public performances is required each semester. prereq: Audition, instr consent

MUS 3380. Gospel Choir. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Gospel Choir is a non-auditioned choral ensemble open to all members of the University community, including students, faculty, staff, and alumni. Throughout the semester, students will perform in choral department concerts, observe and critique musical performances, and demonstrate improved musicianship. The music performed will cover a wide range of musical styles and will help students develop improved vocal skills. Students explore history of gospel music through experiential/participatory songs, field songs, songs of struggle, Southern, traditional, and contemporary songs. Pre-req: Although no audition is required, all students will be heard privately by the instructor during the first week of class for voice placement in the choir. Additionally, a survey will be taken at the beginning of the semester to assess students’ prior musical experiences.

MUS 3400. University and Campus Bands. (; 2 cr. [max 20 cr.]; Student Option; Every Fall & Spring) Lab course.

MUS 3401. Basic Conducting. (; 2 cr.; A-F or Audit; Every Fall & Spring) Beginning course in basic conducting techniques and role of the conductor. prereq: 1502, music major

MUS 3410. University Wind Bands. (; 1 cr.; A-F or Audit; Every Fall & Spring)
WIND ENSEMBLE AND SYMPHONY BANDS PERFORM STANDARD AND CONTEMPORARY LITERATURE; CONCERTS AND TOUR APPEARANCES. PLAYERS FROM ALL COLLEGES MAY PARTICIPATE. PREREQ: AUDITION, INSTR CONSENT

MUS 3420. ORCHESTRA. (.1 CR.; [MAX 8 CR.]; A-F OR AUDIT; EVERY FALL & SPRING) SYMPHONY ORCHESTRA PERFORMS STANDARD REPERTORY AND MAJOR WORKS WITH CHORUS; CONCERTS AND TOUR APPEARANCES. PLAYERS FROM ALL COLLEGES MAY PARTICIPATE. PREREQ: AUDITION, INSTR CONSENT

MUS 3430. CAMPUS ORCHESTRA. (.2 CR.; [MAX 16 CR.]; STUDENT OPTION; EVERY FALL & SPRING) THREE CAMPUS ORCHESTRA PERFORM STANDARD AND CONTEMPORARY ORCHESTRAL LITERATURE. NON-MUSIC-MAJOR-WIND, BRASS, PERCUSSION, AND STRING PLAYERS FROM ALL COLLEGES MAY PARTICIPATE. PREREQ: NON-MUSIC MAJOR OR UNABLE TO REGISTER FOR UNIVERSITY ORCHESTRA

MUS 3440. CHAMBER ENSEMBLE. (.1 CR.; [MAX 8 CR.]; A-F OR AUDIT; EVERY FALL & SPRING) PERFORMANCE OF CHAMBER MUSIC: DUOS, TRIOS, QUARTETS, QUINTETS, AND OTHER ENSEMBLE COMBINATIONS FOR INSTRUMENTS AND VOICES. PREREQ: INSTR CONSENT

MUS 3480. MARCHING BAND. (.2 CR.; [MAX 12 CR.]; A-F OR AUDIT; EVERY FALL) A 250-MEMBER PERFORMING ORGANIZATION OPEN TO PLAYERS FROM ALL COLLEGES. PERFORMS AT UNIVERSITY FOOTBALL GAMES AND OTHER ATHLETIC EVENTS. PREREQ: INSTR CONSENT

MUS 3490. ATHLETICS BANDS. (.1 CR.; [MAX 16 CR.]; A-F OR AUDIT; EVERY SPRING) ATHLETICS BANDS FOR MEN'S HOKEY, MEN'S BASKETBALL, AND WOMEN'S SPORTS. PREREQ: INSTR CONSENT

MUS 3501. THEORY AND ANALYSIS OF TONAL MUSIC I. (.2 CR.; A-F OR AUDIT; EVERY FALL) HISTORY AND VOICE-LEADING. DIATONIC AND BASIC CHROMATIC CHORDS. FORM. ANALYSIS OF MUSIC FROM 18TH/19TH CENTURIES. PREREQ: [(1501, 1502, 1511, 1512) WITH GRADE OF AT LEAST C-] OR DIAGNOSTIC TEST ADMINISTERED BY SCHOOL OF MUSIC

MUS 3502. THEORY AND ANALYSIS OF TONAL MUSIC II. (.3 CR.; A-F OR AUDIT; EVERY FALL) HISTORY OF EUROPEAN ART-MUSIC TRADITION, ITS SOCIAL CONTEXTS FROM ANTIQUITY TO 1700: COMPOSERS, STYLES, STRUCTURES, SOCIAL INSTITUTIONS. PREREQ: DEPT CONSENT

MUS 3503. HISTORY OF WESTERN MUSIC I. (.WI; 3 CR.; A-F OR AUDIT; EVERY SPRING) HISTORY OF MUSIC THROUGH THE MAJOR MUSICAL PERIODS: BAROQUE, CLASSICAL, ROMANTIC, MODERN. PREREQ: COMPLETION OF MUS 1501, 1502, 3501, 3502, 3511, 3601, 3602

MUS 3504. HISTORY OF WESTERN MUSIC II. (.WI; 3 CR.; A-F OR AUDIT; EVERY SPRING) HISTORY OF MUSIC THROUGH THE MAJOR MUSICAL PERIODS: BAROQUE, CLASSICAL, ROMANTIC, MODERN. PREREQ: COMPLETION OF MUS 1501, 1502, 3501, 3502, 3511, 3601, 3602

MUS 3505. HISTORY OF WESTERN MUSIC III. (.WI; 3 CR.; A-F OR AUDIT; EVERY SPRING) HISTORY OF MUSIC THROUGH THE MAJOR MUSICAL PERIODS: BAROQUE, CLASSICAL, ROMANTIC, MODERN. PREREQ: COMPLETION OF MUS 1501, 1502, 3501, 3502, 3511, 3601, 3602

MUS 3506. THEORY AND ANALYSIS OF AMERICAN POPULAR MUSIC. (.3 CR.; A-F OR AUDIT; FALL ODD YEAR) ANALYSIS OF POPULAR SONGS, PRIMARILY THOSE WITHIN THE AMERICAN-AMERICAN TRADITION, WITH THE STRONGESTfocus ON THE UNITED STATES. MUSICAL DETAILS, TECHNIQUES, AND FORMS PERTAINING TO POPULAR SONGS. LARGER INTERPRETIVE, HISTORICAL, AND SOCIOLOGICAL QUESTIONS IN THE CONTEXT OF ANALYZING SPECIFIC SONGS AND RECORDINGS. PREREQ: [3501, 3511] WITH A GRADE OF C- OR BETTER

MUS 3508. REVIEW OF TONAL THEORY. (.2 CR.; STUDENT OPTION; EVERY FALL) FAST-PACED REVIEW OF 1501, 1502, AND 3501. FOCUSES ON DIATONIC AND BASIC CHROMATIC PROCEDURES, PART-WRITING, AND ANALYSIS. PREREQ: THEORY PLACEMENT EXAM

MUS 3509. REVIEW OF TONAL THEORY IV. (.2 CR.; STUDENT OPTION; EVERY FALL) REMEDIAL COURSE. HARMONY, VOICE-LEADING. CHROMATIC TONAL PRACTICES. FORM, INCLUDING SONATA, RONDO, VARIATIONS, AND OTHER STANDARD CATEGORIES OF TONAL COMPOSITION. ANALYSIS OF MUSIC FROM 18TH/19TH CENTURIES. PREREQ: GRAD MUSIC STUDENT OR INSTR CONSENT

MUS 3511. EAR-TRAINING AND SIGHT-SINGING III. (.1 CR.; A-F OR AUDIT; EVERY FALL) MELODIC, HARMONIC, AND RHYTHMIC TECHNIQUES. FOCUSES ON DIATONIC AND BASIC CHROMATIC PROCEDURES. EMPHASIS ON MELODIC AND HARMONIC TECHNIQUES. INDIVIDUAL SIGHT-SINGING AUDITIONS. PREREQ: THEORY PLACEMENT EXAM

MUS 3518. REVIEW OF EAR-TRAINING AND SIGHT-SINGING. (.1 CR.; STUDENT OPTION; EVERY FALL) FAST-PACED REVIEW OF 1502 AND 3501 FOCUSING ON DIATONIC AND BASIC CHROMATIC PROCEDURES. EMPHASIS ON MELODIC AND HARMONIC TECHNIQUES. INDIVIDUAL SIGHT-SINGING AUDITIONS. PREREQ: GRAD STUDENT IN MUSIC OR INSTR CONSENT

MUS 3519. REVIEW OF EAR-TRAINING AND SIGHT-SINGING. (.1 CR.; STUDENT OPTION; EVERY FALL & SPRING) REMEDIAL COURSE. FAST-PACED REVIEW OF 3502. FOCUSES ON DIATONIC/BASIC CHROMATIC PROCEDURES. EMPHASIZES MELODIC/HARMONIC TECHNIQUES. INDIVIDUAL SIGHT-SINGING AUDITIONS. PREREQ: GRAD STUDENT IN MUSIC OR INSTR CONSENT

MUS 3601W. HISTORY OF WESTERN MUSIC I. (.WI; 3 CR.; A-F OR AUDIT; EVERY SPRING) HISTORY OF EUROPEAN ART-MUSIC TRADITION, ITS SOCIAL CONTEXTS FROM ANTIQUITY TO 1700: COMPOSERS, STYLES, STRUCTURES, SOCIAL INSTITUTIONS. PREREQ: DEPT CONSENT

MUS 3602W. HISTORY OF WESTERN MUSIC II. (.WI; 3 CR.; A-F OR AUDIT; EVERY FALL) HISTORY OF EUROPEAN ART-MUSIC TRADITION, ITS SOCIAL CONTEXTS FROM 1700 TO 1850. COMPOSERS, STYLES, STRUCTURES, SOCIAL INSTITUTIONS. PREREQ: 1502, 3601, MUSIC MAJOR, INSTR CONSENT

MUS 3603W. HISTORY OF WESTERN MUSIC III. (.WI; 3 CR.; A-F OR AUDIT; EVERY SPRING) HISTORY OF EUROPEAN ART-MUSIC TRADITION, ITS SOCIAL CONTEXTS FROM 1700 TO 1850. COMPOSERS, STYLES, STRUCTURES, SOCIAL INSTITUTIONS. PREREQ: 3502, 3601, MUSIC MAJOR, INSTR CONSENT

MUS 3604. INTENSIVE THEORY AND ANALYSIS OF 18TH-CENTURY MUSIC. (.2 CR.; A-F OR AUDIT; EVERY FALL) THEORY AND ANALYSIS OF ART MUSIC IN VARIOUS STYLES DEVELOPED IN 18TH CENTURY. PREREQ: [3501, 3511] OR INSTR CONSENT

MUS 4505. JAZZ THEORY. (.3 CR.; A-F OR AUDIT; EVERY FALL) BEGINNING THROUGH ADVANCED TECHNIQUES FOR CHORD CONSTRUCTION. EXTENDED CHORDS. NOMENCLATURE IN JAZZ IDIOM. PREREQ: [3501, 3511] WITH GRADES OF AT LEAST C-

MUS 4514. EAR-TRAINING AND SIGHT-SINGING FOR 20TH-CENTURY MUSIC. (.1 CR.; A-F OR AUDIT; EVERY SPRING) DEVELOPING AURAL SKILLS RELATIVE TO 20TH-CENTURY WESTERN ART MUSIC. FOCUSES ON PITCH RELATIONS, RHETORIC TECHNIQUES, FORM, AND TO A LESSER DEGREE, TIMBRE AND TEXTURE. PREREQ: COMPLETION OF [3502, 3512] WITH GRADES OF AT LEAST C-

MUS 5101. PIANO PEDAGOGY I. (.2 CR.; STUDENT OPTION; PERIODIC FALL) DEMONSTRATION AND DISCUSSION OF TEACHING TECHNIQUES, METHODS, AND MATERIALS FOR GROUP AND INDIVIDUAL INSTRUCTION AT THE ELEMENTARY, EARLY INTERMEDIATE, AND LATE INTERMEDIATE LEVELS. PREREQ: 8 CR IN MUSA 1301 OR MUSA 1401 OR INSTR CONSENT

MUS 5102. PIANO PEDAGOGY II. (.2 CR.; STUDENT OPTION; PERIODIC FALL & SPRING) DEMONSTRATION AND DISCUSSION OF TEACHING TECHNIQUES, METHODS, AND MATERIALS FOR GROUP AND INDIVIDUAL INSTRUCTION AT THE ELEMENTARY, EARLY INTERMEDIATE, AND LATE INTERMEDIATE LEVELS.

MUS 5150. BODY AWARENESS IN ACTIVITY: THE ALEXANDER TECHNIQUE FOR MUSICIANS. (.2 CR.; [MAX 8 CR.]; STUDENT OPTION; EVERY FALL & SPRING) ALEXANDER TECHNIQUE WITH SPECIFIC APPLICATIONS TO MUSIC PERFORMANCE. EMPHASIS ON BODY/MIND AWARENESS TO PROMOTE TECHNICAL EASE AND FREEDOM.

MUS 5151. ORGAN LITERATURE I. (.3 CR.; A-F OR AUDIT; PERIODIC FALL) ORGAN LITERATURE FROM THE 14TH CENTURY TO THE MID-18TH CENTURY. INFLUENCE OF ORGAN DESIGN OF VARIOUS PERIODS AND NATIONAL SCHOOLS ON THE LITERATURE AND ITS PERFORMANCE. PREREQ: 3502, 3603, SR OR GR OR INSTR CONSENT

MUS 5152. ORGAN LITERATURE II. (.3 CR.; A-F OR AUDIT; PERIODIC FALL)
Organ literature of J. S. Bach and of other 19th- and 20th-century composers. Influence of organ design of various periods and national schools on the literature and its performance. prereq: 3502, 3603, sr or grad or instr consent

MUS 5153. Organ Pedagogy. (2 cr.; A-F or Audit; Spring Odd Year) Familiarization with materials and techniques for teaching playing the pipe organ. Through their study, students are to gain knowledge of organ methods and various aspects of teaching and learning to play the King of Instruments.

MUS 5181. Advanced Piano Literature I. (2 cr.; A-F or Audit; Fall Even, Spring Odd Year) Literature for piano from late Baroque period to mid-20th century, prereq: grad piano major or instr consent

MUS 5182. Advanced Piano Literature II. (2 cr.; A-F or Audit; Periodic Spring) Literature for piano from late Baroque period to mid-20th century, prereq: grad piano major or instr consent

MUS 5230. Chorus. (1-2 cr. [max 16 cr.]; Student Option; Every Fall & Spring) University Women’s Chorus, Men’s Chorus, Concert Choir and Choral Union. Chorus participants in a variety of programs exploring both Western and non-Western repertoire from the Middle Ages through the 20th century. Concerts include touring, and collaborative campus and community performances. prereq: Choral and/or instrumental music background; audition, instr consent

MUS 5240. University Singers. (1-8 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Mixed chorus with members of former chamber singers and concert choir. Programs exploring Western/non-Western repertoire from Middle Ages through 20th century. Concerts include touring and collaborative campus/community performances. prereq: Audition, instr consent

MUS 5241. Vocal Literature I. (3 cr.; A-F or Audit; Periodic Fall) Vocal literature of major/minor composers from 17th century to present. Structure, style, performance practice, prereq: [12 cr in MusA 1304, grad music student] or instr consent

MUS 5242. Vocal Literature II. (3 cr.; A-F or Audit; Periodic Spring) Vocal literature of major and minor composers from 17th century to present; structure, style, and performance practice. prereq: 12 cr in MusA 1104 or MusA 1304, grad music major or instr consent

MUS 5250. Opera Workshop and Ensemble. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Preparation and performance of operatic arias, choruses, and scenes. Participation in fully staged or workshop productions of music theatre repertoire. prereq: audition, instr consent

MUS 5271. Diction for Singers I. (2 cr.; A-F or Audit; Every Fall) Principles and techniques of singing in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used, prereq: 12 cr MusA 1304 or grad music major or instr consent

MUS 5272. Diction for Singers II. (2 cr.; A-F or Audit; Periodic Spring) Principles and techniques of singing in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used, prereq: 12 cr MusA 1304 or grad music major or instr consent

MUS 5275. Vocal Pedagogy I. (3 cr.; Student Option; Every Spring) Advanced study of mind/body preparations for singing, anatomy, and physiology of the vocal mechanism. Voice use and care, historical and comparative pedagogy, learning theories, models and guidelines for teaching, instructional techniques, and diagnosing and solving vocal problems. prereq: Sr vocal major or instr consent

MUS 5276. Vocal Pedagogy II. (3 cr.; A-F or Audit; Periodic Spring) History of solo vocal performance; selection and preparation of beginning level solo vocal repertoire; development of vocal performance skills (interpretation, expression, artistry), recital programming, and vocal career counseling. prereq: Sr vocal major or instr consent

MUS 5280. Opera Theatre. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Preparation and performance of fully-staged operatic production. Major involvement in singing, acting, and technical aspects of opera. prereq: audition, instr consent

MUS 5331. Jazz Improvisation I. (2 cr.; A-F or Audit; Periodic Summer) Rudiments, analysis. Improvisation on blues in three major keys and on standard American popular jazz compositions from swing era to early bebop. Applications of major/minor scales. Ear training. prereq: Music major or instr consent

MUS 5332. Post-tonal Theory and Analysis II. (3 cr.; A-F only; Spring Even Year) Art music composed since 1945. Develop skills in analyzing and interpreting this literature.

MUS 5336. Jazz Arranging. (3 cr.; A-F or Audit; Every Fall & Spring) Beginning techniques of arranging for jazz combo and jazz ensemble; vocal and instrumental. prereq: 3502 or instr consent

MUS 5340. Jazz Ensemble. (1 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium. prerq: audition, instr consent

MUS 5400. University and Campus Bands. (1 cr. [max 10 cr.]; Student Option; Every Fall & Spring) Lab course.

MUS 5410. University Wind Bands. (1 cr. [max 14 cr.]; A-F or Audit; Every Fall & Spring) Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate. prereq: audition, instr consent

MUS 5420. Orchestra. (1 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) Symphony orchestra performs standard repertory and major works with chorus; concerts and tour appearances. Players from all colleges may participate. prereq: audition, instr consent

MUS 5425. Suzuki Pedagogy Practicum. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring) Supervised teaching of both individual and group lessons. Instructor provides periodic critiques from observation of live or videotaped lessons. Prereq: (& 5424 or & 5425); grad music student] or instr consent, grad consent.

MUS 5426. Final project Suzuki Pedagogy. (1 cr.; A-F or Audit; Periodic Spring) Research project.

MUS 5427. Violin Pedagogy I. (2 cr.; A-F or Audit; Periodic Fall) Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques. prereq: Violin or viola major or instr consent

MUS 5430. Contemporary Music Workshop. (1 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) Generation/performance of new chamber works set within context to situate musical works within dynamic field of historical, philosophical, and expressive import. prereq: instr consent

MUS 5440. Chamber Ensemble. (1 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring) Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and/or voices. prereq: audition, instr consent

MUS 5450. Orchestral Repertoire. (1-3 cr. [max 9 cr.]; A-F or Audit; Every Fall & Spring) Investigation of practical and performance problems in standard orchestral repertoire with regard to style and interpretation. prereq: instr consent

MUS 5460. World Music Ensemble. (1-2 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Afro-Brazilian/Afro-Caribbean popular repertories. Samba, bossa nova, salsa, merengue, mambo. Planned master classes; clinics with local artists to complement regularly scheduled rehearsals/performances. No audition required.

MUS 5461. Guitar Literature. (2 cr.; Student Option; Fall Odd Year) This course is principally intended for guitar majors (graduate and undergraduate students). The main focus of this course is to introduce students to guitar literature, through the historical overview of the repertoire, classical guitar composers, and performers. It will also introduce students to method books, in chronological order (through an examination of specific styles and “performance practices”) and teaching methods through the history
of guitar and guitar literature intended for technique development (studies, exercises, etc.).

MUS 5464. Cello Pedagogy. (2 cr.; A-F or Audit; )
Concentrated study of cello teaching methods. Provides students with the strategies for teaching cello privately, develops analytical skills, and increases knowledge of cello repertoire. Designed for practical application in conjunction with the string technique class.

MUS 5466. Guitar Pedagogy. (2 cr.; A-F or Audit; Fall Even Year)
Intended for guitar performance majors. This course will introduce basic teaching concepts/methods/philosophies and examine method books, studies, and methodology through the history of classical guitar. Other topics (e.g., starting a studio, developing promotional material/website, contemporary teaching methods) will be addressed. prereq: Guitar performance major or instr consent

MUS 5480. University Brass Choir. (1 cr. [max 8 cr.]; Student Option; Every Fall & Spring)
The University Brass Choir is an ensemble of 16 brass and percussion players exploring unique literature that spans 400 years. From the rich antiphonal music of Giovanni Gabrieli (1557-1612) to the works of the 20th century. The Brass Choir performs in Twin Cities churches and concert halls. prereq: audition, instr consent

MUS 5481. Trumpet Pedagogy. (2 cr.; Student Option; Fall Odd, Spring Even Year)
Principles of trumpet pedagogy. Discussion of literature, history, and current teaching aids. prereq: Sr or grad in music or instr consent

MUS 5485. Transcription for Winds. (2 cr.; Student Option; Periodic Fall)
Principles of music manuscript and examination of transcription examples. Transcription projects with score and parts. Smaller projects that involve arrangements and original compositions. prereq: 3502 or instr consent

MUS 5490. Percussion Ensemble. (1 cr. [max 10 cr.]; A-F or Audit; Every Fall & Spring)
Practice and performance of standard and contemporary compositions for percussion instruments in various combinations. prereq: instr consent

MUS 5491. Percussion Literature I. (2 cr.; A-F or Audit; Periodic Fall)
Repertoire derived from orchestral and band literature for snare drum, timpani, mallet instruments, and various percussion accessories. Major works of the 20th century written for solo percussion, percussion ensemble, and chamber groups of percussion and non-percussion instruments. prereq: Jr or Sr or grad or instr consent

MUS 5493. Javanese Gamelan Music Ensemble. (1 cr. [max 8 cr.]; Student Option; Periodic Fall & Spring)
Hands-on experience in learning to play Javanese gamelan music, one of the great non-western musical traditions that is readily accessible to beginners. Related insights into the role of this tradition in Javanese culture. Open to all students - no musical background needed!

MUS 5494. West African Music Ensemble. (1 cr. [max 8 cr.]; Student Option; Periodic Fall & Spring)
Hands-on experience in learning to play West African music, one of the great non-western musical traditions that is readily accessible to beginners. Also, insights into function, context, structure, gender roles, politics, instruments, life-cycle rites, genres, musical organizations, traditional musicians, and contemporary popular music. Open to all students - no musical background needed!

MUS 5534. Musical Minimalisms. (3 cr.; A-F or Audit; Periodic Fall & Spring)
This course provides an introduction to the various musics associated with the label "minimalism," including musical trajectories emerging from them. Numerous artists and compositions will be covered, spanning from 1958 to the present, though the focus is on music composed during the 1960s and 1970s, including that by Young, Riley, Reich, Glass, Monk, the Velvet Underground, Andriessen, P?rt, Eno, Feldman, and others. The class blends analysis, historical and analytical secondary readings, and in-class performance. Students must contribute informed comments to discussion, which in turn requires the completion of reading and listening assignments. prereq: Undergraduates-Mus 4504/4514 or equivalent; Graduates-Mus 3508/3518 or passing of the Theory Entrance Exam

MUS 5541. 16th-Century Counterpoint. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Polyphonic counterpoint in modal style of Renaissance. Writing exercises in species counterpoint and in two, three, and four parts. Cantus firmus techniques, mixed values, invertible counterpoint, canon. Representative works by Josquin, Lassus, Palestrina, Victoria, and others. Renaissance treatises by Artusi, Banchieri, Diruta, Morley, Zarlino, and others. prereq: [3501, 3508] or pass basic skills exam

MUS 5550. Class Composition. (2 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Original works in various forms. Development of individual compositional style in a post-tonal idiom. Various forms, performing forces, techniques. prereq: [4504, 4514] with C- or better) or instr consent

MUS 5551. Orchestration I. (3 cr.; A-F or Audit; Every Fall)
Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries. prereq: 3502

MUS 5571. Schenkerian Analysis for Performers. (3 cr.; A-F or Audit; Periodic Fall & Summer)
Theory/analysis of tonal music using principles developed by Henrich Schenker. Basic concepts/notation, their application to excerpts/short pieces from 18th/19th centuries. prereq: 3502

MUS 5573. Analysis of Late-Romantic Orchestral Literature. (3 cr.; A-F or Audit; Periodic Spring)
Advanced tonal analysis. Dramatic orchestral music by Wagner, Strauss, Tchaikovsky, Rimsky-Korsakov, Moussorgsky, and Rachmaninoff as focus for projects/discussions related to chromatic harmony, form, and orchestration. prereq: 3502 or Theory IV Exam or instr consent; [4504 or equiv] recommended

MUS 5574. Wagner's Ring: Conception, Coherence, Consequence. (3 cr.; A-F or Audit; Spring Even Year)
Enrich process of listening to Wagner's Ring by providing analytic insight into Wagner's compositional technique and the dramatic, tonal, and motivic structure of the work. Analytic approach broadened with a number of interdisciplinary forays. prereq: 3502 or equiv

MUS 5581. Trumpet Pedagogy. (2 cr.; Student Option; Fall Odd, Spring Even Year)
Principles of trumpet pedagogy. Discussion of literature, history, and current teaching aids. prereq: Sr or grad in music or instr consent

MUS 5624. Music of J. S. Bach. (3 cr.; A-F or Audit; Spring Even Year)
Issues of musical style, historical context. Moves chronologically through Bach's career. Relationships between his duties and works he composed. Genesis, function, relationship of a work to genre and performing forces. Lectures, presentations, research/analysis assignments. prereq: Grad student in music or instr consent

MUS 5630. Performance Practice: 1700 to the Present. (3 cr.; A-F only; Fall Even Year)
This course will explore issues relevant to the historically informed performance of music written between 1700 and the present, including primary sources, original instruments and iconography, editions, treatises, phrasing and articulation, tempo and rubato, rhythmic alteration, ornamentation and cadenzas, and basso continuo. Class activities and assignments will include readings, discussion, and practicalim. Pre-requisite: Graduate student in Music or instructor consent

**MUS 5631. Beethoven Sonatas for Solo Piano, Violin, & Cello.** (3 cr.; A-F only; Fall Odd Year)
Beethoven's sonatas are central to the violin, cello, and piano repertoires, and they will be examined in relation to the composer's life, times, and developing style. Scholarly books and articles, mostly musicological but also analytical, will provide the stimulus for understanding these works. The implications of such scholarly investigations for performance will also be a running theme of the course. Attention will therefore be given to performance practice issues as well as some difficult editorial and notational problems associated with the scores. Pre-requisite: Graduate student in Music or instructor consent

**MUS 5647. 20th-Century European/ American Music.** (3 cr.; A-F only; Periodic Spring)
Emphasizes major artistic movements, stylistic turning points, social roles of music. Interactions between high art, popular, ethnic musics; contributions of men and woman as composers and performers. prereq: 3603 or equiv, 5501 or equiv, 12 undergraduate or in music history

**MUS 5701. Music, Disability, and Society.** (3 cr.; A-F only; Spring Even Year)
Study of intersection of music/disability in life, times, and developing style. Scholarly investigations for performance will also be a running theme of the course. Attention will therefore be given to performance practice issues as well as some difficult editorial and notational problems associated with the scores. Pre-requisite: Graduate student in Music or instructor consent

**MUS 5731. Jazz and Modernism.** (3 cr.; A-F or Audit; Spring Even Year)
Critical consideration of the mutual impact and cross-influences of jazz practices and modernist aesthetics. Contextualizes the emergence of styles including ragtime, swing, bebop, cool, third-stream, modal, and avant-garde jazz within the broader aesthetic currents of 20th-century art and popular music cultures. prereq: Graduate student in music or instr consent

**MUS 5732. Free Jazz: From Structure to Gesture.** (3 cr.; A-F only; Spring Odd Year)
Discuss musical form of free jazz comprising flow expressivity, collaborative interaction, gestural communication from theoretical/practical point of view. Major representatives such as Ornette Coleman, Cecil Taylor, Archie Shepp, The Art Ensemble of Chicago, John Coltrane. Sound material include classical recordings but also recent free jazz CDs/DVDs. prereq: Graduate student in music or instr consent

**MUS 5805. Worlds of Improvisation.** (3 cr.; A-F or Audit; Spring Odd Year)
This course will explore traditions of improvisation from a variety of world cultures -- such as African, African-American, European, Middle Eastern, South Asian -- to gain insight into processes of composition in performance, from ethnomusicological, music-theoretical, and applied vocal/instrumental perspectives.

**MUS 5950. Topics in Music.** (1-4 cr. [max 60 cr.]; Student Option; Periodic Fall, Spring & Summer)
Each offering focuses on a single topic. Topics specified in Class Schedule.

**MUS 5993. Directed Studies.** (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. Prereq instr consent, dept consent, college consent.

**MUS 8110. Sonata Seminar.** (2 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Performance in standard Baroque, Classical, and Romantic sonatas for piano and violin, cello, viola, flute, clarinet, or oboe. prereq: Accompanying emphasis, strings and winds by audition, instr consent

**MUS 8112. Instrumental Repertoire: Reduction and Realization.** (2 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Reducing orchestra scores, representing orchestral reductions at piano, working with conductors. Conductors join course in mid-semester. prereq: Graduate student in accompanying/conducting

**MUS 8131. Advanced Keyboard Skills.** (2 cr. [max 8 cr.]; A-F or Audit; Periodic Fall)
Diatonic/chromatic tonal harmony applied to keyboard. Emphasizes harmonicization, transposition, and improvisation. Open score and clef reading using alto, tenor, and soprano clefs. prereq: Graduate student in music or instr consent

**MUS 8133. Seminar in Basso Continuo.** (3 cr.; A-F or Audit; Periodic Fall)
Realization of figured basses (bass lines annotated with Arabic numerals indicating harmony) and performance of continuo parts in European concerted music from 17th/18th centuries at keyboard. Emphasizes developing stylistic accompaniment skills at harpsichord/organ. prereq: Graduate student in Music or instr consent

**MUS 8151. Seminar in Organ Repertoire.** (3 cr.; A-F or Audit; Periodic Fall)
Repertoire for pipe organ. Readings/presentations on selected areas of repertoire of 15th through 20th centuries. Organ design/construction of various European and American schools, as well as relevant performance practices. prereq: Graduate student in music or instr consent

**MUS 8170. Advanced Vocal Accompanying Skills and Repertoire.** (2 cr. [max 8 cr.]; A-F or Audit; Periodic Fall)
Advanced performance (Liefer, melody, opera) emphasizing coaching techniques and performance skills of pianists and singers. prereq: French, German, Italian diction, accompanying or DMA voice emphasis or MM voice emphasis by audition

**MUS 8171. Song Repertoire and Performance for Pianists and Singers: German Lieder.** (2 cr.; A-F or Audit; Periodic Spring)
Surveys standard German-language song repertoire: Mozart, Schubert, Schumann, Brahms, Strauss, Wolf. prereq: Grad student with major in vocal performance or in accompanying or in piano, instr consent

**MUS 8181. Operatic Accompaniment Skills and Repertoire.** (2 cr.; A-F or Audit; Every Fall & Spring)
Development of skills required in operatic accompanying/coaching work. Standard opera arias, cultivation of orchestral sound at the piano, stylistic traditions, working with conductors. prereq: Graduate student with major in accompanying or in conducting

**MUS 8182. Opera History in Context: Monteverdi and Mozart.** (3 cr.; A-F only; Every Fall)
Development of opera in context of other artistic, social, cultural, and political events, movements, and changes. Focuses on two representative composers and some of their significant operas. prereq: Graduate student in music or instr consent

**MUS 8183. Opera History in Context: Verdi and Britten.** (3 cr.; A-F only; Every Spring)
Development of opera in context of other artistic, social, cultural, and political events, movements, and changes. Focuses on two representative composers and some of their significant operas. prereq: Graduate student in music or instr consent

**MUS 8237. Score Study: Choral.** (3 cr.; A-F or Audit; Every Fall)
Analysis of various choral scores ranging from Renaissance through 20th century. Reading of choral and choral/orchestral scores at piano, including scores with C clefs and transposing instrument. prereq: instr consent

**MUS 8255. Choral Literature: Baroque Era to the Present.** (3 cr.; A-F or Audit; Every Spring)
Study of sacred and secular choral works. prereq: instr consent

**MUS 8299. Performance in Choral Conducting.** (3 cr.; A-F or Audit; Every Fall & Spring)
Preparation and performance of choral conducting recital, with supporting paper. prereq: instr consent

**MUS 8333. FTE: Master's.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

**MUS 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**MUS 8450. Graduate Seminar in Conducting.** (3-4 cr. [max 32 cr.]; A-F or Audit; Every Fall & Spring)
Schenker. Application of his method to representative repertoire from 18th and 19th centuries. Contrapuntal writing modeled after presentation in Schenker’s [Counterpoint]. 
prereq: instr consent

MUS 8582. Schenkerian Theory and Analysis II. (3 cr. ; A-F or Audit; Spring Even Year) Application of Schenkerian theory to 18th-/19th-century music, coordinated with critical study of major music treatises from that era. 
prereq: 8581 or instr consent

MUS 8584. Current Issues in the Analysis of 19th-Century Music. (3 cr. ; A-F or Audit; Spring Even Year) Recent analytic approaches to 19th-century music. Students demonstrate fluency with methods and current issues. In-class discussions, short written analytical projects, two longer papers. 
prereq: [3502, 3512] or equiv placement exam], instr consent; grad-level Schenkerian analysis recommended

MUS 8590. Topics in 20th-Century Analysis. (3 cr. ; A-F or Audit; Every Fall & Spring) Seminar explores literatures of 20th-century art music.

MUS 8631. Seminar: Music in Medieval Europe. (3 cr. ; A-F or Audit; Periodic Fall) Selected genres of polyphonic and monophonic music, 9th-14th centuries, for analysis and cultural criticism. Social roles of music and performance traditions; current musicological issues.

MUS 8632. Seminar: Music in Early Modern Europe. (3 cr. ; A-F or Audit; Periodic Fall) Transformation of chanson, madrigal, mass, and motet from 1400 to 1580. Analysis and cultural criticism; social roles of music and performance traditions; current musicological issues.

MUS 8640. Seminar in Musicology. (3 cr. ; A-F or Audit; Every Fall & Spring) Topics vary; readings, research, strategies, and methods. 
prereq: Musicology or theory emphasis or instr consent

MUS 8644. Seminar: Advanced Research in Historical Musicology. (3 cr. ; A-F or Audit; Periodic Fall) Major reference and research materials in musicology and related disciplines, including databases. Historical methods and historiography. Locating and interpreting primary sources of music and archival documents. Developing research strategies for degree papers and theses. Forms of documentation and historical writing. 
prereq: Undergrad music degree

MUS 8647. Seminar: The Critical Editing of Early Music—Method and Practice. (3 cr. ; A-F or Audit; Periodic Fall) Preparation of critical editions from primary sources of vocal and instrumental music (partbooks and tablatures). Nature of musical sources, both manuscripts and prints. Stenmatic filiation, editorial judgment and method, presentation of text. 
prereq: Undergrad music degree

MUS 8651. Sonata Theory. (3 cr. ; A-F or Audit; Periodic Fall) Principles of the classic sonata: norms, types, and deformations. Structural analysis, analytical methodologies, and fundamentals of sonata hermeneutics. 
prereq: instr consent

MUS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. ; max 12 cr.) ; No Grade Associated; Every Fall, Spring & Summer 
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

MUS 8711. Performance Theory. (3 cr. ; A-F only; Spring Odd Year) Investigate transformation process from score to its sounding instrumental realization. Discuss most important scholarly publications by B. Repp, Th. W. Adorno, et al. Theory first describes structure of such transformations, then investigates analytical, emotional, gestural rationales for expressive performance. 
prereq: Grad student in music or instr consent

MUS 8777. Thesis Credits: Master’s. (1-18 cr. ; max 50 cr.) ; No Grade Associated; Every Fall, Spring & Summer 
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

MUS 8864. Current Issues in Ethnomusicology. (3 cr. ; A-F or Audit; Every Fall) Ethnomusicological methods, theorizing, and research practice. Current issues in monographs, journals, and anthologies.

MUS 8888. Thesis Credit: Doctoral. (1-24 cr. ; max 100 cr.) ; No Grade Associated; Every Fall, Spring & Summer 
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

MUS 8994. Directed Research. (1-3 cr. ; max 12 cr.) ; A-F or Audit; Every Fall & Spring) Directed research. 
prereq: instr consent

MUS 8999. Recital Credits: Doctoral. (4 cr. ; max 20 cr.) ; A-F or Audit; Every Fall, Spring & Summer) Registration for recital credits coincides with performance of D.M.A. recital (five recitals for 20 credits). 
prereq: DMA student, instr consent

Music Applied (MUSA)

MUSA 1101. Piano: Elective (non-major in music). (2-4 cr. ; max 32 cr.) ; A-F or Audit; Every Fall & Spring
Private instruction. 
prereq: dept consent

MUSA 1103. Organ: Elective (non-major in music). (2-4 cr. ; max 32 cr.) ; A-F or Audit; Every Fall & Spring
Private instruction. 
prereq: dept consent

MUSA 1104. Voice: Elective (non-major in music). (2-4 cr. ; max 32 cr.) ; A-F or Audit; Every Fall & Spring

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
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<td>(2 cr. [max 32 cr.])</td>
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<td>MUSA 1117</td>
<td>Trombone: Elective (non-major in music)</td>
<td>(2 cr. [max 32 cr.])</td>
<td>A-F or Audit; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: dept consent</td>
</tr>
<tr>
<td>MUSA 1121</td>
<td>Bassoon: Music Education and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
<tr>
<td>MUSA 1124</td>
<td>Bassoon: Music Education and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
<tr>
<td>MUSA 1125</td>
<td>French Horn: Music Education and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
<tr>
<td>MUSA 1126</td>
<td>Trumpet: Music Education and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
<tr>
<td>MUSA 1127</td>
<td>Trombone: Music Education and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
<tr>
<td>MUSA 1128</td>
<td>Tuba: Music Education and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
<tr>
<td>MUSA 1129</td>
<td>Percussion: Music Ed and BA</td>
<td>(2 cr. [max 16 cr.])</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Private instruction. prereq: [Music education or BA applied] major, dept consent</td>
</tr>
</tbody>
</table>

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
MUSA 1313. Saxophone: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1314. Bassoon: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1315. French Horn: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1316. Trumpet: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1317. Trombone: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1318. Euphonium: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1319. Tuba: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1321. Percussion: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1322. Harp: Music Major. (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1401. Piano: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Music major, dept consent

MUSA 1402. Harpsichord: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1403. Organ: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1404. Voice: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 1405. Violin: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 1406. Viola: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 1411. Oboe: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1412. Clarinet: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1413. Saxophone: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1414. Euphonium: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1415. French Horn: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1416. Trumpet: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1417. Trombone: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1418. Euphonium: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1419. Tuba: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1420. Harp: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1421. Organ: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1422. Harp: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1423. Guitar: Music Major Secondary (undergraduate). (; 2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 1901. Piano: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1902. Harp: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1903. Organ: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1904. Voice: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1905. Violin: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1906. Viola: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Periodic Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1907. Cello: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1908. Double Bass: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1909. Flute: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1910. French Horn: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1911. Oboe: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1912. Clarinet: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1913. Saxophone: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1914. Euphonium: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1915. French Horn: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1916. Trumpet: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1917. Trombone: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1918. Euphonium: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Periodic Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1919. Tuba: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1920. Percussion: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1921. Harp: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1922. Organ: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

MUSA 1923. Guitar: Music Major Transfer. (; 2-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Private instruction for transfer students. One semester only. prereq: Audition, dept consent

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
MUSA 2201. Piano: Music Ed and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2204. Voice: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2205. Violin: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2206. Viola: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2207. Cello: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2208. Bass: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2209. Flute: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2211. Oboe: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2212. Clarinet: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2213. Saxophone: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2214. Bassoon: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2215. French Horn: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2216. Trumpet: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2217. Trombone: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2219. Tuba: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2221. Percussion: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2222. Harp: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2223. Guitar: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2301. Piano: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2302. Harpsichord: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2303. Organ: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2304. Voice: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2305. Violin: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2306. Viola: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2307. Cello: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2308. Double Bass: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2309. Flute: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2310. Piano: Elective (non-major in music). (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 2311. Oboe: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2312. Clarinet: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2313. Saxophone: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2314. Bassoon: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2315. French Horn: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2316. Trumpet: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2317. Trombone: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2318. Euphonium: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2319. Tuba: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2321. Percussion: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2322. Harp: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 2323. Guitar: Music Major. (2 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. prereq: Audition, dept consent

MUSA 3101. Piano: Elective (non-major in music). (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 3103. Organ: Elective (non-major in music). (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 3104. Voice: Elective (non-major in music). (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Private instruction. prereq: dept consent

MUSA 3105. Violin: Elective (non-major in music). (2 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Private instruction. prereq: dept consent
MUSA 3117. Trombone: Elective (non-major in music). (2-4 cr. [max 16 cr.]; A-F or Audit; Periodic Fall & Spring) Prerequisite instruction. Prerequisite: dept consent.

MUSA 3121. Percussion: Elective (non-major in music). (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Prerequisite instruction. Prerequisite: dept consent.

MUSA 3123. Guitar: Elective (non-major in music). (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Prerequisite instruction. Prerequisite: dept consent.

MUSA 3121. Percussion: Elective (non-major in music). (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall & Spring) Prerequisite instruction. Prerequisite: dept consent.

MUSA 3122. Harp: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3123. Guitar: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3124. Voice: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3125. French Horn: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3127. Trumpet: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3127. Trombone: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3119. Tuba: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

MUSA 3120. Flute: Music Education and BA. (2 cr. [max 16 cr.]; A-F only; Every Fall & Spring) Prerequisite instruction.

Private instruction. Prerequisite: Audition, dept consent.

MUSA 3302. Harpsichord: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3303. Organ: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3306. Viola: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3307. Cello: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3308. Double Bass: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3309. Flute: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3311. Oboe: Music Major. (2-4 cr. [max 16 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

Private instruction. Prerequisite: Audition, dept consent.

MUSA 3312. Clarinet: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3313. Saxophone: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3314. Bassoon: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3315. French Horn: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3316. Trumpet: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3317. Trombone: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3318. Euphonium: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3319. Tuba: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.

MUSA 3321. Percussion: Music Major. (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer) Private instruction. Prerequisite: Audition, dept consent.
MUSA 5104. Voice: Elective (graduate non-major in music). (2-4 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5105. Violin: Elective (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5106. Viola: Elective (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Periodic Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5112. Clarinet: Elective (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Periodic Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5113. Saxophone: Elective (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Periodic Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5116. Trumpet: Elective Individual Lessons (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Periodic Fall, Spring & Summer)
Individualized trumpet instruction. prereq: dept consent

MUSA 5121. Percussion: Elective (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5123. Guitar: Elective (graduate non-major in music). (2 cr. [max 8 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: dept consent

MUSA 5409. Flute: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5144. Bassoon: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5145. French Horn: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5146. Trombone: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5147. Baritone: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 5148. Clarinet: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5149. Harpsichord: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 5150. Voice: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5151. Percussion: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 5152. Guitar: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 5153. Organ: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent

MUSA 5154. Voice: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5155. Violin: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5156. Double Bass: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5157. French Horn: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall & Spring)
Private instruction. prereq: Audition, dept consent

MUSA 5158. Tuba: Music Major Secondary (graduate). (2-4 cr. [max 24 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Private instruction. prereq: Audition, dept consent
MUSA 8321. Percussion: Music Major (graduate). (2-4 cr. [max 48 cr.]; A-F or Audit; Every Fall, Spring & Summer) 
Private instruction. prereq: Audition, dept consent

MUSA 8322. Harp: Music Major (graduate). (2-4 cr. [max 48 cr.]; A-F or Audit; Every Fall, Spring & Summer) 
Private instruction. prereq: Audition, dept consent

MUSA 8323. Guitar: Music Major (graduate). (2-4 cr. [max 48 cr.]; A-F or Audit; Every Fall, Spring & Summer) 
Private instruction. prereq: Audition, dept consent

MUSA 8324. Accompanying/Coaching: Music Major (graduate). (2-4 cr. [max 48 cr.]; A-F or Audit; Every Fall, Spring & Summer) 
Private instruction. prereq: Audition, dept consent

Music Education (MUED)

MUED 1201. Introduction to Music Education. (2 cr.; A-F only; Every Spring) 
Framework to work effectively in diverse settings. Field experiences, readings, presentations, instructional technologies. Historical, psychological, and philosophical foundations. prereq: Music education major

MUED 1801. Introduction to Music Therapy. (2 cr.; A-F or Audit; Every Fall & Spring) 
Methods, materials, and applications of music therapy in various clinical settings with emphasis on field observation.

MUED 3011. Music in Childhood. (3 cr.; Stude. Option; Every Fall & Spring) 
Learning each child's interests, needs, and abilities. Integrate music with other classroom subjects. Written/oral discussions, music making, micro-teaching, lesson presentations. Taught from arts perspective.

MUED 3802. Guitar I for Music Education and Music Therapy Majors: Developing Group Songleading Skills. (2 cr.; A-F only; Every Fall) 
How to play standing up, accompany oneself, cue/promote, move around room while playing, sight-read chords, read tablature. Open chords, tuning, keys that facilitate group singing. Eye contact. Simple 2-3 chords songs. Teaching guitar to novice players. prereq: [Music therapy or music education major], dept consent

MUED 3803. Guitar II for Music Education and Music Therapy Majors: Developing Group Songleading Skills. (2 cr.; A-F only; Every Spring) 
Students play guitar, accompany themselves as they sing songs, and role play live music therapy and music education settings. How to play in various styles using open chords and different rhythmic accompaniment. prereq: 3802 with grade of at least C-. [music therapy or music education major], dept consent

MUED 3807. Percussion Techniques for Music Therapists. (2 cr.; A-F or Audit; Every Spring) 
Design, implement, and facilitate percussion into music therapy session. Variety of music therapy percussion instruments/how to successfully implement them into clinical practice with children, adolescents, and adults who are differently-abled.

MUED 4417. Style, Pedagogy, and Diction in the Choral Music Classroom I. (2 cr.; A-F only; Every Fall) 
Vocal styles. Lyric diction, vocal pedagogy. Performance in vocal jazz, musical theater, and classical styles. How to apply style concepts in school setting. SMARTMUSIC software. prereq: two semesters of applied voice at college level

MUED 4418. Style, Pedagogy, and Diction in the Choral Music Classroom II. (2 cr.; A-F only; Spring Even Year) 
Vocal styles. Lyric diction, vocal pedagogy. Performance in vocal jazz, musical theater, and classical styles. How to apply style concepts in school setting. SMARTMUSIC software. prereq: two semesters of applied lessons at college level

MUED 4502. String Techniques and Teaching. (2 cr.; A-F or Audit; Every Spring) 

MUED 4503. Woodwind Techniques and Teaching. (2 cr.; A-F or Audit; Every Spring) 

MUED 4504. Brass Techniques and Teaching. (2 cr.; A-F or Audit; Every Fall) 

MUED 5101. Improvisation and Creativity in the Music Classroom. (2 cr.; A-F only; Every Fall) 
This course will address issues of improvisation, composition, and creativity of critical importance to musicians and music educators, with a strong emphasis on music-theoretical and socio-cultural modes of understanding the meanings and functions of music. Students will gain experience with the creative practices characteristic of a variety of Western and non-Western forms, including those of jazz and Minnesota American Indian music. The workshop format of the class will challenge students to improvise and compose works, present and perform them to their peers, provide and receive constructive feedback, engage and respond to this feedback with reference to clearly articulated statements of artistic intent, and revise the works accordingly. Students will apply insights derived in this manner in final research projects focused on the development of lesson and unit plans. prereq: At least C- in MUS 4504

MUED 5301. General Music I. (3 cr.; A-F or Audit; Every Spring) 
Materials, strategies and the field experience for planning and implement instruction for global arts understanding among early childhood and lower elementary school children. Experiential learning, for integrating international music and culture perspectives while planning and implementing sequential elementary music instruction. prereq: MUED 1201, MUS 4504, MUS 4514, [music education major or instr consent], successful completion of soph proficiency exam

MUED 5302. General Music II. (3 cr.; A-F only; Every Fall) 
Materials, strategies and an extensive field experience with expert general music teachers for planning and implementing sequential upper elementary, middle and high school music instruction for global arts understanding. Includes interdisciplinary connections, performance, and applications of academic technologies. prereq: MUED 5301, MUED 1201, MUS 4504, and MUS 4514 with a grade of at least C-

MUED 5350. Student Teaching in Classroom Music. (4-8 cr.; A-F or Audit; Every Fall & Spring) 
Supervised teaching and observing of classroom and general music in elementary, junior high, and senior high schools. Weekly seminar emphasizing classroom management, curriculum development, and administration of music programs.

MUED 5415. Choral/Vocal Methods and Materials I. (3 cr.; A-F only; Every Spring) 
Choral/vocal methods and materials as part of licensure to work in K-12 settings per legislated standards. Sight-singing, classroom management, warm-ups, adolescent voice, choral conducting skills, repertoire, and rehearsal techniques. 25 hours of practicum at the middle school level. Applications of technology. First of two required semesters. prereq: MUED 1201, MUS 4504, MUS 4514, [music education major or instr consent], successful completion of soph proficiency exam

MUED 5416. Choral/Vocal Methods and Materials II. (3 cr.; A-F only; Every Fall) 
Choral/vocal methods and materials as part of licensure to work in K-12 settings per legislated standards. Choral conducting skills, rehearsal techniques, and interpretation of choral compositions. Methods, materials, and curriculum for high school choral ensembles. 20 hours of practicum at the high school level. Second of two required semesters. prereq: MUED 5415, MUED 1201, MUS 4504, and MUS 4514 with grade of at least C-. [music education major or instr consent], successful completion of soph proficiency exam
education major or instr consent], completion of the Music Education sophomore proficiency exam

MUED 5419. Advanced Conducting and Repertoire (Choral). (2 cr. : A-F only; Every Fall)
Conducting/baton technique, non-verbal communication skills, rehearsal techniques, score study habits. Aural/diagnostic skills to rehearse a choral ensemble. Selection of age-appropriate repertoire. prereq: 3416, MUS 3401, MUS 3502, MUS 3512, music education major [choral]

MUED 5450. Student Teaching in Vocal Music. (4-8 cr. : A-F or Audit; Every Fall & Spring)
Supervised teaching and observing of vocal music in elementary, junior high, and senior high schools. Weekly seminar emphasizing classroom management, curriculum development, and administration of music programs.

MUED 5516. Instrumental Methods and Materials I. (3 cr. : A-F only; Every Spring)
Instrumental methods and materials as part of licensure to work in K-12 settings per legislated standards. Sight-singing, classroom management, adolescent development, instrumental conducting skills, repertoire, and rehearsal techniques. 25 hours of practicum at the middle school level. Applications of technology. First of two required semesters. prereq: MUED 1201, MUS 4504, and MUS 4514 with a grade of C- or better, music education major, successful completion of Music Education sophomore proficiency exam

MUED 5517. Instrumental Methods and Materials II. (3 cr. : A-F only; Every Fall)
Instrumental methods and materials as part of licensure to work in K-12 settings per legislated standards. Sight-singing, classroom management, adolescent development, instrumental conducting skills, repertoire, and rehearsal techniques. 25 hours of practicum at the middle school level. Applications of technology. Second of two required semesters. prereq: MUED 1201, MUS 4504, and MUS 4514 with a grade of C- or better, music education major, completion of the Music Education sophomore proficiency exam

MUED 5519. Advanced Conducting and Repertoire (Instrumental). (2 cr. : A-F only; Every Fall)
Conducting/baton technique, non-verbal communication skills, rehearsal techniques, score study habits. Aural/diagnostic skills necessary to effectively rehearse an instrumental ensemble. Selection of quality, age-appropriate repertoire. prereq: 3517, MUS 3502, MUS 3512, music education major, dept consent

MUED 5550. Student Teaching in Instrumental Music. (4-8 cr. : A-F or Audit; Every Fall & Spring)
Supervised teaching and observing of instrumental music in elementary, junior high, and senior high schools. Weekly seminar emphasizing classroom management, curriculum development, and administration of music programs.

MUED 5650. Student Teaching Seminar. (2 cr. : A-F or Audit; Every Fall & Spring)
Reflective practice during student teaching. Developing materials for professional employment (e.g., resume, portfolio). prereq: At least C- in all required [music, music education, professional education] courses

MUED 5669. Psychology of Music. (3 cr. : A-F or Audit; Every Fall)
Basic study of the psychology and psychoacoustics of music including hearing, music perception and cognition, values and preferences, musical abilities, musical systems, media music effects, the influence of music on human behavior, and psycho-socio-physiological processes involved in musical behavior. prereq: Psy 1001 or Psy 3604 or instr consent

MUED 5750. Topics in Music Education. (1-4 cr. [max 16 cr.]: A-F or Audit; Every Fall, Spring & Summer)
Focuses on single topic, specified in Class Schedule.

MUED 5800. Group Music Leadership Skills. (3 cr. : A-F or Audit; Every Spring)
Role of group music experiences in human development. Relations specific to music therapy. Students develop repertoire of music applications/techniques for various age groups/populations. Standards for group leadership. Precision teaching skills. prereq: [(Completion of [MUS 1151, MUS 1152] or MUS 1155), music therapy major] or instr consent

MUED 5803. Therapeutic Management in Music Settings. (4 cr. : A-F only; Every Fall)
Cognitive behavioral methodology related to music therapy and music education settings. Prepares students to complete case studies mandated for internship completion set forth by American Music Therapy Association. prereq: [5804, 5805] or instr consent

MUED 5804. Music Therapy Methods and Procedures I. (4 cr. : A-F or Audit; Every Fall)
Methods/procedures for developing basic music therapy competencies/professionalism. Music therapy populations, their clinical needs. How to use music therapy in an evidence-based approach to meet client objectives. prereq: 5800 or instr consent

MUED 5805. Music Therapy Methods and Procedures II. (4 cr. : A-F only; Every Spring)
Second course in professional sequence for music therapy. Topics include psychotherapy techniques and other music therapy approaches. Practicum in the community, in-class lab. prereq: 5804 or instr consent

MUED 5806. Career Preparation. (4 cr. : A-F or Audit; Every Spring)
Ethics, grant writing, resume/CV preparation, supervision, board certification, professional responsibilities. Students design evidence-based research-based music therapy program, present their proposals to class/community. prereq: 5805 or instr consent

MUED 5807. Psychiatric Music Therapy. (3-4 cr. : A-F only; Every Fall)
Psychiatric populations. How music therapy can be implemented as evidence-based practice. Students design original research and role-play music therapy interventions for psychiatric populations. Practicum component on designing music therapy interventions. Graduate students registering for this course should enroll for 4 credits. Undergraduate students registering for this course should enroll for 3 credits. prereq: Grad music therapy student or instr consent

MUED 5808. Medical Music Therapy. (3-4 cr.: A-F only; Every Spring)
Role/scope of music therapy in medical treatment. Medical diagnoses. How to program appropriate music therapy interventions to address patient needs. prereq: Grad music therapy major or instr consent

MUED 5855. Music Therapy Internship. (1-13 cr.: S-N or Audit; Every Fall & Spring)
Six-month resident internship in music therapy at an affiliated, approved hospital or clinic. prereq: Music therapy major, instr consent

MUED 5991. Independent Study. (1-4 cr. [max 8 cr.]: A-F or Audit; Every Fall, Spring & Summer)
Independent study project organized by the student in consultation with the appropriate instructor. prereq: Music ed or music therapy major or grad, instr consent, dept consent

MUED 8112. Introduction to Research Methods and Design in Arts Education. (3 cr.: A-F or Audit; Fall Odd, Spring Even Year)
Methods and research designs employed in investigating education issues in the arts. Reporting results. Proposal development. Bibliographic skills for conducting a review of related research literature. Common analytical techniques. prereq: Grad student in [music or music education], dept consent

MUED 8115. Assessment in Arts Education. (3 cr.: A-F or Audit; Fall Odd, Spring Even Year)
Methods for assessing unique challenges in artistic achievement: performances, products, and other artistic achievements. Assessment design. Interpretation for large-/small-scale assessments in performance, classroom, and clinical settings. prereq: Grad student in [music or music education], dept consent

MUED 8118. Qualitative Research in Arts Education. (3 cr.: A-F or Audit; Fall Even, Spring Odd Year)
A theoretical, practical and systematic approach to qualitative research in arts education. Students participate in a joint field exploration or work in a setting relevant to their long-term research interests. prereq: Grad student in [arts or education], dept consent

MUED 8119. Advanced Applications of Research Methods. (3 cr.: A-F only; Spring Even Year)
Application of research methods/design. Emphasizes both quantitative and qualitative methods. Contemporary procedures/theories of data collection, management, analysis, and

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
interpretation. prereq: Grad music education student or instr consent

**MUED 8210. Advanced Music Teaching Seminar.** (1 cr. [max 3 cr.]; A-F only; Every Fall & Spring)
Advanced music teaching techniques. Assessment, comprehensive musicianship, action research, international education. Readings/assignments vary depending on topic. Focus on promising practices with immediate application in music classroom. prereq: Grad student in music education or with music teaching license

**MUED 8211. Foundations of Music Education.** (3 cr.; A-F or Audit; Every Fall & Summer)
Major historical, philosophical, sociological, and psychological foundations of music education. Primary literature in the field. Role and current state of music education. prereq: Grad student in [music or music education] or instr consent

**MUED 8212. Curriculum Design in Music Education.** (3 cr.; A-F only; Every Fall & Spring)
Examine/critically analyze curricular models from multiple perspectives, consider influence on music teaching/learning. Design/construct curricula with view towards promoting musical growth. prereq: Grad student in music education or instr consent

**MUED 8280. Seminar: Current Trends in Music Education.** (3 cr.; max 30 cr.; A-F only; Periodic Fall, Spring & Summer)
Current issues/trends in music education: philosophical, historical, psychological, and pedagogical. Course’s focus varies, reflecting the dynamic nature of the field. prereq: dept consent

**MUED 8284. Seminar: Research and Scholarly Issues.** (3 cr.; A-F or Audit; Spring Even Year)
Scholarly/professional expectations of music educators and music therapists in academia and other positions of leadership. Writing for a variety of professional purposes/publications. prereq: Doctoral student in music or music education or instr consent

**MUED 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

**MUED 8334. Advanced Music Therapy Competencies.** (3-4 cr. [max 8 cr.]; A-F only; Fall Even Year)
Enter to the music therapy profession requires basic competencies that are acquired through undergraduate music therapy coursework. This course is designed to provide graduate music therapy students with advanced music therapy competencies related to ethics, supervision, diversity, social justice, counseling, and higher education in a seminar style format. prereq: Music Therapy 4th-year undergraduates with instructor consent; Music Therapy MA or PhD

**MUED 8880. Master's Research Project.** (3-6 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Individual projects for MM in Music Education emphases (Research/Pedagogical). prereq: Grad music ed major, instr consent

**MUED 8900. Seminar: Music Education Doctoral Seminar.** (1 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Research-oriented collaboration between students and faculty. Models the manner in which research is conceived, primary literature evaluated, methods designed, and research projects carried through to completion. prereq: dept consent

**MUED 8994. Directed Research.** (1-8 cr.; A-F or Audit; Every Fall, Spring & Summer)
tbd prereq: instr consent

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**NPSE 8001. Introduction to Nanoparticle Science and Engineering.** (3 cr.; A-F or Audit;)
A broad, interdisciplinary overview of the emerging field of nanoparticle science and engineering. This introductory course, designed for students with diverse backgrounds in science and engineering, covers a wide spectrum of topics—from the synthesis of nanoparticles, to nanoparticle growth and transport, to characterization methods for nanoparticles, to novel nanoparticle-based materials and devices.

**NPSE 8002. Nanoparticle Science and Engineering Laboratory.** (3 cr.; A-F or Audit; Periodic Summer)
Practical exposure to computational and experimental techniques in nanoparticle research. Required for Ph.D. students minoring in nanoparticle science and engineering. prereq: 8001.[CSE grad student or instr consent

**NPSE 8101. Nanoparticle Science and Engineering Seminar.** (1 cr.; S-N or Audit; Every Fall & Spring)
Broad overview of current research in nanoparticle science and engineering. Topics include areas of nanoparticle synthesis, nanoparticles characterization, nanoparticle-based materials and devices, environmental impact of nanoparticles, and instrumentation for nanoparticle research. Speakers from the University of Minnesota as well as external experts. prereq: CSE grad student or

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**NR 5021. Statistics for Agricultural and Natural Resource Professionals.** (3 cr.; Student Option; Every Fall)
The primary audience for this course is graduate students in the agricultural, environmental, natural resources, and other related programs that need competence in statistics. The subject matter will be approaches and applications involving analysis of data using common statistical methods, e.g., describing and visualizing data, the design of single factor experiments, linear modeling, and the ability to examine journal articles in their field and assess their content in a critical manner. prereq: College algebra

**NR 8100. Topics in Natural Resources Science and Management.** (1-2 cr.; S-N only; Every Fall)
Topics course for NRSM

**NR 8107. Seminar: Natural Resources Science and Management.** (1 cr.; Student Option; Every Fall & Spring)
Assign topics, student presentations, student presentation evaluations.

**NR 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

**NR 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**NR 8666. Doctoral Pre-Thesis Credits.** (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**NR 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**NR 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(no description) prereq: Max 18 cr per semester or summer; 24 cr required. Must be doctoral student with advisor's consent to register.

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**Naval Science (NAV)**

**NAV 1000. Professional Training in Naval Science.** (1 cr.; S-N or Audit; Every Fall & Spring)
Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies. prereq: enrolled in NROTC

**NAV 1101. Introduction to Naval Science.** (3 cr.; A-F or Audit; Every Fall)
Navy organization, customs and traditions, officer and enlisted rank and rating structures, uniforms and insignia, shipboard duties, seamanship, damage control, and safety. Core values of the naval services, Navy regulations, and the Uniform Code of Military Justice.
NAV 1102. Seapower and Maritime Affairs. (3 cr.; A-F or Audit; Every Spring) Historical influences on development of U.S. Navy, from American Revolution to present. Critical, contemporary issues.

NAV 2000. Professional Training in Naval Science. (1 cr.; S-N or Audit; Every Fall & Spring) Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies. prereq: Soph enrolled in NROTC


NAV 3000. Professional Training in Naval Science. (1 cr.; S-N or Audit; Every Fall & Spring) Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies. prereq: Jr enrolled in NROTC

NAV 3301. Navigation I: Piloting and Celestial Navigation. (3 cr.; A-F or Audit; Every Fall) Great military leaders of history. Development of warfare, from dawn of recorded history to present. Focuses on effect of major military theorists, strategists, tacticians, technological developments.


NAV 3309. Fundamentals of Maneuver Warfare. (3 cr.; A-F or Audit; Fall Even Year) Fundamentals of Maneuver Warfare (FMW) is a detailed look at broad aspects of warfare and their interactions with maneuver warfare doctrine, with a focus on the United States Marine Corps. Throughout the course there is a strong focus on Leadership, as the fundamental purpose of this course is to develop the skills, knowledge, leadership background and mentality necessary for a successful Marine Corps Officer.

NAV 3310. Evolution of Warfare. (3 cr.; A-F or Audit; Periodic Fall) Great military leaders of history. Development of warfare, from dawn of recorded history to present. Focuses on effect of major military theorists, strategists, tacticians, technological developments.

NAV 4000. Professional Training in Naval Science. (1 cr. [max 4 cr.]; S-N or Audit; Every Fall & Spring) Instruction and training in basic military subjects and professional development, including military leadership, close order drill, marksmanship, honors and ceremonies, personnel inspections, and computer-based war game simulations. Classes and small group seminars on leadership and ethical issues with case studies. prereq: Sr enrolled in NROTC

NAV 4401W. Leadership and Management I. (WI; 3 cr.; A-F or Audit; Every Fall) Advanced study of organizational behavior/management. Major behavioral theories examined in detail. Practical applications. Exercises, case studies, seminar discussions.

NAV 4402W. Leadership and Ethics. (CIV, WI; 3 cr.; A-F or Audit; Every Spring) Junior officer role. Responsibilities faced as leader, manager, professional officer of Naval Services. Develops specific competencies in areas of leadership, management, professional administration, development. Emphasizes Naval Service ethics, core values. prereq: NAV 4401W

Neurology (NEUR)

NEUR 5121. Descriptive Neurology. (2 cr.; O-N or Audit; Every Spring) Central and peripheral nervous system. Correlation of neuroanatomy, neurophysiology, clinical neurology, and pathology of the nervous system. prereq: enrolled OT or PT.

NEUR 5230. Cerebrovascular Hemodynamics and Diseases I. (4 cr.; A-F only; Every Fall) Principles of cerebrovascular disease/pathophysiology, hemodynamics, diagnostic imaging, and endovascular devices. Bench-to-bedside experiments. Clinical trials, including design constraints and biostatistics. prereq: [PHSL 3051 or PHSL 3063], [MATH 1271 or MATH 1371], [MATH 1272 or MATH 1372], [PHYS 1201W or PHYS 1301W], instr consent or [grad student; PHSL 5061 or instr consent]

NEUR 5240. Cerebrovascular Hemodynamics and Diseases II. (4 cr.; A-F only; Every Spring) Principles of cerebrovascular disease/pathophysiology, hemodynamics, diagnostic imaging, and endovascular devices. Bench-to-bedside experiments. Clinical trials, including design constraints and biostatistics. Treatment options, endovascular devices, design of new clinical studies. prereq: 5230, instr consent

NEUR 7120. Neurology Research. (2-8 cr.; H-N only; Every Fall, Spring & Summer) Students are eligible to participate in clinical or basic science research programs conducted by members of the Department of Neurology at the Fairview-University Medical Center or affiliated hospitals. The specific nature of the project is decided upon by the student and the faculty member. The student is responsible for making their own arrangements with the faculty member.

NEUR 7124. Sleep Disorders. (2 cr.; H-N only; Every Fall, Spring & Summer) Students will rotate with sleep medicine physicians at one of two sites.

NEUR 7300. Interventional Neurology Elective. (2-4 cr.; H-N only; Every Fall, Spring & Summer) Rotation with the interventional neurology team: observe procedures, see patients in clinic, participate in research projects. Prereq 7510.

NEUR 7510. Neurology Externship. (4 cr.; H-N only; Every Fall, Spring & Summer) This required 4-week clerkship offers students the opportunity to work directly with neurologists in inpatient and outpatient settings.

NEUR 7520. Pediatric Neurology Elective. (4 cr.; H-N only; Every Fall, Spring & Summer) Offers students a chance to interact with Child Neurologists with varying focuses of practice including developmental, neuromuscular, movement, epilepsy, and miscellaneous neuro-genetic and neuro-metabolic disorders. Students will be involved in both the inpatient and outpatient aspects concurrently. As ensuring completion of this step may be difficult given limited clerkship availability, requests will be considered if at least one of the prerequisites has been completed. Alt: Required: (NEUR 7510, “Externship in Clinical Neurology”)

NEUR 7542. Pediatric Neurology. (4 cr.; H-N or Audit; Every Fall & Spring) Successful completion of this rotation satisfies the neurology requirement (Neur 7-510). Pediatric neurology patients have a variety of problems ranging from coma, muscular dystrophy, epilepsy to learning disabilities; from inborn errors of metabolism, metabolic neurologic dysfunction to behavior disorders. Patients are seen both on service and in consultation in the hospital and in the outpatient clinic which meets three times weekly. Students will function as part of the group of physicians who evaluate and suggest therapy for these children. There will be close supervision and tutorial sessions with the senior pediatric neurology fellows as well as scheduled rounds with pediatric neurology staff members at least three times weekly. There is no night call, routinely. A teaching conference
is held weekly and students are encouraged to participate during the rotation.

**NEUR 7545. Neuromuscular Diseases.** (4 cr.; H-N or Audit; Every Fall, Spring & Summer)
Students participate in all aspects of diagnosis/management of patients with neuromuscular disease. Rotation includes neuromuscular and Muscular Dystrophy Association clinics, clinical electrophysiology laboratory evaluations of patients, nerve/muscle biopsy histological interpretation, and clinic/electrocytography conferences. Diseases seen include carpal tunnel syndrome, radiculopathies, polyneuropathies, muscular dystrophy, amyotrophic lateral sclerosis, myasthenia gravis. Molecular basis of inherited neuromuscular disease. Students may participate in clinical research projects.

**NEUR 7565. Neurology Subspecialty Elective.** (4 cr.; H-N only; Every Fall, Spring & Summer)
Students are exposed to various neurological subspecialty outpatient clinics.

**NEUR 7599. Subinternship in Clinical Neurology.** (4 cr.; H-N only; Every Fall, Spring & Summer)
This hospital-based course is designed for students with special interest in the clinical and basic neurosciences who desire additional experience in clinical neurology. prereq: 7510

**NEUR 7600. Epilepsy Diagnosis and Treatment.** (2 cr.; H-N only; Every Fall, Spring & Summer)
The student works with an epileptologist in inpatient/outpatient settings. Emphasis is on learning diagnosis, pharmacological and surgical treatment, and the social and psychological consequences to care for the needs of epilepsy patients.

**NEUR 7910. Neurology Medical Residency.** (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Neurology medical residency.

**NEUR 7930. Neurology Medical Fellowship.** (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Neurology medical fellowship.

**NEUR 8201. Clinical Pediatric Neurology.** (1-15 cr.; Student Option)

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### Neuroscience (NSC)

**NSC 5031W. Perception.** (WI; 3 cr.; Student Option; Periodic Fall)
Cognitive, computational, and neuroscience perspectives on visual perception. Color vision, pattern vision, image formation in eye, object recognition, reading, impaired vision. Course is biennial: offered fall of odd years. prereq: Psy 3031 or Psy 3051 or instr consent

**NSC 5040. Brain Networks: From Connectivity to Dynamics.** (4 cr.; A-F or Audit; Fall Odd Year)
Intensive introduction to cellular and molecular aspects of research techniques in contemporary neuroscience, held at Itasca Biological Station. Electrophysiological investigations of neuronal properties, neuropharmacological assays of transmitter action, and immunohistochemical studies in experimental preparations. prereq: Neuroscience grad or instr consent

**NSC 5561. Systems Neuroscience.** (4 cr.; A-F or Audit; Every Fall)
Principles of organization of neural systems forming the basis for sensation/movement. Sensory-motor/neural-endocrine integration. Relationships between structure and function in nervous system. Team taught. Lecture, laboratory. prereq: NSc grad student or instr consent

**NSC 5561W. Behavioral Neuroscience.** (WI; 3 cr.; A-F or Audit; Every Spring)
Neural coding/representation of movement parameters. Neural mechanisms underlying higher order processes such as memorization, memory scanning, and mental rotation. Emphasizes experimental psychological studies in human subjects, single cell recording experiments in subhuman primates, and artificial neural network modeling. prereq: Grad NSc major or grad NSc minor or instr consent

**NSC 5667. Neurobiology of Disease.** (2-3 cr.; S-N or Audit; Fall Even Year)
Basic clinical/pathological features, pathogenetic mechanisms. Weekly seminar course. prereq: instr consent

**NSC 8014. Small RNA Biology.** (2 cr.; A-F or Audit; Every Spring)
Small RNAs as major regulators of gene/protein expression. MicroRNAs and their potential use in diagnosis/prognosis of various disease conditions, including cancers. Small RNAs and their role in health and disease. prereq: BIOC 8002 or MICA 8004 or equiv or instr consent

**NSC 8026. Neuro-Immune Interactions.** (3 cr.; Student Option; Periodic Fall & Spring)
Regulatory systems (neuroendocrine, cytokine, and autonomic nervous systems) linking brain and immune systems in brain-immune axis. Functional effects of bidirectional brain-immune regulation. Course is offered fall of even-numbered years. prereq: 5561, MiCB 4131

**NSC 8041. Cognitive Neuroscience.** (4 cr.; A-F only; Every Fall)

**NSC 8111. Quantitative Neuroscience.** (3 cr.; A-F or Audit; Every Fall)
Principles of experimental design and statistical analysis in neuroscience research. Includes an introduction to computer programming for data analysis using both classic and modern quantitative methods.
NSC 8207. Seminar: Psychopharmacology. (**; 1-3 cr.; [max 12 cr.]; Student Option; Every Fall & Spring)
Faculty and postdoctoral fellows interested in psychotropic drugs and chemicals participate.
Some seminars devoted to biomedical ethics, Neurochemistry, pharmacology, and behavior as antecedent or consequential variables. prerequisite: instructor consent

NSC 8208. Neuropsychopharmacology. (**; 3 cr.; A-F or Audit; Fall Even Year)
Methodologies to study relationships between drugs and biochemical, behavioral, and neurophysiological consequences. Functional biogenic amine, peptideergic, other pathways. How manipulations alter neuronal function or behavior. Feedback mechanisms, induction, inhibition. Reinforcement of, tolerance to, or dependence on drugs of abuse: stimulants, hallucinogens, depressants, opiates. Student presentations. prerequisite: [5212, 6112, PSY 5021, PSY 5061] or instructor consent

NSC 8211. Developmental Neurobiology. (**; 3 cr.; A-F or Audit; Every Spring)
How neuronal types develop. Emphasizes general mechanisms. Experimental data demonstrating mechanisms. prerequisite: Neuroscience grad student or instructor consent

NSC 8216. Selected Topics in Autonomic and Neuroendocrine Regulation. (**; 1 cr.; S-N or Audit; Every Fall & Spring)
Advanced seminar. Course is offered fall and spring semesters. prerequisite: instructor consent

NSC 8217. Systems and Computational Neuroscience. (**; 2 cr.; S-N or Audit; Every Fall & Spring)
Advanced seminar. prerequisite: 5561 or instructor consent

NSC 8221. Neurobiology of Pain and Analgesia. (**; 3 cr.; Student Option; Periodic Fall & Spring)
Pain and analgesia. Course is triennial. prerequisite: instructor consent

NSC 8222. Central Regulation of Autonomic Function. (**; 3 cr.; A-F or Audit; Every Fall & Spring)
Neural/hormonal sensory pathways affecting central autonomic nuclei involved in maintenance of homeostasis. Current research on physiological control systems at cellular, organ, and integrative levels. Course is offered fall of odd-numbered years. prerequisite: 5561

NSC 8247. Anatomy and Physiology of the Human Nervous System. (**; 3 cr.; S-N or Audit; Every Fall & Spring)
The human nervous system. The course will introduce the structure and function of neurons, the major anatomical parts of the nervous system and the main functional systems. Current research on biophysics and physiology of auditory system; topics selected for each student. Written reviews prepared and discussed.

NSC 8320. Readings in Neurobiology. (**; 1-4 cr.; [max 16 cr.]; Student Option; Every Fall & Spring)
Topics in neurobiology and neurophysiology.

NSC 8321. Career Skills and Understanding Responsibilities as a Neuroscientist. (**; 0.5 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring)
Information that falls outside of core neuroscience academic curriculum. Areas of practical value for graduate school and career development. Career skills, writing skills, responsible conduct in research. prerequisite: Neuroscience grad major or instructor consent

NSC 8333. FTE: Master's. (**; 1 cr.; No Grade Associated; Every Fall & Spring)
FTE: Master's prerequisite: Master's student, advisor approval

NSC 8334. Laboratory Neuroscience. (**; 1-3 cr.; S-N or Audit; Every Fall & Spring)
Guided research. prerequisite: Grad NSC major

NSC 8411. Teaching in Neuroscience. (**; 1 cr.; [max 4 cr.]; S-N or Audit; Periodic Spring)
Grad students serve as primary instructors in 4151 and work with fellow students and faculty mentors to design curriculum, classroom sessions, exams, and course evaluations. prerequisite: instructor approval

NSC 8444. FTE: Doctoral. (**; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prerequisite: Doctoral student, advisor and DGS consent

NSC 8481. Advanced Neuropharmacology. (**; 4 cr.; A-F or Audit; Fall Even Year)
Delivery of compounds to central nervous system (CNS) to activate proteins in specific brain regions for therapeutic benefit. Pharmaceutical/pharmacological issues specific to direct drug delivery to CNS. prerequisite: instructor consent

NSC 8666. Doctoral Pre-Thesis Credits. (**; 1-6 cr.; [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Doctoral Pre-Thesis Credits prerequisite: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

NSC 8777. Thesis Credits: Master's. (**; 1-18 cr.; [max 50 cr.]; No Grade Associated; Every Fall & Summer)
Thesis Credits: Master's

NSC 8888. Thesis Credit: Doctoral. (**; 1-24 cr.; [max 100 cr.]; No Grade Associated; Every Fall & Spring)
(No description) prerequisite: Max 18 cr per semester or summer; 24 cr required

Neuroscience Department (NSCI)

NSCI 1001. Fundamental Neuroscience: Understanding Ourselves. (TS; 3 cr.; A-F only; Every Fall & Spring)
Assessing objectively the neuroscience information presented to public at-large across various media outlets. Explaining the potential importance of these discoveries.

NSCI 1002. Social Neuroscience: Understanding Others. (3 cr.; A-F only; Every Spring)
The field of neuroscience makes a special contribution to our understanding of the human condition, as it can both help us understand ourselves and also how we interact in a world of other individuals. Historically, there has been a dichotomy between disciplines that identify the abstract principles of the social world we live in and the biology of the organ (i.e., the central nervous system) we use to identify and coordinate those abstract principles as we function in our daily lives. By merging these disciplines and studying our interactions with the world on many layers of analysis, from genes to social dynamics, we can develop a richer understanding of who we are as people. prerequisite: None

NSCI 2001. Human Neuroanatomy (without a lab.). (**; 3 cr.; Student Option; Every Spring)
The material covered in NSCI 2001 and 2010 is very similar. 2100 is taught only fall semester. It is a traditional lecture course that includes a weekly laboratory. The faculty believe that the laboratory is a valuable part of the course. 2001 is taught only spring semester for those who cannot take the fall course. It does not have a lab, but has the advantage of a flipped format. Students will be expected to watch the assigned lectures prior to coming to class. Class time will be spent on exercises and discussions that use the material presented in the online lectures. Students who take one of these two courses will not be allowed to take the other course. The vertebrate nervous system is possibly the most complex, highly evolved biological system. The functional unit of the nervous system is the nerve cell or neuron, and the human nervous system has approximately 10,000 unique types of neurons. Most neurons have a wire-like process, the axon. Neurons carry information to other cells via their axons and communicate with those cells via a transfer of chemicals at synapses. The connections among neurons are organized into functional systems. Disease affecting a small number of cells can affect the function of many parts of the nervous system. This course will provide a broad introduction to the nervous system with an emphasis on the human nervous system. The course will introduce the structure and function of neurons, the major anatomical parts of the nervous system and the main functional systems. Functional systems will be approached through an understanding of the anatomical circuitry. The fundamental concepts of neurochemical communication studied in general terms in the first part of the course will be re-examined relative to specific functional systems later in the course. Although the major focus of the course will be on the normal nervous system, common diseases will be introduced for each main topic. Students will gain an understanding of the nature of many common neurological diseases, which will provide further insight into how the normal nervous system functions. The anatomical substrates of learning/memory,
emotions and drug actions will be examined. Through the assigned readings, lectures, and discussions, students are expected to gain an understanding of the neural circuitry and information processing responsible for the diverse ranges of human behaviors. See http://mcloonlab.neuroscience.umn.edu/2001/index.htm for more information.

NSCI 2100. Human Neuroanatomy. (Biol; 4 cr.; Student Option; Every Fall) Introduction to the nervous system. Structure/ function of neurons and the major anatomical parts of the nervous system. Processes that underlie many bodily functions and diseases. Lectures/lab exercises.

NSCI 3001W. Neuroscience and Society. (CIV; Wi; 4 cr.; A-F only; Every Spring) Ethical implications. Readings, personal reflections, class discussions, debates, and formal writing. Development of logical arguments, writing skills, oral presentation skills, and teamwork. Students present/argue both their own personal views and those of others. What it is like to have altered mentation, i.e. a brain disease or disability. Readings/ multimedia reports from primary neuroscience literature as well as philosophy, policy, and law literature and popular media.

NSCI 3100. Mind and Brain. (3 cr.; Student Option; Every Spring) New view of cognition that has recently emerged based on how neuroscience instantiates mental processes in physical process of brain. Topics range from the mechanisms of decision-making, to topics of emotion, memory, imagination, self-control, addiction, morality, consciousness. prereq: no prereq (1001, 1100, or other broad neuroscience course recommended)

NSCI 3101. Neurobiology I: Molecules, Cells, and Systems. (3 cr.; A-F or Audit; Every Fall & Spring) This course discusses the basic principles of cellular and molecular neurobiology and nervous systems. The main topics include: Organization of simple networks, neural system regulation and the cellular basis of cell organization; ion channel structure and function; the molecular basis of synaptic receptors; transduction mechanisms and second messengers; intracellular regulation of calcium; neurotransmitter systems, including excitation and inhibition, neuromodulation, system regulation and the cellular basis of learning, memory and cognition. The course is intended for students majoring in neuroscience, but is open to all students with the required prerequisites.

NSCI 3102W. Neurobiology II: Perception and Behavior. (Wi; 3 cr.; A-F or Audit; Every Spring) This is the second of the introductory neurobiology courses. It introduces fundamental concepts in systems and behavioral neuroscience with emphasis on the neural circuits underlying perception and sensorimotor integration. Lectures will examine the neural basis of specific behaviors arising from the oculomotor, visual and auditory systems and notes are available on Canvas. Topics include: retinal processing, functional organization in the cerebral cortex, neural circuit development, language, reward, and addiction. Students must learn to read scientific papers, and to understand the main ideas well enough to synthesize them and communicate them both orally and in writing. The course is writing intensive: exams are in essay and short answer format, and a 10-15 page term paper is required. The course is required for students majoring in neuroscience. The course consists of two hours of lecture and one hour of discussion per week.

NSCI 4100. Development of the Nervous System: Cellular and Molecular Mechanisms. (3 cr.; A-F only; Every Fall) How nervous system develops. General cellular/molecular mechanisms. Experimental data demonstrating mechanisms.

NSCI 4105. Neurobiology Laboratory I. (3 cr.; A-F or Audit; Every Fall) Principles, methods, and laboratory exercises for investigating neural mechanisms and examining experimental evidence.

NSCI 4150. Advanced Topics in Neuroscience. (3 cr.; max 9 cr.; A-F or Audit; Periodic Intensive) In-depth study of aspects of neurodevelopment, neurochemistry/molecular neuroscience, sensory systems, motor control, and behavioral neuroscience. Primarily for undergraduates majoring in neuroscience or related areas.

NSCI 4167. Neuroscience in the Community. (1-3 cr.; A-F or Audit; Every Fall & Spring) A service learning experience in which a student is paired with a middle school science teacher who has completed the BrainU program in neuroscience. Student observes and assists in implementing previously developed neuroscience educational activities and designs and implements a new classroom activity to teach concepts of neuroscience directly to middle school learners. prereq: instr consent

NSCI 4793W. Directed Studies: Writing Intensive. (Wi; 1-6 cr.; max 42 cr.; S-N or Audit; Every Fall, Spring & Summer) Individual study of selected topics. Emphasis on readings, use of scientific literature. Writing intensive. prereq: instr consent, dept consent; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements

NSCI 4794W. Directed Research: Writing Intensive. (Wi; 1-6 cr.; max 42 cr.; S-N or Audit; Every Fall, Spring & Summer) Lab or field investigation of selected areas of research. Writing intensive. prereq: instr consent, dept consent; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements

NSCI 4993. Directed Studies. (1-7 cr.; S-N or Audit; Every Fall, Spring & Summer) Individual study of selected topics with emphasis on selected readings and use of scientific literature. prereq: instr consent, dept consent; max of 7 cr of 4993 and/or 4994 may count toward major requirements

NSCI 4994. Directed Research. (1-6 cr.; max 42 cr.; S-N or Audit; Every Fall, Spring & Summer) Lab or field investigation of selected areas of research. prereq: instr consent, dept consent; max of 7 cr of 4993 and/or 4994 may count toward major requirements

NSCI 5101. Neurobiology I: Molecules, Cells, and Systems. (3 cr.; A-F or Audit; Every Fall & Spring) This course discusses the basic principles of cellular and molecular neurobiology and nervous systems. The main topics include: Organization of simple networks, neural systems and behavior; how the brain develops and the physiology and communication of neurons and glia; the molecular and genetic basis of cell organization; ion channel structure and function; the molecular basis of synaptic receptors; transduction mechanisms and second messengers; intracellular regulation of calcium; neurotransmitter systems, including excitation and inhibition, neuromodulation, system regulation and the cellular basis of learning, memory and cognition. The course is intended for students majoring in neuroscience, but is open to all students with the required prerequisites.

NSCI 5110. Dental Neuroscience for Graduate Students. (5 cr.; A-F or Audit; Every Spring) Structure/function of human nervous system. Lectures and reading assignments emphasize topics pertinent to dentistry. prereq: Credit will not be granted if credit has been received for: 6110; BioC 3021, Biol 4004, instr consent; intended for grad students who require a comprehensive grad-level neuroscience course

NSCI 5111. Medical Neuroscience for Graduate Students. (5 cr.; A-F or Audit; Every Spring) Survey of molecular, cellular, and systems neuroscience as related to medicine. Lecture/lab. prereq: Credit will not be granted if credit has been received for: 6110; BioC 3021, Biol 4004, instr consent; intended for grad students who require a comprehensive medically-oriented neuroscience course

NSCI 5300. Biological Microscopy & Digital Imaging. (3 cr.; Student Option; Every Spring) Optical microscopy is among the most powerful available to biologists. Course introduces graduate students and advanced undergraduates to the principles that underlie its use and to the appropriate use of resulting digital images. Students ideally will have access to a microscope in a research laboratory. Required Prerequisites: None. Recommended Prerequisites: PHYS 1101 or PHYS 1201 or PHYS 1301 or PHYS 1401

NSCI 5913. BrainU 101: Neuroscience in the Classroom. (3 cr.; A-F or Audit; Every Fall & Spring) Two-week summer workshop. Week one focuses on training teachers in neuroscience through lectures, activities, and discussion sessions. Week two focuses on designing
NOR 1001. Beginning Norwegian. (1-5 cr.; Student Option; Every Fall) Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

NOR 1002. Beginning Norwegian. (1 cr.; Instructor Consent) Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Content includes grammar and vocabulary with a proficiency emphasis. Topics include free-time activities, careers, and Norwegian culture. prerequisite: 1001.

NOR 1003. Intermediate Norwegian. (1-5 cr.; Student Option; Every Fall) Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by authentic readings and essay assignments. Prerequisite: 1002.

NOR 1004. Intermediate Norwegian. (1 cr.; Instructor Consent) Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary with a proficiency emphasis. Topics include free-time activities, careers, and Norwegian culture. Prerequisite: 1003.

NOR 4001. Beginning Norwegian for Graduate Research. (1-5 cr.; Student Option; Every Fall) Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.). Meets concurrently with 1001.

NOR 4002. Intermediate Norwegian for Graduate Research. (1-5 cr.; Student Option; Every Fall) Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by authentic readings and essay assignments. Meets concurrently with 1003.

NOR 4004. Intermediate Norwegian for Graduate Research. (1-5 cr.; Student Option; Every Fall) Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by authentic readings and essay assignments. Meets concurrently with 1004.

NUR 777. School of Nursing Professional Active Status. (0 cr.; No Grade Associated; Every Fall, Spring & Summer) Limited to two enrollments during school career. prerequisite: instructor consent.

NURS 1020. Challenge of Nursing. (1 cr.; S-N or Audit; Every Fall) Profession of nursing overview. Contemporary nursing and its historical roots/stages. Career opportunities and challenges.

NUR 1030. Nursing First Year Seminar I. (1 cr.; Student Option; Every Fall) This course is designed to guide each student through their individual goals by promoting proactive educational and career planning, introducing students to resources available at the University and in the School of Nursing, and connecting students with academic advisors, faculty, and student groups in the School of Nursing and throughout the University. prerequisite: Freshman guarantee student, instructor consent.

NURS 1031. Nursing First Year Seminar II. (1 cr.; A-F only; Every Spring) This course will provide the student with opportunities to explore the wide range of opportunities in the nursing profession. Throughout this course students will be asked to reflect on the alignment of their academic
decisions; personal strengths, values, and interests; related to their future career in nursing and life goals. This course will allow the student to deepen their understanding of campus engagement, consider supporting coursework to complement the nursing major, and advance progress toward the BSN degree and future graduate education.

**NURS 2001. Human Growth and Development: A Life Span Approach.** (3 cr.; Student Option; Every Fall & Spring) Theoretical, personal, and culturally determined theories on life span development, from prenatal period through death/dying. Psychoanalytical, behavioristic, cognitive, sociocultural, and epigenetic categories of biobehavioral, cognitive, and psychosocial domains.

**NURS 3115. Health Informatics and Information Technology.** (TS; 3 cr.; A-F only; Every Fall & Spring) Examine health informatics and information technology from consumer, clinical, and public health perspectives. Develop skills in using information technology to communicate, manage knowledge, mitigate error, and support decision-making.

**NURS 3690. Life Span, Growth, and Development I.** (2 cr.; Student Option; Every Fall, Spring & Summer) Biological/sociological/psychological perspectives of human life span development from prenatal period through young adulthood.

**NURS 3691. Life Span, Growth, and Development II.** (1 cr.; Student Option; Every Fall, Spring & Summer) An introductory, multimedia course that incorporates biological, sociological, and psychological perspectives of human life span development for the period of young adulthood through aging and the death experience.

**NURS 3703. Assessment and Beginning Intervention: Nursing Lab 1.** (2 cr.; A-F only; Every Fall) Psychomotor skills/interventions with focus on therapeutic interventions. Experiential learning activities used to build skill in assessment, planning/implementation of select nursing interventions. Theoretical foundations of nursing interventions. prereq: Admitted to Nurs BSN program

**NURS 3705. Nursing Interventions.** (2 cr.; A-F or Audit; Every Spring) Psychomotor skills/interventions with focus on therapeutic interventions. Experiential learning activities used to build skill in assessment, planning, implementation of select nursing interventions. prereq: 3703, enrolled in School of Nursing

**NURS 3710. Statistics for Clinical Practice and Research.** (MATH; 3 cr.; Student Option; Every Fall) Numerical reasoning, measurement principles. Vital statistics, rates, data description. Probability. Hypothesis testing/confidence intervals for tests on means. Proportions, correlations, linear regression. prereq: [High school algebra or instr consent], students enrolled in School of Nursing must take A/F option

**NURS 3800. Nursing Topics.** (1-4 cr. [max 8 cr.]; Student Option; Every Fall & Spring) Topics not included in regular courses. prereq: instr consent

**NURS 3801. Patient Centered Care of Adults and Older Adults I.** (3 cr.; A-F only; Every Fall & Spring) Person-centered evidence based nursing care for adults, including physical/mental health promotion, acute/chronic illness management. Critical analysis of patient needs/planning nursing care. prereq: Admitted to Nurs BSN program

**NURS 3802. Patient Centered Care: Nursing Care of Families I.** (3 cr.; A-F only; Every Fall & Spring) Introduction to nursing care of childbearing/childrearing families. Family theory, family-centered care, and family culture in the context of home and community settings. prereq: Enrolled in School of Nursing

**NURS 3802H. Nursing Care of Families I Honors.** (4 cr.; A-F only; Every Fall & Spring) Nursing care of childbearing/childrearing families. Family theory, family-centered care, family culture in the context of home and community settings and therapeutic communication between nurse and patients/families. prereq: Enrolled nursing student

**NURS 3803. Application of Genetics in Nursing.** (2 cr.; A-F or Audit; Every Spring) Application of genetics to the practice of professional nursing. prereq: Enrolled in nursing major

**NURS 3806. Nurse as Professional.** (2 cr.; A-F or Audit; Every Fall & Spring) Basic nursing concepts, role development, competencies, therapeutic use of self, and communication skills for person-centered care and professional teamwork; beginning development of own nursing philosophy; career exploration. prereq: Admitted to nursing BSN program

**NURS 3806H. Nurse as Professional: Honors.** (3 cr.; A-F only; Every Fall) Basic nursing concepts, role development, competencies, therapeutic use of self, communication skills for person centered care/professional teamwork. Develop own nursing philosophy. Explore careers/qualitative research methods while interviewing School of Nursing alumni. prereq: [Undergrad nursing student, honors] or instr consent

**NURS 3899. Clinical Internship.** (1 cr. [max 3 cr.]; S-N or Audit; Every Summer) Application of nursing theory/research based knowledge in clinical practice. prereq: Completed jr yr of baccalaureate nursing program, accepted into approved clinical internship program

**NURS 4104. Ethical Sensitivity and Reasoning in Health Care.** (CIV; 2 cr.; A-F only; Every Fall) Developing sensitivity to range/complexity of ethical issues/dilemmas in health care. Ethical principles/theories. Key ethical concepts in addressing morally troubling issues in health care settings.

**NURS 4106. Nurse as Collaborator.** (1 cr.; A-F only; Every Fall) Examination of evidence-based teamwork systems and processes to improve communication and collaboration among health care professionals. prereq: Enrolled in nursing program

**NURS 4205V. Honors: Nursing Theory and Research.** (WI; 3 cr.; Student Option; Every Spring) Knowledge basic to discipline/practice of nursing. Relationships among research, theory, practice. Introduction to research process, with attention to use of research in practice. Students develop honors research proposal. prereq: Nurs honors

**NURS 4205W. Nursing Theory and Research.** (WI; 3 cr.; A-F or Audit; Every Fall & Spring) Knowledge basic to discipline/practice of nursing. Relationships among research, theory/theoretical formulations, and practice. Research process is introduced with attention to utilization of research in practice. prereq: Undergrad in nursing

**NURS 4301. Person Centered Care of Adults and Older Adults II.** (4 cr.; A-F only; Every Fall & Spring) Person-centered evidence based nursing care for adults with complex physical and mental health illnesses. Critical analysis of multiple complex patient needs. Planning nursing care. prereq: 3801, 3802, 3703, 3705, enrolled in School of Nursing

**NURS 4303. Practicum: Person Centered Care of Adults in Acute Care.** (3 cr.; A-F only; Every Fall & Spring) Clinical reasoning is applied to the nursing care of young through older adults in acute care. Examined based practice and clinical reasoning to provide person centered care within the health system environment. prereq: 3703, 3705, 3801, [3802 or 3802H], enrolled in nursing

**NURS 4305. Practicum: Community-based Care of Families Across Life Span.** (3 cr.; A-F only; Every Fall & Spring) Examine an evidence-based teamwork system to improve communication and teamwork skills among health care professionals. prereq: 3703, 3705, 3801, [3802 or 3802H], enrolled Nurs student

**NURS 4312. Patient Centered Care: Nursing Care of Families II.** (4 cr.; A-F only; Every Fall & Spring) Family centered care theory applied to care of childbearing, childrearing families in acute care setting. High risk pregnancy. Child response to illness/hospitalization. prereq: 3802, enrolled nursing student

**NURS 4321. Public Health Nursing.** (2 cr.; A-F or Audit; Every Fall & Spring) Concepts of epidemiology, systems theory, and social justice applied to population-

NURS 4324. Transcultural Nursing and Global Health. (GP; 3 cr.; Student Option; Every Fall & Spring) Influence of culture on nursing care delivery/role of nurse in providing culturally appropriate care for increasingly diverse populations. Global health issues and factors affecting the health status of populations. prereq: Nursing student or instr consent

NURS 4402. Taking Ethical Action in Health Care. (CIV; 1 cr.; A-F only; Every Fall) Ethical dimensions/role obligations of health care professionals related to selected social issues with health consequences. prereq: Senior undergrad nursing student. [4104 or instr consent]

NURS 4404V. Honors: Applied Research and Research Utilization. (WI; 3 cr.; A-F only; Every Fall) Systematic inquiry in interpreting/evaluating research. Implement study proposed in Nurs 4205W. Write scholarly research report, which will serve as honors research thesis. prereq: Honors student in School of Nursing, Nurs 4205W, upper division statistics course

NURS 4430. Immunization Tour. (1 cr.; S-N or Audit; Every Fall) Nursing/pharmacy students operate influenza immunization clinics for faculty, staff, students. Inter-professional collaboration, public health principles, interventions. Logistics, screening, aseptic technique, emergency response strategies, syncope, needle sticks/mass immunization. prereq: [Senior Bachelor of Science nursing student or professional master's nursing student], completion of CPR

NURS 4432. Epidemiology and Management of Seasonal Influenza. (1 cr.; A-F only; Every Fall) This course will focus on public health principles and interventions related to influenza: logistics, screening, aseptic technique, emergency response, strategies for anaphylaxis, syncope, needle sticks/mass immunization. Includes practicum in a supervised community immunization clinic.

NURS 4701. Advanced Nursing Across the Lifespan. (2-3 cr.; [max 4 cr.]; A-F only; Every Fall) Examines person-centered evidence based nursing care for persons across the lifespan considering the underlying pathophysiology and pharmacological interventions in complex physical and mental health illnesses. Emphasis is on critical analysis of complex patient needs and planning and prioritizing nursing care.

NURS 4703. Specialty Focused Practicum I. (2 cr. [max 4 cr.]; A-F only; Every Fall) Person-centered nursing care that is safe, effective, holistic, culturally sensitive. prereq: Nursing student in School of Nursing

NURS 4704. Continuum of Care Practicum. (2 cr.; A-F only; Every Fall) Care coordination/relationship of acute, home, community services. Populations may include chronically ill, all ages (aging adults, pediatric), culturally diverse/healthy communities. prereq: Nursing Student in School of Nursing

NURS 4705. Specialty Focused Practicum II. (6 cr.; A-F or Audit; Every Spring) Synthesis of previous learning while providing to high quality nursing care that is safe, ethical, evidence-based, holistic, culturally sensitive, and person-centered in selected clinical specialty. Application of professional nursing values to clinical practice. Preceptor led. prereq: 4703, sr in good standing in BSN prereq: 4703, sr in good standing in BSN

NURS 4706. Transition to Practice. (1 cr.; A-F or Audit; Every Fall & Spring) Professional and legal issues necessary to the transition into nursing practice; strategies for lifelong learning and nursing career trajectories in preparation for entry into practice in a complex health care system. prereq: Sr in BSN program

NURS 4707. Nursing Leadership: Professional Practice in Complex Systems. (2 cr.; A-F only; Every Spring) Leadership skills for safe effective practice as a new graduate nurse; issues affecting nursing practice; leadership attributes, e.g., creating effective teams, confident interaction with others, resolving conflict, managing resources, leadership for assuring patient safety and quality care. prereq: Sr enrolled in BSN program

NURS 4777W. Senior Project in the Nursing Major. (WI; 3 cr. [max 9 cr.]; A-F only; Every Fall & Spring) Fundamental skills in systematic inquiry, interpretation, evaluation of research. Scholarly exploration of clinical problem or system issue affecting nursing practice/patient outcomes. Development/presentation of project. prereq: 4205W or 4205V

NURS 4800. Nursing Topics. (0-16 cr. [max 48 cr.]; Student Option; Every Fall, Spring & Summer) Exploration of a topic to meet individual student needs; prereq: instr consent

NURS 4801. Research Topics. (1-16 cr. [max 48 cr.]; Student Option; Periodic Fall & Spring) Exploration of research topic to meet individual student needs.

NURS 5010. Foundations of Interprofessional Communication and Collaboration. (1 cr.; S-N only; Every Fall) Exploration of nature/need for interprofessional communication among health care professionals. Qualities of successful interprofessional teams/interactions. Introduction to professional identity, ethics, integrity, values. Strategies for communication/decision making. prereq: Nursing student

NURS 5011. Interprofessional Diabetes Experience. (2 cr.; A-F only; Every Spring) Explore diabetes mellitus through active, hands-on learning in an interprofessional environment. Week-long simulated experience of living with diabetes. Online learning activities focused on interprofessional teamwork for optimal care to patients with diabetes. prereq: 2nd or 3rd year in nursing curriculum prereq: 2nd or 3rd year in nursing curriculum

NURS 5012. Phillips Neighborhood Clinic: Interprofessional Service. (0 cr.; No Grade Associated; Every Fall, Spring & Summer) Apply for position as nursing student volunteer at Phillips Neighborhood Clinic. Provide nursing care under guidance of licensed faculty mentors. Meet Board of Nursing requirements for nursing students engaged in direct patient care. prereq: Sophomore in School of Nursing, [2 year commitment or MN student]

NURS 5014. Examining the Evidence: Forensic Health Care Practices and Opportunities. (2 cr.; Student Option; Periodic Fall) Forensic health care, including sexual assault forensic examiners/death investigators. Examine current research regarding these roles. Opportunity for relevant community-based field experiences. prereq: Grad student or undergraduate senior or instr consent

NURS 5016. Critical Reading of Scientific Literature in Adolescent Health. (1 cr.; Student Option; Every Fall) Develop skills for critically reading empirical literature within field of adolescent health. Written/oral critiques of core elements of research articles, including literature review, conceptual framework, research questions/hypotheses, methods, results, discussion, conclusions. prereq: [Grad-level research methods course, inferential statistics course] or instr consent

NURS 5029. Introduction to Nursing Interventions. (4 cr.; A-F only; Every Fall) Evidence-based interventions for safe, culturally appropriate, and ethical nursing practice. Experiential learning activities in laboratory and clinical settings build skills in assessment, planning, implementation, and evaluation. prereq: Admission to master of nursing (MN) program, concurrent registration is required (or allowed) in 5030

NURS 5030. Foundational Concepts of Professional Nursing. (3 cr.; A-F or Audit; Every Fall) Foundation of knowledge for culturally appropriate, ethical, evidence-based nursing practice across the life span. Research/theory that underlie the art/science of professional nursing. Concepts of person, environment, health, and nursing. prereq: Admission to master's in nursing program

NURS 5031. Human Response to Health and Illness: Adults and Elders. (4 cr.; A-F or Audit; Every Spring) Focus on individual responses to health and illness in the context of families and environments. The clinical component will emphasize the application of the nursing process in adult and older adult populations.

NURS 5032. Human Response to Health and Illness: Children and Childbearing Families. (5 cr.; A-F or Audit; Every Spring)
Focus is on family responses to health and illness. Application of the nursing process in children and childbearing families is emphasized. The family as the unit of care is the focus of a seminar.

**NURS 5033. Population-Focused Health in Public Health and Mental Health Nursing.** (3 cr.; F-S or Audit; Every Fall)
Focus on population-based public health and mental health nursing practice across the lifespan, with local to global perspectives. Emphasis on health equity, health promotion, and levels of disease prevention. Apply theory and research to examine interventions and outcomes.

**NURS 5034. Transition to Professional Nursing Practice.** (3 cr.; A-F or Audit; Every Fall)
Critical analysis of issues affecting the transition to professional nursing practice including those related to the quality of healthcare, quality improvement, and the ability of nurses to improve patient outcomes across settings. prereq: NURS 5033, Nurs 6200

**NURS 5035. Practicum Nursing Care for Complex Health Conditions.** (4 cr.; A-F or Audit; Every Fall)
Clinical decision-making, comprehensive nursing care of clients with complex health problems. In collaboration with a clinical preceptor and a faculty advisor, students develop an individualized learning contract. prereq: Nursing postbaccalaureate certificate program or master of nursing program

**NURS 5040H. Seeking Solutions to Global Health Issues.** (GP; 3 cr.; A-F only; Every Fall)
Global health issues from interdisciplinary perspective. Ethical/cultural sensitivity, complexities. Students propose realistic actions to resolve issues. prereq: Prereq: Junior or senior University Honors Program (UHP) student in nursing or other major, or graduate student, or instr consent; meets Lib Ed req of Global Perspectives; meets Honors req of Honors

**NURS 5115. Interprofessional Health Care Informatics.** (3 cr.; A-F or Audit; Every Fall & Spring)
Implications of informatics for practice, including nursing, public health, and health care in general. Electronic health record issues. Ethical, legislative, political, and global/future informatics issues.

**NURS 5116. Consumer Health Informatics.** (1 cr.; A-F only; Every Fall & Spring)
Examines issues from consumer's perspective in acquisition, understanding, use or provision of health information. Online strategies for improving health. Impact on consumer-provider relationships/ethical and legal issues. prereq: Grad student or instr consent

**NURS 5117. Consumer Health Informatics Practicum.** (1 cr.; S-N only; Every Fall)
Apply student knowledge to analysis of health needs and consumer health principles, theories, and research to a consumer health informatics project. prereq: [Grad student, [5116 or concurrent registration is required (or allowed) in 5116]] or instr consent

**NURS 5120. Palliative Care for Children.** (1 cr.; Student Option; Every Summer)
Physical, psychosocial, and spiritual needs of children with life-limiting conditions. Family centered approach. Holistic assessment/intervention for child/family, within interdisciplinary health care team. prereq: instr consent

**NURS 5170. Research Topics.** (1-16 cr.; Student Option; Periodic Fall & Spring)
Exploration of research topic to meet individual student needs.

**NURS 5183. Scholarly Leadership.** (1 cr.; S-N or Audit; Every Spring)
Implications of dissertation research on advancing science, clinical practice, and leadership in nursing and health care. Principles of scholarly collaboration. prereq: Advanced doctoral nursing student, instr consent

**NURS 5190. Essentials of Holistic Health Assessment.** (3 cr.; A-F only; Every Fall & Spring)
Health assessment knowledge/skills for nursing practice across life span. History taking, interviewing techniques, technical skills to perform complete, systematic health assessment, focused assessments for acute care settings. prereq: Admission to MN Program

**NURS 5200. Advanced Holistic Health Assessment for the Advanced Practice Nurse.** (3 cr.; A-F only; Every Fall & Summer)
Provides students with advanced holistic health assessment knowledge and skills needed for ANP across the life span. Prepares students to utilize advanced health assessment skills to differentiate between normal, variations of normal and abnormal findings. Integrates integrates EBP data into a comprehensive health assessment. prereq: Admission to advanced practice nursing area of study (DNP or Post Graduate certificate program), instr consent

**NURS 5222. Advanced Human Physiology.** (2 cr.; A-F or Audit; Every Fall)
This course will use a systems approach to human physiology across the life span. Emphasizes clinical application using population-specific content related to various specialty areas in advanced practice nursing.

**NURS 5225. Psychopharmacology Advanced Practice Psychiatric/Mental Health Nursing.** (3 cr.; A-F only; Every Fall & Spring)
Advanced concepts in neuroscience, psychopharmacology, and clinical management related to psychopharmacologic treatment of psychiatric disorders/symptoms. Application to problems in various clinical settings. prereq: 5228 or instr consent

**NURS 5226. Advanced Human Pathophysiology.** (2 cr.; A-F or Audit; Every Spring)
This course will use a systems approach to human pathophysiology across the life span. Emphasizes clinical application using population-specific content related to various specialty areas in advanced practice nursing.

**NURS 5228. Pharmacology for Advanced Practice Nursing.** (2 cr.; A-F or Audit; Every Fall)
Overview of pharmacological principles for commonly used medication classes. Each drug class, related physiology. Pharmacodynamics and pharmacokinetics of drug classes and specific medications. prereq: Grad nursing student or instr consent

**NURS 5229. Clinical Pharmacotherapeutics.** (2-4 cr.; A-F only; Every Spring)
Pharmacokinetics, pharmacodynamics, therapeutic dosages for various age groups. Client patterns of drug use. Prescriptive privileges. Prescription writing for advanced practice nurses. prereq: 5222, [5228 or PHAR 5800], DNP student, instr consent

**NURS 5230. Pharmacotherapeutics for Nurse Anesthesia.** (4 cr.; A-F only; Every Spring)
Reviews basic physics, organic and biochemistry of metabolic processes, pharmacodynamics & pharmacokinetics. Detailed description of anesthetic drugs, physiologic mechanisms, side effects, toxicities, metabolism & elimination as outlined on National Certification Examination. Synthesis of pharmacotherapeutics into nurse anesthesia plan of care.

**NURS 5241. Nursing Leadership for Effective Practice.** (2 cr.; [max 3 cr.]; A-F or Audit; Every Fall)
Analysis of leadership theory and application of leadership skills needed for safe and effective practice as a new graduate nurse. Exploration of system issues affecting nursing practice and patient outcomes. prereq: Final sem of MN Program

**NURS 5284. Supporting Physiologic Labor and Childbirth for Nurses.** (2 cr.; S-N only; Every Fall & Spring)
Techniques to provide labor support, discussion about doula role and overlap with nursing support. Emphasizing continuous physical and emotional labor support plus information to enhance physiologic birth. Experience providing labor support to women at a clinical facility included.

**NURS 5501. Professional Issues in Nurse-Midwifery.** (1-2 cr.; S-N or Audit; Every Spring)
Analysis of professional issues that confront and impact the practice of certified nurse-midwives. History and development of the professional organization including certification, legislation, ethical dimensions, public policy, and clinical practice issues. prereq: Nurs grad major, instr consent

**NURS 5505. Assessment and Support of Women in Labor.** (2 cr.; S-N only; Every Spring)
Self-directed study with goal of working with experienced labor nurses/learning knowledge/
skills required to perform labor. Clinical experience. Completion of selected online modules related to nursing care of women in labor. prereq: Admission to DNP Program

NURS 5604. Advanced Health Assessment and Interventions with Adolescents. (2 cr.; Student Option; Every Summer) Integrates knowledge from nursing, public health, health behavior, and adolescent development as framework for developing health assessment/intervention strategies for clinical practice with adolescents. prereq: CPsy 5303 or equiv or instr consent

NURS 5800. Nursing Topics. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Course allows students to study a topic not included in regular courses, or for faculty to offer a course to determine interest in a topic. prereq: instr consent

NURS 5812. Global Health Through Study Abroad. (1-2 cr.; S-N only; Every Spring & Summer) Nursing as a global profession and the issues that impact health of populations worldwide. prereq: instr consent

NURS 5830. Advanced Clinical Nursing. (1-6 cr.; Student Option; Every Fall, Spring & Summer) Independent study or faculty seminar on special clinical topic.

NURS 5925. Grant Writing and Critique. (1 cr.; Student Option; Every Spring) Self-paced course. Online modular format. How to write/critique grants. Students select a research or program grant to critique, applying knowledge obtained through learning modules. prereq: Grad student or instr consent

NURS 6102. Family Health Theory. (2 cr.; A-F only; Every Fall) Emerging theory in family nursing science, related theories. Research on family systems for structuring systemic framework to examine clinical problems related to family health care. Applies family health theories to selected phenomena of interest to health care. prereq: 6200 or instr consent

NURS 6105. Systems Analysis and Design. (3 cr.; A-F or Audit; Every Spring) Role of informant in interprofessional team for analysis and design of information systems. Concepts/theories of systems analysis, system life cycle, project management, system requirements, human factors. Evaluation of use of health information systems. prereq: 5115 or equiv or instr consent

NURS 6110. Epidemiology in Nursing. (2 cr.; A-F only; Every Fall & Spring) For nurses in advanced practice and leadership positions to utilize basic epidemiological principles in assessing determinants of health and their outcomes in populations. Application of epidemiological concepts to nursing.

NURS 6200. Science of Nursing Intervention. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Examination/application of theories and conceptual frameworks to clinical practice problems. prereq: Admission to MN or DNP program

NURS 6210. Midwifery Care of the Childbearing Family. (3 cr.; A-F only; Every Summer) Evidence-based models of midwifery practice for management/support of women/families during labor, birth, and immediate postpartum period. Care of newborn. prereq: instr consent

NURS 6211. Midwifery Care of the Childbearing Family Practicum. (2 cr.; S-N only; Every Summer) Implement evidence-based models of midwifery practice in the management and support of women and families during labor, birth, the immediate postpartum period, and care of the newborn. prereq: 6305, 6306. concurrent registration is required (or allowed) in 6212

NURS 6213. Reproductive Healthcare for Women at Risk. (2 cr.; A-F only; Every Fall) Evidence based, theoretical/epidemiologic basis for advanced practice nursing care of women with complex reproductive health problems requiring multidisciplinary interventions. Selected high-risk gynecologic/obstetric conditions. prereq: (NM and WHNP) N6305, N6306, 6501. (NM only) 6210/6211, 6212 (WHNP only) 6502, 7504, 7505, 6929

NURS 6214. Reproductive Healthcare for Women at Risk Practicum. (2 cr.; S-N only; Every Fall) Apply advanced assessment/management skills in care of women/infants at risk for medical/psychosocial problems. Gain experience in management of selected high-risk perinatal conditions. prereq: WHNP DNP student, Nurs 5222, 5228, 5200, 6305, 6306, 6925, 6926. Nurse-Midwife DNP student, Nurs 5222, 5228, 5200, 6305, 6306, 6925, 6210, 6211

NURS 6305. Women's Reproductive Health Care. (2-3 cr.; A-F only; Every Fall) Application of theory/evidence to holistic practice in women's health. Emphasis placed on conceptual knowledge/skills related to caring for common reproductive health needs of women throughout life cycle. Sociopolitical context of women's lives integrated throughout. prereq: DNP student

NURS 6306. Women's Reproductive Health Practicum. (1 cr.; S-N only; Every Fall) Clinical experience in women's reproductive health setting to develop basic skills in providing holistic, safe, competent care, including history taking, physical examination, patient education specific to women's reproductive health issues across lifespan. prereq: [6305 or concurrent registration is required (or allowed) in 6305]

NURS 6307. Assessment and Management of Health for APNs Practicum III. (1 cr.; S-N only; Every Summer) Comprehensive advanced nursing assessment and management for acute and chronic health conditions of the adult primary care population across the life span. Synthesis and application of nursing theory and evidence-based implementation and evaluation of safe and effective therapeutic interventions to promote, maintain, and restore health.

NURS 6308. Women's Primary Care Practicum. (1-2 cr.; S-N only; Every Spring) Practicum in women's reproductive and primary care settings to continue development of basic skills in providing holistic, safe, competent care, including history taking, physical examination, patient education specific to reproductive and primary healthcare issues across lifespan. prereq: 5200, 5222, 5228, 5229, 6501, 6305, 6306

NURS 6405. Advanced Practice CNS Roles Across the Lifespan. (3 cr.; A-F only; Every Fall) Develop expertise and leadership in the clinical nurse specialist roles within the three spheres of influence (patient, nursing, organization), using current evidence. prereq: 5200, 7103, 7900

NURS 6406. Advanced Practice CNS Roles Across the Lifespan: Practicum. (1 cr.; S-N only; Every Fall) Students analyze/evaluate roles of CNS within three spheres of influence, using current practice standards/research. prereq: 5200, 7103

NURS 6407. Advanced Nursing Care of Older Adults. (3 cr.; A-F only; Every Fall) Theory/research in promotion, maintenance, and restoration of the health of older adults within the context of their families and different care settings. Independent/collaborative roles of the advanced practice nurse in different settings. prereq: [5200, 5222, 5224, 5228, 6500, 6501, 5250, 7504, 7505] or instr consent

NURS 6408. Advanced Nursing Care of Older Adults Practicum. (1-2 cr.; S-N only; Every Fall) Application of theory and evidence-based knowledge for advanced practice nursing students to develop skill in assessing and managing health issues commonly experienced by older adults in a variety of care settings. prereq: [5200, 5222, 5228, 6500, 6501, 5250, 7504, 7505] or instr consent

NURS 6501. Assessment and Management of Health for Advanced Practice Nurses, I. (3 cr.; A-F only; Every Fall) Advanced practice nursing. Health promotion and data-based assessment/management of common acute and stable chronic conditions for the primary care populations. Role of the advanced practice nurse, process of clinical reasoning and decision-making, and independent and collaborative practice health care plans, utilizing evidence-based practice. prereq: DNP student or instr consent

NURS 6504. Assessing, Managing Psychiatric Disorders in Adv Practice. (1 cr.; A-F only; Every Spring)
Apply advanced concepts from nursing theory and research, social sciences, neuropsychology, and neurophysiology in the differentiation and explanation of psychiatric symptoms and disorders across the age continuum.

NURS 6505. PMH/APN Practicum I: Assessing, Managing Psychiatric Disorders in Adv Pract Psychiatric-Mental Health Nurs. (2 cr.; S-N only; Every Spring)
Diagnostic interviewing skills to conduct a comprehensive psychiatric assessment for patients across the lifespan. In collaboration with an interdisciplinary team and patient, students develop an initial evidence-based, integrative treatment plan, prereq: concurrent registration is required (or allowed) in 6404, 5200, 5222, 5228, 5229, CSH 5101, concurrent registration is required (or allowed) in 6404

NURS 6600. Health Systems and Care Models. (3 cr.; A-F only; Every Spring)
Current/emerging care delivery systems and nursing models are analyzed as to how they meet dynamic, social, economic, technological, political trends. Impact of disruptive technologies, business models, value networks, designing better models.

NURS 6602. PMH Advanced Practice Nursing: Group as a Health Care Intervention. (2 cr.; A-F only; Every Fall)
Theoretical concepts/research findings from areas of group theory, group dynamics, group therapy applied in development of model for utilizing group as intervention for various client populations. prereq: concurrent registration is required (or allowed) in 6603

NURS 6603. PMH APN Practicum IV: Group as a Health Care Intervention. (2 cr.; S-N only; Every Fall)
Develop new competencies in conducting group therapy. Diagnostic interviewing/assessment skills. Evidence-based management plans with individuals/families at risk of psychiatric disorders/mental health problems. prereq: concurrent registration is required (or allowed) in 6602, 6603, 6604, 6605

NURS 6604. Foundations for Integrative Mental Health and Psychiatric Advanced Practice Nursing. (2 cr.; A-F only; Every Fall)
Examine concepts, theories, and paradigms foundational to psychiatric and mental health nursing practice and inter-professional integrative mental health care. Develop clinical interviewing methods that elicit a client’s health narrative and facilitate the therapeutic relationship. Promotes beginning skill in reflective clinical practice. prereq: concurrent registration is required (or allowed) in 6605.

NURS 6605. Psychiatric/Mental Health Advanced Nursing Practicum I. (1 cr.; S-N only; Every Fall)
First clinical course in advanced practice psychi atric/mental health nursing. Mental health promotion/mental illness risk reduction. Clinical interviewing, holistic health assessment, integrative mental health care management. prereq: concurrent registration is required (or allowed) in 6604, 5222, 5228, 5229, CSH 5101

NURS 6702. Nursing Leadership Seminar: Introduction to Innovation and Leadership. (3 cr.; A-F only; Every Fall)
Leadership models and recommended competencies in context of current trends. Applying design thinking/insights from nursing leaders. Innovation and expansion of nursing leadership into new settings and roles.

NURS 6703. Nursing Leadership Seminar: Organizational Culture and Leadership. (2 cr.; A-F only; Every Spring)
Evaluate the evidence base for nurse executive practices and the relationships between leadership and organizational culture and performance. prereq: Grad student or instr consent

NURS 6704. Nursing Leadership Practicum: Organizational Culture and Leadership. (2 cr.; A-F only; Every Spring)
Implement evidence-based models through projects with preceptor in area of organizational environment and culture through experiential activities, including conferences, intensive clinical experiences, clinical conferences, and simulation. prereq: concurrent registration is required (or allowed) in 6703

NURS 6705. Nursing Leadership Seminar: Quality and Change Management. (2 cr.; A-F only; Every Fall)
Comprehensive background in the science of patient safety, quality improvement, error management, and change implementation. prereq: concurrent registration is required (or allowed) in 6703

NURS 6706. Nursing Leadership Practicum: Quality and Change Management. (1-2 cr.; S-N only; Every Fall)
Gain experience in implementing evidence-based model of change related to safety promotion, quality improvement, or error management in collaboration with preceptor or designee. prereq: concurrent registration is required (or allowed) in 6704

NURS 6707. Health Care Design and Innovation Practicum. (2 cr.; S-N only; Every Fall & Spring)
A health care design and innovation practicum experience to support integration of knowledge, skills and abilities related to human centered thinking and an experienced based design innovation: product, service, or system innovation delivery change. prereq: Students in Health Care Design and Innovation certificate program or DNP students who have completed, NURS 7610, CSPh 5711, HUMF 5874.

NURS 6802. Psychiatric/Mental Health Advance Practice Nursing: Psychotherapy with Individuals and Families. (2 cr.; A-F only; Every Summer)
Evaluate selected theories/models, research, clinical evidence, therapeutic use of self for developing/implementing psychotherapeutic interventions used to promote mental health/assist individuals. prereq: 6102, 6604, 6605

NURS 6803. Psychiatric/Mental Health Adv Prac Nurs Practicum III: Psychotherapy With Individuals,Families. (1 cr.; S-N only; Every Summer)
Theories, research, clinical evidence. Psychotherapeutic interventions/therapeutic use of self to promote mental health/advance treatment, management, recovery from bio/psycho/social sequelae of psychiatric illnesses. prereq: concurrent registration is required (or allowed) in 6802, 6102, 6504, 6505

NURS 6895. Adult Acute Care Holistic Health Assessment. (2 cr.; A-F only; Every Fall)
Provides nurse anesthesia students and other interested APRN students with the cognitive and psychomotor skills necessary to perform an advanced health assessment for acute care adult patients and/or those in need of a preoperative assessment. prereq: Nurse anesthesia DNP student or instr consent

NURS 6900. Introduction to Principles of Anesthesia. (6 cr.; A-F only; Every Spring)
First in a series of four courses that introduces the nurse anesthesia student to the safe and effective principles of nurse anesthesia. prereq: Doctorate of nursing practice program

NURS 6901. Basic Nurse Anesthesia Principles. (3 cr.; A-F only; Every Fall)
Examination/application of basic principles of anesthesia to formulate nurse anesthesia care plans for care of adults undergoing anesthesia. prereq: 6900, 6910, concurrent registration is required (or allowed) in 6911

NURS 6902. Nurse Anesthesia Care: Cardiothoracic Disease. (2 cr.; A-F only; Every Spring)
Principles of anesthesia used to deliver anesthesia to complex patients/populations. Anesthesia for patients undergoing cardiovascular and thoracic procedures. prereq: 5222, 5228, 6900, 6901, concurrent registration is required (or allowed) in 6912, PHSL 5115

NURS 6903. Nurse Anesthesia Care: Special Populations. (2 cr.; A-F only; Every Summer)
Examine/apply principles used to deliver anesthesia by nurse anesthetists to special populations: pediatric, trauma, obstetric/gynecologic, and acute and chronic pain patients. prereq: 6900, 6901, 6902, concurrent registration is required (or allowed) in 6912, admission to BSN-DNP nurse anesthesia specialty

NURS 6910. Introduction to Nurse Anesthesia Practicum I. (1 cr.; S-N only; Every Spring)
Basic skills in nurse anesthesia practice. Equipment safety checks, room set up, preoperative assessment, basic airway skills, intravenous fluid replacement, positioning of patient/management of emergence, prereq: Grad Student in Doctorate of Nursing Practice Program, concurrent registration is required (or allowed) in 6900
NURS 6911. Basic Nurse Anesthesia Principles Practicum II. (2 cr.; S-N only; Every Summer)
Develop proficiency in nurse anesthesia practice including basic equipment safety checks, room set up, pre-operative assessment, basic airway skills, intravenous fluid replacement, positioning of patient, management of emergence. prereq: N6910, concurrent registration is required (or allowed) in N6901, Grad student in Doctorate of Nursing Practice Program

NURS 6912. Nurse Anesthesia Care: Cardiothoracic Disease Practicum. (3 cr.; S-N only; Every Spring)
Develop proficiency in nurse anesthesia practice. Basic equipment safety checks, room set up, pre-operative assessment, basic airway skills, intravenous fluid replacement, positioning of the patient and managing emergence. prereq: concurrent registration is required (or allowed) in 6902, DNP-nurse anesthesia specialty student

NURS 6913. Nurse Anesthesia Care: Special Populations Practicum. (4 cr.; S-N only; Every Summer)
Develop proficiency in nurse anesthesia practice for specific populations, including pediatrics, obstetrics/gynecology, trauma, and patients with acute and chronic pain. prereq: Grad student in doctorate of nursing practice program nurse anesthesia specialty; concurrent registration is required (or allowed) in 6903

NURS 6914. Basic Nurse Anesthesia Principles Practicum III. (3 cr.; S-N only; Every Fall)
Develop progressive proficiency in nurse anesthesia practice including basic equipment safety checks, room set up, pre-operative assessment, basic airway skills, intravenous fluid replacement, positioning of patient, management of emergence. prereq: N6910, concurrent registration is required (or allowed) in N6901

NURS 6920. Primary Care: Assessment of Health and Care of Well Children. (3 cr.; A-F only; Every Spring)
Age specific, family-centered, assessment, prevention and health promotion services for infants through adolescents. Comprehensive health supervision. Critical thinking and advanced practice nursing interventions. prereq: 5200, 5222, 5229, concurrent registration is required (or allowed) in 6921, instr consent

NURS 6921. Assessment of Health and Care of Well Children: Primary Care Practicum. (1-2 cr.; S-N only; Every Spring)
Age-specific, family-centered nursing assessment and interventions to promote wellness for infants through adolescence. Compiling and evaluating advanced nursing interventions for disease prevention and health promotion. Models of primary prevention. prereq: 5200, 5222, 5229, concurrent registration is required (or allowed) in 6920, instr consent

NURS 6922. Primary Care: Assessment and Management of Common Conditions Affecting Children. (3 cr.; A-F only; Every Fall)
Research-based evaluation and management of common conditions affecting children from infancy through adolescence. Theories and models used to explain and predict physiologic and psychological adaptation of children and their families. prereq: 6920, 6921, concurrent registration is required (or allowed) in 6923, instr consent

NURS 6923. Primary Care Practicum: Assessment and Management of Common Conditions Affecting Children. (2 cr.; S-N only; Every Fall)
Age-specific, family-centered nursing assessment and intervention of acute and chronic conditions of children within the family context. Nursing intervention strategies including diagnostics, therapies, education, and follow-up evaluation of outcomes. prereq: 6920, 6921, concurrent registration is required (or allowed) in 6922, instr consent

NURS 6924. Assessment and Interventions for Children and Youth With Special Health Care Needs. (2 cr.; A-F only; Every Fall)
Children and youth with special health care needs. Growth and development, pathophysiology, and specific conditions within a holistic, family-centered, community based, culturally competent, coordinated approach to assessment and intervention. prereq: instr consent

NURS 6925. Advanced Concepts in Women's Health Care I. (1-3 cr.; A-F only; Every Spring)
The course builds on foundational theoretical and evidence-based content to develop advanced assessment and care planning competencies in working with patients with complex gynecological and pregnancy-related conditions. prereq: 6305, 6306, 6501

NURS 6926. Advanced Concepts in Women's Health for WHNP Practicum I. (1 cr. [max 2 cr.]; S-N only; Every Spring)
Develop advanced women's health assessment/planning skills. Experience working with women who have complex gynecological/pregnancy-related conditions. prereq: WHNP DNP student, concurrent registration is required (or allowed) in 6925, 5222, 5228, 5229, 5200, 6305, 6306

NURS 6927. Advanced Concepts in Women's Health II. (3 cr.; A-F only; Every Summer)
Advanced concepts in gender-specific health care over adult lifespan and common primary health care issues. Utilization of evidence based integrative therapies and inter-professional practice competencies to promote positive outcomes in women's health populations. prereq: 6305, 6306, 6925, 6926, concurrent registration is required (or allowed) in 6928, CSPH 5101, current DNP WHNP student

NURS 6928. Adv Concepts in Women's Health II WHNP Pract. (1 cr.; S-N only; Every Summer)
Expands on advanced assessment/management skills in women's health through individualized patient centered care that encompasses primary health issues utilizing integrative approaches/interprofessional practice to promote positive outcomes in women's health populations. prereq: 6305, 6306, 6925, 6926, concurrent registration is required (or allowed) in 6927, CSPH 5101, DNP WHNP student

NURS 6929. Advanced Nursing Care of Children with Acute Illness; Practicum for PCNS. (2 cr.; S-N only; Every Fall)
Synthesis and application of theory, research, and evidence-based practice to effectively implement pediatric clinical nurse specialist role. Focuses on comprehensive acute, complex care, role implementation, and contextual factors affecting health of children with special health needs and families. prereq: [6405, grad student in Nursing admitted to pediatric clinical nurse specialist area] or instr consent

NURS 6930. Foundations of Advanced Public Health Nursing Practice. (3 cr.; A-F or Audit; Every Fall)

NURS 6931. Health Equity and Social Justice. (1 cr.; A-F only; Every Fall)
Complex relationships among social determinants of health, health disparities, population health status. Analyze/critique both evidence-based/untested strategies for reducing health disparities. prereq: 6930 or instr consent

NURS 6934. Population-focused Assessment and Prioritization. (1 cr.; A-F or Audit; Every Fall)
Principles of community-based participatory methods used to conduct population-focused assessments. Review literature/identify gaps in knowledge. prereq: 6930 or instr consent

NURS 6942. Health Equity and Social Justice Practicum. (2 cr.; S-N only; Every Fall)
Practicum experiences at community site serving populations with compromised health status related to health disparities. Collaborate with agency staff/community partners to identify health disparities relevant to populations served. Develop social justice conceptual framework/propose strategies to improve population health. prereq: instr consent

NURS 6944. Population-focused Assessment & Prioritization Practicum. (1 cr.; S-N only; Every Fall)
Population-focused assessment in collaboration with community partners. Identify key informants. Develop community partnerships. Use multiple approaches to data collection/analyzes. Prioritize community assets, needs, contributing factors. prereq: 6930 or instr consent

NURS 7000. DNP Proseminar. (1 cr.; A-F only; Every Fall)
NURS 7004. Nurse Anesthesia Practicum A.  
(3 cr.; S-N only; Every Fall)  
First in a series of three clinical courses that focus on developing proficiency in nurse anesthesia practice. management. prereq: 5920  
NURS 7005. Nurse Anesthesia Practicum B.  
(3 cr.; S-N only; Every Spring)  
Second in a series of three clinical courses that develop proficiency in nurse anesthesia practice. prereq: 7004  
NURS 7006. Nurse Anesthesia Practicum C.  
(3 cr.; S-N only; Every Summer)  
Third in a series of three clinical courses that develop proficiency in nurse anesthesia practice. prereq: 7004, 7005  
NURS 7100. Quality Improvement and Implementation Science in Health Care.  
(3 cr.; A-F only; Every Fall)  
Study of improvement and implementation science with emphasis on integration of organizational change theory, quality improvement models, guidelines, and strategies to drive evidence-based change and improve patient outcomes in the context of healthcare systems.  
NURS 7101. Integrating Change Theory and Quality Improvement.  
(2 cr.; A-F only; Every Spring & Summer)  
Analysis and evaluation of change theories in relationship to quality improvement in health care in order to integrate change theory into the design and development of the student's DNP project. prereq: 7100 or inst consent  
NURS 7102. Scholarly Dissemination and Advanced Professional Engagement.  
(2 cr.; A-F only; Every Fall, Spring & Summer)  
Synthesis of DNP project components with emphasis on development and dissemination of scholarly manuscript. Recognition of advancement of professional opportunities and commitment.  
NURS 7105. Knowledge Representation and Interoperability.  
(2 cr.; A-F only; Every Summer)  
Conceptual/operational aspects of knowledge representation structures in nursing, including standards and interoperability. Representation of clinical work in the electronic health record. Critical analysis of interoperability, ethical issues, and values. prereq: NURS 5115 or inst consent  
NURS 7106. Knowledge Representation and Interoperability Practicum.  
(2 cr.; S-N only; Every Summer)  
Knowledge representation and interoperability principles/standards to improving knowledge in clinical or public health settings. Applied knowledge representation to nursing. prereq: [NURS 5115 or inst consent], [NURS 7105 or concurrent registration is required (or allowed) in NURS 7105]  
NURS 7108. Population Health Informatics.  
(2 cr.; A-F only; Every Fall)  
Standards, interoperability, and integration of information systems for population health are examined. Population health use cases are analyzed for potential benefits, legal, ethical, and practical issues related to the development of population health information systems. prereq: [5115 or [HINF 5430, HINF 5431]] or inst consent  
NURS 7109. Population Health Informatics Practicum.  
(2 cr.; S-N only; Every Fall)  
Apply principles, theories, and standards to integration of data to solve a particular population health problem. prereq: [5115, [7108 or concurrent registration is required (or allowed) in 7108] or [HINF 5430, HINF 5431]] or inst consent  
NURS 7110. NURS 7110 DNP Project Practicum.  
(1-3 cr. [max 12 cr.]; S-N only; Every Fall, Spring & Summer)  
Directed application of a quality improvement process, change theory, and inter-professional collaboration through the development, implementation, evaluation and dissemination of an evidence-based intervention (DNP Project) within the context of health, a health care system and/or healing environment.  
NURS 7111. DNP Project Direction II: Implementation.  
(1 cr.; S-N only; Every Fall, Spring & Summer)  
Directed application of quality improvement process/change theory. Inter-professional collaboration through leadership/implementation of scholarly clinical leadership project. Health care system/healing environment.  
NURS 7112. DNP Project Direction III: Evaluation.  
(1 cr.; S-N only; Every Fall, Spring & Summer)  
Directed application of program evaluation and analysis. Interpretation of project data, dissemination of findings during evaluation phase of DNP Leadership Project. Health care system and healing environment.  
(2 cr.; A-F only; Every Spring)  
Principles and concepts of knowledge management and decision making for support of clinical practice. Students design a clinical decision support intervention and examine the legal, ethical, and practical issues related to its implementation and maintenance of CDS interventions. prereq: 5115 or HINF 5430/5431 or inst consent  
(2 cr.; S-N only; Every Spring)  
Apply clinical decision support knowledge to the development and application of a clinical decision support intervention. prereq: [5115, [7113 or concurrent registration is required (or allowed) in 7113] or [HINF 5430, HINF 5431]] or inst consent  
NURS 7118. Human Factors and Human-Computer Interaction in Health Informatics.  
(3 cr.; A-F or Audit; Every Spring)  
Principles of human factors and human-computer interaction to optimize research/practice in nursing and health informatics. Interactive system design that accommodates/enhances capabilities of user. prereq: Biostatistics or inst consent  
NURS 7200. Economics of Health Care.  
(3 cr.; A-F or Audit; Every Spring & Summer)  
Economic theories of health care in relation to health disparities and global health. Financing strategies, payment systems, and their effect on doctor/nursing practice. prereq: Admission to DNP program  
NURS 7202. Moral and Ethical Positions and Actions in Nursing.  
(2 cr.; A-F or Audit; Every Fall & Spring)  
Normative ethics and theoretical underpinnings for positions taken. Implications for subsequent action. Morally defensible positions on health-related issues, corresponding actions from perspective of nursing.  
NURS 7209. Integrative Health and Healing.  
(1 cr.; A-F only; Every Spring)  
Foundational course for advanced nursing practice. Scholarship, research, and theory underlying integrative therapies and advanced holistic nursing practice. prereq: 5101, 5200, 5222, 6200, 7000, beginning level skill in one integrative therapy, inst consent  
NURS 7210. Integrative Health and Healing Practicum I.  
(1 cr.; S-N only; Every Spring)  
Foundational clinical course in advanced nursing practice for integrative health and healing. Development of clinical competencies in holistic health assessment, management, and evaluation. prereq: 5101, 5200, 5222, 6200, 7000, 7209, 7210, 7900, CSH 5701, beginning level skill in two integrative therapies, inst consent  
NURS 7211. Integrative Health and Healing II.  
(1 cr.; A-F only; Every Fall)  
Foundational clinical course in advanced nursing practice. Scholarship, research, and theory underlying integrative therapies and advanced holistic nursing practice within the context of disease prevention, health promotion, and teaching/learning. prereq: 5101, 5200, 5222, 6200, 7000, 7209, 7210, 7900, CSH 5701, beginning level skill in two integrative therapies, inst consent  
NURS 7212. Integrative Health and Healing Practicum II.  
(2 cr.; S-N only; Every Fall)  
Foundational clinical course in advanced nursing practice for integrative health/healing. Development of clinical competencies in holistic health assessment, teaching/learning, and understanding the role of other CAM providers. prereq: 5101, 5200, 5222, 6200, 7000, 7209, 7210, [7211 or concurrent registration is required (or allowed) in 7211], 7900, CSH 5701, beginning level skill in two integrative therapies, inst consent  
NURS 7213. Midwifery Clinical and Professional Integration.  
(3 cr.; S-N only; Every Spring)  
Integration of clinical role of nurse midwife. Role in leadership, legislation, and policy. prereq: Nurse midwifery DNP student in final semester, no incomplete cr, inst consent  
NURS 7214. Integrative Health and Healing III.  
(1 cr.; A-F only; Every Spring)  
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Programs of integrative therapies and healing practices in a variety of clinical/organizational settings. Creation of holistic nursing health care models, sustainable business plans, and the application of leadership skills. preq: 7211 or instr consent

NURS 7215. Integrative Health and Healing Practicum III. (2 cr.; S-N only; Every Spring) Application of leadership competencies in developing, evaluating, and evaluating integrative health and healing services and programs. preq: 7212 or instr consent

NURS 7300. Program Planning and Evaluation. (3 cr.; A-F or Audit; Every Fall & Spring) A critical analysis of methods for practical program planning and evaluation for advanced nursing professionals in leadership roles; includes evaluation of approach and design, intervention processes including stakeholder issues, measurement issues, and strategies to evaluate outcomes achievement. preq: Admission to DNP program or instr consent

NURS 7310. WHNP Clinical and Professional Integration. (2 cr.; S-N only; Every Spring) Integration of the clinical and professional role of the women’s health nurse practitioner, including understanding of the role of the WHNP in leadership, legislation, and policy. preq: WHNP DNP student in final semester, passed all courses, no incomplete credits

NURS 7400. Health Policy Leadership. (3 cr.; A-F or Audit; Every Fall) Acquisition of policy leadership and advocacy principles and skills and engagement in the process of organizational and governmental health policy development to transform health care delivery, promote equitable distribution of health care resources, address health disparities, and improve population health. preq: Admission to DNP program

NURS 7401. Health Policy Leadership Practicum. (0.5-1 cr.; S-N only; Every Spring) Translation of nursing, health, and political science and application of health policy advocacy knowledge and skills to improve health care delivery, address health disparities, and advance population health.

NURS 7406. Advanced Nursing Practicum in Adult-Gerontology Health. (2 cr.; S-N only; Every Spring) Final clinical course developing proficiency in the advanced practice specialty role. Focus is on applying/evaluating evidence for clinical practice and achieving a level of competency as a clinical nurse specialist or nurse practitioner in adult-gerontology health. preq: [5222, 5228, 5224, 5200, 6407, 6501, 7505, not [ANP or GNP]] or [5222, 5228, 5224, 5200, 6407, 6500, 6501, 7504, 7505, [ANP or GNP]] or instr consent

NURS 7500. Health Care of Children for the Family Nurse Practitioner. (3 cr.; A-F only; Every Fall) Application of mid-range theories, models, concepts, and research in designing age-specific plans for the promotion, maintenance, and restoration of the health of infants, children, and adolescents within the context of their families and communities. preq: 5200, 7503, 7504, concurrent registration is required (or allowed) in 6102, concurrent registration is required (or allowed) in 7501, concurrent registration is required (or allowed) in 7506, instr consent

NURS 7501. Health Care of Children for the Family Nurse Practitioner Practicum. (1 cr.; S-N only; Every Fall) Nursing theory, research, and evidence-based practice standards in evaluating/implementing safe and effective interventions to promote health and prevent illness in infants, children, and adolescents. Evaluation of evidence-based outcomes. preq: 5200, 5222, 5228, 5229, 6501, 7504, 7505, instr consent

NURS 7503. Reproductive Health Care of Women Practicum for Family Nurse Practitioners. (1 cr.; S-N only; Every Spring) Application of holistic health histories and physical assessments of women. Synthesize/ use knowledge in clinical decision making to formulate health care management plans related to women’s reproductive and sexual health throughout the life cycle. preq: 5200

NURS 7504. Assessment and Management of Health for Advanced Practice Nurses, Practicum I. (1-2 cr.; S-N only; Every Fall) Application of holistic health histories and physical assessments by advanced practice nurses to formulate and implement individualized patient-centered health care management plans to support positive health outcomes in primary care populations experiencing acute and stable chronic conditions. preq: 5200, 5222, 5224, 5229, 6501

NURS 7505. Assessment and Management of Health for Advanced Practice Nurses Practicum II. (1-2 cr.; S-N only; Every Spring) Comprehensive advanced nursing assessment/management for acute and chronic health conditions of the primary care population across the life span. Synthesis/application of nursing theory and evidence-based implementation/evaluation of safe and effective therapeutic interventions to promote, maintain, and restore health. preq: 5200, 5222, 5224, 5229, 6501 or concurrent registration is required (or allowed) in 6501, (6502 or concurrent registration is required (or allowed) in 6502)

NURS 7506. Family Practice Practicum III: Assessment and Management of Health for the Family Nurse Practitioner. (1 cr.; S-N only; Every Fall) Evaluation of theories and research to support the development of holistic nursing practice models and clinical decision-making for health promotion, disease prevention and intervention. Evaluation of patient outcomes using nursing standards and criteria. preq: 5200, 5222, 5228, 5229, 6501, 7504, 7505, instr consent

NURS 7507. Assessment Management of Health Practicum IV: Community Health Leadership for Family Nurse Pract. (1 cr.; S-N only; Every Spring) Application of principles of health policy and interdisciplinary collaboration while synthesizing and utilizing knowledge and evidence-based research to formulate a proposal for organizational, institutional, community, or governmental arenas to address needs related to access, health disparities, or health promotion issues. preq: 7400 or concurrent registration is required (or allowed) in 7400, 7506

NURS 7508. Health Care of the Elderly for the Family Nurse Practitioner Practicum. (1 cr.; S-N only; Every Summer) Synthesis and application of nursing theory, research and evidence-based practice standards in the evaluation and implementation of safe, effective interventions to promote health and prevent illness in elder patients from family- and patient-centered contexts. Evaluation of evidence-based outcomes. preq: 7504, 7505

NURS 7509. Assessment and Management of Health Practicum VI: Primary Care for the Family Nurse Practitioner. (1 cr.; S-N only; Every Spring) Managing health across the lifespan in primary care settings. Health promotion, disease prevention, intervention. Implementing holistic, culturally-sensitive comprehensive, collaborative nursing practice models. Theories, ethical principles, research. preq: 5200, 5222, 5228, 5229, 6501, 7504, 7505, concurrent registration is required (or allowed) in 7507, concurrent registration is required (or allowed) in 7508


NURS 7516. Health Care of Children for the Family Nurse Practitioner: Acute and Chronic Management. (2 cr.; A-F only; Every Fall) Identifying diagnostic criteria for common acute/chronic pediatric conditions. Apply mid-range theories, research, models of care to restore health of newborns, infants, children, adolescents. preq: 5200, 7515, 7504, 7505

NURS 7518. Health Care of the Elder Patient for the Family Nurse Practitioner. (1 cr.; A-F only; Every Summer) The application of mid-range theories, models, and concepts applicable to the promotion, maintenance, and restoration of the health elderly patients within the context of their families and communities. Current research is evaluated and used as the basis for designing age-specific interventions for elderly patients and their families. preq: Nurs 6502

NURS 7600. Nursing Research and Evidence Based Practice. (2-4 cr.; A-F only; Every Fall & Spring)
Examination of evidence-based nursing including types and levels of evidence, research process, critique and synthesis of research studies. Science of implementation. 
prereq: Completion of or concurrent enrollment in a 3 credit inferential statistics course

NURS 7604. Executive Leadership Seminar: Boundary Spanning Leadership. (2 cr.; A-F only; Every Spring) Boundary spanning leadership for solving problems, driving innovation, and transforming healthcare organizations to advance the common good and improve health care by employing strategies that engage people from outside the organization in collaborative teams. prereq: [6704, 6706] or instr consent

NURS 7605. Executive Leadership Practicum: Boundary Spanning Leadership. (1-2 cr.; S-N only; Every Spring) Apply boundary spanning leadership in comparison to other leadership theories for solving problems, driving innovation, and transforming healthcare organizations to a specific healthcare setting/organization by implementing strategies that engage people from outside the organization in collaborative teams. prereq: Graduate student or instr consent

NURS 7606. Relationship-Based Leadership and Management. (3 cr.; A-F only; Every Spring) Concepts, theories, and practices that support relationship-based leadership and management. Framework/set of tools to provide leadership in an empowered organization. prereq: Grad student or instr consent

NURS 7608. Health Care Finance and Resource Management. (3 cr.; A-F or Audit; Every Fall) Financial planning, budgeting, reimbursement and decision-making concepts and strategies are applied to health care and service organizations. Emphasis is on conceptualizing resources broadly, particularly nursing, and translating practice relevant concepts and priorities into actions valued by organizational decision makers. prereq: Graduate student or instr consent

NURS 7610. System Leadership and Innovation. (3 cr.; A-F only; Every Fall & Spring) Health innovation and leadership, integrating whole systems thinking, relevant theories and generative leadership to advance innovation and achieve sustainable change in contemporary health settings.

NURS 7612. Psychiatric/Mental Health Advanced Practice Nursing: Professional Seminar. (1 cr.; A-F only; Every Spring) Psychiatric/mental health advanced practice nursing: professional seminar. prereq: 6802, 6803

NURS 7613. Psychiatric/Mental Health Advanced Practice Nursing: Practicum V. (2 cr.; S-N only; Every Spring) Final course provides opportunities for refinement of PMH APN roles and integration of DNP activities into clinical experiences.

Providing evidence-based nursing care to persons experiencing or at risk of experiencing psychiatric disorders to positively influence health care delivery. prereq: [6802, 6803] or instr consent

NURS 7705. The Adult and Gerontological Clinical Nurse Specialist in Acute Care. (2 cr.; A-F only; Every Summer) Development of advanced clinical reasoning, assessment of clinical outcomes, quality improvement and research based care for adult and elderly patients with acute illness. Use of theory and research in the role of the CNS. prereq: 5200, 5222, 5224, 5228, 6100, 6405, 7103, 7900

NURS 7706. Implementing the Role of the Clinical Nurse Specialist in Acute Care. (1 cr.; S-N only; Every Summer) Development of clinical expertise of CNS in provision of advanced nursing care for adults/elders. Students will utilize theory/research to implement roles of CNS. prereq: N5222, N5228, N5224, N7103, N5200, N7900, N6100, 7705 (co-requisite)

NURS 7700. Advanced Topics in Professional Nursing. (1-6 cr. [max 36 cr.]; Student Option; Every Fall, Spring & Summer) Methods, theory, or advanced topics, including supervised projects. prereq: instr consent

NURS 7900. Scholarly Teaching and Learning in Nursing. (3 cr.; A-F only; Every Spring & Summer) Elements of effective teaching/learning. Designing teaching-learning models, creating educational experiences that facilitate achievement of desired learner outcomes.

NURS 7901. Advanced Scholarly Teaching and Learning in Nursing. (1 cr.; S-N only; Every Fall) Exploration of teaching-learning theory and evidence as applied to the design, development, implementation, and evaluation of effective teaching in a variety of settings.

NURS 7904. Nursing Education Practicum. (2 cr.; Student Option No Audit; Every Fall) Design, implementation, and evaluation of education-based, scholarly teaching and learning in various nursing education contexts. Analysis of select nursing program in relation to meeting standards for accreditation and various other expected outcomes of nursing programs. prereq: Graduate student in nursing or Nurs 7900 or equivalent.

NURS 7925. Systems of Care for Children and Youth With Special Health Care Needs Practicum. (2 cr.; S-N only; Every Spring) Research-based evaluation/management of psychologic and physiologic responses to chronic illness of children and youth. Developing theory-based systems of nursing care that are holistic, family-centered, community-based, culturally-competent, and coordinated. prereq: 6924 or instr consent

NURS 7926. Advanced Assessment, Intervention in Families of Children and Youth With Special Health Care Needs. (2 cr.; A-F only; Every Spring) In-depth, systemic, and theory-based study of family health assessment methods/intervention models. Assess, intervene, and evaluate intervention models related to patterns of functioning in families of children with complex health care needs. prereq: [6102 or equiv family theory course, 6200, concurrent registration is required (or allowed) in 7925] or instr consent

NURS 7927. Adv Assessment, Intervention in Families of Children and Youth With Special Health Care Needs Pract. (1 cr.; S-N only; Every Spring) Assess, intervene, and evaluate intervention models related to patterns of functioning in families of children with complex health care needs. Prepares nurses to become members of an interdisciplinary team, working with families with special health care needs from diverse cultural backgrounds. prereq: [6102 or equiv family theory course, 6200, concurrent registration is required (or allowed) in 7925], concurrent registration is required (or allowed) in 7926] or instr consent

NURS 7930. Public Health Nursing Leadership Practicum. (2 cr.; S-N only; Every Spring) Synthesis of advanced public health nursing research. Theory/application to health policy, leadership, management, administration within public health nursing leadership situations. prereq: 6930


NURS 7940. Application of Behavior Change Theory to Population Health. (1 cr.; A-F only; Every Spring) Review of selected theories of health behavior change for individuals, groups, organizations, communities, systems. Synthesize/apply theories appropriately/effectively to guide public health nursing practice. prereq: 6930, [PubH 6020 or instr consent]

NURS 7942. Application of Behavior Change Theory to Population Health Practicum. (2 cr.; S-N only; Every Spring) Clinical application/synthesis of selected theories of health behavior change for individuals, groups, organizations, communities, systems in population-based setting. prereq: 6930, PubH 6020

NURS 8121. Health Behaviors and Illness Responses. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theories of health behaviors and responses to illness are analyzed/analyzed. Multivariate research designs. Specification of testable, descriptive, dynamic models for health/illness that incorporate culture, biology, environment, and health systems for diverse individuals, families, communities, and populations. prereq: Doctoral student or instr consent
NURS 8134. Interventions and Outcomes Research. (3 cr.; A-F or Audit; Every Spring) Design/evaluation of intervention/outcomes research. Use of advanced experimental design and multivariate statistical approaches to evaluate theory-based interventions with longitudinal outcomes in context. prereq: 8121, PhD student, instr consent

NURS 8152. Scholarship in Health Care Ethics. (3 cr.; A-F only; Every Fall) Analyze the underlying values in the concepts and discourses of health/disease. Evaluate ethical frameworks regarding their capability to address issues in health care. Analyze/discuss issues related to the responsible and ethical conduct of research. prereq: Doctoral student or instr consent

NURS 8171. Qualitative Research Design and Methods. (3-4 cr.; Student Option; Every Spring) Overview and comparative analysis of selected qualitative research methods and analytic strategies. Focuses on developing rigorous qualitative designs that contribute to development of nursing and health care knowledge for diverse populations. prereq: 8170 or equiv

NURS 8172. Theory and Theory Development for Research. (3 cr.; Student Option; Periodic Fall & Spring) Paradigms in nursing/health, associated methods of scientific/scholarly inquiry. Inductive/deductive techniques for theory development Theory-testing using data obtained under controlled conditions. prereq: Doctoral student

NURS 8173. Principles and Methods of Implementing Research. (3 cr.; Student Option; Every Spring) Integrates scientific, statistical, and practical aspects of research. Inter-relationships among design, sample selections, subject access, human subjects requirements, instrument selection and evaluation, data management, analyses plans, grant writing, and research career issues. Field experiences required. prereq: 8114 or other 8xxx grad research methods course, 2 grad stat courses;

NURS 8175. Quantitative Research Design and Methods. (3 cr.; A-F or Audit; Every Fall) Designs for quantitative description and quasi-experimental/quasi-experimental evaluation of scientific problems across domain of nursing. Evaluation of logic of design/attribute of causality from health and social science perspectives. prereq: [PhD student in nursing, advanced applied statistics] or instr consent

NURS 8177. Advanced Nursing Research Practicum. (2 cr.; S-N or Audit; Every Fall, Spring & Summer) Students collaborate with research team under supervision of faculty mentor in designing/conducting a health-related research project. prereq: PhD nursing student, instr consent, adviser consent

NURS 8179. Biophysical Measurement and Instrumentation in Clinical Research. (3 cr.; Student Option; Every Fall) Critical issues in measurement and instrumentation for clinical research. Methodological issues and critical appraisal of instruments in the study of biophysiological phenomena. Field observation experiences. prereq: [8173, 8175 or equiv, advanced level stat or concurrent registration is required (or allowed) in advanced level stat] or instr consent

NURS 8180. Doctoral Proseminar I: Scholarly Development. (1 cr.; S-N or Audit; Periodic Fall & Spring) Transition to doctoral study. Begins socialization process to role of nursing scholar/scientist. Career trajectories of nursing scholars who have pursued various roles. prereq: Doctoral nursing student

NURS 8185. Qualitative Data Analysis for Health Care Research. (3-4 cr.; Student Option; Every Summer) Techniques for descriptive, interpretive, and analytic data. Data preparation, management, and analysis. Transforming data from multiple texts to theoretical conceptualizations. Writing, dissemination of findings, prereq: 8171 or grad course in qualitative research methods

NURS 8190. Critical Review in Health Research. (2 cr.; A-F or Audit; Every Summer) Skills needed to critique a body of scientific literature in focused areas of nursing research and related fields. Construction of literature reviews for planning research projects and for research utilization. prereq: Advanced statistics course, instr consent

NURS 8193. Special Topics in Nursing Research. (1-6 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Seminar and/or individual study of research design, methodologies, or instruments. prereq: instr consent

NURS 8195. Mixed Methods in the Social, Behavioral, and Applied Health Sciences. (3 cr.; A-F only; Every Spring) Integrate qualitative strategies with quantitative approaches in research designs. Strengths/challenges of using mixed-methodological frameworks when studying the etiology of phenomena or evaluating clinical interventions. prereq: instr consent

NURS 8360. Advanced Clinical Nursing. (1-6 cr.; Student Option; Every Fall, Spring & Summer) Independent study or faculty seminar on special clinical topic when interest exists. prereq: Grad nurs major, instr consent

NURS 8361. Special Topics in Nursing. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Students select and study a topic of interest.

NURS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

NUTR 5622. Vitamin and Mineral Biochemistry. (3 cr.; Student Option; Every Fall) Nutritional, biochemical, and physiological aspects of vitamins and essential minerals in human and experimental-animal models. prereq: BioC 3021, Phil 3051, FSON 4612

NUTR 5624. Nutrition and Genetics. (2 cr.; Student Option; Every Fall) Overview of gene-diet interactions and relevant technologies used to study such interactions. Nutrigenomics, epigenetics, transcriptomics, proteomics, metabolomics. Examples of gene-diet interactions, implications. Current issues. prereq: Biochemistry

NUTR 5625. Nutritional Biochemistry. (3 cr.; Student Option; Every Fall) Overview of biochemical molecules and pathways important in nutritional events. prereq: BioC 3021 or instr consent

NUTR 5626. Nutritional Physiology. (3 cr.; A-F or Audit; Every Spring) Whole body macronutrient metabolism as it relates to etiology of metabolic diseases. Signaling between tissues to control homeostasis. How dysregulation of crosstalk can lead to metabolic diseases. How diet, exercise, or starvation impact metabolism. Regulation of food intake and energy expenditure. Designing/analyzing/interpreting research data. prereq: NUTR 5625

NUTR 5627. Nutritional and Food Toxicology. (3 cr.; A-F only; Every Spring) Toxic agents, organisms, and toxic effects that are important in the toxic events, with a focus on food toxicants and nutrient-toxicant interaction. prereq: BioC 3021; designed for students majoring in [nutrition or food science or toxicology]

NUTR 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

Nutrition (NUTR)
OBST 7500. Obstetrics and Gynecology and Women's Health Clerkship. (4 cr; max 8 cr; H-N only; Every Fall, Spring & Summer) This is the core clinical course in Ob/Gyn for years three and four students.

OBST 7520. Advanced Externship in Ob/Gyn. (3 cr; H-N or Audit; Every Fall & Spring) Three-week rotation focusing on the management of gynecologic oncology patients. Students serve as junior interns, work up cases, and participate in rounds and case discussion conferences. prereq: 7500

OBST 7521. Advanced Externship in Ob/Gyn. (3 cr; H-N or Audit; Every Fall, Spring & Summer) Each student is under preceptorship of member(s) of full-time faculty. Areas of study may include general obstetrics/gynecology, maternal/fetal medicine, high risk obstetrics, benign gynecology, and reproductive endocrinology. prereq: 7500, instr consent

OBST 7542. Advanced OB/Gyn: Obstetrics and Gynecology Medical Fellowship. (6 cr; H-N or Audit; Every Fall, Spring & Summer) This course focuses on the management of gynecologic oncology patients. Students will serve as junior interns, work up cases and participate in rounds and case discussion conferences.

OBST 7540. Advanced Externship in Ob/Gyn. (6 cr; H-N or Audit; Every Fall, Spring & Summer) Six-week rotation focusing on the management of gynecologic oncology patients. Students serve as junior interns, work up cases, and participate in rounds and case discussion conferences. prereq: 7500

OBST 7531. Advanced OB/Gyn: Gynecologic Oncology. (4 cr; H-N only; Every Fall, Spring & Summer) This course focuses on the management of gynecologic oncology patients. Students will serve as junior interns, work up cases and participate in rounds and case discussion conferences.

OBST 7541. Advanced OB/Gyn: Maternal-Fetal Medicine. (4 cr; H-N only; Every Fall, Spring & Summer) Students will receive in-depth exposure to diagnosis and management of maternal and fetal complications of pregnancy.

OBST 7525. Gynecological Endocrinology II. (1-15 cr; Student Option; Every Fall & Spring) N/A prereq: prereq 8223

OBST 7526. Obstetric Physiology and Anesthesiology. (1-15 cr; Student Option; Every Fall & Spring) N/A prereq: prereq 8224

OBST 8227. Preceptorship in Clinical Practice. (1-15 cr; Student Option; Every Fall, Spring & Summer) N/A prereq: prereq 8226

OBST 8240. Human Gametes and Fertilization. (3 cr; Student Option; Every Fall & Spring)

OBST 8241. Human Gametes and Fertilization Laboratory. (2 cr; Student Option; Every Fall & Spring)

OBST 8243. Topics in Family Planning. (2-8 cr; max 12 cr; Student Option; Every Fall, Spring & Summer)

OBST 7550. Reproductive Health. (2 cr; P-N only; Every Fall, Spring & Summer) This is a comprehensive course covering family planning methods, including abortion and contraception, their effectiveness, mechanism of action, advantages, disadvantages and management of complications. This course will look specifically at the etiology, prevention, diagnosis of and management plans for unplanned pregnancy.

OBST 7560. Research in Obstetrics and Gynecology. (4-8 cr; H-N only; Every Fall, Spring & Summer) This is an individually designed course, with topics selected for each student. Most members of the ob-gyn staff are available for this one-to-one experience depending upon the establishment of joint interests with the student.

OBST 7575. Gynecological Pathology and Diagnostic Cytology. (3-6 cr; H-N or Audit; Every Fall & Spring) The student participates in the diagnostic practice with the gynecologic pathology staff. Includes diagnostic cytology of pap smears encountered in actual practice and participation in working conferences. To be arranged in advance with the Ob/Gyn Education office. prereq: 7500

OBST 7591. Women's Health Rotation. (2-6 cr; H-N or Audit; Every Fall, Spring & Summer) Multidisciplinary exploration of women's health issues. Clinical experience/academic perspectives in gynecology/reproductive health, internal medicine, adolescent medicine, and psychology. Culture, economics, psycho-social status, and life span in women's health care delivery. prereq: 7500, Med 5500

OBST 7593. Obstetrics and Gynecology Medical Fellowship. (6 cr; max 120 cr) No Grade Associated; Every Fall, Spring & Summer) Obstetrics and gynecology medical residency.

OBST 8224. Gynecological Endocrinology I. (1-15 cr; Student Option; Every Fall & Spring)

OBST 8225. Gynecological Endocrinology II. (1-15 cr; Student Option; Every Fall & Spring) N/A prereq: prereq 8223

OBST 8260. Obstetric Physiology and Anesthesiology. (1-15 cr; Student Option; Every Fall & Spring) N/A prereq: prereq 8226

OBST 8261. Obstetric Physiology and Anesthesiology Laboratory. (2 cr; Student Option; Every Fall & Spring)

OBST 8243. Topics in Family Planning. (2-8 cr; max 12 cr; Student Option; Every Fall, Spring & Summer)

OCCUPATIONAL THERAPY (OT)

OT 1003. Introduction to Occupational Therapy. (1 cr; A-F only; Every Fall, Spring & Summer)
Introduction to career of occupational therapy. Overview of profession's domain/process. Work settings, populations served, approaches used by occupational therapist.

OT 5121. Issues in Mental Health. (1 cr.; S-N or Audit; Every Fall)
Psychiatric/neuropsychological assessment/treatment. Issues related to medical/community management and to roles of OT/PT with respect to clients with mental health needs. Interaction between physical/mental health and disability. Prereq: One course gen psych, one course abnorm psych.

OT 5122. Descriptive Neurology. (2 cr.; A-F or Audit; Every Fall)
Relates neuroanatomical/neuropsychological principles to neurological conditions commonly seen in occupational/physical therapy practice. Prereq: OT student or instr consent

OT 5161. Theory of Physical Medicine and Rehabilitation Applied to Medical Sciences. (2 cr.; A-F or Audit; Every Fall)
Diagnostic procedures. Medical, surgical, and rehabilitation management of patient problems in orthopedics, surgery, pediatrics, dermatology, medicine, cancer, and speech. Correlation to current practice. Presentation of patients. Prereq: OT student or instr consent

OT 5182. Functional Neuroanatomy and Neurophysiology. (4 cr.; A-F or Audit; Every Spring)
Neuroanatomic structures as functional systems, basic neurophysiologic concepts. Emphasizes applications for understanding/treating physical dysfunctions. Prereq: Registered occupational therapy student or instr consent

OT 5300. Concepts for Occupational Therapy Practice. (4 cr.; A-F or Audit; Every Fall)
Critical thinking, ethics, professional resources/organizations, patient-therapist relationship. Level I fieldwork experience. Prereq: Enrolled OT student or instr consent

OT 5313. Therapeutic Occupation. (4 cr.; A-F or Audit; Every Fall)
Occupational therapy philosophy, history, and frames of reference. Activity analysis applied to purposeful, therapeutic activities for individuals and groups. Prereq: Enrolled OT student or instr consent

OT 5341. Introduction: Evaluation and Intervention I. (4 cr.; A-F or Audit; Every Spring)
Assessment concepts/techniques. Application to patient populations with both mental health/physical disabilities. Treatment planning/documentation. Prereq: 5393 or instr consent

OT 5342. Compensatory Rehabilitation: Evaluation and Intervention II. (4 cr.; A-F or Audit; Every Spring)
Assessment of daily living performance areas; adaptation techniques to compensate for performance deficits. Level I fieldwork experience. Prereq: 5300; 5313 or instr consent

OT 5343. Specialty Topics: Evaluation and Intervention III. (4 cr.; A-F or Audit; Every Fall)
Applies critical thinking model to assessment/intervention of selected patient populations with mental/physical problems requiring specialized approaches. Focus on habilitation/rehabilitation of populations with multiple performance component deficits. Fieldwork. Prereq: 5342 or instr consent

OT 5344. Neurorehabilitation: Evaluation and Intervention IV. (5 cr.; A-F or Audit; Every Spring)
Assessment/intervention related to perception, cognition, reflexes, sensory integration, and motor control. Application to individuals with multiple performance component deficits. Prereq: 5343 or instr consent

OT 5350. Dynamics of Group Models. (2 cr.; A-F or Audit; Every Fall)
Application of group/team dynamics in diverse professional settings. Prereq: 5313 or instr consent

OT 5357. Theory of Occupation. (1 cr.; A-F or Audit; Every Fall)
Occupational therapy frames of reference, role of activity, and historical development of profession. Prereq: Enrolled OT student or instr consent

OT 5375. Community Resources and Health-Care Issues. (2 cr.; A-F or Audit; Every Fall)
Analysis of community health-care systems, including cultural/family influences on individual health and decision making. Students identify current trends in health care and determine responses to them at social, political, or legislative level. Prereq: [5300, 5342] or instr consent

OT 5376. Adult Education and Planning. (1 cr.; A-F or Audit; Every Spring)
Skills needed to plan, implement, and evaluate adult educational programs/materials for patient/family education, peer/professional education, and education of others in order to carry out therapeutic interventions. Student teaching unit, community based activity. Prereq: 5313 or instr consent

OT 5380. Management of Occupational Therapy Services. (3 cr.; A-F or Audit; Every Spring)
Administration/management of occupational therapy services within managed care environment. Issues in Medicare, HMOs, TQM, consultation, human resources, promotion of profession. Emphasizes program development in current organizational structures. Prereq: [5360, 5375, 5376] or instr consent

OT 5391. Occupation Across the Life Span. (3 cr.; A-F or Audit; Every Spring)
The well elderly, school therapy, work-related injuries/industrial rehabilitation. Fieldwork. Prereq: [5375, 5376] or instr consent

OT 5392. Research in Occupational Therapy. (3 cr.; A-F or Audit; Every Spring)
Analysis of scientific literature, development of research proposals. Prereq: 5313 or instr consent

OT 5393. Functional Anatomy and Kinesiology. (4 cr.; A-F or Audit; Every Fall)
Gross human anatomy emphasizing skeletal, muscular, circulatory, and peripheral nervous systems of the extremities and trunk. Includes cadaver lab prossections. Analyzing functional human movement from a biomechanical perspective. Prereq: Enrolled OT student or instr consent

OT 5394. Orthotics. (3 cr.; A-F or Audit; Every Fall)
Analysis, design, and construction of orthotic devices. Prereq: 5341 or instr consent

OT 5395. Independent Study in Occupational Therapy. (1-4 cr.; max 16 cr.; Student Option; Every Fall, Spring & Summer)
Independent Study in Occupational Therapy Prereq: Enrolled OT student or instr consent

OT 6000. Foundations of Interprofessional Communication and Collaboration. (1 cr.; S-N only; Every Fall)
Foundations of Interprofessional Communication & Collaboration (FIPCC) is the first interprofessional course in Phase I of the 1 Health curriculum. More than 1,000 health and health care students from allied health, dentistry, dietetics, medicine, nursing, pharmacy, physical therapy, psychology, public health, social work, speech-language-hearing sciences, and veterinary medicine will be enrolled in this course. The course will be delivered to interprofessional groups of approximately 30-45 students in each room. This is a hybrid course with a blended format that involves trained facilitators leading face-to-face discussions which is supported by online resources and pre-work that addresses the following topics: Roles and responsibilities? Health systems and interactions? Teams and teamwork? Wellbeing and resiliency? Ethics and professionalism? Leadership Prereq: Enrolled OT student

OT 6100. Public and Professional Engagement I. (0.5 cr. [max 1 cr.;] S-N only; Every Fall & Spring)
Working with an academic adviser, students establish personal/professional goals and design a series of experiences in natural setting, including a broad base of contexts/practice settings/clients across the lifespan.

OT 6101. Foundations of Occupational Science and Occupational Therapy. (4 cr.; A-F only; Every Fall)

OT 6102. Professional Identity: Behaviors and Attitudes. (2 cr.; S-N only; Every Fall)

OT 6103. Occupational Therapy Process for Society. (3 cr.; A-F only; Every Fall)
Influence of society on health, occupational participation, and practice of occupational therapy. Students analyze health care system through global comparisons and apply key concepts. Written assignments, experiential learning activities.

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**OT 6111. Foundations: Occupations as Therapy.** (3 cr.; A-F only; Every Fall)

Students apply Occupational Therapy Practice Framework in an analyzing of a series of craft-based activities and representative daily occupations. How to grade/adapt activities to enhance performance.

**OT 6113. Occupational Therapy Process for Community.** (3 cr.; A-F only; Every Fall)

Application of occupational therapy process to wellness and health promotion activities in the community. Knowledge, skills, and attitudes necessary to understand influence of community health on health of individuals. Health behavior theories, program development/evaluation. Applying theoretical models to community health.

**OT 6200. Public and Professional Engagement II.** (0.5 cr. max. 1.5 cr.; S-N only; Every Fall, Spring & Summer)

Continuation of 6100. Students engage in professional/community activities that align with occupational therapy practice. prereq: 6100 or instr consent

**OT 6201. Functional Anatomy and Kinesiology.** (3 cr.; A-F only; Every Spring)

Gross human anatomy. Emphasizes skeletal, muscular, circulatory, and peripheral nervous systems of extremities, neck, and trunk. Online Anatomy TV, videotapes, cadaver lab projections. Students analyze/evaluate human occupations tasks and activities from biomechanical perspective. prereq: OT student or instr consent

**OT 6202. Occupational Therapy Process for Individuals: Occupation Through Compensation.** (5 cr.; A-F only; Every Spring)

Compensatory approaches to enhance an individual's participation in occupations of daily living. OT practice framework applied to evaluation/intervention of individuals. Face-to-face labs, level I fieldwork. prereq: Registered OT student or instr consent

**OT 6203. Occupational Therapy Process for Family.** (2 cr.; A-F only; Every Spring)

Influence of family systems on health, well-being, and occupational participation of individual members. Family theories' influence on models of care. Non-standardized OT assessment in families of very young children and of elders with dementia. At-risk families. OT in home care settings. prereq: OT student or instr consent

**OT 6213. Occupational Therapy Process for Individuals: Medical Contexts.** (2 cr.; A-F only; Every Spring)

Overview of medical model systems/settings (e.g. inpatient acute, long-term care, partial hospitalization). Client assessment/intervention from medical model perspective. Reimbursement. Written/verbal communication. prereq: OT student or instr consent

**OT 6301. Neuroscience.** (5 cr.; A-F only; Every Summer)

Neuroanatomic structures, functional systems, neurophysiologic concepts. Applications to evaluate/treat client conditions in all areas of physical, psychosocial, and cognitive dysfunction. prereq: Registered OT student or instr consent

**OT 6302. Occupational Therapy Process for Individuals: Occupation Through Remediation.** (4 cr.; A-F only; Every Summer)

Biomechanical approach to evaluation/treatment of clients with clinical conditions with loss of strength, endurance, range of motions, sensibility, and soft tissue integrity. Cases on how to apply OT process to specific clients. prereq: Registered OT student or instr consent

**OT 6312. Occupational Therapy Process for Individuals: Psychosocial Approaches.** (3 cr.; A-F only; Every Summer)

This course emphasizes concepts of occupation as a tool for support and recovery of mental health across the lifespan. Theory based evaluations; client centered interventions; and appropriate safety and documentation practices for addressing both psychological and psychosocial aspects of occupational engagement and performance are emphasized. prereq: Registered OT student or instr consent

**OT 6322. Occupational Therapy Process for Individuals: Work Contexts.** (2 cr.; A-F only; Every Summer)

Knowledge, skills, and attitudes needed to apply occupational therapy process with individuals injured at work settings to promote injury prevention programs in work settings. Unique role of rehab. Includes consultant, prereq: Registered OT student or instr consent

**OT 6402. Occupational Therapy Process for Individuals: Occupation Through Neurorehabilitative Approaches.** (4 cr.; A-F only; Every Fall)

Major theories of sensory systems, vision, motor control/learning, perception, cognition. Evaluation/intervention of central nervous system disorders. Theories for non-CNS issues in expanded populations. prereq: Registered OT student or instr consent

**OT 6403. Management of Occupational Therapy Services.** (1 cr.; A-F only; Every Fall)

Management/human resource knowledge/skills to create, maintain, and evaluate occupational therapy services. Health care systems, contexts, practice. Marketing, staffing, supervision, quality improvement. prereq: Registered OT student or instr consent

**OT 6412. Occupational Therapy Process for Individuals: Orthotics and Prosthetics.** (3 cr.; A-F only; Every Fall)

Occupational therapy process using prosthetic/orthotic devices to treat selected conditions in children, adults, and elders. Lab emphasizes practical skills, critical appraisal. Physical agent modalities, wound care. Fieldwork. prereq: Registered OT student or instr consent
OT 7596. Occupational Therapy Level II Fieldwork I. (6 cr.; S-N only; Every Fall, Spring & Summer)
Guided, supervised OT practice in affiliated medical, educational, or community institutions. Application of client-centered, culturally-effective care during active engagement as student develops professional role. prereq: Registered OT student or instr consent

OT 7696. Occupational Therapy Level II Fieldwork II. (6 cr.; S-N only; Every Fall, Spring & Summer)
Guided, supervised OT practice in affiliated medical, educational, or community institutions. Application of client-centered, culturally-effective care during active engagement as student develops professional role. prereq: Registered OT student or instr consent

OT 7796. Occupational Therapy Level II Fieldwork III: Optional. (1-6 cr.; S-N only; Every Fall, Spring & Summer)
Supervised practice in clinic or community agency with specialty focus. Sample topics: hand therapy, school therapy, clinical research. Students apply critical thinking through supervised application of theory/skills. prereq: Registered OT student or instr consent

OT 8300. Research Seminar in Occupational Therapy. (1 cr.; S-N or Audit; Every Fall & Spring)
Critical review of research literature in occupational therapy. Issues related to ethical/successful conduct/publication of research. Development of Plan B project outline. prereq: 5392 or instr consent

OT 8310. Research Problems in Occupational Therapy. (1-6 cr.; S-N or Audit; Every Fall & Spring)
Individual, concentrated study of a problem in occupational therapy. Completion of Plan B project. prereq: [5392, Plan B OT student] or instr consent

OT 8320. Fieldwork Education in Occupational Therapy I. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer)
Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory/skills. prereq: Occupational therapy student or instr consent

OT 8321. Fieldwork Education in Occupational Therapy II. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer)
Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory/skills. prereq: Occupational therapy student or instr consent

OT 8322. Fieldwork Education in Occupational Therapy III: Optional. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer)
Optional fieldwork experience involving supervised practice in clinic or community agency with specialty focus. Sample topics: hand therapy, school therapy, clinical research. Students apply critical thinking through supervised application of theory/skills. prereq: Occupational therapy student or instr consent

OT 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

OT 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

Off-Campus Study (OCS)

OCS 550. NSE: National Student Exchange Plan A. (0-20 cr. [max 60 cr.]; S-N only; Every Fall, Spring & Summer)
Off-campus study program. prereq: dept consent

OCS 3000. Non-affiliated Domestic Program. (0-30 cr.; S-N only; Every Fall, Spring & Summer)
Not printed in catalog. A registration mechanism for students pursuing a unique off-campus study experience through either other educational institutions or through private non-credit granting agencies. Limited to students whose study is approved by University of Minnesota faculty who certify likely departmental credit for successfully completed study as specified by agreement forms signed by both student and faculty. prereq: instr consent

OCS 3550. NSE: National Student Exchange Plan B. (0-20 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer)
National Student Exchange: off-campus study. (Do not publish.) prereq: dept consent

Office of Undergrad Education (OUE)

OUE 1086. The First Year Experience: Fall. (2 cr.; A-F only; Every Fall)
Awareness of roles, identity, needs, and interactions with diverse groups. Expectations, resources, and challenges associated with transition into college. Speakers, journals/portfolios, technology, reading/writing assignments, classroom exercises/ experiences. prereq: 1st-yr student athletes

OUE 1087. The First Year Experience: Summer. (3 cr.; A-F only; Every Summer)
Awareness of roles, identity, needs, and interactions with diverse groups. Expectations, resources, and challenges associated with transition into college. Speakers, journals/portfolios, technology, reading/writing assignments, classroom exercises/ experiences. prereq: 1st-yr student athletes

OUE 2001. Academic Planning and Exploration. (1 cr.; A-F only; Every Fall & Spring)
Undecided and competitive-major students engage in academic and career decision-making process. Students develop an exploratory action plan to help them discover/declare a best-fit major matching their interests, values, and academic skills. Customized course assignments include self-assessment, reflective essays, and an action plan project.

OUE 3050. Introduction to Peer Education. (1 cr.; Student Option; Every Fall)
Peer cooperative learning. Factors that enhance effectiveness of group learning, including facilitating learning process, integrating learning skill development/content knowledge acquisition, application of appropriate theories of learning.

OUE 3310. Leadership Development for University Student Leaders. (3 cr.; S-N only; Every Spring)
This course will provide an opportunity for student orientation leaders to translate theory to practice, using the University of Minnesota Orientation and Welcome Week experience as a learning laboratory. Students will build upon existing self-awareness to further examine their identity, biases, and strengths through the use of critical reflective models and leadership theory concepts. Guest lecturers will share expertise on the topics of leadership, communication, and diversity. Course participants will gain an advanced level of leadership self-awareness and responsibility vital to creating an inclusive and welcoming environment for incoming students and their families.

Ojibwe (OJIB)

OJIB 1100. Ojibwe Immersion. (3 cr.; max 5 cr.); Student Option; Every Summer)
Three week course designed to help students with little or no knowledge of Ojibwe language. Introduction to fundamentals of Ojibwe language. Taught primarily in Ojibwe with some grammatical description. Learn to read/write in Ojibwe language.

OJIB 1101. Beginning Ojibwe I. (5 cr.; Student Option; Every Fall)
Speaking. Grammar. Writing systems.

OJIB 1102. Beginning Ojibwe II. (5 cr.; Student Option; Every Spring)
Speaking. Grammar. Writing systems. prereq: 1101

OJIB 3103. Intermediate Ojibwe I. (5 cr.; Student Option; Every Fall)

OJIB 3104. Intermediate Ojibwe II. (5 cr.; Student Option; Every Spring)

OJIB 3127. Ojibwe Language for Teachers. (3 cr.; A-F only; Every Spring)
How to learn Ojibwe outside classroom and teach it in formal/informal learning settings, including second language classrooms, immersion schools, language tables, and immersion camps. prereq: 1101
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Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

**OJIB 5010. Methods in Research and Writing.** (2 cr.; Student Option; Every Fall)
Skills necessary to begin a research project, including literature review, hypothesis formation, research design, and writing. Each student develops a research protocol.

**OBIO 5501. Virology Research Presentations.** (1 cr. [max 10 cr.]; S-N only; Every Fall & Spring)
This course is designed to enhance knowledge in virology through research presentations as well as the critical evaluation of presentations of other students and researchers. Presentation will include current virology research, both individual research projects and critical reading, and presentation of current literature.

**OBIO 5502. Ophthalmology Research.** (4-8 cr. [max 16 cr.]; H-N only; Every Fall, Spring & Summer)
This course will introduce the student to some of the research problems in ophthalmology. It will be particularly valuable to someone who is headed for a career in ophthalmology.

**OBIO 7190. Ophthalmology Research.** (2 cr. ; A-F or Audit; Spring Even Year)
Student presents a research project. Faculty supervision. Prereq: Consent of instructor. Oral presentations. CDE available for practitioners.

**OBIO 7191. Ophthalmology Medical Fellowship.** (6 cr. ; No Grade Associated; Every Fall, Spring & Summer)
Ophthalmology medical fellowship.

**OJIB 5204W. Ojibwe Mastery II.** (WI; 3 cr.; A-F or Audit; Every Spring)
The purpose of the first three years of the Ojibwe language courses at the University is to introduce students to the most common Ojibwe grammatical and conjugational systems, and to help develop their fluency through immersion. In this course and in the subsequent course in the winter semester, students will work towards Ojibwe language mastery by learning less frequent, but crucial aspects of the Ojibwe language and further working towards a more sophisticated level of talking.

**OBIO 8020. Oral Pathobiology.** (2 cr.; A-F or Audit; Every Fall)
Clinical understanding of oral disease.

**OBIO 8021. Oral Microbiology.** (2 cr.; Student Option; Fall Odd Year)
Role of indigenous human oral microflora in health/disease.

**OBIO 8022. Oral Neuroscience.** (2 cr.; Student Option; Spring Even Year)
Background lectures and student presentations on current research topics to evaluate questions in general motor/sensory function related to oral/nasal structures. Taste, smell, and other chemical senses as they relate to those structures. Prereq: Dental specialist or oral research trainee or instr consent.

**OJIB 5010. Methods in Research and Writing.** (2 cr.; Student Option; Every Fall)
Skills necessary to begin a research project, including literature review, hypothesis formation, research design, and writing. Each student develops a research protocol.

**OBIO 5501. Virology Research Presentations.** (1 cr. [max 10 cr.]; S-N only; Every Fall & Spring)
This course is designed to enhance knowledge in virology through research presentations as well as the critical evaluation of presentations of other students and researchers. Presentation will include current virology research, both individual research projects and critical reading, and presentation of current literature.

**OBIO 5502. Ophthalmology Research.** (2 cr.; A-F or Audit; Every Spring)
This course is designed to provide graduate students and undergraduate students with junior or senior standing a knowledge base for understanding how HIV and other emerging viruses (e.g., Ebola, influenza, SARS, West Nile virus, hantavirus, hepatitis C) evolve and become public health threats. Topics for the course will focus on the biochemical, molecular, cellular, clinical, and epidemiological aspects of emerging viruses, with an emphasis on how each plays a role in virus evolution and emergence. This course will emphasize HIV as a key example of an emerging virus disease that has had a profound impact on human health.

**OBIO 8020. Oral Pathobiology.** (2 cr.; A-F or Audit; Every Fall)
Clinical understanding of oral disease.

**OBIO 8021. Oral Microbiology.** (2 cr.; Student Option; Fall Odd Year)
Role of indigenous human oral microflora in health/disease.

**OBIO 8022. Oral Neuroscience.** (2 cr.; Student Option; Spring Even Year)
Background lectures and student presentations on current research topics to evaluate questions in general motor/sensory function related to oral/nasal structures. Taste, smell, and other chemical senses as they relate to those structures. Prereq: Dental specialist or oral research trainee or instr consent.

**OBIO 8023. Physical Biology of the Oral Cavity.** (2 cr.; A-F or Audit; Spring Even Year)
Structures and functions of load-bearing components of human masticatory system from biomechanical and biophysical point of view. Mandibular form/movement. Infrastructure of hard tissues as related to occlusal wear and masticatory efficiency. Role of saliva and salivary pellicle in reduction of interocclusal friction. Computer simulation of jaw mechanics. Prereq: Dental specialist or oral research trainee or instr consent.

**OBIO 8024. Genetics and Human Disease.** (1 cr.; Student Option; Every Spring)
Principles of medical genetics. Emphasizes oral diseases. Twins, chromosomes, recombinant DNA, major gene traits, genes...
in populations, chromosomal abnormalities, complex traits, facial clefts, dental caries, periodontal diseases. prereq: Dental specialist or oral research trainee or instr consent

**OBIO 8025. Topics in Cariology.** (; 2 cr.; A-F or Audit; Spring Even Year)

Lectures, assigned readings, and discussions of basic epidemiological, biological, and chemical aspects of dental caries. Etiology, epidemiology, and pathogenesis of dental caries. Influence of dietary, salivary, plaque, and microbial factors on caries process. prereq: Dental specialist or oral research trainee or instr consent

**OBIO 8026. Salivary Glands and Secretions.** (; 2 cr.; A-F or Audit; Fall Even Year)

Salivary gland structure/development. Mechanisms/control of macromolecule/elctrolyte secretion. Salivary protein structure/function, interactions with bacteria. Salivary pellicle, salivary gland disease. Clinical studies, readings, student presentations. Each student develops a research proposal. prereq: Dental specialist or oral research trainee or instr consent

**OBIO 8027. Biomaterials in Regenerative Dentistry.** (; 2 cr.; A-F or Audit; Fall Odd Year)

Describes most modern research strategies that are being developed by interdisciplinary groups to obtain revolutionary materials for its use in tissue engineering and regenerative medicine. The central role of biotechnology, nanotechnology, and biomimetics in these research strategies is highlighted. Focus on dental applications is provided. prereq: Dental specialist or oral research trainee or instr consent

**OBIO 8028. Molecular Basis of Cellular and Microbial Adhesion.** (; 2 cr.; A-F or Audit; Spring Odd Year)

Biochemical basis of adhesion phenomena. Cells of immune system, development of organs, tissue formation, bacterial colonization of the human. prereq: Dental specialist or oral research trainee or instr consent

**OBIO 8030. Oral Biology Seminar.** (; 1 cr. [max 10 cr.]; S-N or Audit; Every Fall & Spring)

Faculty and student discussion of current topics in oral biology. prereq: Dental specialist or oral research trainee or instr consent

**OBIO 8093. Tutorial in Oral Biology.** (; 1-2 cr.; S-N only; Every Fall & Spring)

Semester-long apprenticeship with faculty members to familiarize students with faculty research interests. Individual study of selected topics. prereq: instr consent

**OBIO 8094. Directed Research.** (; 1-10 cr.; S-N or Audit; Every Fall & Spring)

Tbd prereq: instr consent

**OBIO 8333. FTE: Master's.** (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)

(No description) prereq: Master's student, adviser and DGS consent

**OBIO 8371. Mucosal Immunobiology.** (; 3 cr.; A-F or Audit; Every Fall)

Host immune processes at body surfaces. Innate/adaptive immunity at mucosal surfaces. Interactions/responses of various mucosal tissues to pathogens. Approaches to target protective vaccination to mucosal tissues. Lectures, journal. prereq: MiCa 8001 or equiv or instr consent

**OBIO 8444. FTE: Doctoral.** (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)

(No description) prereq: Doctoral student, adviser and DGS consent

**OBIO 8666. Doctoral Pre-Thesis Credits.** (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)

Tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**OBIO 8777. Thesis Credits: Master's.** (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)

(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**OBIO 8888. Thesis Credit: Doctoral.** (; 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)

(No description) prereq: Max 18 cr per semester or summer; 24 cr required

**Oral and Maxillofacial Surgery (OSUR)**

**OSUR 5257. Ambulatory General Anesthesia for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Clinical rotation involving experience in outpatient management and using intravenous sedation and general anesthesia. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 5276. Medicine Rotation for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Clinical rotation at Fairview-University Medical Center under the direction of the Internal Medicine Department. Involves workup, admission, and daily management of patients on medical service, specifically cardiology and pulmonology. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 5277. Physical Diagnosis for Oral Surgery Residents.** (; 2 cr. [max 6 cr.]; S-N only; Every Summer)

Six-week didactic course coupled with evaluation of patients. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8250. Oral and Maxillofacial Surgery Rotation for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Rotations at assigned oral and maxillofacial surgery clinics and operating rooms at Fairview-University Medical Center, Hennepin County Medical Center, Veterans Administration Medical Center. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8251. Oral and Maxillofacial Surgery Core Curriculum.** (; 0-2 cr.; S-N only; Every Fall, Spring & Summer)

Standardized curriculum of fundamental concepts of surgery and medicine. Fourteen core curriculum topics covered in a two-year cycle. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8253. Case Presentations and Chief Conferences.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Topic-oriented journal reviews. Guest oral surgeons, specialists, or chief resident present topics in case-based format. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8254. Oral and Maxillofacial Surgery Resident Presentations.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Contemporary subjects researched and presented by current residents. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8255. General Surgery Rotation for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Clinical rotation on general surgery, neurosurgery, and surgical intensive care unit at Hennepin County Medical Center. Seminars, clinics, and operating room experience. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8256. Contemporary Anesthesia Literature Review.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Seminar presentation format of current publications that address anesthesia management for the oral and maxillofacial surgery patient. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8260. Surgical Rounds for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Pre- and post-operative case discussions of patients currently being managed for surgery at all affiliated institutions. As they relate to individual patients, discussions involve medical, anesthesia, surgical, and management of postsurgical and sequela complications. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8262. Plastic Surgery Rotation for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Clinical rotation at HealthPartners St. Paul Ramsey Medical Center under direction of plastic and reconstructive surgery faculty. Elective or trauma cosmetic and esthetic surgery experience. prereq: Participation in oral and maxillofacial surgery training program.

**OSUR 8267. Anesthesia Rotation for the Oral and Maxillofacial Surgeon.** (; 0-6 cr.; S-N only; Every Fall, Spring & Summer)

Clinical rotation at Fairview University Medical Center under direction of anesthesia faculty. After a suitable period of supervision.
OLPD 1231. Technological Change and Workplace Learning: Past and Present. (HIS; 3 cr.; Student Option; Every Fall & Spring)
Within the historical context of the United States over the past 150 years, this course examines how we learn to be "good workers." The impact of multiple technological changes on workplace learning and broader American society is the main thematic focus of the course. In other words, how have various technologies continually re-made workers and disciplined them into being "good workers"?

OLPD 1302. Personal Leadership in the University. (3 cr.; A-F only; Every Fall, Spring & Summer)
Students examine own views of leadership, differences between personal/positional leadership, leadership ethics/values, leadership strengths/skills.

OLPD 1461. Presentations in Work Settings: Business & Marketing Education and Human Resource Development. (CIV; 3 cr.; A-F or Audit; Every Fall, Spring & Summer)
This course prepares students to present information and hone their messages based on audience need in a variety of business, leadership, and workplace contexts. Students interested in majoring in Business and Marketing Education (BME), Human Resource Development (HRD), and other majors can take this course in order to develop the disciplinary practices used in training and development, as well as business and industry to convey vital and timely messages.

OLPD 1801. Introduction to Career and Technical Education Teaching. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Enter-level skills to function as a teacher. Philosophy of career/technical education, planning of instruction, instructional methods, student evaluation, working with students who have special needs, ancillary duties of career/technical education faculty. Emphasizes microteaching and feedback. prereq: Occupationally certifiable individual

OLPD 2811. Societies of the Future: Changing Work Contexts. (TS; 3 cr.; A-F or Audit; Every Fall & Spring)
Ongoing evolution of social contexts and work through the interdisciplinary lens of future studies.

OLPD 2811H. Societies of the Future: Changing Work Contexts, Honors. (TS; 3 cr.; A-F only; Every Fall & Spring)
Ongoing evolution of social contexts and work through the interdisciplinary lens of future studies. prereq: Honors student

OLPD 3202. Introduction to Strategies for Teaching Adults. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Theories of adult learning, teaching/learning styles, methods/perspectives of teaching, applications of teaching in various settings.

OLPD 3305. Learning About Leadership Through Film and Literature. (3 cr.; Student Option; Every Fall)
Readings from leadership studies, literature, and film. Ethical dilemmas. Different styles of leadership and their consequences. Intersection of public/private in exercising leadership. Competing loyalties/pressures felt by leaders/followers. Fundamental questions about nature/desirability of leadership.

OLPD 3310. Special Topics for Undergraduates. (1-3 cr.; max 9 cr.; Student Option; Every Fall, Spring & Summer)
Inquiry into special topics related to organizational leadership, policy/development.

OLPD 3318. Introduction to Project Management. (3 cr.; Student Option; Every Fall, Spring & Summer)
Project management for business and industry. Project lifecycles, deliverables, and processes as they are commonly used in the workplace.

OLPD 3324W. Writing in the Workplace for Education and Human Development Majors. (WI; 4 cr.; Student Option; Every Fall & Spring)
Explore professional communication. Research/analysis writing. Memos, reports, proposals, human resource-related documentation, letters or announcements, presentations. prereq: 60+ undergraduate credits, declared major

OLPD 3330. Global Identity: Connecting Your International Experience to Your Future. (1 cr.; Student Option; Every Fall, Spring & Summer)
Reflect on activities/readings of study abroad experiences overseas. E-journaling, written activities, group interaction using various formats. prereq: [3320 or EDPA 3102 or instr consent], studying abroad the semester student is enrolled in course

OLPD 3336. Religion, Ethics, and Educational Policy. (CIV; 3 cr.; Student Option; Every Spring)
American religious pluralism in relationship to ethics and educational policy. History of religious belief/expression in K-12 and higher education. Students interact with community leaders. Legal issues, religion/science, sexuality, religious alternatives, policy topics.

OLPD 3380. Developing Intercultural Competence. (3 cr.; A-F or Audit; Every Fall)
Past/current research on intercultural leadership. Students share their understanding/experiences within intercultural framework.

OLPD 3401. Teaching Marketing Promotion. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Materials, methods, and approaches to teaching marketing promotion. Advertising, promotion, public relations, direct selling, visual merchandising, and direct marketing.

OLPD 3424. Sales Training. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Strategies and techniques for developing effective sales people.

OLPD 3493. Directed Study in Business & Marketing Education. (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Open to qualified students. Opportunity to pursue study not available through regular coursework. In consultation with instructor, develop prospectus/complete progress reports/final report on project. prereq: BME major, instr consent

OLPD 3496. Profession and Practice of Business and Marketing Education. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Application of theory to practice related to BME core coursework with integrative paper. prereq: Undergrad student, BME major, OLPD 3318, OLPD 3401, OLPD 3424, and OLPD 4426 completed or in progress.

OLPD 3601. Introduction to Human Resource Development. (3 cr.; A-F or Audit; Every Fall & Spring)
Human resource development theories, principles, concepts, and practices.

OLPD 3620. Introduction to Training and Development. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Processes to carry out theoretically sound training/development practices, within the context of systemic relationship with host organization or system.

OLPD 3640. Introduction to Organization Development. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Organization development theories, principles, concepts, and practices. How development is used to direct change in an organization.

OLPD 3693. Directed Study: Human Resource Development. (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Open to qualified students. Opportunity to pursue study not available through regular coursework. In consultation with instructor, student develops prospectus/complete progress reports/final report on project. prereq: HRD major, instr consent

OLPD 3696. Profession and Practice of Human Resource Development. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Course assists students with advancing career development skills, prepares them for HRD internship. prereq: Undergrad student, HRD major, 3 of following 4 courses need to be completed or in progress: 3202, 3601, 3620, 3640

OLPD 3805. Introduction to Strategic Planning Through Human Resources. (3 cr.; A-F or Audit; Periodic Spring)
Processes organizations use when engaged in strategic planning. How to participate in planning, implementing, and evaluating strategic initiatives to improve performance. prereq: 3601 or HRD 3001

OLPD 3808. Foundations of Student and Trainee Assessment. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Developing tests of knowledge, affect, and processes for programs focused on instruction of skills associated with business/industry. Developing learning-progress reporting systems. Evaluating instructional effectiveness. Applying tests and other evaluation instruments to assess/report learning in business/industry and in career/technical education fields.

OLPD 3820. Principles of Supervisory Management. (3 cr.; Student Option; Every Fall & Spring) Introduction to the principles of supervision in education, business, industry, government, and service organizations.

OLPD 3828. Diversity in the Workplace. (3 cr.; A-F or Audit; Every Fall & Spring) Diversity in the workplace. Issues of recruiting and selection, management, and performance.

OLPD 3829. Foundations of Course Development for Business and Industry. (2 cr.; A-F or Audit; Every Fall & Spring) Designing instructional programs/courses focused on helping learners develop desired competence. Designing instruction for performance-based training and vocational/technical education. Developing course syllabus components that clarify broad course expectations. Developing academic/community-based elements that complement course goals.

OLPD 4301. Global Youth Leadership and Community Engagement. (6 cr.; A-F only; Periodic Fall, Spring & Summer) Six-credit course over three semesters. Students take courses at the U of M (spring and fall) and at FLASCO University in Buenos Aires, Argentina, (four weeks in August). Theory and practice of youth-engagement/empowerment to address issues that affect their lives, their communities, and the broader global society.

OLPD 4318. Advanced Project Management. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Project management for business and industry. Advanced aspects and techniques in project management, project lifecycles, deliverables, and processes as they are commonly used in the workplace. prereq: 3318 or EDPA 3218

OLPD 4400. Education for Small Business Entrepreneurship. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Process of starting a small business. Helps students identify the skills necessary to operate the business.

OLPD 4401. E-Marketing. (3 cr.; A-F or Audit; Every Fall & Spring) Basic understanding and personal experience with how e-marketing can be used as part of an overall marketing and promotion plan.

OLPD 4420. Practicum in Nonprofit Organizations. (2 cr.; max 4 cr.; A-F or Audit; Every Fall & Spring) This course will provide students the opportunity to develop and implement critical aspects of a nonprofit organization from board selection, training, fundraising, event marketing and management, and conducting outreach programs. Students will have the opportunity to develop a variety of job functions including: sales, marketing, e-marketing, operations, management, accounting, administration, purchasing, procurement, fundraising, pre-event planning, and post-event evaluation.

OLPD 4426. Strategic Customer Relationship Management. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Principles of customer relationship management, brand identity, and integrated marketing communications. Comprehensive framework for how organizations interact with their various publics to create goodwill/loyalty.

OLPD 4496. Applied Experience in Business & Marketing Education. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Application of theory to practice related to BME core coursework with integrative paper. Work, internship, study abroad, research, field experience, service learning, etc. can all fulfill this degree requirement. Contact OLPD Program Advisors for more information. prereq: BME major, ugrd [3496 or concurrent registration is required (or allowed) in 3496]

OLPD 4696. Internship: Human Resource Development. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Apply/contract for human resource development positions. Contracts describe specific HRD responsibilities to be fulfilled during internship/theory-to-practice learning outcomes.

OLPD 4870. Introduction to Integrating Human Rights into Organizational Leadership. (3 cr.; A-F or Audit; Every Spring) Forum to explore local and international policies/practices for integrating human rights into organizational leadership and management.

OLPD 5000. Cultures, Schools, and Communities (Human Relations). (1 cr.; A-F only; Every Fall) Addressing social/cultural dimensions of education. Challenges/dilemmas facing contemporary educators. Speakers, simulation, presentations, professional learning communities, field assignments. prereq: Enrolled in initial licensure program

OLPD 5001. Forms of Organizations in Education. (3 cr.; Student Option; Every Fall, Spring & Summer) Classical/current theories of organizations. Applications to education and related fields.

OLPD 5002. Private Colleges as Formal Organizations. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Provide certificate students with introduction to contemporary thinking on organizations/administration. Primary focus on organizational theory. prereq: Bachelors degree must be completed before starting this course.

OLPD 5003. Borderland, Education Policy, Immigrant Experience. (3 cr.; Student Option; Every Spring) Borderland, Education Policy and Immigrant Student Experience brings to focus the history of individual, institutional (educational) and cultural forms of marginalization and discrimination of immigrant communities from US history. This class includes a Spring Break trip to Tucson and the Sonora Desert led by the non-profit Borderlinks (www.borderlinks.org). Service learning opportunities may include water drops in the desert, interpreting for newly arrived migrants and serving as a supportive witness for migrants at deportation court. Both in Minnesota and Tucson, participants will dialogue with local stakeholders, advocates and agents of change including migrants, activists, border patrol, ranchers, faith communities, lawyers and lawmaker. Students will also have the opportunity to compare and contrast US immigrant issues with those across the globe.

OLPD 5005. School and Society. (2 cr.; A-F or Audit; Every Fall, Spring & Summer) Readings in history, philosophy, social sciences, and law revealing diverse educational values in a pluralistic society. Multiple expectations of schools. Civil liberties, rights, community. Varying cultural backgrounds of students, family circumstances, exceptional needs. prereq: Jr or sr or MEd/initial licensure student or CLA music ed major or preteaching major or instr consent

OLPD 5009. Human Relations: Applied Skills for School and Society. (1 cr.; A-F or Audit; Every Fall, Spring & Summer) Issues of prejudice/discrimination in terms of history, power, social perception. Knowledge/skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, leadership, decision making, prejudice reduction, conflict resolution, teaching in diverse educational settings. prereq: MEd/init lic or CLA music ed major or preteaching or instr consent

OLPD 5010. Cultures, Schools, and Communities (Human Relations). (2 cr.; A-F only; Every Fall) Addressing social/cultural dimensions of education. Challenges/dilemmas facing contemporary educators. Speakers, simulation, presentations, professional learning communities, field assignments. prereq: Enrolled in initial licensure program

OLPD 5011. Leading Organizational Change: Theory and Practice. (3 cr.; Student Option; Every Fall) How theory is incorporated, affects the change process, and can improve schools/institutions of higher education. Characteristics that impact change processes/outcomes. Leadership/policy effects.

OLPD 5020. Cultures, Schools, and Communities (Human Relations). (1 cr.; A-F only; Every Fall) Addressing social/cultural dimensions of education. Challenges/dilemmas facing contemporary educators. Speakers, simulation, presentations, professional learning communities, field assignments. prereq: Enrolled in teacher initial licensure program

OLPD 5033. Foundations of Individual/Organizational Career Development. (3 cr.; Student Option; Every Spring)
Introduction to individual and organizational career development theory and practice. Examines critical issues in work patterns, work values, and workplaces in a changing global society, with implications for career planning, development, and transitions, emphasizing personal and organizational change. For nonmajors: serves students in adult ed, HRD, IR, college student advising, and other related fields.

OLPD 5041. Sociology of Education. (3 cr.; Student Option; Every Spring) Structures and processes within educational institutions; linkages between educational organizations and their social contexts, particularly related to educational change.

OLPD 5044. Introduction to the Economics of Education. (3 cr.; Student Option; Periodic Fall & Spring) Costs and economic benefits of education, with a focus on K-12; educational markets, prices, and production relationships; investment and cost-benefit analysis.

OLPD 5048. Cross-Cultural Perspectives on Leadership. (3 cr.; Student Option; Every Fall & Summer) Introduction to cultural variables of leadership that influence functioning of cross-cultural groups. Lectures, case studies, discussion, problem-solving, simulations. Intensive workshop.

OLPD 5056. Case Studies for Policy Research. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Qualitative case study research methods and their applications to educational policy and practice. Emphasis on designing studies that employ open-ended interviewing as primary data collection technique.

OLPD 5057. Research in International Education. (3 cr.; Student Option; Every Summer) Key skills/proficiencies for rigorous graduate research. Quantitative/qualitative/mixed methods. How to be a critical consumer of policy-related, comparative/intercultural research. Conducting cross-cultural/comparative research. Related ethical issues.

OLPD 5061. Ethnographic Research Methods. (3 cr.; Student Option; Every Fall & Spring) Practice in aspects of field methodology below the level of full field study; detailed reading; analysis of studies in anthropology and education for methodological content.

OLPD 5080. Special Topics: Organizational Leadership, Policy, & Development. (1-3 cr.; max 9 cr.; Student Option; Every Fall, Spring & Summer) Topical issues in organizational leadership, policy, development.

OLPD 5087. MA Research Seminar. (1-3 cr.; max 24 cr.; S-N only; Every Fall, Spring & Summer) This research seminar is designed for students who are in their final year of completing Plan A theses or Plan B papers as part of their degree program requirements. During this seminar we will work towards the completion of your paper by writing solid drafts of the first three chapters of your thesis.

OLPD 5095. Problems: Organizational Leadership, Policy, and Development. (1-3 cr.; max 24 cr.; Student Option; Periodic Fall, Spring & Summer) Course or independent study on specific topic within department program emphasis.

OLPD 5096. Internship: Organizational Leadership, Policy, and Development. (1-9 cr.; max 24 cr.; Student Option; Every Fall & Spring) Internship in elementary, secondary, general, postsecondary administration, or other approved field related setting.

OLPD 5103. Comparative Education. (3 cr.; Student Option; Every Fall) Examination of systems and philosophies of education globally with emphasis upon African, Asian, European, and North American nations. Foundations of comparative study with selected case studies.

OLPD 5104. Strategies for International Development of Education Systems. (3 cr.; A-F or Audit; Periodic Fall) Strategies for improving quality/efficiency of schooling in developing countries. Introduction to current research on what policy/programmatic interventions have proven most successful in increasing access, raising quality, and improving efficiency of education in developing countries. prereq; Grad student

OLPD 5107. Gender, Education, and International Development. (3 cr.; A-F or Audit; Every Fall) Role of gender/gender relations in international development/education. Interdisciplinary body of literature from development studies, political science, economics, anthropology, cultural studies, gender/women's studies.

OLPD 5121. Educational Reform in International Context. (3 cr.; Student Option; Every Spring) Critical policy analysis of educational innovation and reform in selected countries. Use theoretical perspectives and a variety of policy analysis approaches to examine actual educational reforms and their implementation.

OLPD 5124. Critical Issues in International Education and Educational Exchange. (3 cr.; Student Option; Every Spring) Analysis of comprehensive policy-oriented frameworks for international education; practices of U.S. and other universities; conceptual development of international education and its practical application to programs, to employment choices, and to pedagogy.

OLPD 5128. Anthropology of Education. (3 cr.; Student Option; Periodic Spring) Insights from educational anthropology for educators to address issues of culture, ethnicity, and power in schools.

OLPD 5132. Intercultural Education and Training: Theory and Application. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Examination of intercultural education; formal and nonformal education programs intended to teach about cultural diversity, promote intercultural communication and interaction skills, and teach students from diverse background more effectively.

OLPD 5201. Strategies for Teaching Adults. (3 cr.; A-F or Audit; Periodic Fall, Spring & Summer) Psychological theories of adult learning; learning styles and personality types; teaching styles; group and team learning; moderating and study circles; teaching technologies and distance learning; gender, race, and cultural communication. Applications of strategies. prereq; Grad student only

OLPD 5202. Perspectives of Adult Learning and Development. (3 cr.; Student Option; Periodic Fall & Summer) Emphasis on major adult development theorists, theories, and current applications. Transformative learning, self-directed learning, experiential learning, and cooperative learning provide theoretical framework for exploring physiological, psychological, sociological, and cultural aspects of adult development through the life span.

OLPD 5204. Designing the Adult Education Program. (3 cr.; A-F or Audit; Periodic Spring) Designing and implementing educational programs for adults. Application of concepts, theories, and models in different adult learning situations.

OLPD 5211. Introduction to the Undereducated Adult. (1 cr.; A-F or Audit; Every Summer) Definitions of literacy in workplace, community, and family. Issues: poverty/welfare, ethnicity, cultural diversity, social class, language/learning, immigrants.

OLPD 5212. Introduction to Adult Literacy in the Workplace. (1 cr.; A-F or Audit; Every Summer) Review workplace literacy programs, funding, program planning, and needs assessment. Reaching/recruiting workers. Role of employers and the unions. Writing for low literacy employees. prereq; 5211 or ADED 5211

OLPD 5213. Introduction to Adult Literacy in the Community. (1 cr.; A-F or Audit; Every Summer) Community programs in United States. Literacy building. Family literacy skills. Correctional education in reintegrating offenders back into community. Integrating people with disabilities through community literacy programs. Literacy/development in developing countries. Reaching/recruiting indigenous, migrant, immigrant groups. Social action approaches to literacy education. prereq; 5211 or ADED 5211

OLPD 5224. Formal Assessment of Adult Literacy. (1 cr.; A-F or Audit; Periodic Fall) Assessment of adult English/literacy skills for work, family, community, and continuing education. Formal testing policy, techniques,
OLPD 5225. Informal Assessment of Adult Literacy. (1 cr.; A-F or Audit; Periodic Fall) Informal assessment of adult English/literacy skills for work, family, community, and further education. Informal testing techniques, setting educational goals, formal versus informal assessment. prereq: 5211 or ADED 5211

OLPD 5226. Advanced Assessment of Adult Literacy. (1 cr.; A-F or Audit; Periodic Fall) Applications/case studies. Educational planning for work, family, community. prereq: 5211 or ADED 5211

OLPD 5233. Methods of Teaching Beginning Adult Literacy. (1 cr.; A-F or Audit; Periodic Fall) Learning English/literacy as an adult. Initial approaches to teaching reading, writing, and communications skills. Theories of learning/curriculum design. Technology as teaching tool. Teaching students with disabilities or with cultural/gender differences. prereq: 5211 or ADED 5211

OLPD 5234. Methods of Teaching Intermediate Adult Literacy. (1 cr.; A-F or Audit; Periodic Fall) Learning English/literacy as an adult. Approaches to teaching reading, writing, and communications skills. Communication/comprehension in oral/written English. English reading/oral communication skills for workplace. Evaluating commercial materials/software. prereq: [5211 or ADED 5211], [5233 or ADED 5233]

OLPD 5235. Methods of Teaching Advanced Adult Literacy. (1 cr.; A-F or Audit; Periodic Fall) Approaches to teaching reading, writing, study, communication skills. Preparing students for college/continuing education. English in workplace/on Internet. Problem solving, analytical thinking. Technology as teaching tool. Evaluating commercial material/software. prereq: 5211 or ADED 5211

OLPD 5296. Field Experience in Adult Education. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer) Supervised fieldwork and practice. Presentations and evaluations of adult education practices.

OLPD 5321. The Principal as Leader of High-Performing Schools. (3 cr.; Student Option; Every Fall, Spring & Summer) Role of principal: qualifications, duties, problems.

OLPD 5322. Leaders in the Superintendent and Central Office. (3 cr.; Student Option; Every Fall & Summer) Role/responsibility of superintendent in school district. Real life experiences, leadership potential as CEO. Purposes, power, politics, practices of position. Interplay of internal school forces, community forces. Leadership in public, high-profile appointment.

OLPD 5323. Women in Leadership. (3 cr.; Student Option; Every Fall) Women in leadership, in context of larger systems and their own lives. Supporting equity/equality across areas of difference. prereq: Technology access

OLPD 5324. Strategic Financial Planning and Policy for Educational Leaders. (3 cr.; Student Option; Periodic Fall, Spring & Summer) State-local school finance systems, budgeting, governmental fund accounting. Interpretation of financial information. prereq: Grad student pursuing licensure as elementary-secondary [principal or superintendent]

OLPD 5332. Personal Leadership and the Private College. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Recognize/develop leadership skills and competencies necessary for team work, consensus building, group leadership within private colleges. Blend practice/theoretical perspectives to develop leadership competencies of students. prereq: Must have Bachelors degree awarded prior to taking this course.

OLPD 5344. School Law. (3 cr.; Student Option; Every Spring & Summer) Legal foundations of elementary/secondary education. Statutory themes, relevant case law, emergent policy issues. Implications for educational organizations and for administrative practice.

OLPD 5346. Politics of Education. (3 cr.; A-F or Audit; Every Fall & Spring) Political dimensions of policy formulation/implementation in education. Use of power/influence in shaping educational policies and in resolving conflicts over educational issues. Analysis of consequences/cross-impacts. prereq: postbac, MEd, or grad student

OLPD 5348. Leaders of Human Resources Administration. (3 cr.; Student Option; Every Fall & Summer) Skills for administrator/leader. Human resources administration, employee recruitment, selection, orientation/support, supervision, performance appraisal of school district personnel. prereq: Designed for students working on licensure for [dir of community educ or superintendent or K-12 principal or dir of special educ]

OLPD 5356. Disability Policy and Services. (3 cr.; Student Option; Every Spring & Summer) Policy, research, and current practices related to education, health, and social services that support children, youth, and adults with special needs, and that support their families. Federal, state, and local perspectives.

OLPD 5361. Project in Teacher Leadership. (3 cr.; Student Option No Audit; Every Fall, Spring & Summer) Create, implement, evaluate, and present a leadership project designed to initiate positive change in educational environments. Review of related literature, proposal development, project development, implementation and evaluation, critical reflection, sharing learning outcomes. prereq: MEd student in Teacher Leadership Program

OLPD 5364. Context and Practice of Educational Leadership. (3 cr.; A-F or Audit; Every Fall & Summer) Current research/practice on educational leadership. Focuses on creating school cultures conducive to continuous improvement/change. Strategies for personal/organizational leadership in PK-12 settings.

OLPD 5366. Leadership for Special Education Services. (3 cr.; Student Option; Every Fall & Spring) Legislative, procedural, executive, and judicial actions that affect services, families, and children with special needs at federal, state, and local levels. prereq: Administrator or supervisor or professional responsible for managing general or special or alternative education program

OLPD 5374. Leadership for Professional Development. (4 cr.; Student Option; Every Fall) Designing, implementing, evaluating staff development in preK-12 settings. Research-based standards for effective staff development. Need for embedded time for collaborative learning, evaluating staff/student outcomes. prereq: Postbac/bsculaureate, at least 3 yrs teaching experience

OLPD 5385. Licensure Seminar: Program Policies and Inclusionary Leadership. (1 cr.; S-N or Audit; Every Fall, Spring & Summer) Preparation for licensure program. Program overview, preassessment, reflective practice, APA writing, exit panel review, administrative employment interview.

OLPD 5386. Leadership Portfolio Seminar. (1 cr.; S-N or Audit; Every Fall, Spring & Summer) Development of electronic administrative licensure portfolio to earn endorsement for license as school superintendent, K-12 principal, director of special education, or director of community education. prereq: 5385 or concurrent registration is required (or allowed) in 5385 or EDPA 5385

OLPD 5387. Leadership for Teaching and Learning. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Multiple aspects of administering teaching/learning. Administration of teaching/learning as system in inclusive schools. Questions administrator must ask as leader of learning for students/adolescents.

OLPD 5388. Leadership for Master(ful) Scheduling. (2 cr.; Student Option; Every Fall & Summer) Work of high-performing professional learning communities. Implications for moving from building master schedule to leadership for master(ful) scheduling of time, space, motion, people. Hands-on work with infinite campus software/scheduling-building logic.

OLPD 5389. Community Education Leadership. (3 cr.; Student Option; Every Spring & Summer)
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<tr>
<td>OLPD 5391</td>
<td>Special Education Law for Leaders.</td>
<td>1 cr.</td>
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<td>OLPD 5521</td>
<td>Cost and Economic Analysis in Educational Evaluation.</td>
<td>3 cr.</td>
<td>Student Option</td>
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<td>OLPD 5522</td>
<td>Evaluation Colloquium.</td>
<td>1 cr.</td>
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<td>OLPD 5523</td>
<td>Focus Group Interviewing Research Methods.</td>
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<td>OLPD 5524</td>
<td>Systems Foundation of Human Resource Development.</td>
<td>1 cr.</td>
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<td>OLPD 5525</td>
<td>Strategic Planning through Human Resources.</td>
<td>3 cr.</td>
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<td>OLPD 5526</td>
<td>Focus Group Interviewing Research Methods.</td>
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<td>OLPD 5527</td>
<td>Organization Development.</td>
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<td>OLPD 5528</td>
<td>Survey of Research Methods and Emerging Research in Human Resource Development.</td>
<td>3 cr.</td>
<td>A-F or Audit</td>
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Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
OLPD 5753. Institutional Research in Postsecondary Education. (2-3 cr.; A-F or Audit; Periodic Fall) Scope, role, administration, research strategies, and evaluation of institutional research in postsecondary institutions. Methodologies, disciplinary foundations of research. Use of institutional, state, and national databases in addressing institutional missions/functions. prereq: [5701, [EPSY 5231 or EPSY 8261], grad student] or instr consent

OLPD 5736. Public Engagement and Higher Education. (3 cr.; A-F only; Every Fall) Study/practice of public engagement in higher education. Civic roles of post-secondary education institutions.

OLPD 5795. Plan B Research Design. (3 cr.; A-F or Audit; Periodic Fall) Foundation to design Plan B research project relevant to student's professional interests. Literature review strategies to establish conceptual framework for project. Relates research question to design alternatives and to associated qualitative/quantitative analysis techniques. Issues such as human subjects and APA guidelines for preparing research papers. prereq: Grad student

OLPD 5796. Supervised Practicum in Multicultural Postsecondary Teaching and Learning. (3 cr.; S-N only; Every Fall, Spring & Summer) Postsecondary teaching experience in supervised settings. Weekly group supervision session. Classroom experiences, learning centers, and other postsecondary teaching venues. prereq: Grad student in PsTL certificate program or admitted to PsTL master's program

OLPD 5801. Survey: Human Resource Development and Adult Education. (3 cr.; Student Option; Every Fall, Spring & Summer) Overview of fields of human resource development and adult education. Societal context, theories, processes, definitions, philosophies, goals, sponsoring agencies, professional roles, participants, and resources. Unique characteristics and ways fields overlap and enhance one another. prereq: Grad student only


OLPD 5811. Education for Work. (3 cr.; Student Option; Periodic Spring) Examination of contextual bases underlying education for work; implications for practice.

OLPD 5812. Consulting Skills for Organization Change. (3 cr.; Student Option No Audit; Every Fall & Spring) This course is an introduction to major theories, concepts, skills, and techniques of consulting for industry, education, and government.

OLPD 5813. Enhancing Work-based Learning Through Collaboration. (2 cr.; Student Option; Every Summer) Interagency planning issues/practices relating to special populations for educational, business, and human service organization personnel, family members, and advocates.

OLPD 5816. Distance Learning in Adult Education and Training. (3 cr.; A-F or Audit; Every Fall & Spring) Distance learning concepts, theory, history, present practice, delivery systems, course design, major issues, future directions.

OLPD 5819. Evaluating and Using Research in Organizations and Education. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Role of educational research in professional practice. Problems of practice for research. Alternative modes of research. Synthesis/evaluation of research. prereq: Grad student

OLPD 5823. Work-Based Learning Policies. (2 cr.; Student Option; Periodic Fall & Summer) Aims/purposes of federal, state, and local policies, related to work-based learning.

OLPD 5829. Course Development for Business and Industry. (2 cr.; A-F or Audit; Every Fall, Spring & Summer) Designing instructional programs/courses that help learners develop desired competence. Designing instruction for performance based training and vocational/technical education.

OLPD 5845. The Entrepreneurial Private College. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Financial management/entrepreneurial strategies for private college. Enrollment management, revenue generating strategies, branding/marketing, fundraising, developing/sustaining entrepreneurial institutions. Design strategies for private colleges. prereq: Must have completed Bachelors degree before taking this course.

OLPD 5861. Instructional Methods for Business and Industry. (2 cr.; Student Option; Every Spring) Theory/practice in instructional methods for career/technical education (CTE) instructors and human resources/development (HRD) professionals. How to select various teaching methods and plan for their delivery. Preparing an instructional methods plan to clarify course content, teaching methods selected, rationale for their selection, and how a student organization might facilitate student learning.

OLPD 5893. Directed Study in OLPD. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Self-directed study, with faculty advice, in areas not covered by regular courses.

OLPD 5902. Leading Change in Private Colleges. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Theories of organizational change process/implications for leading private colleges with application for leading private colleges with unique cultures/distinctive missions. Factors impacting change process/implications for leading private colleges. prereq: Must have Bachelors degree awarded prior to taking this course.

OLPD 6402. Integrative Leadership Seminar. (3 cr.; A-F or Audit; Every Fall & Spring) Basic concepts, practices, people, and organizations associated with integrative leadership. Case materials, related readings, presentations, interactive discussion.


OLPD 8002. Critical Issues in Contemporary Education. (3 cr.; Student Option; Every Fall & Spring) Meanings of difference from sociological, psychological, historical and philosophical perspectives as related to current and emerging critical issues in education. Participants help design, facilitate, and present the course. prereq: EdD or PhD student

OLPD 8011. Doctoral Research Seminar I. (1 cr.; S-N or Audit; Every Fall & Summer) Developing course syllabus components that clarify course expectations. Developing academic/community-based elements that complement course goals. Reflect on and compare performance-based instruction with other curriculum models for the field.
OLPD 8012. Doctoral Research Seminar II. (1 cr.; S-N or Audit; Every Spring & Summer) Introduction to qualitative/quantitative research approaches/methods. Nature of research, role of researcher, philosophical perspectives on research, ethical issues in conducting research. prereq: EdPA doctoral student

OLPD 8013. Doctoral Research Seminar III. (1 cr.; S-N or Audit; Every Fall & Spring) Introduction to most important quantitative/qualitative approaches employed in educational policy research. prereq: EdPA doctoral student

OLPD 8015. Inquiry strategies in educational and organizational research. (3 cr.; A-F only; Every Fall) Logic of research design, from research questions and audience considerations to selecting a design for collecting/analyzing quantitative, qualitative, and mixed-method data. Writing proposals that build a reasoned statement of research problem. prereq: [8011 or EDPA 8011], OLPD PhD student

OLPD 8016. Research Design and Educational Policy. (3 cr.; max 6 cr.; Student Option; Every Fall) Logic of research design, from research questions to selecting a design for collecting/analyzing quantitative, qualitative, and mixed-method data. Writing proposals that build a reasoned statement of research problem. prereq: [8015 or EDPA 8015], CEHD doctoral student, instr consent

OLPD 8020. Leadership: From Theory to Reflective Practice. (3 cr.; A-F or Audit; Periodic Fall) Leadership theory. Emphasizes seminal scholars’ work from related social science disciplines. Implications of theory for practice of leadership. Knowledge, behaviors, values, and skills needed in educational and other public settings.

OLPD 8022. Education and Globalization: Anthropological Perspectives. (3 cr.; A-F or Audit; Every Spring) Anthropological/comparative perspectives used to understand educational processes in a globalized world. What can be gained by adopting translocal view of educational phenomena.

OLPD 8087. Seminar: Organizational Leadership, Policy, and Development. (1-3 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer) Topical issues.

OLPD 8095. Problems: Organizational Leadership, Policy, and Development. (1-3 cr.; max 24 cr.; Student Option; Periodic Fall, Spring & Summer) Independent study on issues of educational policy/administration. Arranged with instructor.

OLPD 8096. Internship: Organizational Leadership, Policy, and Development. (1-9 cr. [max 24 cr.]; Student Option; Every Fall & Spring) Internship on issues of educational policy/administration. Arranged with instructor.

OLPD 8101. International Education and Development. (3 cr.; A-F or Audit; Every Fall) History of international development in post-World War II era. Theories of how education affects economic, political, social development. Case studies of contemporary international development/education issues. prereq: Doctoral student or instr consent

OLPD 8103. Comparative Education. (3 cr.; A-F or Audit; Every Fall) Doctoral-level course. History, methodologies, and major debates in the field of comparative education. Major research paper or extensive literature review.

OLPD 8104. Innovative Systems Thinking in Education and Culture. (3 cr.; Student Option; Every Fall) Critical aspects of historical/contemporary systems philosophy, thinking, and analysis. Development of concepts/skills applicable to understanding multiple dimensions of educational systems in diverse contexts. Implications for leadership and fostering organizational and systemic change.

OLPD 8121. Doctoral Seminar: Comparative and International Development Education. (1-6 cr.; S-N or Audit; Every Fall & Spring) Focuses on needs of students while writing the dissertation; general guidance in how to construct the thesis. prereq: EdPA PhD candidate


OLPD 8314. Data Analysis for Educational Management. (3 cr.; Student Option; Periodic Fall, Spring & Summer) Managers of educational organizations are faced with problems that require analysis of a wide range of information. Outlines a frame for data analysis and introduces a set of computer-based tools suited to the practice of educational administration.

OLPD 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

OLPD 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

OLPD 8502. Program Evaluation Theory and Models: Qualitative and Quantitative Alternatives. (3 cr.; Student Option; Every Spring) Concepts, approaches, models, and theoretical frameworks for program evaluation that have developed since the 1960s. prereq: 5501 or EDPA 5501 or EPSY 5243

OLPD 8595. Evaluation Problems. (1-6 cr.; max 24 cr.); Student Option; Every Fall, Spring & Summer) Independent study of an issue in theory or practice of program evaluation. prereq: [5501 or EDPA 5501 or EPSY 5243], instr consent

OLPD 8596. Evaluation Internship. (1-9 cr.; max 24 cr.); Student Option; Every Fall, Spring & Summer) Hands-on experience in conducting program evaluation in real-world setting under supervision of evaluation professional. prereq: [5501 or EDPA 5501 or EPSY 5243], instr consent

OLPD 8601. Advanced Training and Development of Human Resources. (3 cr.; A-F or Audit; Periodic Fall) Personnel training/development research. Critical review of selected/innovative practices. prereq: 5615 or HRD 5201


OLPD 8603. HRD Capstone Research Experience. (3 cr.; max 6 cr.; A-F only; Every Fall & Spring) The goal of this course is to assist doctoral students in developing their ability to conduct research and theory building in human resource development (HRD). Designed as a capstone experience for students in their second year of doctoral studies, the course will not only strengthen their understanding of approaches to disciplined inquiry and knowledge of current theories and advanced scholarly work in HRD, but will also provide them with an opportunity to develop practical research skills, by developing proposals for research projects aimed at addressing real-life needs of various organizations, and conducting these projects. Through this course students will be able to: 1. Further develop their understanding of the philosophical foundations of theory and theory development 2. Understand and discuss current approaches to research and theory building, used in HRD and related fields 3. Examine different perspectives on research and theory building 4. Develop and demonstrate critical thinking skills necessary to understand, interpret, and evaluate research and theories in HRD 5. Identify, compare and critique examples of cutting-edge HRD research and theory building efforts 6. Become part of a community of scholars and contribute to the viability and productivity of this community 7. Understand issues of research ethics and apply ethics principles in their own scholarly work 8. Gain hands-on experience conducting HRD research in organizations 9. Learn how to write successful research proposals and practice developing proposals for dissertation research 10. Understand how to develop
research reports for submission to industry clients and to academic publications, and practice writing and submitting papers to academic publications. This course will be offered over two semesters. During the fall semester sessions will consist of lectures and discussions, and during spring semester, in addition to regular class meetings, students will be working on their field research projects on-site with client organizations. Students will be expected to make one presentation in each of the two semesters: present a proposal for a dissertation research project in fall, and present the results of the field project at the end of the spring semester.

OLPD 8666. Doctoral Pre-Thesis Credits. (1-6 cr. ; max 12 cr.) ; No Grade Associated; Every Fall, Spring & Summer)

Pre-thesis credit prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

OLPD 8702. Administration and Leadership in Higher Education. (3 cr. ; Student Option; Every Fall, Spring & Summer)

Leadership, governance, and administration in higher education through theoretical perspectives and practical analysis. Planning, change, decision making, organizational culture, budgets, conflict. prereq: [5001 or EDPA 5001], [5701 or EDPA 5701]

OLPD 8703. Public Policy in Higher Education. (3 cr. ; A-F or Audit; Every Fall)

Theories, analytic methods, and critical issues in postsecondary education policy at national/state levels. Equality of educational opportunity, affirmative action, system governance/coordination, research funding, student financial aid, public accountability. prereq: [5001 or EDPA 5001], [5701 or EDPA 5701]

OLPD 8715. Plan B Capstone Seminar. (3 cr. ; S-N only; Every Fall, Spring & Summer)

Determining topic, creating timeline, and initiating project in conjunction with year 2 internship. prereq: 5206; grad student admitted to master's program in multicultural college teaching/learning; if Plan B project includes research with human subjects, application to Institutional Review Board is required

OLPD 8721. Instruction and Learning in Higher Education. (2-3 cr. ; Student Option; Every Spring)


OLPD 8777. Thesis Credits: Master's. (1-18 cr. ; max 50 cr.) ; No Grade Associated; Every Spring & Summer)

(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

OLPD 8796. Supervised Internship in Postsecondary Teaching and Learning. (3-12 cr. ; S-N only; Every Fall, Spring & Summer)

Classroom-based or online group supervision. Weekly supervised experiences. Internship settings based on students' interests/goals. prereq: 5196; [grad student admitted to Multicultural College Teaching and Learning MA or College Student Development and Counseling Psychology PhD]

OLPD 8800. Organizational Leadership, Policy, and Development Colloquium. (1-3 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer)

Selected topics regarding work/human resource education professionals. Topics based on interest/demand.

OLPD 8801. Advanced Theory in Human Resource Development and Adult Education. (3 cr. ; A-F or Audit; Periodic Fall)

Theory of individuals/organizations as adaptive entities. Roles of human resource development and adult education in mediating complex demands. prereq: 5801 or ADED 5001 or WHRE 5001

OLPD 8812. Quantitative Research in Education. (3 cr. ; Student Option; Every Fall)

Assumptions, procedures for, considerations in planning/conducting quantitative research in education.

OLPD 8815. Ethics and Responsible Research. (1 cr. ; A-F or Audit; Periodic Fall, Spring & Summer)

Introduction to ethical/legal issues involved in practicing responsible educational research. Key issues, formal/informal codes of conduct, ethical reasoning.

OLPD 8841. Foundations of Organizational Leadership, Policy, and Development. (3 cr. ; Student Option; Periodic Fall)

Key historical/philosophical concepts in work, career, adult development. Individual/organizational change. Learning through experience.

OLPD 8842. Comparative Systems in Organizational Leadership, Policy, and Development. (3 cr. ; Student Option; Periodic Spring)

Looking critically across/within countries/regions at structures intended to deliver work/career-related education/training. prereq: 8141 or WHRE 8141

OLPD 8888. Thesis Credit: Doctoral. (1-24 cr. ; max 100 cr.) ; No Grade Associated; Every Fall, Spring & Summer)

(No description) prereq: Max 18 cr per semester or summer; 24 cr required

OLPD 8890. Research Seminar. (1 cr. ; max 6 cr.) ; S-N or Audit; Periodic Fall)

Developing, reporting, and evaluating research. Participants make/react to presentations. prereq: [[8811 or WHRE 8911] [8812 or WHRE 8912 or WHRE 8913 or WHRE 8914]] or instr consent

OLPD 8896. Internship. (1-10 cr. ; S-N or Audit; Every Fall, Spring & Summer)

Student applies for position in professional practice; individual arrangements describe specific responsibilities during internship. Ed.D. program requirement.

Orthodontics (OTHO)

OTHO 7101. Growth & Development. (0-5 cr. ; A-F or Audit; Every Summer)

Head growth, development, osteology, and myology. Both normal and abnormal morphology and function, with emphasis on cephalometric methods. prereq: Admission to graduate orthodontic program.

OTHO 7102. Growth & Development. (0-5 cr. ; A-F or Audit; Every Fall & Spring)

Head growth, development, osteology, and myology. Both normal and abnormal morphology and function, with emphasis on cephalometric methods.

OTHO 7103. Growth & Development. (0-5 cr. ; A-F or Audit; Every Spring)

Head growth, development, osteology, and myology. Both normal and abnormal morphology and function, with emphasis on cephalometric methods.

OTHO 7111. Diagnosis & Treatment Planning. (0-5 cr. ; A-F or Audit; Every Summer)

Etiology, treatment and prognosis of clinical orthodontic patients. prereq: Admission to graduate orthodontic program.

OTHO 7112. Diagnosis & Treatment Planning. (0-5 cr. ; A-F or Audit; Every Fall)

Etiology, treatment and prognosis of clinical orthodontic patients. prereq: Admission to graduate orthodontic program.

OTHO 7113. Diagnosis & Treatment Planning. (0-5 cr. ; A-F or Audit; Every Spring)

Etiology, treatment and prognosis of clinical orthodontic patients. prereq: Admission to graduate orthodontic program.

OTHO 7201. Clinical Orthodontics. (0-5 cr. ; A-F or Audit; Every Spring & Summer)

Students assigned patients for complete management of orthodontic and orthodontically related occlusal problems under direct staff supervision. prereq: Admission to graduate orthodontic program.

OTHO 7202. Clinical Orthodontics. (0-5 cr. ; A-F or Audit; Every Fall & Spring)

Students assigned patients for complete management of orthodontic and orthodontically related occlusal problems under direct staff supervision. prereq: Admission to graduate orthodontic program.

OTHO 7203. Clinical Orthodontics. (0-5 cr. ; A-F or Audit; Every Spring)

Students assigned patients for complete management of orthodontic and orthodontically related occlusal problems under direct staff supervision. prereq: Admission to graduate orthodontic program.

OTHO 8121. Orthodontic Seminar. (0-5 cr. ; A-F or Audit; Every Summer)
Evaluating orthodontic literature, including preparation and presentation of literature reviews. prereq: Orthodontic grad student

OTHO 8122. Orthodontic Seminar. (0-0.5 cr.; A-F or Audit; Every Fall)
Evaluating orthodontic literature, including preparation and presentation of literature reviews. prereq: Orthodontic grad student

OTHO 8123. Orthodontic Seminar. (0-0.5 cr.; A-F or Audit; Every Spring)
Evaluating orthodontic literature, including preparation and presentation of literature reviews. prereq: Orthodontic grad student

OTHO 8131. Topics in Orthodontics. (0-0.5 cr.; A-F or Audit; Every Spring & Summer)
Theoretical aspects of kinematics and biological reactions to orthodontic forces, risk management and jurisprudence, public health aspects of orthodontics, practice management. prereq: Orthodontic grad student

OTHO 8132. Topics in Orthodontics. (0-0.5 cr.; A-F or Audit; Every Spring)
Theoretical aspects of kinematics and biological reactions to orthodontic forces, risk management and jurisprudence, public health aspects of orthodontics, practice management. prereq: Orthodontic grad student

OTHO 8133. Topics in Orthodontics. (0-0.5 cr.; A-F or Audit; Every Spring)
Theoretical aspects of kinematics and biological reactions to orthodontic forces, risk management and jurisprudence, public health aspects of orthodontics, practice management. prereq: Orthodontic grad student

OTHO 8141. Research in Orthodontics. (0-0.5 cr.; A-F or Audit; Every Summer)
Required for all degree candidates. Preparation, execution, and evaluation of all ongoing research projects and pertinent literature. prereq: Orthodontic grad student

OTHO 8142. Research in Orthodontics. (0-0.5 cr.; A-F or Audit; Every Fall & Spring)
Required for all degree candidates. Preparation, execution, and evaluation of all ongoing research projects and pertinent literature. prereq: Orthodontic grad student

OTHO 8143. Research in Orthodontics. (0-0.5 cr.; A-F or Audit; Every Fall & Spring)
Required for all degree candidates. Preparation, execution, and evaluation of all ongoing research projects and pertinent literature. prereq: Orthodontic grad student

OTHO 7186. Orthopaedic Surgery Research. (4-6 cr.; H-N only; Every Fall, Spring & Summer)
This course provides an opportunity for students to take part in research. (Note: S-N grading option for nonmajors only. prereq: Orthopaedic surgery medical fellowship program; prereq: Orthopaedic surgery medical residency)

ORSU 7190. General, Reconstructive and Geriatric Orthopaedics. (4 cr.; H-N only; Every Fall, Spring & Summer)
This course provides an opportunity for students to take part in research. (Note: S-N grading option for nonmajors only. prereq: Orthopaedic surgery medical fellowship program; prereq: Orthopaedic surgery medical residency)

ORSU 7195. Orthopaedics for the Generalist. (4 cr.; H-N or Audit; Every Fall, Spring & Summer)
This course provides an opportunity for students to take part in research. (Note: S-N grading option for nonmajors only. prereq: Orthopaedic surgery medical fellowship program; prereq: Orthopaedic surgery medical residency)

ORSU 7200. Surgical Subspecialty Orthopaedics. (4 cr.; H-N or Audit; Every Fall, Spring & Summer)
This course provides an opportunity for students to take part in research. (Note: S-N grading option for nonmajors only. prereq: Orthopaedic surgery medical fellowship program; prereq: Orthopaedic surgery medical residency)

ORSU 7205. Orthopaedic Trauma Surgery. (4 cr.; H-N only; Every Fall, Spring & Summer)
This course provides an opportunity for students to take part in research. (Note: S-N grading option for nonmajors only. prereq: Orthopaedic surgery medical fellowship program; prereq: Orthopaedic surgery medical residency)

ORSU 7290. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7390. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7490. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7590. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7690. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7790. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7890. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 7990. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8100. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8200. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8300. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8400. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8500. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8600. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8700. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8800. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 8900. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9000. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9100. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9200. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9300. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9400. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9500. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9600. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9700. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9800. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

ORSU 9900. Orthopaedic Surgery Research, 10 University Drive, Duluth, MN 55812 (218-726-7916) at least one month prior to quarterly cancel/add deadline.

OTOL 5101. Introduction to the Basic Sciences in Otolaryngology I: Ear. (2 cr.; A-F or Audit; Every Fall & Spring)
Multidisciplinary introduction to the basic sciences of the ear. Acoustics and psychoacoustics, temporal bone anatomy, external and middle ear mechanisms, cochlear physiology, auditory neurophysiology, ear embryology, ear biochemistry, immunology, fine structures, vestibular mechanisms and measurement. S-N grading option for nonmajors only. prereq: Otolaryngology major or instr consent

OTOL 5103. Introduction to the Basic Sciences in Otolaryngology II: Head and Neck. (2 cr.; A-F or Audit; Every Fall & Spring)
Multidisciplinary introduction to the basic sciences of the head and neck. Laryngeal anatomy and physiology, nasal anatomy and physiology, immunology, biology, embryology

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
of head and neck. S-N grading option for nonmajors only. prereq: Otol major or instr consent

OTOL 5993. Directed Studies. (1-12 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer)

Directed readings and preparation of reports on selected topics. prereq: instr consent

OTOL 7200. Introduction to Otolaryngology. (2 cr. [max 4 cr.]; P-N only; Every Fall, Spring & Summer)

This elective is intended for early 3rd-year students interested in exploring the specialty of ENT. This course will include clinical experiences in the specialty and interactive presentations emphasizing primary care problems related to the field.

OTOL 7501. Otolaryngology Acting Internship. (4 cr.; H-N only; Every Fall, Spring & Summer)

This advanced elective is designed for the late third-year or early fourth-year student wanting to be competitive for residency selection. Working closely with residents, the student will have increased responsibility in patient care and management.

OTOL 7503. Otolaryngology Research. (2-8 cr. [max 16 cr.]; H-N only; Every Fall, Spring & Summer)

Opportunities are provided to work with otolaryngology faculty and basic scientists within the Department of Otolaryngology. Additional opportunities for clinical otolaryngology are provided if relevant.

OTOL 7910. Otolaryngology Medical Residency. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)

Otolaryngology medical residency.

OTOL 7930. Otolaryngology Medical Fellowship. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)

Otolaryngology medical fellowship.

OTOL 8230. Clinical Otolaryngology. (4 cr.; A-F or Audit; Every Fall, Spring & Summer)

Diagnostic and management instruction and experience in all phases of clinical otolaryngology. Both inpatient and outpatient patients are provided at Fairview-University Medical Center, St. Paul Ramsey Medical Center, Veterans Administration Medical Center, and Hennepin County Medical Center. Clinical practice and weekly special group conferences. prereq: Grad otol major

OTOL 8231. Surgery of the Ear, Nose, and Throat. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)

Surgical training and experience with broad scope of surgical problems encountered in otolaryngology provided at Fairview-University Medical Center, St. Paul Ramsey Medical Center, Veterans Administration Medical Center, and Hennepin County Medical Center. Clinical practice and weekly special group conferences. prereq: Grad otol major

OTOL 8232. Maxillofacial Surgery. (1 cr.; A-F or Audit; Every Fall, Spring & Summer)

Basic science and management principles of maxillofacial diseases. Problems of maxillofacial trauma. Experience with these problems in the hospitals of the training program, especially the county hospitals. prereq: Grad otol major

OTOL 8233. Plastic and Reconstructive Surgery: Head and Neck. (1 cr.; A-F or Audit; Every Fall, Spring & Summer)

Otolaryngologic cosmetic surgery emphasizing rhinoplasty and otoplasty. prereq: Grad otol major

OTOL 8234. Anatomy of the Head and Neck and Temporal Bone Dissection. (2 cr.; Student Option; Every Fall, Spring & Summer)

Head and neck anatomy studied from cadaver through programmed learning. Temporal bones dissected to learn anatomy and to practice otologic surgical procedures. S/N for nonmajors only. prereq: Grad otol major or instr consent

OTOL 8235. Roentgenology of the Head and Neck. (1 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)

Principles and procedures in roentgenology for otolaryngologic and head and neck problems. prereq: Grad otol major

OTOL 8236. Pharmacology in Otolaryngology. (1 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)

Principles of pharmacology as they relate to otolaryngology. prereq: Grad otol major

OTOL 8237. Endoscopy. (1 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)

Didactic and practical instruction in laryngoscopy, esophagoscopy, bronchoscopy, and mediastinoscopy. General management principles emphasized. prereq: Grad otol major

OTOL 8238. Pathology of the Ear, Nose, and Throat. (1 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)

Gross pathology and histopathology of diseases of the ear, nose, throat, and related regions. prereq: Grad otol major

OTOL 8239. Otoneurology. (1-2 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)

Instruction and experience in diagnosis and management of otoneurologic problems, including training in electrophysiologic analysis of vestibular function. prereq: Grad otol major or instr consent

OTOL 8240. Allergy. (1 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)

Concepts and management of otolaryngologic allergy. prereq: Grad otol major

OTOL 8241. Cancer of the Head and Neck. (1 cr. [max 12 cr.]; A-F or Audit; Every Fall, Spring & Summer)

Clinical head and neck oncology; etiology, treatment (both surgical and nonsurgical), and other principles of management. prereq: Grad otol major

OTOL 8242. Audiology and Speech Pathology. (2 cr.; Student Option; Every Fall & Spring)

Clinical audiology and speech-language pathology, including diagnosis and treatment of conductive, sensorineural, and central hearing loss; voice disorders; swallowing disorders; velopharyngeal insufficiency related to cleft lip/ palate and craniofacial anomalies; alaryngeal speech; and speech disorders related to head and neck cancer. prereq: Grad otol major or instr consent

OTOL 8243. Introduction to Research Methodology. (1 cr.; Student Option; Every Fall & Spring)

Statistical methods, experimental design, and execution of otolaryngologic research. Ethics of research with human and animal subjects. prereq: Grad otol major or instr consent

OTOL 8244. Seminar: Current Literature. (1 cr.; Student Option; Every Fall, Spring & Summer)

Presentation and discussion of selected articles. Required for all otolaryngology graduate students. prereq: Grad otol major or instr consent

OTOL 8246. History of Hearing and Balance. (3 cr.; Student Option; Every Fall & Spring)

Structure and function of auditory and vestibular systems. Network analysis of middle and inner ear mechanics, hair cell biophysics, auditory nerve and CNS electrophysiology, information processing, neural mechanisms subserving balance and gaze, cellular morphology, and computer models. prereq: instr consent

OTOL 8248. Directed Readings in Auditory Physiology. (1-2 cr.; Student Option; Every Fall & Spring)

Current research on biophysics and physiology of auditory system; topics selected for each student. Written reviews prepared and discussed. prereq: instr consent

OTOL 8249. Current Topics in Cochlear Anatomy. (1 cr.; Student Option; Every Fall & Spring)

Review of current research papers concerning cochlear anatomy and pathology. prereq: instr consent

OTOL 8250. Advanced Biochemistry of the Auditory System. (1 cr.; Student Option; Every Fall, Spring & Summer)

Review of recent progress in biochemical aspects of auditory end organs. prereq: MDbc 6100, MDbc 6101 or equiv or instr consent

OTOL 8251. Molecular Carcinogenesis of Head and Neck Squamous Cell Carcinoma. (2 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)

Current topics in molecular carcinogenesis of head and neck squamous cell carcinoma. prereq: MICA 8009 or concurrent registration is required (or allowed) in MICA 8009 or instr consent

OTOL 8262. Advanced Clinical Audiology. (2 cr.; Student Option; Every Fall, Spring & Summer)

Comprehensive reading and practicum in auditory evaluation of patients. Assumes basic knowledge of clinical audiology. Each session devoted to aspect of auditory evaluation.
or aural rehabilitation, including behavioral audiometry, electrophysiologic evaluation, hearing aid selection, and cochlear implants. prereq: Grad otol major, 8242 or instr consent

OTOL 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

OTOL 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

OTOL 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Doctoral Pre-Thesis Credits prereq: Doctoral student who has not passed prefinal oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

OTOL 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

OTOL 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

Pathology (PATH)

PATH 7865. Departmental Seminar. (1 cr. [max 2 cr.]; H-N or Audit; Every Fall, Spring & Summer)

Pediatric Dentistry (PDEN)

PDEN 7000. Directed Research in Pediatric Dentistry. (1 cr.; S-N or Audit; Every Fall, Spring & Summer)
Completion of senior project, prepare table clinic presentation, and prepare AAPD presentations through regular progress meetings with faculty.

PDEN 7010. Fundamentals of Pediatric Dentistry. (0-2 cr.; A-F only; Every Summer)
Comprehensive introductory course in pediatric dentistry. Cariology/oral prevention, oral radiology, diagnosis/treatment planning, behavior guidance, analgesia/anesthesia, restorative dentistry, pulpal therapy, nitrous oxide- oxygen inhalation, periodontal disease.

PDEN 7020. Introduction to Pediatric Hospital Dentistry. (0-2 cr.; A-F only; Every Summer)

PDEN 7030. Parenteral and Oral Moderate Sedation for Children and Young Adults in Dental Settings. (0-2 cr.; A-F only; Every Fall)
Learn to provide evidence-based, safe, effective mild/moderate sedation to children/adolescents. Patient case selection for office based sedation, pre-sedation pediatric physical examination/history taking, parenteral/enteral administration, physiology/monitoring, pharmacology, emergency planning/simulation, post-operative management.

PDEN 7040. Primer in Pediatric Medicine. (0-2 cr.; A-F only; Every Fall)
Provides foundation knowledge in pediatric patient assessment, history taking, communication with pediatric healthcare community. Arranged as 8 modules covering topics of medical home care, health history taking, physical examination, diet/nutrition, health screening, prevention of injury/disease, management of disease, hospital admission.

PDEN 7100. Advanced Clinical Pediatric Dentistry. (1-6 cr. [max 36 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Faculty-supervised treatment of patients, including treatment of difficult or unusual pediatric dentistry problems.

PDEN 8010. Pediatric Dentistry Diagnosis and Treatment Planning. (1 cr. [max 5 cr.]; S-N only; Every Fall, Spring & Summer)
Systematic approach to diagnosis of and treatment planning for various pediatric dentistry problems. Faculty/peer review of selected patient cases managed by students. Patient care is reviewed/discussed to ensure appropriate treatment protocols and quality of care.

PDEN 8031. Independent Study in Pediatric Dentistry. (1 cr. [max 5 cr.]; S-N only; Every Fall, Spring & Summer)
Independent readings from pediatric dentistry textbooks in preparation for an oral exam. May include additional clinical experiences.

PDEN 8100. Hospital Pediatric Dentistry. (1 cr.; S-N or Audit; Every Fall, Spring & Summer)
Faculty-supervised diagnosis/treatment of pediatric dentistry problems at Fairview-University Medical Center and Hennepin County Medical Center. Rotation seminars in pediatrics/anesthesia. Pre-post-operative discussion/evaluation of treatment plans.

PDEN 8110. Pediatric Dentistry Outreach Experiences. (1 cr. [max 3 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Faculty-supervised diagnosis and treatment of pediatric dentistry problems at Hennepin County Medical Center, the CUHCC Clinic, and other off-site locations. Participation on a rotation basis in seminars in pediatrics and anesthesia. Pre/postoperative seminar discussion and evaluation of treatment plans.

Pediatrics (PED)

PED 6121. Conflict, Anger, Aggression, Violence. (2 cr.; A-F or Audit; Spring Even Year)
Current studies of biological bases (e.g., evolutionary adaptation, genetic, physiological substrates), behavioral expression (e.g., roles of environment, development, learning/motivation, personality, psychopathology), and social interactions (e.g., culture, criminal violence, warfare, genocide). prereq: Ped 6121/ Pubh 6121

PED 6996. Department of Pediatrics-Summer Internship in Pediatrics. EPAC Explore Students Only. (0 cr.; No Grade Associated; Every Summer)
Exposure to clinical general pediatrics early in medical school. Two-week preceptorship with general pediatrician during summer hiatus between first/second year of medical school. Only available to students part of EPAC Explore group. Participating students need to be in academic good standing at the medical school.

PED 7091. Independent Study in the Neural Basis of Anger, Tantrums, and Aggression. (2 cr.; A-F only; Periodic Fall)
Neural and other biological bases for emotional expression of anger and for tantrum/aggression. prereq: instr consent

PED 7501. Pediatric Externship. (4 cr.; H-N only; Every Fall, Spring & Summer)
Provides basic pediatric skills and knowledge necessary for each student, no matter what field of medicine they select.

PED 7512. Pediatric Acting Internship. (2-6 cr.; H-N or Audit; Every Fall, Spring & Summer)
An intensive learning experience focusing on children with diseases treated by subspeciality services, generally cardiology, nephrology, or oncology. The student functions as an acting intern. prereq: 7501

PED 7531. Pediatrics-Psychology Internship. (12 cr. [max 48 cr.]; No Grade Associated; Every Fall, Spring & Summer)
The aim of the University of Minnesota Medical School Psychology Internship is to prepare interns to meet the mental health needs of children and to function as psychologists in academic health centers or other clinical contexts. Interns provide clinical assessments and care for children and their families in a broad mix of clinical settings within a teaching hospital. In addition to extensive supervised clinical experiences, interns participate in a blend of didactics, conferences, and team meetings to further their professional development. The internship year provides ample opportunities for interns to collaborate closely with faculty and develop collegial relationships with our faculty, staff, and each other. The Internship has been continuously accredited since 1965 by the American Psychological Association making it the longest APA-accredited internship in this region, and is known for its quality assessment and improvement activities. William Robiner, PhD, ABPP, is the Internship Director.

PED 7533. Clinical Allergy at Fairview-University Medical Center. (3-6 cr.; H-N or Audit; Every Fall, Spring & Summer)
Emphasizes the practical aspects of allergic and immunologic work-ups and treatments. The particular content of the course is modified depending upon individual needs.

PED 7534. Pediatric Cardiology. (4 cr.; H-N only; Every Fall, Spring & Summer)
The elective rotation in Pediatric Cardiology is open to third and fourth year medical students who are interested in pediatric cardiovascular disease. The rotation is primarily an outpatient one.

PED 7535. Pediatric Infectious Disease. (4 cr.; H-N only; Every Fall, Spring & Summer)
The student works closely with the infectious disease fellow and pediatric resident on service, and contribute to the diagnosis and management of patients with suspected or proven infections. Prereq: Med Student Yr 3 or 4/PED 7501 or equivalent courses/one other pediatric elective

PED 7536. Pediatric Hematology/Oncology/Bone Marrow Transplantation. (4 cr.; H-N only; Every Fall, Spring & Summer)
This course provides inpatient and outpatient experience in clinical management of children, adolescents and young adults with various blood, cancer, immunologic, or other diagnoses.

PED 7537. Pediatric Endocrinology & Diabetes. (4 cr.; H-N only; Every Fall, Spring & Summer)
The student works with faculty, fellows, and residents in a small group. This course is particularly suitable for students planning to pursue residency programs in Internal Medicine and in Pediatrics.

PED 7538. Pediatric Gastroenterology and Nutrition. (4 cr.; H-N only; Every Fall, Spring & Summer)
The student sees GI and nutrition consultations on the pediatric stations, attends clinic and observes all diagnostic and biopsy procedures pertaining to gastrointestinal patients.

PED 7539. Neonatal Medicine Externship. (4 cr.; H-N only; Every Fall, Spring & Summer)
This course offers the student an opportunity to be an extern in one of the neonatal intensive care units. For assigned patients, the student will assume the responsibility of a first year resident; the student will make rounds with the house officers and attending staff on all patients, write orders and progress notes on assigned patients, and carry out necessary procedures under supervision.

PED 7540. Pediatric Neurology. (4 cr.; H-N or Audit; Every Fall, Spring & Summer)
Successful completion of this rotation satisfies the Department of Neurology 7-510 requirement. Pediatric neurology patients have a variety of problems ranging from coma, muscular dystrophy, epilepsy to learning disabilities; from inborn errors of metabolism, metabolic neurologic dysfunction to behavior disorders.

PED 7541. Children's Hospitals and Clinics of MN Pediatric ENT Elective. (2 cr.; P-N only; Every Fall, Spring & Summer)
This rotation would be geared towards those with strong interest in ENT or strong interest in Pediatrics with the objectives to improve ENT assessment of the pediatric patient and gain proficiency in head and neck exam. Reading about pertinent issues that the student is encountering in clinic, rounds or the operating room will be expected.

PED 7542. Pediatric Palliative Medicine and Hospice. (4 cr.; H-N only; Every Fall & Summer)
This course is designed to introduce students to the fields of pediatric hospice and palliative medicine. Students will primarily spend time with the Pain and Advanced/Complex Care Team (PACCT), the pain and palliative consult service at the University of Minnesota Masonic Children's Hospital (UMMCH), as well as its broader interdisciplinary team members (nurse practitioners, social workers, child life specialists, music therapists, and spiritual health providers). Students will also spend at least one day with the interdisciplinary pediatric home hospice and palliative care team teams at Fairview Homecare and Hospice. Depending on availability, students may also rotate in the outpatient clinic at UMMCH. They will be expected to engage in patient care planning, including family meetings and interdisciplinary team collaborations.

PED 7543. Pediatric Nephrology. (2 cr.; H-N only; Every Fall, Spring & Summer)
Daily working rounds with the staff will be made, and the team will make formal rounds with the students to discuss the patients in hospital. Outpatient management of a wide variety of problems, both nephrologic and urologic, are considered in clinics.

PED 7544. Pediatric Pulmonary Disease. (4 cr.; H-N only; Every Fall, Spring & Summer)
This pediatric course will focus on care of pulmonary problems of patients with diverse lung diseases and will include work with the pediatric pulmonary health care team.

PED 7545. General Pediatrics Outpatient Elective. (4 cr.; H-N only; Every Fall, Spring & Summer)
This is a general pediatric primary care elective. It will allow students to work closely with an outpatient clinical practice team to provide care for patients and families seeking ongoing pediatric primary care.

PED 7547. Children's Hospitals and Clinics of MN Pediatric Sleep Medicine Elective. (2 cr.; P-N only; Every Fall, Spring & Summer)
Pedicatrics Clerkship - Marshfield, WI. (4 cr.; H-N or Audit; Every Fall & Summer)
This elective involves two adolescent interviewing workshops and one adolescent pelvic exam workshop. Special emphasis is placed on acquisition of effective clinical communication skills. Students are exposed to a variety of community-based services for youth, including general adolescent medicine clinics, programs for at-risk youth, and for youth in foster care.

PED 7550. Children's Hospitals and Clinics of MN Pediatric Ethics Elective. (4 cr.; H-N only; Every Fall, Spring & Summer)
Clinical ethics is an integral part of the practice of medicine ? medicine by definition is an ethical practice. Taking the time to understand how the ethical principles work in day to day clinical decision making is paramount to the development of ethically astute clinicians. In order to provide students with an immersive experience in clinical ethics this elective has been created for those who seek more directive knowledge on how ethics affects patient care.

PED 7555. Neonatal Clerkship - Marshfield, WI. (4 cr.; H-N or Audit; Every Fall & Summer)
The student functions as a house officer on the pediatric ward and in the emergency room and has night call every third or fourth night. Prereq: 7512, enrolled yr 4 med

PED 7556. Pediatrics Clerkship - Marshfield, WI. (4 cr.; H-N or Audit; Every Fall & Summer)
The elective revolves primarily around medical problems related to the newborn, including neonatal infections, metabolic problems, cardiovascular problems, shock, pulmonary insufficiency, central nervous system asphyxia and hemorrhage. Prereq: 7501, enrolled yr 4 med

PED 7557. Children's Hospitals and Clinics of MN Pediatric/Adolescent Gynecology Elective. (4 cr.; H-N only; Every Fall & Spring)
Pedicatrics Clerkship - Marshfield, WI. (4 cr.; H-N or Audit; Every Fall & Summer)
Pedicatrics Clerkship - Marshfield, WI. (4 cr.; H-N or Audit; Every Fall & Summer)
This elective involves two adolescent interviewing workshops and one adolescent pelvic exam workshop. Special emphasis is placed on acquisition of effective clinical communication skills. Students are exposed to a variety of community-based services for youth, including general adolescent medicine clinics, programs for at-risk youth, and for youth in foster care.

PED 7558. Clinical Genetics. (4 cr.; H-N only; Every Fall, Spring & Summer)
This course will be valuable for students interested in any discipline and allows exposure to patients in pediatrics, medicine, and obstetrics/perinatology.

PED 7560. Children's Hospitals and Clinics of MN Pediatric Ethics Elective. (4 cr.; H-N only; Every Fall, Spring & Summer)
Clinical ethics is an integral part of the practice of medicine ? medicine by definition is an ethical practice. Taking the time to understand how the ethical principles work in day to day clinical decision making is paramount to the development of ethically astute clinicians. In order to provide students with an immersive experience in clinical ethics this elective has been created for those who seek more directive knowledge on how ethics affects patient care.

PED 7559. Pediatric Critical Care Medicine. (4 cr.; H-N only; Every Fall, Spring & Summer)
The student works as a member of the resident-fellow-attending physician team in assessing and treating all medical and surgical patients on the pediatric intensive care unit.

PED 7560. Pediatric Research. (2-8 cr.; max 16 cr.) H-N only; Every Fall, Spring & Summer)
A research experience in pediatrics can be arranged on an individual basis with various members in the Pediatrics Department. This course affords the student opportunity to
work with a pediatric faculty member on a predetermined research project.

PED 7566. Evolution of American Pediatrics. (6 cr.; H-N or Audit; )
This course explores the evolution of American Pediatrics from the post-Civil War period to the present. American Pediatrics may be divided into several distinct eras based on the forces which defined its boundaries and identity. These include societal and governmental influences, changing norms of medical practice, emerging scientific knowledge, and reforms in medical education. The course will also examine Pediatrics' contribution to medical knowledge and the influence of pediatrics on the attitudes of government and society toward children. Team teaching format combines formal lectures, assigned readings, and student/faculty discussion.

PED 7583. Fundamentals of Clinical Oncology. (4 cr.; H-N or Audit; Every Fall, Spring & Summer)
This multidisciplinary course provides an introduction to the fundamentals of clinical oncology (adult and pediatric) and is designed for the medical student interested in entering any specialty. prereq: Med 7500 or 7501

PED 7700. Primary Care Selective - Pediatrics. (4 cr.; P-N only; Every Fall, Spring & Summer)
A 4-week ambulatory experience with a focus on both the specialty specific content areas and the process-of-care in the ambulatory setting.

PED 7800. Advanced Selective in Pediatrics. (4 cr.; H-N only; Every Fall, Spring & Summer)
The Advanced Selective in Pediatrics is an opportunity for students to serve patients in a community-based general inpatient setting. Advanced selective students will take on the responsibility of an acting intern on the general pediatrics inpatients team. They will collaborate with pediatric and medicine-pediatric interns and medical students in their foundational training. They will be supervised by pediatric and medicine-pediatric senior residents and faculty attendings.

PED 7910. Pediatric Medical Residency. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Pediatric medical residency.

PED 7930. Pediatric Medical Fellowship. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Pediatric medical fellowship.

Performance of Veterinary Serv (PVS)

PVS 5881. Food Production, Manufacturing/Processing, and Supply Chains. (1 cr.; S-N only; Every Summer)
Food commodities and agricultural crops play critical roles relevant to public health, energy and economic vitality, feeding the increasing global human population, and providing multiple outputs from feed for animals to fuel for vehicles, transportation and energy. Each time the course is offered it will focus on a different agricultural commodity which provides critical outputs for the state of MN. Some examples include corn, sugar beets, and soy beans. Individuals working or interested in complex food systems will benefit from the knowledge, networking, and breadth of understanding about agricultural commodities, as a means to think more critically about the interconnection of food, animal feed, fiber and fuel in the economics, culture and health of our society.

PVS 5882. Food governance, Policy and Regulation. (1 cr.; S-N only; Every Spring)
This course provides an overview of food governance, policy, and regulation in the United States. The roles of legislative bodies and regulatory agencies at local, state, and national levels will be reviewed in order to explore the complexity of food policy. Current issues will be analyzed.

PVS 5883. Global Food Systems: Geography, Politics and Trade. (1 cr.; S-N only; Every Spring)
This course explores the global distribution of food production and consumption in order to understand the dynamics of food systems including both domestic production and trade. The course provides students an opportunity to expand their knowledge about the drivers of global food systems and the complexity of the issues such as food security, global economic development and the implications of climate change, and sustainability.

PVS 5995. Engaging Intergovernmental Organizations. (2 cr.; S-N only; Every Fall & Spring)
Each enrolled student will be expected prepare for the program prior to traveling to the off-campus site by becoming familiar with the relevant organizations which includes reading the background materials provided online. Prior to the off-campus component of the course, students will be asked to participate in an online webinar and work as a member of a virtual team preparing an executive overview of one of the intergovernmental organizations to share with the entire class at the first meeting. Each student is also expected to participate in directed discussions, interact with key officials, perform group task assignments, and ultimately develop and share a presentation to foster professional and private-academic partnerships with relevant stakeholders.

PVS 5996. Professional Communications: Policy Issue Briefs. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring)
Critical review of scientific and lay literature. Principles of risk communication. Presentation of scientific information. Prepare and critique executive summaries of current topics for CAHFS Daily News. Support media interactions of CAHFS faculty. Generate fact sheets for use on CAHFS website. prereq: Students must have a professional or graduate degree related to human, animal, or ecosystem health or be pursuing a graduate degree (MS/PhD) or professional masters (MPH/MPA) or instr consent

PVS 5997. Farm to Table Study Program. (1.5 cr.; Student Option; Every Fall)
Enrolls the food system within a specific country while considering aspects of animal welfare/health, food safety, food protection, public health. Site visits along food supply chain. Discussions with government/private sector leaders. Interactive cross-cultural group activities. prereq: instr consent

PVS 5998. Leadership to Address Global Grand Challenges. (1.5 cr.; Student Option No Audit; Every Spring)

PVS 5999. Professional Communications: Daily News. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Meetings are commonplace in most organizations yet the effectiveness of these meetings is commonly questioned. Students will research and practice some proven techniques for enhancing the effectiveness of meetings such as agendas, note-taking and preparation of minutes and meeting summaries. Most professionals utilize email as one of their most common forms of communication yet they’ve never learned how to maximize the likelihood that emails will be effective. Students
will write and critique emails to enhance the effectiveness of their email communications.

**Periodontics (PERO)**

PERO 5123. Practice Management Externship. (1 cr.; Student Option; Every Spring) Familiarizes periodontal students with the private practice environment and prepares them to select the type of practice they want to purchase or build and successfully manage their office. prereq: Resident in advanced education program in periodontology

PERO 7321. Periodontics/Orthodontics Seminar. (1 cr.; S-N only; Every Fall & Spring) Seminar related to postdoctoral work in periodontics/orthodontics.

PERO 7322. Multidisciplinary Treatment Seminar in Dentistry Related to Periodontics. (1 cr.; S-N or Audit; Every Summer) Series of multidisciplinary treatment seminars related to specialized fields in periodontology, endodontics, pediatric dentistry, AEGD/GPR, and prosthodontics. prereq: Resident enrolled in [periodontology, endodontics, pediatric dentistry, AEGD/GPR, prosthodontics]

PERO 8000. Advanced Clinical Periodontology. (1-3 cr.; A-F or Audit; Every Fall, Spring & Summer) Clinical training in examination, diagnosis, treatment planning, and various phases of prevention and treatment of periodontal diseases in patients. prereq: Resident in advanced education program in periodontology

PERO 8200. Clinical Seminars. (1 cr.; Student Option; Every Fall, Spring & Summer) tbd prereq: Resident in advanced education program in periodontology

PERO 8250. Anatomy of the Periodontium. (1 cr.; A-F or Audit; Fall Odd Year) Gingival tissues, cementum, periodontal ligament, and alveolar bone discussed from histological, physiological, and pathological point of view. prereq: Resident in advanced education program in periodontology

**Pharmaceutics (PHM)**

PHM 5200. New-Drug Development Process. (1 cr.; Student Option; Periodic Fall & Spring) New-drug development process in the U.S. pharmaceutical industry.

PHM 6738. Pharmacokinetics. (0 cr.; A-F or Audit; Every Fall) Designed to give generalist practitioners fundamental skills to solve pharmacoekinetically-based problems in patient care, particularly in regards to dosage regimen design/adjustment. Follows path of drug molecule from incorporation into dosage form to release/disposition in biological system. Requires instructor consent.

PHM 8100. Seminar: Pharmaceutics. (1 cr. [max 4 cr.]; S-N or Audit; Every Fall & Spring) tbd prereq: Grad Phm major

PHM 8110. Readings in Pharmaceutics. (1 cr. [max 4 cr.]; S-N or Audit; Every Fall & Spring) Current literature. prereq: Grad Phm major

PHM 8120. Readings in Central Nervous System (CNS) Drug Delivery. (1 cr. [max 4 cr.]; S-N only; Every Fall & Spring) Weekly discussion of recent publications or new techniques, methods, and analyses on delivery of drugs to central nervous system. Topics vary. Informal presentations from CNS drug delivery researchers. prereq: instr consent

PHM 8150. Pharmacokinetics Research Seminar. (1 cr. [max 12 cr.]; S-N or Audit; Every Fall & Spring) Current concepts and literature review. prereq: Grad Phm major

PHM 8210. Pharmacokinetics Module. (1 cr. [max 2 cr.]; S-N only; Every Fall) Foundational materials in pharmacokinetics for pharmaceutics graduate students.

PHM 8220. Physical Pharmacy Module I. (1 cr. [max 2 cr.]; S-N only; Every Fall) First course in a two course sequence which provides foundational materials in physical pharmacy for pharmaceutics graduate students.

PHM 8230. Physical Pharmacy Module II. (1 cr. [max 2 cr.]; S-N only; Every Spring) Second course in a two course sequence which provides foundational materials in physical pharmacy for pharmaceutics graduate students.

PHM 8240. Biopharmaceutics Module. (1 cr. [max 2 cr.]; S-N only; Every Spring) Foundational materials in biopharmaceutics for pharmaceutics graduate students.

PHM 8295. Research Problems in Pharmaceutics. (1-12 cr.; max 72 cr.; S-N or Audit; Every Fall, Spring & Summer) Experimental investigation of problems in pharmaceutics. prereq: instr consent

PHM 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

PHM 8888. Thesis Credit: Doctoral. (1-24 cr.; max 100 cr.; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

PHM 8900. Special Topics in Pharmaceutics. (1-4 cr.; Student Option; Periodic Fall & Spring) Special topics in Pharmaceutics

**Pharmacology (PHCL)**

PHCL 3100. Pharmacology for Pre-Med and Life Science Students. (2 cr.; A-F or Audit; Every Spring) Principles/mechanisms of drug action. Major drug categories for different organ systems. prereq: College-level biology, biochemistry or physiology recommended

PHCL 3210. Gateway to Pharmacology: How popular drugs work. (3 cr.; A-F only; Every Fall) This course will study the mechanisms of prototype drugs in the major drug categories.
We will focus on drugs that are frequently used for the treatment of common conditions in the United States. We will also explore different types of drugs to treat some conditions.

PHCL 4001. Mechanisms of Drug Action. (2 cr.; A-F or Audit; Every Fall & Spring)
How drugs function as applied to treatment of a single medical condition. Pharmacokinetics, pharmacodynamics, pharmacogenetics, pharmacogenomics. prereq: Upper div or instr consent; [prev or concurrent] courses in [biology, biochemistry] recommended

PHCL 4003. Anti-infective drugs: Drugs that kill invaders. (2 cr.; A-F or Audit; Every Spring)
Principles/mechanisms of anti-infective drugs, and treatments of infectious diseases. prereq: College-level biology

PHCL 4010. Current Research Topics in Pharmacology. (2 cr.; A-F only; Every Fall)
Cutting-edge research projects in pharmacology. Research seminars, literature studies, discussion sessions, oral presentations. prereq: Upper div or instr consent

PHCL 4020. Chemotherapy: from current anticancer drugs to future cancer therapeutics. (3 cr.; A-F only; Every Fall)
This course will expose students to the studies of therapeutic agents used for the treatment of cancer. We will study the mechanisms of current anticancer drugs. We will also explore the recent development of novel anticancer agents, as well as the process of drug discovery & development. prereq: College-level biology, PHCL 2001 and/or PHCL 3100, GCD4151 recommended.

PHCL 4100. Laboratory in Molecular Pharmacology. (2 cr.; A-F only; Every Fall & Spring)
Hands-on experimentation using molecular techniques for data collection/analysis. prereq: [2001 or 4001], 3100, [BioC 3021 or BioC 4331], [BioC 4025, BioC 4125 recommended]

PHCL 4343. Pharmacology of the Synapse. (3 cr.; A-F only; Every Fall)
Study synapse as pharmacological gateway to nervous system. Explore physiology of/cellular signalling at synapse, how signalling influences conditions such as Parkinson's disease, depression, anxiety, pain, addiction. How various drugs modify signalling at synapse. recommend: [PHCL 2001, PHCL 3100]

PHCL 4993. Directed Studies. (1-3 cr.; max 6 cr.; S-N only; Every Fall, Spring & Summer)
Individual study ("dry lab" experience) on selected topics in pharmacology/biomedical science with faculty from the Pharmacology Department or other biomedicine disciplines. Readings and use of scientific literature. prereq: instr consent, dept consent

PHCL 4994. Directed Research. (1-3 cr.; max 12 cr.; S-N only; Every Fall, Spring & Summer)
Laboratory research ("wet lab" experience) in the areas of pharmacological/biomedical research, prereq: instr consent, dept consent

PHCL 5012. Pharmacology for Pharmacy Students II. (2 cr.; A-F only; Every Spring)
Action/fate of drugs. prereq: 5101 or instr consent

PHCL 5019. Problems in Pharmacology. (1-18 cr.; Student Option; Every Fall, Spring & Summer)
Research projects and special problems by arrangement. prereq: Upper div or grad student or instr consent

PHCL 5110. Introduction to Pharmacology. (3 cr.; A-F or Audit; Every Fall)
Basic principles of Pharmacology. Focuses on molecular mechanisms of drug action. prereq: Grad student or instr consent

PHCL 5111. Pharmacogenomics. (3 cr.; A-F or Audit; Every Spring)
Human genetic variation, its implications. Functional genomics, pharmacogenomics, toxicogenomics, proteomics. Interactive, discussion-based course. prereq: Grad student or instr consent

PHCL 5112. A Graduate Toolkit I: An Introduction to the Scientific Research Lab. (1 cr.; A-F only; Every Fall)
Basic operating principles/techniques of scientific research lab. Personnel structure, professionalism, authorship/publication. Reombinant protein production/purification, DNA/RNA purification/methods, molecular biology methods, microscopy, model systems/ bioinformatics. prereq: instr consent

PHCL 5113. A Graduate Toolkit II: Scientific Speaking and Writing for Graduate Students. (2 cr.; A-F only; Every Fall)
Guidance on PowerPoint design, public speaking, question/answer sessions at scientific talks. Practice sessions are videotaped/analyzed to highlight strategies for improvement. Guidance in writing thesis research topic. prereq: Completion of one yr of a grad program

PHCL 5462. Neuroscience Principles of Drug Abuse. (2 cr.; Student Option; Periodic Spring)
Current research on drugs of abuse, their mechanisms of action, characteristics shared by various agents, and neural systems affected by them. Offered biennially, spring semester of even-numbered years. prereq: instr consent

PHCL 8014. Small RNA Biology. (2 cr.; A-F or Audit; Every Spring)
Small RNAs as major regulators of gene/protein expression. MicroRNAs and their potential use in diagnosis/prognosis of various disease conditions, including cancers. Biology of small RNAs and their role in health and disease. prereq: BIOL 8002 or MICA 8004 or equiv or instr consent

PHCL 8026. Neuro-Immune Interactions. (3 cr.; Student Option; Every Fall)
Regulatory systems (neuroendocrine, cytokine, autonomic nervous systems) linking brain/immune systems in brain-immune axis. Functional effects of bidirectional brain-immune regulation. prereq: MICA 8001 or equiv or instr consent

PHCL 8100. Laboratory Research in Pharmacology. (4 cr.; max 8 cr.; S-N only; Every Fall & Spring)
Supervised independent research in pharmacology. Modern biomedical/pharmacology research methodology, data generation/analysis. Formulation/testing of basic science hypotheses. prereq: Grad student or instr consent

PHCL 8200. Seminar: Selected Topics in Pharmacology. (1 cr.; max 8 cr.; A-F only; Every Fall & Spring)
Student-presented seminars. prereq: 5212 or instr consent

PHCL 8207. Seminar: Psychopharmacology. (1 cr.; Student Option; Every Fall & Spring)
For graduate students and postdoctorals interested in studies and research associated with psychotropic drugs and chemicals. Neurochemistry, pharmacology, and behavior as antecedent or consequential variables. Some seminars devoted to biomedical ethics. prereq: instr consent

PHCL 8208. Neuropsychopharmacology. (3 cr.; A-F or Audit; Fall Even Year)
Relationships between drugs/biochemical, behavioral, neurophysiological consequences. Functional biogenic amine, peptidergic. How manipulations alter neuronal function or behavior. Feedback mechanisms, induction, inhibition. Reinforcement of, tolerance to, or dependence on drugs. prereq: [5212, Psy 5021, Psy 5061] or instr consent

PHCL 8209. Substance Abuse at the bedside. (1 cr.; S-N only; Every Fall & Spring)
Clinical management of addictive diseases. Students discuss how observed clinical interactions can influence a basic science project in which they are involved. prereq: Grad student in any basic-science program

PHCL 8211. Advanced Medical Pharmacology I. (5 cr.; A-F only; Every Spring)
Online content focused on organ system-based study of medical therapeutics. In-class content focused on current biomedical literature. Develop critical reasoning skills needed to interpret/critique basic science, translational, clinical research papers/presentations. prereq: 5116, [grad student or instr consent]

PHCL 8212. Advanced Medical Pharmacology II. (0-3 cr.; A-F only; Every Summer)
Online content focused on organ system-based study of medical therapeutics. In-class content focused on current biomedical literature. Develop critical reasoning skills needed to interpret/critique basic science, translational, clinical research papers/presentations. Prereq 8211 or instr consent

PHCL 8217. Problems in Investigative Pharmacology. (0 cr.; S-N or Audit; Every Fall)
Presentation and discussion of contemporary research problems, investigative approaches, and methodologies in experimental pharmacology. Related to
cardiovascular, renal, endocrine, and autonomic pharmacology; neuropharmacology; psychopharmacology; chemotherapy; toxicology; and molecular pharmacology.

PHAR 8221. Neurobiology of Pain and Analgesia. (3 cr.; Student Option; Periodic Fall & Spring)
Course offered triennially. prereq: instr consent

PHCL 8222. Transdisciplinary Tobacco Research. (1 cr. [max 2 cr.]; S-N or Audit; Fall Odd Year)
Transdisciplinary science, its application to nicotine/tobacco research. Transdisciplinary theories/methods, examples of their application/integration. Draws on TTURC/local investigators, public health advocates. Offered every other year. prereq: instr consent

PHCL 8320. Readings in Neurobiology. (1-4 cr.; Student Option; Every Fall & Spring)
Topics in neurobiology/neurophysiology. prereq: instr consent

PHCL 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Master's student, adviser and DGS consent

PHCL 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Doctoral student, adviser and DGS consent

PHCL 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to 4 times, up to 60 combined cr

PHCL 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

PHCL 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Max 18 cr per semester or summer; 24 cr required

Pharmacy (PHAR)

PHAR 1. CoP - Phillips Neighborhood Clinic. (0 cr.; No Grade Associated; Every Fall, Spring & Summer)
Teaching laboratories to community/clinic-based interprofessional patient care model at Phillips Neighborhood Clinic. prereq: Current Student Pharmacist in the College of Pharmacy

PHAR 1001. Orientation to Pharmacy. (2 cr.; Student Option; Every Fall, Spring & Summer)
You may know that pharmacists are responsible for the dispensation of medications, but did you know that pharmacists play a critical role in the healthcare process by ensuring that their patients receive the best overall care? Designed to help you better understand the world of pharmacy, this online pharmacy course will introduce you to this exciting profession and help you gain an understanding of the impact pharmacists have in the patient care process. This course examines what training is necessary for success in the pharmacy field, demonstrates the roles a pharmacist can have in patient care, research and academia, and provides virtual tours of various settings in which pharmacists work. This is a non-credit, self-paced course. While it is completely online, there are deadlines for assignments throughout the semester. No late registrations will be accepted. Course information is sent to the U of M email addresses of registered students shortly before, and/or on, the first day of classes each Fall, Spring, and Summer term. For more information, contact phar1003@umn.edu or 612-624-7976.

PHAR 1002. Medical Terminology. (2 cr.; Student Option; Every Fall, Spring & Summer)
Interested in learning the difference between an antigen and an antibiotic? During this course, you will not only increase your medical vocabulary by more than 2500 words in a self-paced manner, you will also learn to identify and articulately describe a wide variety of medical conditions and processes. Communication related to disease states, procedures, and diagnostics in health care can sometimes seem like another language. This course will help you recognize medical abbreviations, relate terms to procedures and diagnostics, and comprehend the meaning of medical terminology by using word elements. If you are interested in the health care field or would like to understand more about your own medical care, this course is a great place to start. This is a completely online, self-paced course but runs on an accelerated 10-week schedule each Fall, Spring, and Summer term. For more information, contact phar1002@umn.edu or 612-624-7976.

PHAR 1003. Non-Prescription Medications and Self-Care: Treating Minor Conditions. (2 cr.; Student Option; Every Fall, Spring & Summer)
Non-prescription medications and dietary supplements comprise a large market within the healthcare industry. Throughout this course, you’ll learn about these medications and other self-care remedies available to treat many different medical conditions. For each condition discussed, you will learn basic causes, signs, and symptoms, self-care guidelines, and when to see a healthcare provider. For medications discussed you will learn the basic mechanism of action, uses, and potential side effects. This course will help you gain a better understanding of how non-prescription and self-care products can be used safely and effectively. This online class is primarily self-paced with due dates for certain aspects at times throughout the semester. Students may choose to work ahead in the course. Course information is sent to the University of Minnesota email addresses of registered students shortly before, and/or on, the first day of classes each fall, spring, and summer term. For more information, contact phar1004@umn.edu or 612-624-7976.

PHAR 3206. Foundations of Health Literacy. (3 cr.; Student Option; Every Fall & Spring)
In this course, we will focus on health literacy and its implications for patients, health care providers, and the health care system at large. We will discuss the consequences of poor health literacy and practical strategies for improving health literacy. This will include steps that individual patients can take and communication strategies for future health care providers. You will explore disparities in health and health care and the relationship to health literacy. We will discuss cultural competency through both student discussions and a book club and consider the impact on the patient experience. Functional health literacy includes being able to navigate the health care system and health insurance. As a class, we will discuss choosing a health insurance policy and controversies therein.

PHAR 3207. Leadership in Health Care. (3 cr.; A-F Only; Every Fall, Spring & Summer)
Leadership skills/theories to create positive change in health care settings.

PHAR 3700. Fundamentals of Pharmacotherapy. (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Pharmacotherapy?the treatment of disease through the administration of medications? is a field particularly interesting to many healthcare workers. This course is designed to introduce you to some of the most common drug classes available for the treatment of particular diseases. You will also learn about basic pharmacology, recognize brand and generic drug names, and explore their common uses and therapeutic classes. A basic understanding

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
of treatment options available for common disease states will also be developed during this course. Additionally, the course develops basic proficiency in the use of drug information resources. This is a completely online course with due dates throughout the semester though students have the option to work ahead if they choose. Course information is sent to the University of Minnesota email addresses of registered students shortly before, and/or on, the first day of classes each fall, spring, and summer term. For more information, contact phar3700@umn.edu or 612-624-7976. Prereq: Medical terminology recommended

PHAR 3800. Pharmacotherapy for the Health Professions. (3 cr.; A-F only; Every Fall & Spring)
Pharmacotherapy?the treatment of disease through the administration of medications? is a topic central to the practice of nursing. This course is designed to introduce you to the main drug classes available for the treatment of particular diseases and the monitoring parameters for patients taking these medications. You will also learn about basic pharmacology, recognize brand and generic drug names, and explore their common uses and therapeutic classes. A basic understanding of contraindications and precautions related to various classes of medications will also be covered. Additionally, the course develops basic proficiency in the use of drug information resources. Students will be assessed through patient case quizzes and exams. This is a completely online course with weekly due dates. Course information is sent to the University of Minnesota email addresses of registered students shortly before and/or on the first day of classes each fall and spring term. For more information, contact phar3800@umn.edu or 612-624-7976. Prereq: Anatomy and physiology

PHAR 4200W. Drugs and the U.S. Healthcare System. (CIV.WI; 3 cr.; Student Option; Every Fall & Spring)
Being an empowered patient is important when discussing ethics-driven issues within the U.S. healthcare system. This course will expose students to current controversial issues surrounding medications and national health care and help students examine their own role as a participant in this system. Students will learn to draw comparisons between medication use systems around the world and analyze other controversies related to access, choice, and quality of health care. During this course, students will understand how their choices, ethics and behavior affect societal decisions surrounding the availability of medications in the US and what their rights are as a citizen-participant during the health care debate. This is a completely online course with weekly due dates offered each Fall and Spring term. For more information, contact phar4200@umn.edu or 612-624-7976.

PHAR 4201. Applied Medical Terminology. (2 cr.; Student Option; Every Fall, Spring & Summer)
This course will help students recognize medical abbreviations, relate terms to procedures and diagnostics, comprehend the meaning of medical terminology by using words, elements, and terms in the context of patient care. Communication related to disease states, procedures, and diagnostics in health care can sometimes seem like another language. During this course, students will not only increase their medical vocabulary by more than 2500 words in a self-paced manner, they will also learn to identify and articulately describe a wide variety of medical elements, processes, and terms in the context of patient care. For more information, contact phar4201@umn.edu or 612-624-7976. Prereq: Basic knowledge of human anatomy/physiology

PHAR 4205. Obesity: Issues, Interventions, Innovations. (2 cr.; Student Option; Every Fall & Spring)
This course will focus on the role of the pharmacist in treating obesity. Students will learn the pharmacology of past and current medications to treat obesity, as well as the pathophysiology of the disease to understand why more options aren’t available. Students will explore drug information sources for dietary supplements for weight loss, discuss the care of an obese patient including non-pharmacologic treatments for obesity, as well as recognizing the potential for bias and its effect on patient care. Finally, students will look at bariatric surgery and discuss some specific adjustments in care for bariatric patients. This is a completely online course with weekly due dates offered each Fall and Spring term. For more information, contact phar4205@umn.edu or 612-624-7976. Prereq: Second or third year pharmacy student, or student enrolled in a graduate science or health-related program. Biochemistry and physiology suggested.

PHAR 5212. Survey of Pediatric Metabolic, Genetic, and Oncologic Disease. (2 cr.; A-F only; Every Fall & Summer)
Appraisal of major genetic/metabolic disorders and oncologic diseases of childhood. Disease state epidemiology, pharmacotherapy, monitoring, practical applications. Prereq: Second year or higher in College of Pharmacy or instr consent

PHAR 5217. Therapeutics of Herbal and Other Natural Medicinals. (2 cr.; A-F or Audit; Every Spring)

PHAR 5224. Directed Research II for Undergraduates. (1-5 cr.; Student Option; Every Fall, Spring & Summer)
Individualized study. Students work with faculty on special projects. Prereq: Undergrad, instr consent

PHAR 5231. Directed Research I for Undergraduates. (1-15 cr.; [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Individualized study. Students work with faculty on special projects. Prereq: Undergrad, instr consent

PHAR 5230. Principles of Clinical Pharmacology Research. (2 cr.; A-F only; Every Fall)
Drug therapy investigation. Topics include experimental design of drug studies in human research subject volunteers. Topics related to individualization of therapy including effects of genetic polymorphisms and anthropometric variables, physiologic variables, age on drug disposition treatment outcomes. Prereq: 3rd Year Pharmacy Student or instr consent

PHAR 5270. Therapeutics of Herbal and Other Natural Medicinals. (2 cr.; A-F or Audit; Every Spring)

PHAR 5700. Applied Fundamentals of Pharmacotherapy. (3 cr.; A-F Only; Every Fall, Spring & Summer)
Pharmacotherapy, the treatment of disease through the administration of medications, is a field particularly interesting to many health care workers. This course is designed to introduce students to some of the main drug classes available for the treatment of particular diseases. Students will also learn about basic pharmacology, recognize brand and generic drug names, and explore their common uses and therapeutic classes. A basic understanding of treatment options available for common disease states will also be developed during this course. Additionally, the course develops basic proficiency in the use of drug information resources. This is a completely online course with due dates throughout the semester, though students have the option to work ahead if they choose. This course is offered each Fall, Spring, and Summer term. For more
PHAR 5800. Pharmacotherapy for the Health Professions. (3 cr.; A-F only; Every Fall) Pharmacotherapy, the treatment of disease through the administration of medications, is a topic central to the practice of nursing. This course is designed to introduce you to the main drug classes available for the treatment of particular diseases and the monitoring parameters for patients taking these medications. You will also learn about basic pharmacology, recognize brand and generic drug names, and explore their common uses and therapeutic classes. A basic understanding of contraindications and precautions related to various classes of medications will also be covered. Additionally, the course develops basic proficiency in the use of drug information resources. This is a completely online course with weekly due dates offered each Fall term. For more information, contact phar5800@umn.edu or 612-624-7976. Prereq: Medical terminology recommended.


PHAR 6123. Pharmacotherapy III: Patient-centered Pathophysiologic Approach. (5 cr.; A-F only; Every Fall) Pathophysiology/pharmacotherapy of common neurologic, psychiatric, pulmonary, geriatric disorders. prereq: 6122, 6163, concurrent registration is required (or allowed) in 6175, PHCL 5101, PHCL 5102.


PHAR 6131. Pharmacy and the Health Care System. (3 cr.; A-F only; Every Spring) Delivery of pharmaceuticals/pharmacy services in U.S. health care system. Issues in hospital/community practice, characteristics of pharmaceutical industry. Economic/financial issues in delivering pharmaceutical services. prereq: 2nd year pharmacy student.

PHAR 6133. Pharmacy Practice Management. (3 cr.; A-F only; Every Spring) Principles of pharmacy management, including inventory control, purchasing, pricing, financial analysis, personnel management. prereq: 3rd year pharmacy student.

PHAR 6135. Pharmacy Outcomes. (2 cr.; A-F only; Every Spring) How to integrate knowledge of basic sciences, pharmacotherapy, pharmacy practice management, pharmaceutical care, written communication, literature evaluation, drug information retrieval, law/ethics, and pharmacoeconomics to manage patients with multiple medical conditions. prereq: 6123, 6175.

PHAR 6137. Ethics in Pharmacy Practice. (1 cr.; A-F only; Every Spring) Theories of ethics, ethical analysis of practical ethical issues experienced by pharmacists. Relationship of ethical reasoning to public policy and law. Readings from peer-reviewed publications and popular media. Case studies. prereq: 3rd yr pharmacy student.

PHAR 6150. CoP Honors: Medicinal Chemistry Seminar. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring) Current topics in medicinal chemistry. prereq: instr consent.

PHAR 6151. Biochemistry of Medicinals I. (3 cr.; A-F only; Every Spring) Biochemistry topics required for understanding pharmacodynamic action/therapeutic use of medicinal agents. prereq: 1st yr PHAR, 6171.


PHAR 6155. Medicinal Agents II. (2 cr.; A-F only; Every Spring) Chemical/biological properties and therapeutic uses of drugs affecting central nervous, endocrine, and intermediary metabolism systems. prereq: 6154, concurrent registration is required (or allowed) in 6174 and Phcl 5102.

PHAR 6156. Medicinal Agents III. (4 cr.; A-F only; Every Fall) Therapeutic properties/uses of antiviral, anti-infective, antineoplastic agents. prereq: 6151, 6141.

PHAR 6157. Human Nutrition and Drug Therapy. (3 cr.; A-F only; Every Spring) Basic concepts of human nutrition and clinical application. prereq: 6152.

PHAR 6158. Recombinant DNA-Derived Drugs. (1 cr.; A-F only; Every Spring) Biotechnology as it relates to basic clinical pharmaceutical sciences. Emphasizes recombinant DNA techniques and preparation/use of biotechnology-derived agents in diagnosing/treating disease. prereq: 6151.

PHAR 6160. CoP Honors: Experimental and Clinical Pharmacology Seminar. (1 cr.; A-F only; Every Fall & Spring) Selected topics in experimental/clinical pharmacology. prereq: instr consent.

PHAR 6164. Biopharmaceutics. (3 cr.; A-F only; Every Fall) Applied theory of dosage form design for optimal drug activity/bioavailability for all routes of drug administration. prereq: 6161, 6162, 6163.

PHAR 6174. Pharmaceutical Care Skills IV. (2 cr.; A-F only; Every Spring) Basic/clinical science curriculum in lab setting. Longitudinal care in lab setting. prereq: concurrent registration is required (or allowed) in 6122.

PHAR 6175. Pharmaceutical Care Skills V. (2 cr.; A-F only; Every Fall) Integrates basic/clinical science curriculum lab setting, prereq: concurrent registration is required (or allowed) in 6171, 6172, 6173, 6174, 6111, 6112 or instr consent.


PHAR 6182. Pharm.D. IV Seminar. (1 cr.; S-N only; Every Fall) Students present thesis topics to peers and faculty evaluators. prereq: 4th yr pharmacy student, 6181.

PHAR 6183. Pharm.D. IV Paper. (2 cr.; S-N only; Every Fall, Spring & Summer) Final paper describing hypothesis-driven research project, patient-care oriented project, management project, drug-usage evaluation, or extensive literature review. prereq: 6181.

PHAR 6203. College of Pharmacy Community Outreach. (1-2 cr.; max 3 cr.) Apply knowledge gained in classroom and teaching laboratories to community-based patient care activities. prereq: Current student pharmacist/College of Pharmacy.

PHAR 6205. Interprofessional Teamwork for the Health Professions. (1 cr.; A-F only; Every Fall) Interprofessional education that provides an introductory experience to interprofessional teamwork skills with a focus on patient-centered care, especially end of life care. prereq: Major in [public health or nursing or medicine or dentistry or social work or pharmacy].

PHAR 6208. Community-based Immunization Delivery. (1 cr.; S-N or Audit; Every Fall) Students will learn about, plan, and implement influenza immunization clinics.


PHAR 6212. Dermatology. (1 cr.; A-F or Audit; Every Fall) Pathophysiology/pharmacotherapy of dermatologic disorders. prereq: 3rd yr Pharmacy student.

PHAR 6217. Advanced Pharmaceutical Care Clinic. (1-2 cr.; Student Option; Every Spring)
Expanded, direct patient care opportunities. Students conduct comprehensive pharmacy care assessments in presence of practitioners. Weekly student case presentations/discussions. prereq: [6230] or 3rd yr pharmacy student

PHAR 6219. Building a Pharmaceutical Care Practice. (2 cr.; A-F only; Every Spring)
Initiating pharmaceutical care practice. Building personal practice plan. prereq: 2nd or 3rd year pharmacy student

PHAR 6220. Pediatric Drug Therapy. (2 cr.; A-F only; Every Spring)
Pathophysiology/therapeutics of disease states. Common issues encountered in providing pharmaceutical care to pediatric patients.

PHAR 6222. Advanced Pharmaceutical Compounding. (2 cr.; A-F only; Every Fall & Spring)
Expands skills gained in pharmaceutical care lab. prereq: 2nd or 3rd year pharmacy student

PHAR 6223. Pharmacokinetics Research Seminar. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring)
Evaluate literature in pharmacokinetics/pharmacodynamics/drug metabolism. prereq: 6163 with grade of “B” or better

PHAR 6224. Pharmacogenomics: Genetic Basis for Variability in Drug Response. (2 cr.; A-F only; Every Spring)
Theory/practice of pharmacogenomics. Principles of human genetics/genomics. Applications to scientific education, problems in drug therapy optimization, patient care. prereq: At least 3rd year or later in healthcare or related program or equivalent experience or instr consent

PHAR 6225. Interprofessional Diabetes Experience. (2 cr.; A-F only; Every Spring)
Diabetes mellitus through active, hands-on learning in interprofessional environment. Participate in week-long experience of living with diabetes. Online learning activities. prereq: 2nd year or later pharmacy student

PHAR 6227. Leading Adaptive Change. (2 cr.; S-N only; Every Fall)
Hands-on experience leading change initiative. Create vision for change, plan approach, implement plan, evaluate outcomes. Project focuses on area of pharmacy practice or education.

PHAR 6230. Ambulatory Pharmaceutical Care Clinic. (2 cr.; Student Option; Every Spring)
How to conduct pharmaceutical care assessments, for patients with actual drug-related needs, in a controlled clinic setting. prereq: Enrolled pharmacy student

PHAR 6231. Community Pharmacy Management. (2 cr.; A-F only; Every Spring)
Management techniques needed in community pharmacy practice. Emphasizes marketing/service.

PHAR 6232. Health System Pharmacy Management. (2 cr.; A-F only; Every Spring)
Management techniques needed in various institutional pharmacy settings. Integrating distributive/clinical components of institutional practice. prereq: 2nd or 3rd yr pharmacy student

PHAR 6233. Drug Use Review and Management. (2 cr.; A-F only; Every Fall)
Principles of drug use review in various health care settings. Optimizing quality, minimizing cost. prereq: 3rd year Pharmacy student

PHAR 6234. Pharmaceutical Economics and Public Policy. (2 cr.; A-F only; Every Spring)
Economic and public policy aspects of the U.S. health care system. Health economic principles and trends applied to the pharmaceutical market.

PHAR 6235. Pharmaceutical Industry: Business and Policy. (2 cr.; A-F or Audit; Every Spring)
Developing, manufacturing, distributing, economically evaluating, purchasing, managing, and ordering pharmaceuticals in health sector. Unique market characteristics, complex regulatory processes, rapid technological change, high expense growth, public policy issues.

PHAR 6236. Clinical/Pharmacy Management in Modern U.S. Health-Care and Regulatory Landscape. (2 cr.; A-F only; Every Fall)
This interactive course provides diverse introductory exposure to key non-traditional pharmacy topics within the broader, complex, and evolving US healthcare and managed care landscape. Class entails expertise and critical evaluation of clinical and pharmacy management topics such as utilization & care management, formulary, clinical planning, HEOR, healthcare policy and strategy, clinical account management, specialty pharmacy, Medicare, benefits consulting, pharmaceutical industry, business issues in managed care, and clinical pharmacy leadership. Relevant regulatory topics such as drug development are included as complementary topics, time permitting.

PHAR 6237. Leading Change in Pharmacy I. (2 cr.; S-N only; Every Fall)
Mini-curriculum. Leadership development, its relation to advancing the profession of pharmacy.

PHAR 6238. Leading Change in Pharmacy II. (2 cr.; S-N or Audit; Every Spring)
Mini-curriculum. Leadership development, its relation to advancing the profession of pharmacy.

PHAR 6249. Addiction Medicine, Substance Abuse, and Chemical Dependency. (2 cr.; A-F or Audit; Every Spring)
Addiction, chemical abuse, chemical dependency. How pharmacists can impact those affected. prereq: 2nd or 3rd yr Pharmacy student

PHAR 6250. CoP Honors: Social and Administrative Pharmacy Seminar. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring)
Current topics in hospital pharmacy. prereq: instr consent

PHAR 6260. CoP Honors: Pharmaceutics Seminar. (1 cr.; A-F or Audit; Every Fall & Spring)
Contemporary topics in pharmaceutics research. prereq: instr consent

PHAR 6293. Directed Research I. (1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Directed research in pharmacy practice, pharmaceutics, medicinal chemistry, or experimental and clinical pharmaceutical. prereq: instr consent

PHAR 6294. Directed Study I. (1-5 cr.; Student Option; Every Fall, Spring & Summer)
Directed studies in pharmacy practice, pharmaceutics, medicinal chemistry, or experimental or clinical pharmaceutical.

PHAR 6301. Veterinary Pharmacotherapy. (2 cr.; A-F only; Every Spring)
Pharmacotherapy of common medical conditions of small animals. prereq: 3rd year pharmacy student

PHAR 6393. Directed Research II. (1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Directed research in pharmacy practice, pharmaceutics, medicinal chemistry, or experimental and clinical pharmaceutical. prereq: instr consent

PHAR 6394. Directed Study II. (1-5 cr.; A-F or Audit; Every Fall, Spring & Summer)
Directed studies in pharmacy practice, pharmaceutics, medicinal chemistry, or experimental or clinical pharmaceutical.

PHAR 6493. Directed Research III. (1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Directed research in pharmacy practice, pharmaceutics, medicinal chemistry, or experimental and clinical pharmaceutical. prereq: instr consent

PHAR 6494. Directed Study III. (1-5 cr.; S-N only; Every Fall, Spring & Summer)
Directed studies in pharmacy practice, pharmaceutics, medicinal chemistry, and experimental or clinical pharmaceutical.

PHAR 6700. Becoming a Pharmacist. (2 cr.; S-N only; Every Fall)
Introduction to knowledge, skills, attitudes necessary for success in professional pharmacy curriculum/practice of pharmacy.

PHAR 6701. CoP Community Outreach. (0 cr.; No Grade Associated; Every Fall, Spring & Summer)
Teaching laboratories to community/clinic-based interprofessional patient care model.

PHAR 6702. Integrated Biochemical Sciences. (4.5 cr.; A-F only; Every Fall)
Foundation in structure/function of medicinals. Familiarize students with structural/physical properties of proteins, nucleic acids, lipids, carbohydrates, ligands/drugs. Basic concepts central to structure-function relationships of
PHAR 6704. Foundations of Social and Administrative Pharmacy. (2.5 cr.; A-F only; Every Fall)
Foundation for how one should think about rational use of drugs in system of care. Content/skills learned will be applied in subsequent courses continuing through 4th year of curriculum. Module focused on Drug Literature Evaluation (DLE). prereq: Successful completion of Becoming a Pharmacist (BaP)

PHAR 6706. Foundations of Pharmaceutical Care. (1.5 cr.; A-F only; Every Fall)
How pharmacist should think about rational use of drugs in caring for patients. Content/skills learned will be applied in/provide framework for all subsequent courses continuing through 4th year of curriculum/lifelong into practice. prereq: Successful completion of Becoming a Pharmacist (BaP)

PHAR 6708. Drug Delivery I. (2.5 cr.; A-F only; Every Fall)
Fundamental physicochemical principles applicable to dosage forms. Foundational scientific principles (continued in DDII) illuminated with examples of solution drug dosage forms. Concepts relevant to current/future dosage forms. prereq: Successful completion of Becoming a Pharmacist (BaP)

PHAR 6710. Pharmaceutical Care Skills Lab I. (2 cr.; S-N only; Every Fall)
Introduction to profession/building skills necessary to become competent, caring pharmaceutical care practitioner. Course consists of laboratory section and lecture. prereq: Successful completion of Becoming a Pharmacist (BaP)

PHAR 6715. Professional Development and Assessment Sequence I. (1 cr.; A-F only; Every Spring)
Knowledge acquisition. Career/professional development. prereq: Successful completion of Becoming a Pharmacist

PHAR 6716. Applied Pharmaceutical Care. (3.2 cr.; A-F only; Every Spring)
Common medical conditions/medications students are likely to encounter during their introductory pharmacy practice experiences (IPPEs). prereq: Successful completion of Becoming a Pharmacist

PHAR 6718. Drug Delivery II. (2.4 cr.; A-F only; Every Spring)
Builds on Drug Delivery I. Dosage forms, mostly solid/dispersed. Chemical kinetics, chemical stability, buffer systems, polymers/proteins, rheology. Physicochemical principles relevant to design, preparation, storage, use, efficacy, evaluation of pharmaceutical dosage forms. prereq: Successful completion of Drug Delivery I

PHAR 6720. Pharmaceutical Care Skills Lab II. (2 cr.; A-F only; Every Spring)
Part of pharmaceutical care learning center curriculum spanning six semesters. Introduction to profession. Begin building skills necessary to become competent/caring pharmaceutical care practitioner. prereq: Successful completion of Pharmaceutical Care Skills Lab I

PHAR 6722. Principles of Medicinal Chemistry. (2.1 cr.; A-F only; Every Spring)
Discipline of medicinal chemistry. Principles of drug design/drug metabolism. prereq: Successful completion of Integrated Biochemical Sciences

PHAR 6724. Immune System and Infectious Disease. (3.1 cr.; A-F only; Every Spring)
Immunological, epidemiological, pathogenic basis of viral, bacterial, protozoal, fungal, helminthic disease. Biological composition of vaccines/immuneologic response to live attenuated pathogens/microbial extracts. Chemical, cellular, biological principles of immune system, prereq: Successful completion of Integrated Biochemical Sciences

PHAR 6726. Principles of Pharmacology. (2.3 cr.; A-F only; Every Spring)
Builds on information in basic science courses offered in first semester of PharmD program. Foundational content necessary for comprehension/application of all subsequent pharmacotherapy modules that require application of pharmacological concepts/knowledge. prereq: Successful completion of Foundations of SApH

PHAR 6728. Pharmaceutical Calculations. (0.7 cr. [max 3.1 cr.]; A-F only; Every Fall)
Accurately performing pharmaceutical calculations is a critical component of patient care in every pharmacy practice environment. Calculations contribute just as much to good patient outcomes as the newest methods and guidelines for diagnosis, treatment, and prevention. The challenge of pharmacy calculations lies not in the cutting edge of science or their mathematical complexity, but in the need for consistent accuracy to prevent patient harm and possible fatality. To obtain this level of accuracy, an understanding of methods and deliberate, undivided attention to detail is required. Students must understand and master the basic concepts of pharmaceutical calculations with organization, consistency, and accuracy in order to provide optimal care to their future patients every day. Students should be committed to becoming a competent generalist practitioner who assumes responsibility and is willing to be held accountable for their patients’ medication outcomes, prereq: enrolled in the Pharm.D. program, successful completion of Phar 6700

PHAR 6730. Career and Professional Foundations II. (0.5 cr.; S-N only; Every Fall)
Emphasis on reinforcing, supporting, developing, assessing competencies/skills exercised in multiple courses. Includes work in career/professional development, prereq: PDC concurrent registration is required (or allowed) in A I

PHAR 6732. Medicinal Chemistry and Pharmacology of Cardiovascular Agents. (2.3 cr.; A-F only; Every Fall)
Builds upon foundational concepts learned in Principles of Pharmacology/Principles of Medicinal Chemistry, applies them to drug classes primarily used for treatment of cardiovascular diseases. prereq: Principles of Pharmacology, Principles of Medicinal Chemistry

PHAR 6734. Cellular Metabolism and Nutrition. (2.8 cr.; A-F only; Every Fall)
Basic principles of intermediary metabolism/how such processes are used by body. Basic nutrients used by body/their roles as OTC products in community pharmacies. prereq: Integrated Biochemical Sciences

PHAR 6736. Cardiovascular Pharmacotherapy. (1.9 cr.; A-F only; Every Fall)
Key topics critical to preparing generalist practitioner to have input on optimizing care of patients with common conditions such as hypertension, dyslipidemia, ischemic heart disease (angina, acute myocardial infarction) supraventricular arrhythmias (atrial fibrillation), chronic heart failure. prereq: All PharmD year one coursework, Physiology Competency Exam

PHAR 6738. Pharmacokinetics. (3.7 cr.; A-F only; Every Fall)
Designed to give generalist practitioners fundamental skills to solve pharmacokinetically-based problems in patient care, particularly in regards to dosage regimen design/adjustment. Builds on concepts learned in Drug Delivery I/II. Follows path of drug molecule from incorporation into dosage form to release/disposition in biological system. prereq: Drug Delivery I concurrent registration is required (or allowed) in II

PHAR 6740. Pharmaceutical Care Skills Lab III. (2.0 cr.; S-N only; Every Fall)
Designed for second year pharmacy students to continue to build skills necessary to become pharmaceutical care practitioner. Laboratory section/discussion. prereq: Pharmaceutical Care Skills Lab I concurrent registration is required (or allowed) in II, Applied Pharmaceutical Care

PHAR 6742. Evidence based problem analysis I. (1 cr.; S-N only; Every Spring)

PHAR 6745. Professional Development and Assessment III. (0.5 cr.; A-F only; Every Spring)
For the second year of the Professional Development and Assessment Sequence, the emphasis is on knowledge comprehension. Class includes work in career and professional development. prereq: Successful completion of Professional Development and Assessment I concurrent registration is required (or allowed) in II

PHAR 6748. Biopharmaceutics. (2.6 cr.; A-F only; Every Spring)
Biopharmaceutics is the final course in a four-course sequence that comprises the
Curriculum in pharmacetics. Biopharmaceutics integrates core knowledge obtained in the previous three courses (Drug Delivery I & II and Pharmacokinetics), and also relies on general knowledge in anatomy, physiology, mathematics, general chemistry, and pharmacology. Prerequisites: Courses and/or content: Calculus, thermodynamics, viscosity, sedimentation, diffusion, chemical kinetics, novice to developing level understanding of dosage forms, developing understanding of pharmacokinetics/pharmacodynamics, physiology, general chemistry, physics, biochemistry, enzyme kinetics, and metabolic pathways. It is strongly recommended that students review course materials in Drug Delivery I concurrent registration is required (or allowed) in II and Pharmacokinetics as well as anatomy, physiology, calculus, and physics with consideration of the application of the concepts to the delivery of drugs to patients.

**PHAR 6750. Pharmaceutical Care Skills Lab IV.** (2 cr.; A-F only; Every Spring) This course is designed for second-year pharmacy students to continue to build the skills necessary to become a competent, caring pharmaceutical care practitioner. Prerequisites: Students must have successfully completed Pharm Care Skills 1, 2, and 3, and Applied Pharmaceutical Care. Students must be concurrently registered in all required PD2 courses in order to have the content required to complete integrated activities. e.g., students must be enrolled in Diabetes in order to successfully complete the patient care sequence utilizing diabetes content in this course. Exceptions may be made on a case by case basis.

**PHAR 6752. Integrated Endocrinology.** (2.1 cr.; A-F only; Every Spring) This course will integrate all pertinent endocrinology topics (excluding diabetes) into one course. Specifically, the pathophysiology, medicinal chemistry, pharmacology and the therapeutic application of the knowledge covered will be integrated in an approach through specific modules. All major endocrine pathways will be taught including: hypothalamic/pituitary, steroids, female sex hormones, hormonal contraception, menopause/hormone therapy, bone health, male gonadal hormones, drugs in pregnancy and lactation, sexual dysfunction and thyroid hormone. Prerequisites: Students will need to have successfully completed: Cellular Metabolism/Nutrition, Cardiovascular Pharmacotherapy, Pharmaceutical Care Skills Labs 1-3. Students will be concurrently enrolled in Kidney, Fluids, and Electrolytes, and Diabetes and Metabolic Syndrome. Students should be able to describe the function of the overall endocrine systems and the multiple roles of hormones in the body.

**PHAR 6754. Diabetes and Metabolic Syndrome.** (2.1 cr.; A-F only; Every Spring) In this course, students will learn the principles of the pathophysiology of diabetes, pharmacology of the diabetic agents, evaluate key research on diabetes, interpret and apply clinical guidelines for diabetes, assess socioeconomic aspects of diabetes, and apply this information to patient cases. Special populations with diabetes will also be discussed including pediatric, gestational, and geriatric diabetes. Students will also learn the pathophysiology of metabolic syndrome, pharmacology of obesity treatments, nonpharmacological and pharmacological ways to treat metabolic syndrome, including the implications of bariatric surgery on use of pharmacologic agents in general, and apply this information to patient cases. Prerequisites: Students will need to have successfully completed: Molecular Metabolism/Nutrition, Cardiovascular Pharmacotherapy concurrent registration is required (or allowed) in Pharmaceutical Care Skills Lab 1-3. Students should be able to describe the physiology of insulin action, incretin hormones, amylin, and the fasting and fed states. Students should be able to describe how insulin is designed and manufactured. Students should be able to describe the following biochemistry topics: carbohydrate metabolism and lipid metabolism, and protein. Students should be able to assess a patient and determine most appropriate pharmacotherapy treatment options for a patient's hypertension and dyslipidemia treatments, including ability to describe, interpret and apply evidence-based guidelines. Students should be able to describe how nutrition impacts energy production, utilization and storage, and obesity. Students need to be able to describe the caloric content of carbohydrates, proteins and lipids and be able to apply that knowledge to reading food labels and evaluating a patient's nutritional status.

**PHAR 6756. Kidney, Fluid, and Electrolytes.** (2.1 cr.; A-F only; Every Spring) About 75% of new cases of chronic kidney disease (CKD) are due to diabetes and hypertension. Patients with CKD often experience congestive heart failure and anemia. In addition, the kidney is the main excretory route for many drugs. Thus, this course offers an opportunity to integrate material learned in previous and concurrent courses. In this course, students will learn key concepts and develop specific skills in the management of common fluid and electrolyte single acid/base disorders and in prevention and management of chronic kidney disease and associated conditions. Prerequisites: Students must have completed the following courses successfully: Applied Pharmaceutical Care, Foundations of Social and Administrative Pharmacy, - Medicinal Chemistry and Pharmacology of Cardiovascular Agents, - Pharmacokinetics, - Cardiovascular Pharmacotherapy, - Cellular Metabolism and Nutrition See the course syllabus for more detailed prerequisites.

**PHAR 6758. Pulmonary Pharmacotherapy.** (1.1 cr.; A-F only; Every Spring) This course will provide students with the requisite pathophysiology and pharmacotherapeutic knowledge to care for patients with common pulmonary diseases. It will integrate concepts of pediatric and geriatric pulmonary dosing and infectious diseases. Prerequisites: Students must have completed the following courses successfully: Applied Pharmaceutical Care - Foundations of Social and Administrative Pharmacy - Medicinal Chemistry and Pharmacology of Cardiovascular Agents - Pharmacokinetics, - Cardiovascular Pharmacotherapy - Cellular Metabolism and Nutrition. See the course syllabus for more detailed prerequisites.

**PHAR 6760. Career and Professional Foundations IV.** (0.5 cr.; S-N only; Every Fall) For the third year of the Professional Development and Assessment sequence, the emphasis will be on deeper exploration into career options, as well as the tools needed for contemporary pharmacy practice. Students will have the opportunity to engage with their peers as well as practicing pharmacists as they learn about the expectations of contemporary professional practice. Prerequisites: PHAR 6715, 6730, 6745

**PHAR 6762. Medicinal Chemistry and Neuropharmacology.** (2.8 cr.; A-F only; Every Fall) Neuropharmacology and Medicinal Chemistry of Neurological Treatments builds upon the foundational concepts learned in Principles of Pharmacology and Principles of Medicinal Chemistry, and applies them to drug classes primarily used for the treatment of central nervous system (CNS) and peripheral nervous system (PNS) dysfunction. Prerequisites: PHAR 6722, 6726, and 6732

**PHAR 6766. Biotechnology-Derived Drugs.** (1 cr.; A-F only; Every Fall) Biotechnology-derived drugs are where the future is, and pharmacy students need to understand how they are made, how they act and what special considerations are involved. This course will provide the foundational knowledge necessary to dispense current biotechnology-derived drugs and provide the basis for self-education needed to understand the biotechnology-derived drugs of the future. Prerequisites: PHAR 6702, 6722, 6726, 6724, 6734, and 6752

**PHAR 6768. Infectious Diseases.** (3 cr.; A-F only; Every Fall) Course will focus on the pharmacology, pharmacokinetics, and pharmacodynamics of antibiotics and the pharmacotherapy of infectious diseases. Prerequisites: PHAR 6702, 6706, 6718, 6724, 6736, 6738, 6748, 6756, 6758

**PHAR 6770. Pharmaceutical Care Skills Lab V.** (2 cr.; S-N only; Every Fall) This course is designed for third year pharmacy students to continue to build the skills necessary to become a competent, caring pharmaceutical care practitioner. The course consists of two components: a laboratory section and a discussion. Prerequisites: Pharmaceutical Care Skills Labs I, II, III, and IV, and Applied Pharmaceutical Care.

**PHAR 6772. Topics in Pharmacotherapy.** (1.6 cr.; A-F only; Every Fall) Course provides students with the pharmacologic, pharmacotherapeutic, and pharmaceutics knowledge they need to understand therapies for dermatologic, gastrointestinal, and genitourinary conditions.
and arthritis and gout. Prepares future generalist pharmacists to be knowledgeable about common conditions of aforementioned topics and appropriate pharmacotherapy options for treatment. It will focus primarily on pharmacotherapy, but will have an overview of pathophysiology of these conditions. Students will be expected to apply knowledge to design and monitor a patient-centered pharmaceutical care plan and to appropriately educate patients regarding proper use of medications covered in the course. This course prepares students to identify clinically relevant information in the modern healthcare setting, learn it at a depth beyond memorization, and apply and interpret its application to relevant patient case vignettes. prereq: All required PharmD year two coursework

PHAR 6774. Pharmacotherapy of Neurological and Psychiatric Disorders. (3.1 cr. ; A-F only; Every Fall) Course prepares future generalist pharmacists to be knowledgeable about common psychiatric and neurologic disorders and about the appropriate use of medications used to treat them. Course primarily focuses on the pharmacotherapies used to treat psychiatric and neurologic disorders. This course will additionally provide an overview of the presentation and pathophysiology of specific psychiatric and neurologic disorders. an overview of the differences between the practices of psychiatry and neurology and a discussion of stigmas associated with mental illness. An overview of non-pharmacologic therapies will be introduced to the extent relevant to the generalist pharmacists. At the conclusion of the course students will be expected to apply knowledge learned in the course in order to design and monitor a pharmacotherapeutic plan for specific patients and to appropriately counsel patients regarding proper use of the various psychiatric and neurologic medications covered in the course. prereq: All required PharmD year two coursework

PHAR 6775. Pharmacy Law. (; 0.7 cr. [max 1 cr.]; A-F only; Every Spring) The course covers both federal and state laws that impact and regulate the practice of pharmacy including federal regulation of medications, regulation of controlled substances, and the Minnesota Pharmacy Practice Act. The course will be offered entirely online.

PHAR 6780. Evidence Based Problem Analysis II. (0.8 cr. [max 1 cr.]; S-N only; Every Fall) Third year PharmD students practice skills necessary to provide peer review and prepare written and verbal presentations of inquiries/investigations to peers. prereq: Phar 6700, 6704, 6706, 6742

PHAR 6784. Integrated Oncology. (2.8 cr. ; A-F only; Every Spring) This course focuses on the etiology and molecular biology of tumorigenesis, medicinal agents, and pharmacology of antineoplastic agents, treatment of the most common cancers, supportive care of the patient with cancer, and social and ethical considerations of the treatment of the patient with cancer including end of life directives. prereq: PD3 in good academic standing, students will find it helpful to review the following topic areas: Principles of Biochemistry (Lipids [Structure/Function]), Proteins [Folding/Conformation]), Cellular Physiology Molecular Biology, Genetics (Cell Biology [signal transduction, DNA replication, transcription, protein translation, cell cycle, apoptosis], Immunology, Tumorigenesis, Angiogenesis, Genetics principles, Anatomy/Physiology [GI tract, pulmonary, hormone and feedback regulation])

PHAR 6786. Acute Patient Care Pharmacotherapy. (3.4 cr. ; A-F only; Every Spring) Course prepares students to approach patients with multiple medical problems and the dynamic changes that patients can experience in the acute care settings. Students will then learn about the pharmacotherapy approach related to managing those disease states/conditions. Students will be expected to develop therapeutic plans for patient case scenarios at the onset of a hospital admission as well as additional problem that could present over the course of a hospitalization or result in readmission. Additional scenario problems will be incorporated into the cases as the course progresses, and the cases and problems will become more complex. By the end of the course, students will have had an opportunity to address multiple medical problems and make pharmacotherapy decisions and will be evaluated based on those decisions. Knowledge gained in this course will prepare students for the APPE acute care/institutional rotation. prereq: successful completion of all 1st year, 2nd year, and fall 3rd year coursework

PHAR 6799. Being a Pharmacist. (0.1 cr. ; S-N only; Every Spring) The Pharm.D. curriculum at the University of Minnesota is anchored by the basic, clinical, and social sciences relevant to the practice of pharmacy. This course serves as a culmination of academic and intellectual expression of the basic, clinical, and social pharmaceutical sciences and connects them to pharmacy practice. Future growth in knowledge and skill of our graduates/practitioners will predominantly occur through collegial exchange and conference-based learning environments. Being A Pharmacist will model how our students will continue to grow in knowledge and skill as they enter practice. In this course, students will be encouraged to think critically, reflect, and apply their skills.

PHAR 6800. Rehabilitation Pharmacotherapy. (; 2 cr. ; A-F only; Every Summer) The goal of this course is to equip physical therapy students with a general understanding of the impact of medications on rehabilitation and how rehabilitation affects medication use. Students will practice applying content through patient cases and writing a patient care plan. This is a completely online course with weekly due dates offered each summer term. For more information, contact phar6800@umn.edu or 612-624-7976.

PHAR 6900. Curricular Studies for Internship and Pharmacy Employment. (1 cr. [max 4 cr.]; S-N only; Every Fall, Spring & Summer) This course is designed for students pursuing an internship or pharmacy-related employment to receive course credit (typically for visa requirements). The course does NOT count toward elective credit requirements. If applicable, students must remain visa compliant and are solely responsible for doing so. The vast majority of the course is the hours a student spends at their internship/employment site. A written assignment is required at the end of the course. Students will meet once during the semester, which is arranged with instructors.

PHAR 6901. Pharmaceutical Care Experience. (1 cr. ; S-N only; Every Spring) The Pharmaceutical Care Experience builds on Foundations of Pharmaceutical Care and provides an early opportunity to practice pharmaceutical care in a primary care clinic setting. This elective will allow students to assess each patient’s unique medication experience and drug-related needs through patient interviews. Students will use this information to develop a patient-centered care plan under the guidance of a practitioner mentor. The pharmaceutical care process will be applied and assessed in all future coursework, including, but not limited to, pharmacotherapy patient case work-ups, applied learning in the Pharmaceutical Care Learning Center, and during experiential education experiences.

PHAR 6902. Foundations for Integrative Mental Health and Psychiatric Practice. (; 2 cr. ; A-F only; Every Fall) This course is designed to allow students to examine concepts, theories, and paradigms foundational to psychiatric/mental health practice and interprofessional integrative mental health care. Students develop clinical interviewing methods that elicit a client’s health narrative and facilitate the therapeutic relationship. Students also practice techniques...
that promote beginning skills important in reflective clinical practice. The course is primarily online, with 3 required 3-hr patient care simulations. There will be content posted on the course website for student learning. Activities and assessments include quizzes, patient scenario cases, reflective papers (upon re-watching the video of their interactions with the interprofessional teams and standardized patients during the simulation sessions), and individual and interprofessional group.

Pharmacy students need to be PD3 students committed to earning the Interprofessional Integrative Mental Health Focus Area designation. We ask pharmacy students to commit to the entire series (fall and spring electives, and mental health APPE).

PHAR 6903. Assessment and Management of Psychiatric Disorders. (2 cr.; A-F only; Every Spring)
This course is designed to allow students to apply advanced concepts from integrative mental health theory and research, social sciences, neuropsychology, and neurophysiology in the differentiation and explanation of psychiatric symptoms and disorders across the age continuum.

PHAR 6906. Introduction to Pharmacy Research. (1 cr.; A-F only; Every Spring)
Overview of principles to research in particular topic areas. Forum for scientists involved in research in particular topic areas to discuss research, environment, careers with students. Prereq: consent of course director.

PHAR 6908. Drugs of Abuse. (2 cr.; S-N only; Spring Odd Year)

PHAR 6913. The Science and Spirit of Wellbeing. (; 1 cr.; A-F only; Every Spring)
Care, in general, and healthcare in particular, requires a certain degree of wellbeing on the part of the provider. This elective survey course introduces students to evidence-based wellbeing. The course explores individual wellbeing as well as implications for practice and the health and wellbeing of others. Prereq: instr consent.

PHAR 6937. Foundations of Leadership. (2 cr.; A-F only; Every Fall & Spring)
Leadership development/its relation to advancing the profession of pharmacy. Prereq: PDI II or PDIII Pharmacy student.

PHAR 6938. Developing Adaptive Leadership. (1 cr.; A-F only; Every Spring)

PHAR 6939. Leading Change Experience I. (2 cr.; S-N only; Every Fall)
In collaboration with a faculty advisor, students implement a change that requires adaptive leadership. Work will focus on building a "short term win" and a team that can continue efforts into the future. Students will also gain experience in collecting and managing data to assist the change process (e.g., needs assessment and/or outcomes assessment). In addition, working with their faculty advisor, students will create and implement an individualized plan for their own personal leadership development. Students will also gain experience in supporting the leadership development of others. To support individualized development, a leadership networking partner (pharmacist) is assigned and periodic networking events and/or meetings are held. Prereq: PHAR 6937 and 6938.

PHAR 6940. Leading Change Experience II. (2 cr.; S-N only; Every Spring)
Continues leading change and development work initiated in Leading Change Experience I. During this term, students continue with their networking partners, present their leading change work, facilitate transition of the work to new leaders, conduct a critical appraisal of their leadership development, and support second year students as they initiate their projects. This term will also encourage their roles into shifting from personal development to the development of others. Assisting in a mentoring role in several capacities 1) transitioning new leaders into the leading change experience and 2) providing guidance, ideas and encouragement to those students interested in change initiatives. Prereq: PHAR 6937 and 6938.

PHAR 6941. Leadership Best Sellers for Pharmacists. (2 cr.; A-F only; Every Fall & Spring)
Part of the leadership track in pharmacy.

PHAR 6942. Leadership Capstone. (; 2 cr.; S-N only; Every Fall, Spring & Summer)
Supports completion of Leadership Empathy Designation. Documentation/self-reflection of leadership learning experiences pursued inside/outside of classroom. Prerequisites: This course is for students who are in the fourth year of the Leadership Emphasis Area. Successful completion of PHAR 6937, 6938, 6939 and 6940. Completion or concurrent enrollment in 6941 (Leadership Best Sellers).

PHAR 6961. Women's Health. (2 cr.; A-F or Audit; Every Fall & Spring)
During this course, students will have the opportunity to actively learn and discuss women's health issues taught in the core curriculum to a greater extent. The core curriculum focuses on the pharmacotherapy around women's health, we will focus on the patient's perspective, pathophysiology, and other quality care considerations specific to women including cultural, religious, psychosocial, and socioeconomic factors effecting health. Health topics will range from social issues to menstrual health, breast cancer to eating disorders, with a specific focus on preparing students for professional practice and the pharmacist's role. Prereq courses: Endocrinology pharmacotherapy sequence in the PD2 year; prereq topics: Contraceptive agents, emergency contraception, hormonal contraception.

PHAR 6962. Ethics in Pharmacy Practice. (2 cr.; A-F only; Every Spring)
Ethical principles, selected schools of ethical thought. Students discuss/debate ethical dilemmas in pharmacy practice/health care. Prereq: Pharm.D. 3rd year student.

PHAR 6964. Clinical Toxicology. (1 cr.; A-F only; Every Spring)
This course will cover the clinical signs/symptoms, general management and treatment of poisonings and toxicologic emergencies that are not covered in the main curriculum. It will also cover decontamination and laboratory principles associated with poisonings and toxicologic emergencies. This class will be comprised of lecture format presentations. Students will be given 1 hour to complete the final exam and midterm. Prereq: All students will have successfully completed the first year professional pharmacy program, as well as successfully completed fall semester of the second year. All students will have also successfully completed or be in the process of completing anatomy, physiology, pathophysiology, and pharmacology. The student is responsible for this material to the extent necessary as a framework for toxicologic therapeutics. Thus, students are encouraged to review basic anatomy and physiology and specifically encouraged to review the selection of the pharmacology textbook relevant to the classes of drugs covered.

PHAR 6966. Food Medicine: Contemporary Issues. (1 cr.; Student Option No Audit; Every Fall & Spring)
Food contributes to the prevention, and conversely, the development of disease processes. In order to better understand the interrelatedness of food and health, this course offers a critical perspective on how the ubiquity of food, race, class, gender, and indigence; colonization and corporatization affect people's food experiences; and subsequently, individual and population health. Students will examine modern food systems and describe implications for social determinants of health, health promotion, chronic disease management and IP collaborative practice. We will address questions such as: How do food systems impact our health? What makes food a political and environmental issue? Are we what we eat? Why do we categorize things that are not food as food? What is food sovereignty?

PHAR 6968. Critical Care. (1 cr. [max 2 cr.]; A-F only; Every Spring)
Critical Care is an elective that consists of two main components: a faculty/clinician presentation on an important topic to contemporary critical care practice, followed by student evaluation and presentation on a selected primary literature topic that applies and integrates the presentation with current practice challenges. Key topics that are covered include discussion of the Surviving Sepsis Guidelines with discussion on the role of corticosteroids, identification and management of the anxious or delirious ICU patient, and application of the updated PAD guidelines, systems of the second 50-minute a student (or pair of students) present the faculty-selected study using PowerPoint slides, and encourage group discussion of the paper's merit and application to current critical care practice or future research.
PHAR 7002. Early Pharmacy Practice Experience II. (1 cr.; A-F only; Every Spring) Patient perspective in managing/living with chronic conditions/chronic medication use. Community-based instruction, mentoring program, prerequisite: 7001 or instructor consent, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7003. Early Pharmacy Practice Experience III. (0.5 cr.; A-F only; Every Fall) Third in series of four courses. Patient perspective in managing/living with chronic conditions/chronic medication use. Community-based instruction, mentoring program, prerequisite: 7001 or instructor consent, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7004. Early Pharmacy Practice Experience IV. (0.5 cr.; A-F only; Every Spring) Patient perspective in managing/living with chronic conditions/chronic medication use. Community-based instruction, mentoring. Upcoming patient care opportunities, prerequisite: 7001 or instructor consent, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7005. Introductory Community-Practice Pharmacy Experience. (2.5 cr.; S-N only; Every Spring) Experience in patient care at community practice setting. Three weeks, 40 hours/week. prerequisite: 6111, 6171, 7001, 1st year pharmacy student

PHAR 7006. Introductory Institutional-Pharmacy Practice Experience. (2.5 cr.; S-N only; Every Spring) Experience in patient care in hospital setting. Three-week, 40 hours/week. prerequisite: College of Pharmacy student completed 6121, 6122, 6131, 6132, 6173, 6174, 7003 and 7004 with passing grade, registered with Minnesota Board of Pharmacy as intern

PHAR 7010. APPE Continuing Professional Development Portfolio. (1.5 cr.; S-N only; Every Spring) Continuing professional development. Systematic maintenance, development, and broadening of knowledge, skills, and attitudes. Students self-assess performance/learning needs and create/monitor/evaluate a learning plan. Documentation for peer review/support, regulatory review. prerequisite: 3rd yr pharmacy student

PHAR 7128. Acute Patient Care Practice Experience II. (4 cr.; A-F only; Every Fall, Spring & Summer) Experience in an inpatient setting. Students responsible for all drug-related needs of individual patients. Full-time for five weeks. prerequisite: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7213. Elective Practice Experience III. (4 cr.; A-F only; Every Fall, Spring & Summer) Experience in inpatient or outpatient pharmacy practices where direct patient contact occurs for 5 weeks, or experience in non-patient care setting. Sites vary widely from governmental agencies to pharmacy associations to specialized practices for 5 weeks, prerequisite: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7214. Elective Practice Experience IV. (4 cr.; A-F only; Every Fall & Spring) Experience in inpatient or outpatient pharmacy practices where direct patient contact occurs for 5 weeks, or experience in non-patient care setting. Sites vary widely from governmental agencies to pharmacy associations to specialized practices for 5 weeks, prerequisite: Pharm.D. IV, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7217. Elective Practice Experience V. (4 cr.; A-F or Audit; Every Summer) Experience in inpatient or outpatient pharmacy practices where direct patient contact occurs for 5 weeks, or experience in non-patient care setting. Sites vary widely from governmental agencies to pharmacy associations to specialized practices for 5 weeks, prerequisite: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity

PHAR 7310. Introduction to Community Health and Interprofessional Engagement. (1 cr.; S-N only; Every Fall) Course builds on content learned in Becoming a Pharmacist to provide students with fundamental knowledge, skills, and attitudes required of competent, caring general pharmacist practitioners. Content is integrated with concurrent first year didactic courses and prepares students for Pre-APPE. prerequisite: Successful completion of Becoming a Pharmacist (BaP)

PHAR 7325. Introductory Community-Practice Pharmacy Experience. (3 cr.; S-N only; Every Summer) The purpose of the Community IPPE is to introduce you to the fundamentals of pharmacy practice and developing professional attitude and behavior in the community pharmacy setting. The course will build upon knowledge gained in the first year didactic curriculum, specifically Foundations of SAPh and Foundations of Pharmaceutical Care. The format of the IPPE course includes: in person, online and an experiential components. The experiential component is a combination of observation, application of current knowledge, and feedback and assessment between you, the preceptor, and others. prerequisite: College of Pharmacy students must complete PHAR 6700 (Becoming a Pharmacist), 6706 (Fundamentals in Pharmaceutical Care), 6716 (Applied Pharmaceutical Care), 6728 (Pharmaceutical Calculations), 6710 (Pharmaceutical Care Skills Lab 1), 6720 (Pharmaceutical Care Skills Lab 2), 6704 (founding of SAPh), 6730 (first year seminar), 6718 (drug delivery), 6722 (med chem), 6726 (pharmacology) with a passing grade. You must be registered with the Minnesota Board of Pharmacy as an intern prior to the onsite experiential component of this course.

PHAR 7330. Community Teachers I. (0.4 cr.; S-N only; Every Fall) EPHECT is a service learning experience which pairs second year students with a volunteer Community Teacher (CT). Students develop a working/professional relationship with their CT and learn from CT's health and life experiences. Students will work with their CT to choose and complete activities unique to each CT's health profile. CTs benefit by gaining better understanding of their health by discussing and evaluating their health profile with professional students. CTs will also better understand the pharmacist's role in healthcare. prerequisite: Students must have completed or be currently enrolled in the following courses: Becoming a Pharmacist, Foundations of Pharmaceutical Care, Applied Pharmaceutical Care, Pharmaceutical Care, Pharmaceutical Skills Lab I and II

PHAR 7340. Community Teacher Experience II. (0.4 cr.; S-N only; Every Spring) EPHECT is a service learning experience which pairs second year students with a volunteer Community Teacher (CT). Through this course students develop a working/professional relationship with their CT and learn from their CT's health and life experiences. Students
will work with their CT to choose and complete activities unique to each CT’s health profile. prereq: Students must have completed or be currently enrolled in the following courses: Becoming a Pharmacist, Foundations of Pharmaceutical Care, Applied Pharmaceutical Care, Pharmaceutical Skills Lab I, II, and III, EPHECT I, and Foundations of SAPh.

PHAR 7345. Introductory Institutional-Practice Pharmacy Experience. (3 cr. ; S-N only; Every Summer) The purpose of the Institutional IPPE is to introduce students to the fundamentals of pharmacy practice in the institutional pharmacy setting. The course will build upon knowledge gained in the first two years of the didactic curriculum. The student will spend 120 hours at the institutional site with their preceptor (who is approved by the MN BOP) and the College. An Additional 36 hours is allocated between assignments and online course materials. prereq: Students must have successfully completed Pharm 7325 (Community IPPE), Pharm 6730 (Professional Development and Assessment II), Pharm 6736 (Cardiovascular Pharmacotherapy), Pharm 6738 (Pharmacokinetics), Pharm 6740 (Pharmacological Skills III), Pharm 6742 (Colloquium I: Scholarly Presentation Skills). Students must be enrolled concurrently in PD2 Spring semester courses. Students must also be registered interns in the state of Minnesota.

PHAR 7401. Acute Patient Care Practice Experience. (12 cr.; S-N only; Every Fall, Spring & Summer) Experience in an inpatient setting. Students responsible for drug-related needs of individual patients. Full-time for twelve weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. IV, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7411. Ambulatory Patient Care Practice Experience I. (5 cr.; S-N only; Every Fall, Spring & Summer) Experience in an ambulatory setting. Students responsible for drug-related needs of individual patients. Full-time for twelve weeks. prereq: Pharm.D. IV, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. IV, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7412. Ambulatory Care II. (5 cr.; S-N only; Every Fall, Spring & Summer) Experience in an ambulatory setting. Students responsible for drug-related needs of individual patients. Full-time for twelve weeks. prereq: Pharm.D. IV, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7413. Community Pharmacy Practice Experience. (5 cr.; S-N only; Every Fall, Spring & Summer) Students assigned to participating community pharmacies. Community practice activities full-time for 5 weeks. prereq: Pharm.D. IV, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7421. Elective Practice Experience I. (5 cr.; S-N only; Every Fall, Spring & Summer) Experience in patient or outpatient pharmacy practices where direct patient contact/ care occurs for five weeks, or experience in non-patient care setting. Sites vary from governmental agencies to pharmacy associations to specialized practices for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7422. Elective Practice Experience II. (5 cr.; S-N only; Every Fall, Spring & Summer) Experience in patient or outpatient pharmacy practices where direct patient contact/ care occurs for five weeks, or experience in non-patient care setting. Sites vary from governmental agencies to pharmacy associations to specialized practices for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7431. Elective Experience 1. (5 cr.; S-N only; Every Fall, Spring & Summer) Patient care experience in any setting. Students responsible for drug-related needs of individual patients. Full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7432. Elective Experience 2. (5 cr.; S-N only; Every Fall, Spring & Summer) Patient care experience in any setting. Students responsible for drug-related needs of individual patients. Full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, negative Mantoux test (or explanation of positive test), chicken pox immunity.

PHAR 7433. Elective Experience 3. (5 cr.; S-N only; Every Fall, Spring & Summer) Patient care experience in any setting. Students responsible for drug-related needs of individual patients. Full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, full-time for five weeks. prereq: Pharm.D. I-III, MN Board of Pharmacy intern, criminal background check, BLS CPR certification, proof of negative Mantoux test [or explanation of positive test], proof of chicken pox immunity.

PHARMACY SUMMER RESEARCH (PHRM)

PHRM 4999. Pharmacy Summer Research. (0 cr.; No Grade Associated; Every Summer) Pharmacy Summer Research.

PHIL 1001. Introduction to Logic. (MATH; 4 cr.; Student Option; Every Fall, Spring & Summer) Application of formal techniques for evaluating arguments.

PHIL 1002W. Introduction to Philosophy. (AH.WI; 4 cr.; Student Option; Every Fall & Spring) Problems, methods, historical/contemporary schools of philosophy.

PHIL 1003W. Introduction to Ethics. (CIV.WI; 4 cr.; Student Option; Every Fall & Spring) Are values/principles relative to our culture? Is pleasure valuable? Are there any absolute rules? These questions and others are addressed through critical study of moral theories.

PHIL 1004W. Introduction to Political Philosophy. (AH.WI.CIV; 4 cr.; Student Option; Every Fall & Spring) Central concepts, principal theories of political philosophy.

PHIL 1005. Scientific Reasoning. (4 cr.; Student Option; Every Fall) How does science work? What is scientific method? How to evaluate scientific information in popular media or specialized publications, especially when it relates to technology used in everyday life? General reasoning skills. prereq: [1st or 2nd] yr student or instr consent.

PHIL 1005H. Scientific Reasoning. (4 cr.; Student Option; Every Fall) How does science work? What is scientific method? How to evaluate scientific information in popular media or specialized publications, especially when it relates to technology used in everyday life? General reasoning skills. prereq: [1st or 2nd] yr honors student or instr consent.

PHIL 1006W. Philosophy and Cultural Diversity. (AH.WI.DSJ; 4 cr.; Student Option; Every Fall & Spring) Central problems/methods of philosophy through culturally diverse texts. Focus is critical/comparative, reflecting range of U.S. philosophical traditions.

PHIL 1007. Introduction to Political Philosophy Practicum. (1 cr.; Student Option; Every Fall & Spring) Students do at least two hours a week of community service and connect their service activities in writing to issues discussed in 1004. prereq: concurrent registration is required (or allowed) in 1004W.

PHIL 1026W. Philosophy and Cultural Diversity. (AH.WI.DSJ; 3 cr.; Student Option; Every Summer) Central problems/methods of philosophy through culturally diverse texts. Focus is critical/comparative, reflecting a range of U.S. philosophical traditions.

PHIL 1201. Critical Reasoning. (4 cr.; Student Option; Every Spring) In this course, much of our focus will be on what makes reasoning good or bad. We will...
PHIL 1760. Selected Topics in Philosophy. (1-4 cr. [max 12 cr.]; Student Option; Periodic Spring & Summer) Philosophical topics of contemporary interest. Topics specified in Class Schedule.

PHIL 1915. The Philosophy of Food: You Are What You Eat... Or Are You?. (3 cr.; Student Option; Periodic Fall & Spring) Food is a central feature of our lives. Not only do we need it to survive, but it is what brings us together. Just think about how many of our daily activities, and important milestones, are centered around food! But, what is food, exactly? Does something have to nourish us, to count as food? Is candy food? What about beer? What is taste? What does it mean to have manners? And why are there so many manners associated with food? What kinds of food should we eat? Is eating foods that are sourced locally really better? Are genetically modified foods bad? What about eating meat? How do we square the ubiquity and importance of food with Western standards of beauty, especially for women? How should food be distributed? What does it say about a culture if foods that are considered bad for us are the only ones that vast segments of the population can afford? These are just some of the questions we will ponder in this freshman seminar.

PHIL 1916W. What's So Great About the Classical Music?. (WI; 3 cr.; Student Option; Periodic Fall & Spring) Despite what you may have heard, classical music isn't just a dry, landscape of interest only to culture snobs. The great masterpieces are supreme products of the human imagination touching on all aspects of the human condition - comic, tragic, sacred, profane. This is music that has moved generations of listeners to laughter and to tears, while at the same time inviting them to contemplate and reflect on its inner order and architectural grandeur. This seminar will present some of the great works of the classical tradition along with an explanation of what makes them so remarkable. No prior knowledge about music is required - just an open mind.

PHIL 3001W. General History of Western Philosophy: Ancient Period. (AH,WI; 4 cr.; Student Option; Every Fall) Major developments in philosophic thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3100. Value Theory Practicum. (1 cr. [max 3 cr.]; Student Option; Every Fall & Spring) Combines issues in ethics/political philosophy courses to needs of people in Twin Cities through community service. At least 28 hours of community service for semester is required. Prereq: [concurrence registration is required (or allowed) in 3301 or concurrent registration is required (or allowed) in 3302W or concurrent registration is required (or allowed) in 3304 or concurrent registration is required (or allowed) in 3307 or concurrent registration is required (or allowed) in 3308], instr consent

PHIL 3211W. Introduction to Ethical Theory. (WI; 4 cr.; Student Option; Every Fall & Spring) Nature and justification of moral judgments and moral principles; analysis of representative moral views.

PHIL 3322W. Moral Problems of Contemporary Society. (CIV,WI; 3 cr.; Student Option; Every Summer) How do we determine what is right and wrong? How should we live our lives? What do we owe others? Moral/ethical thought applied to problems and public disputes (e.g., capital punishment, abortion, affirmative action, animal rights, same-sex marriage, environmental protection).

PHIL 3502W. Introduction to Aesthetics. (WI; 3 cr. [max 4 cr.]; Student Option; Every Fall) Development of aesthetic theories with applications to specific aesthetic problems.

PHIL 3601W. Scientific Thought. (WI; 4 cr.; Student Option; Every Fall, Spring & Summer) Introduction to philosophical issues concerning the nature of scientific knowledge. Reading of historical and contemporary sources that describe major scientific achievements and controversies. Prereq: One course in philosophy or natural science

PHIL 3602. Science, Technology, and Society. (3 cr.; A-F or Audit; Periodic Fall & Spring) Philosophical issues that arise out of interaction between science, technology, society (e.g., religion and science, genetics and society, science and the environment).

PHIL 3601. Directed Studies. (1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq: instr consent, dept consent, college consent.

PHIL 4010. Ancient Philosophers. (3 cr. [max 6 cr.]; Student Option; Periodic Spring) Major work of selected ancient philosophers (e.g., Plato's Parmenides, Plato'sSophist, Aristotle's Metaphysics). Works discussed may vary from offering to offering. Prereq: 3001 or instr consent

PHIL 4040. Rationalists. (3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Major work of selected early modern rationalists (e.g., Descartes' Principles of Philosophy, Spinoza's Ethics, Conway's Principles of the Most Ancient and Modern Philosophy, Leibniz's Discourse on
PHIL 4055. Kant. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Major work (e.g., Critique of Pure Reason). prereq: 3005 or 4004 or instr consent

PHIL 4085. Wittgenstein. (3 cr.; Student Option; Periodic Fall & Spring)
In "Philosophical Investigations" Wittgenstein challenged some of the most long-standing and entrenched intuitions of philosophers -- basic intuitions about mind, rationality, linguistic understanding, and the very nature of philosophical/conceptual inquiry. Many of these intuitions remain entrenched and Wittgenstein's challenge is as relevant today as it was in 1950. In Phil 4805 we examine the text and the secondary literature, and do so in the light of issues and debates that continue to demand attention.

PHIL 4100. Value Theory Practicum. (. ; 1 cr. [max 3 cr.]; Student Option; Every Fall & Spring)
Issues studied in ethics/political philosophy courses apply to the lives of people in Twin Cities through community service. At least 26 hours of community service for semester is required. prereq: [concurs registration is required (or allowed) in 4320 or concurrent registration is required (or allowed) in 4321 or concurrent registration is required (or allowed) in 4330 or concurrent registration is required (or allowed) in 4324 or concurrent registration is required (or allowed) in 4414], instr consent

PHIL 4101. Metaphysics. (. ; 3 cr.; Student Option; Fall Even Year)
Broadly speaking, metaphysics is the study of the nature of reality. Metaphysical questions include questions about what kinds of things exist, what is the nature of things, what are persons, what is possible or impossible, what is the nature of time, what is causality, and many other fundamental questions about the world. The aim of this course is to introduce students to some of the central questions of metaphysics to investigate some of their answers. prereq: One course in history of philosophy or instr consent

PHIL 4105W. Epistemology. (WI; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Theories of knowledge of sources of evidence, evidence, prereq: 1001 or instr consent

PHIL 4231. Philosophy of Language. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Theories of reference, linguistic truth, relation of language/thought, translation/synonymy, prereq: 1001 or 5201 or instr consent

PHIL 4310W. History of Moral Theories. (WI; 3 cr.; Student Option; Periodic Fall)
Issues in western moral philosophy from classical age to present. prereq: 1003 or instr consent

PHIL 4320. Intensive Study of a Historical Moral Theory. (. ; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
Intensive consideration of an author or theory in the history of moral or political philosophy. prereq: 1003 or instr consent

PHIL 4321W. Theories of Justice. (WI; 3 cr.; Student Option; Fall Even, Summer Odd Year)
Philosophical accounts of concepts/principles of justice. prereq: 1003 or 1004 or instr consent

PHIL 4326. Lives Worth Living: Questions of Self, Vocation, and Community. (AH.CIV; 4 cr. [max 8 cr.]; Student Option; Every Summer)
Immersion experience. Students live together as a residential community of learners. Works of philosophy, history, and literature form backdrop for exploring such questions as "How is identity constructed?" "What is vocation?" and "What experiences of community are desirable in a life?" Each student creates a life-hypothesis for a life worth living. prereq: instr consent

PHIL 4330. Contemporary Moral Theories. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Discusses view that evaluative judgments cannot be based on factual considerations alone, relation of this view to objectivity of ethics. prereq: 1003 or instr consent

PHIL 4350. Catching Lives Worth Living: Participation in the Growth of a Living-Learning Community. (. ; 2 cr. [max 4 cr.]; Student Option; Every Summer)
Involvement in a democratic living-learning community built by students/instructors. Students participate in community activities and daily instructor meetings. Four-seven day offerings each summer. prereq: Application, instr consent

PHIL 4414. Political Philosophy. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Survey of historical/contemporary works in political philosophy. prereq: 1004 or instr consent

PHIL 4501. Principles of Aesthetics. (3 cr.; Student Option; Periodic Fall & Spring)
Aesthetic problems that arise in studying or practicing an art. prereq: 3502 or philosophy course or instr consent

PHIL 4510. Philosophy of the Individual Arts. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Aesthetic problems that arise in studying or practicing an art. prereq: 3502

PHIL 4605. Space and Time. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Philosophical problems concerning nature/structure of space, time, and space-time. prereq: Courses in [philosophy or physics] or instr consent

PHIL 4607. Philosophy of the Biological Sciences. (. ; 3 cr.; Student Option; Periodic Fall & Spring)

PHIL 4615. Minds, Bodies, and Machines. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
Mind-body problem. Philosophical relevance of cybernetics, artificial intelligence, computer simulation. prereq: one course in philosophy or instr consent

PHIL 4760. Selected Topics in Philosophy. (. ; 3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Philosophical problems of contemporary interest. Topics specified in Class Schedule. prereq: 3 [3xxx-5xxx] cr in philosophy or instr consent

PHIL 4993. Directed Studies. (. ; 1-3 cr. ; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. Prereq instr consent, dept consent, college consent.

PHIL 4995. Senior Project (Directed Studies). (. ; 1 cr.; A-F only; Every Fall, Spring & Summer)
Guided individual study leading to research paper that satisfies senior project requirement. prereq: instr consent, dept consent

PHIL 4995H. Honors Senior Project. (. ; 1 cr.; A-F only; Every Fall, Spring & Summer)
Guided individual study leading to research paper that satisfies senior project requirement. prereq: instr consent, dept consent

PHIL 5010. Ancient Philosophers. (. ; 3 cr. [max 6 cr.]; Student Option; Periodic Spring)
Major work of selected ancient philosophers (e.g., Plato's Parmenides, Plato's Sophist, Aristotle's Metaphysics). Works discussed vary. prereq: 3001 or instr consent

PHIL 5040. Rationalists. (. ; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
Major work of selected early modern rationalists (e.g., Descartes' Principles of Philosophy, Spinoza's Ethics, Conway's Principles of the Most Ancient and Modern Philosophy, Leibniz's Discourse on Metaphysics). Works discussed may vary from offering to offering.

PHIL 5085. Wittgenstein. (. ; 3 cr.; Student Option; Periodic Fall & Spring)
In "Philosophical Investigations" Wittgenstein challenged some of the most long-standing and entrenched intuitions of philosophers -- basic intuitions about mind, rationality, linguistic understanding, and the very nature of philosophical/conceptual inquiry. Many of these intuitions remain entrenched, and Wittgenstein's challenge is as relevant today as it was in 1950. In Phil 4805 we examine the text and the secondary literature, and do so in the light of issues and debates that continue to demand attention.

PHIL 5085W. Epistemology. (WI; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Theories of knowledge of sources of evidence, evidence, prereq: 1001 or instr consent

PHIL 5085H. Honors Epistemology. (3 cr. ; A-F only; Every Fall, Spring & Summer)
Guided individual study leading to research paper that satisfies senior project requirement. prereq: instr consent, dept consent

PHIL 5096. Philosophical Problems. (. ; 3 cr. ; A-F only; Every Fall, Spring & Summer)
Philosophical problems of contemporary interest. Topics specified in Class Schedule. prereq: 3 [3xxx-5xxx] cr in philosophy or instr consent

PHIL 5101. Metaphysics. (. ; 3 cr.; Student Option; Fall Even Year)
Broadly speaking, metaphysics is the study of the nature of reality. Metaphysical questions include questions about what kinds of things exist, what is the nature of things, what are persons, what is possible or impossible, what is the nature of time, what is causality, and many other fundamental questions about the world. The aim of this course is to introduce students to some of the central questions of metaphysics to investigate some of their answers. prereq: One course in history of philosophy or instr consent

PHIL 5201. Symbolic Logic I. (. ; 4 cr.; Student Option; Every Fall & Spring)
Study of syntax and semantics of sentential and first-order logic. Symbolization of natural-language sentences and arguments. Development of deductive systems for first-order logic. Metatheoretic proofs and methods, including proof by mathematical induction and proof of consistency and completeness. prereq: 1001 or instr consent

PHIL 5202. Symbolic Logic II. (.4 cr.; Student Option; Every Spring)
Elements of set theory, including the concepts of enumerability and nonenumerability. Turing machines and recursive functions; the results of Church, Godel, and Tarski and the philosophical significance of those results. prereq: 5201 or instr consent

PHIL 5211. Modal Logic. (.4 cr.; Student Option; Spring Odd Year)
Axiomatic and semantic treatment of propositional and predicate modal logics; problems of interpreting modal languages. prereq: 5201 or instr consent

PHIL 5221. Philosophy of Logic. (.3 cr.; Student Option; Periodic Fall)
Attempts to answer, "What is logic?" Scope of logic. Disputes about alternative logics. Theories concerning logical truth (e.g., conventionalism: view that logical truths are contingent). prereq: 5202 or instr consent

PHIL 5222. Philosophy of Mathematics. (.3 cr.; Student Option; Periodic Fall & Spring)
Major philosophical questions arising in connection with mathematics. What is mathematics about? How do we know the mathematics we do? What is the relation between mathematics and the natural sciences? Selected readings of leading contributors such as Frege, Dedekind, Russell, Hilbert, Brouwer, Godel, Quine. prereq: College level logic or mathematics course or instr consent

PHIL 5320. Intensive Study of a Historical Moral Theory. (.3 cr.; Student Option; Periodic Fall & Spring)
Intensive consideration of an author or theory in the history of moral or political philosophy. prereq: 1003 or instr consent

PHIL 5326. Lives Worth Living: Questions of Self, Vocation, and Community. (.4 cr.; Student Option; Every Summer)
Immersion experience. Students live together as a residential community of learners. Works of philosophy, history, and literature form backdrop for exploring such questions as "How is identity constructed?", "What is vocation?", and "What experiences of community are desirable in a life?" Each student creates a life-hypothesis for a life worth living. prereq: instr consent

PHIL 5350. Catching Lives Worth Living: Participation in the Growth of a Living-Learning Community. (.1-3 cr.; max 6 cr.; Student Option; Every Summer)
Involvement in a democratic living-learning community built by students/instructors. Students participate in community activities and daily instructor meetings. Four seven-day offerings each summer. prereq: Application, instr consent

PHIL 5415. Philosophy of Law. (.3 cr.; Student Option; Periodic Spring)
Analytical accounts of law and legal obligation. prereq: 1003 or 1004 or 3302 or social science major or instr consent

PHIL 5510. Philosophy of the Individual Arts. (.3 cr.; Student Option; Periodic Fall & Spring)
Aesthetic problems that arise in studying or practicing an art. prereq: 3502

PHIL 5601. History of the Philosophy of Science. (.3 cr.; Student Option; Periodic Fall & Spring)
History of logical empiricism, from its European origins in first half of 20th century to its emergence as nearly universal account of science in post-war Anglo-American philosophy. prereq: instr consent

PHIL 5602. Scientific Representation and Explanation. (.3 cr.; Student Option; Periodic Fall)
Contemporary issues concerning representation and explanation of scientific facts. prereq: instr consent

PHIL 5603. Scientific Inquiry. (.3 cr.; Student Option; Periodic Spring)
Philosophical theories of methods for evaluating scientific hypotheses. Role of experimentation in science. How hypotheses are accepted within scientific community.

PHIL 5605. Space and Time. (.3 cr.; Student Option; Periodic Fall & Spring)
Philosophical problems concerning nature/structure of space, time, and space-time. prereq: Courses in [philosophy or physics] or instr consent

PHIL 5606. Philosophy of Quantum Mechanics. (.3 cr.; Student Option; )
Problems of interpretation in ordinary (nonrelativistic) quantum mechanics. Two-slit experiment, Schrodinger cat paradox (measurement problem). Einstein-Podolsky-Rosen paradox. Leading approaches to interpretation (Copenhagen, hidden variables, universal wave function) and their connections with philosophical issues.

PHIL 5760. Selected Topics in Philosophy. (.3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring)
Philosophical problems of contemporary interest. Topics specified in Class Schedule. prereq: 3xxx-5xxx course in phil or instr consent

PHIL 5993. Directed Studies. (.1-3 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. prereq: instr consent, dept consent, college consent

PHIL 8010. Workshop in History of Philosophy. (.1 cr.; max 4 cr.; Student Option; Every Fall & Spring)
Topics vary by offering. prereq: concurrent registration is required (or allowed) in 4xxx [history of philosophy] course, instr consent

PHIL 8080. Seminar: History of Ancient and Medieval Philosophy. (.3 cr.; max 6 cr.; Student Option; Every Fall & Spring)
Topics vary by offering. prereq: instr consent

PHIL 8081. Seminar: History of Philosophy--Ancient Philosophers. (.3 cr.; Student Option; )
Major developments in ancient Greek philosophic thought; methods and role of history of philosophy in discipline of philosophy.

PHIL 8085. Seminar: History of Philosophy--Modern Philosophers. (.3 cr.; Student Option; Periodic Fall)
Major developments in modern philosophic thought; methods and role of history in discipline of philosophy. prereq: instr consent

PHIL 8090. Seminar: History of Modern Philosophy. (.3 cr.; max 6 cr.; Student Option; Every Fall & Spring)
Topics vary by offering. prereq: instr consent

PHIL 8100. Workshop in Epistemology and Metaphysics. (.1 cr.; max 4 cr.; Student Option; Every Fall & Spring)
Topics vary by offering. prereq: concurrent registration is required (or allowed) in 4xxx [epistemology or metaphysics] course, instr consent

PHIL 8110. Seminar: Metaphysics. (.3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring)
Topics vary by offering. prereq: 4101 or instr consent

PHIL 8130. Seminar: Epistemology. (.3 cr.; max 6 cr.; Student Option; Every Fall & Spring)
Problems in the theory of knowledge. Topics specified in [Class Schedule]. prereq: 4105 or instr consent

PHIL 8131. Epistemology Survey. (.3 cr.; Student Option; )
Survey, against background of traditional issues, of contemporary developments in theory of knowledge.

PHIL 8133. Feminist Theories of Knowledge. (.3 cr.; Student Option; )
Interdisciplinary seminar; feminist approaches to knowledge and criticism of paradigms of knowledge operative in the disciplines. Feminists' use of concepts of subjectivity, objectivity, and intersubjectivity; feminist empiricism, standpoint theory, and contextualism, and postmodern and postcolonial theorizing.

PHIL 8180. Seminar: Philosophy of Language. (.3 cr.; max 6 cr.; Student Option; Every Fall)
Topics vary by offering. prereq: 4231 or instr consent

PHIL 8182. Formal Semantics of Natural Language. (.3 cr.; A-F or Audit; Periodic Fall)
Truth-conditional model-theoretic semantics applied to treatment of opacity, intensionality, quantification, and related phenomena in natural language. prereq: Phil 5201 or instr consent

PHIL 8200. Workshop in Logic and Philosophy of Mathematics. (.1 cr.; max 4 cr.; Student Option; Periodic Fall & Spring)
PHIL 8210. Seminar: Logical Theory. (; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Topics vary by offering. prereq: [5201, 5205] or instr consent

PHIL 8220. Seminar: Philosophy of Mathematics. (; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Topics such as significance of limiting metatheorems (Goedel, et al), assessment of major foundational programs (set theoretic, modern Hilbertian, constructivist), modal/structuralist alternatives to standard platonism. prereq: 5202 or [4xxx or 5xxx] math course or instr consent

PHIL 8300. Workshop in Moral and Political Philosophy. (; 1 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Topics vary by offering. prereq: [concurrent registration is required (or allowed) in 4xxx moral phi or 4xxx pol phi] instr consent

PHIL 8310. Seminar: Moral Philosophy. (; 3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Concepts/problems relating to ethical discourse. prereq: 4310 or 4320 or 4330 or instr consent

PHIL 8320. Seminar on Medical Ethics. (; 3 cr. [max 6 cr.]; Student Option; Periodic Spring) Patients' rights/duties, informed consent, confidentiality, ethical issues in medical research, initiation/termination of medical treatment, euthanasia, abortion, maternal/fetal conflicts, allocation of medical resources. prereq: 4xxx or 5xxx ethics course or instr consent

PHIL 8333. FTE: Master's. (; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

PHIL 8410. Seminar: Philosophy of Law. (; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Primarily for law students and advanced political science, history, or sociology majors or minors. prereq: 5415 or instr consent

PHIL 8420. Seminar: Political Philosophy. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Topics vary by offering. prereq: 4321 or 4414 or instr consent

PHIL 8444. FTE: Doctoral. (; 1 cr. ; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

PHIL 8500. Workshop in Aesthetics. (; 1 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Topics vary by offering. prereq: concurrent registration is required (or allowed) in 4xxx aesthetics course, instr consent

PHIL 8510. Seminar: Aesthetics Studies. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Topics vary by offering.

PHIL 8550. Seminar: Philosophy of Religion. (; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Topics vary by offering. prereq: 4521 or instr consent

PHIL 8600. Workshop in the Philosophy of Science. (; 1 cr. [max 4 cr.]; Student Option; Every Fall & Spring) Topics vary by offering. prereq: concurrent registration is required (or allowed) in 4xxx phi of sci course, instr consent

PHIL 8602. Scientific Representation and Explanation. (3 cr. ; Student Option; Periodic Fall & Spring) Contemporary issues concerning representation and explanation of scientific facts.

PHIL 8605. Seminar: Philosophy of Medicine and the Biomedical Sciences. (; 3 cr. ; Student Option; Every Fall & Spring) Aims and goals of medicine; concepts of health, illness, and disease; nature of reasoning in clinical medicine; theoretical evolution in medicine; and role of values in practice of medicine and healthcare.

PHIL 8610. Seminar: History of Modern Physical Sciences. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Topics specified in [Class Schedule]. prereq: instr consent

PHIL 8620. Seminar: Philosophy of the Biological Sciences. (; 3 cr. [max 6 cr.]; Student Option; Every Fall) Topics vary by offering.

PHIL 8640. Seminar: Philosophy of the Cognitive Sciences. (; 3 cr. [max 6 cr.]; Student Option; Spring Odd Year) Philosophical framework for analyzing cognitive sciences. Recent developments in metaphysics/epistemology. Nature of scientific theories, methodologies of cognitive sciences, relations among cognitive sciences. Relation of cognitive science to epistemology and to various philosophical problems. Topics vary by offering. prereq: instr consent

PHIL 8660. Seminar: Social and Cultural Studies of Science. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring) Review of recent work: analysis of theoretical and methodological differences among practitioners; selected responses from historians and philosophers of science.

PHIL 8666. Doctoral Pre-Thesis Credits. (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

PHIL 8670. Seminar: Philosophy of Science. (; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Topics vary by offering. prereq: instr consent

PHIL 8710. Seminar: Feminist Philosophy. (; 3 cr. [max 6 cr.]; Student Option; Periodic Fall) Topics vary by offering. prereq: 4622 or 5622 or WoSt 4122 or WoSt 5122 or instr consent

PHIL 8777. Thesis Credits: Master's. (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

PHIL 8888. Thesis Credit: Doctoral. (; 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

PHIL 8893. Directed Study. (; 1-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) TBD prereq: instr consent

PHIL 8894. Directed Research. (; 1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) TBD prereq: instr consent

Physical Education (PE)

PE 1007. Beginning Swimming. (1 cr. ; Student Option No Audit; Every Fall & Spring) Introduction to basic aquatic safety, fundamentals of swimming and hydrodynamics. Principles of hydrodynamics and stroke mechanics; five basic strokes; basic rescue techniques with use of pool equipment; hydrotherapy for disabilities and other conditions, opportunities for competitive activities, lifetime enjoyment of aquatics.


PE 1014. Conditioning. (1 cr. ; Student Option No Audit; Every Fall & Spring) Fundamentals of personal fitness. Principles of fitness; health and motor skill components of fitness; principles of training/conditioning programs; nutrition; weight control; common fitness injuries; motivation and consistency in fitness programs; stress management.

PE 1015. Weight Training. (1 cr. ; Student Option No Audit; Every Fall & Spring) Introduction to weight training. Basic aspects of weight training including exercise selection and technique, charting workouts, program design, nutritional considerations, and safety.

PE 1016. Posture and Individual Exercise. (1 cr. ; Student Option No Audit; Every Fall & Spring) Good posture techniques, individual exercises, fitness concepts, and mental techniques.
Specific overall sound body and mind techniques to include flexibility exercises, cardiovascular fitness, resistance training, nutrition management, weight control, stress management, and self-thought.

PE 1029. Handball. (1 cr.; Student Option No Audit; Every Fall & Spring)
Hand and eye coordination, footwork in practice and game conditions, and skills and strategies of service and rally for the court sport handball (four-wall version). Novice to intermediate levels of play accommodated.

PE 1031. Sabre Fencing. (1 cr.; Student Option No Audit; Every Fall)
Basic sabre techniques, movement, an overview of fencing as a recreational sport and an Olympic sport, and the history of fencing.

PE 1032. Badminton. (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Fundamentals including etiquette, terminology, game rules for singles and doubles, footwork, shot selection, and strategy.

PE 1033. Foil Fencing. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fencing fundamentals, including basic foil techniques, movement, a general overview of fencing as a recreational sport and an Olympic sport, and the history of fencing.

PE 1034. Judo. (1 cr.; Student Option No Audit; Every Fall & Spring)
Basic skills for throwing, holding, grappling (matwork), choking, arm and neck techniques; contest judo from Jiu-Jitsu; fundamental rules and scoring of contests. Videotapes used for technique instruction and contest appreciation.

PE 1035. Karate. (1 cr.; Student Option No Audit; Every Fall & Spring)
Introduction to Traditional Japanese Shotokan Karate. Students learn to punch, block, strike, & kick with a focus on proper form, posture, & body mechanics. Students also learn a Kata (choreographed form), techniques with partners, & practical self-defense. Non-contact - no pads, hitting, or throwing.

PE 1036. Racquetball. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fundamentals of racquetball, including equipment; safety and etiquette; terminology; game rules of singles, doubles, and cutthroat; grips; basic strategies; serves and shots.

PE 1037. Squash Racquets. (1 cr.; Student Option No Audit; Every Fall & Spring)
Entry-level technique, basic equipment, international dimension courts, and fitness.

PE 1038. Beginning Tennis. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fundamental strokes, including forehands, backhands, volleys, lobs, overheads, and serves; introduction to doubles play; terminology, rules, and etiquette.

PE 1044. Self-Defense. (1 cr.; Student Option No Audit; Every Fall & Spring)
Physical, psychological, and de-escalation skills for acting in crisis situations. Distance, body language, and tone of voice are addressed. Physical skills include striking, kicking, shifting, blocking, releasing techniques, floor defenses, and applications to armed attackers and multiple attackers.

PE 1045. Rock Climbing. (1 cr.; Student Option No Audit; Every Fall & Spring)
Safety, knots, equipment, techniques, and anchor systems used in climbing. Course includes all necessary equipment. Held at St. Paul Gym climbing wall. prereq: Good general health, no [neck or back] problems.

PE 1046. Tae Kwon Do. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fundamentals of Tae Kwon Do. Principles of martial arts, body mechanics of Tae Kwon Do, practical self-defense.

PE 1048. Bowling. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fundamentals, including stance, approach and delivery, scoring, bowling terminology, and etiquette.

PE 1053. Ice Skating. (1 cr.; Student Option No Audit; Every Fall & Spring)
Basic turns, basic stops, balance techniques, and various other skills from both the forward and backward positions. Equipment, safety issues, ice skating terminology.

PE 1055. Golf. (1 cr.; Student Option No Audit; Every Fall, Spring & Summer)
Proper grip, stance, ball address, swing, club selection, psychological management, rules, and etiquette. Basic instruction in analyzing, assisting with, and coaching golf.

PE 1057. Beginning Sking. (1 cr.; Student Option No Audit; Every Spring)
Alpine skiing. How to stop, turn, and use lifts. Safety, etiquette, and purchase of equipment. Class held at Highland Hills ski area in Bloomington.

PE 1058. Snowboarding. (1 cr.; Student Option No Audit; Every Spring)
Intermediate snowboarding. Uses American Teaching System. Classes are split into nine skill levels, beginning through advanced. Held at Hyland Ski and Snowboard School in Bloomington. prereq: Good general health, injury free

PE 1065. Beginning Tumbling and Gymnastics. (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Rolls, handstands, cartwheels, extensions, hand springs, tucks (flips). Spotting techniques. Skills on bars, vault, and beam.

PE 1067. Basketball. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fundamental skills and rules of basketball, with emphasis on basic court movement and different offensive and defensive strategies.

PE 1071. Beginning Cricket. (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Fundamentals of Cricket. Laws of Cricket, bowling/batting techniques, competitive/ recreational Cricket opportunities.

PE 1072. Soccer. (1 cr.; Student Option No Audit; Every Fall & Spring)
Fundamentals of soccer including sporting behavior both on and off the field, game rules, soccer terminology, participation and competition drills, fundamental soccer skills, practical instruction in strategy.

PE 1074. Beginning Volleyball. (1 cr.; Student Option No Audit; Every Fall & Spring)
Basic skills, team play, rules, officiating, and strategy.

PE 1076. Flag Football. (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Introduction to flag football, techniques, field positions, rules/regulations. Students will participate in vigorous exercise activities including running, throwing, kicking, and catching.

PE 1078. Ultimate Disc. (1 cr.; Student Option No Audit; Every Fall & Spring)
Introduction to ultimate disc, techniques, field positions, rules, regulations. Students participate in vigorous exercise activities including running, throwing, and catching.

PE 1079. Rugby (Non-contact). (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Appropriate techniques and field positions. Safe play using appropriate rules and laws. Vigorous exercise activities, including running, passing, catching, evasion, and other physical activity associated with rugby.

PE 1107. Intermediate Swimming. (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Intermediate swimming skills. Fundamentals of swimming and hydrodynamics. prereq: 1007 or equiv, proficient ability to swim 100 meters or instr consent

PE 1135. Intermediate Karate. (1 cr.; Student Option No Audit; Every Spring)
Techniques of Japanese traditional Shotokan Karate taught through Ippon Kumite (one step sparring), San Kumite (three step sparring), and Heian Shodan Kata/Nidan Kata (forms). Testing for orange belt is optional. prereq: 1035 or equiv or instr consent

PE 1137. Intermediate Squash. (1 cr.; Student Option No Audit; Periodic Fall & Spring)
Stroke mechanics, shot placement, changing pace. Court movement/positioning. Fitness requirements, joint/muscle stresses. Weight training for squash. On-court etiquette. prereq: 1037 or instr consent

PE 1146. Intermediate Tae Kwon Do. (1 cr.; Student Option No Audit; Periodic Fall)
Continuation of 1046. Focuses on Olympic-style intermediate skills/techniques. Self-defense techniques for men/women. prereq: 1046, previous Tae Kwon Do experience (World Tae Kwon Do Federation sanctioned), basic white Tae Kwon Do uniform

PE 1154. Figure Skating. (1 cr.; Student Option No Audit; Periodic Spring)
Terminology, rules. Basic moves, jumps, spins. On-/off-ice assignments. prereq: 1053 or equiv or instr consent

PE 1174. Intermediate Volleyball. (1 cr.; Student Option No Audit; Periodic Spring)
Volleyball systems of play. Incorporating offensive/defensive formations. Team play,
transition, coaching, officiating, prereq: [1074 or equiv], instr consent

PE 1205. Scuba and Skin Diving. (1 cr.; Student Option No Audit; Every Fall & Spring) Diving equipment, physics, physiology, decompression, emergencies, recreational dive planning, oceans, currents and aquatic life, snorkeling/SCUBA equipment usage, buoyancy control, entries, emergencies. prereq: Ability to swim 400 yds comfortably or instr consent

PE 1262. Marathon Training. (3 cr.; Student Option No Audit; Every Spring) Physical challenge achieved through physiological/psychological adaptation. Goal setting that fosters adaptation in many facets of life. Marathon history, prereq: No pre-existing medical condition that would prevent finishing a marathon, instr consent

PE 1720. Special Activities in Physical Education. (1-3 cr. [max 9 cr.]; Student Option No Audit; Periodic Fall, Spring & Summer) Activities or related opportunities not normally available through regular course offerings.

Physical Med & Rehabilitation (PMED)

PMED 6000. Special Topics for the Transitional DPT: Musculoskeletal. (2-8 cr.; A-F or Audit; Periodic Fall) Selected pathology, assessment, and rehabilitation of musculoskeletal conditions. Industrial consultation, post fracture management, imaging, surgical options for selected conditions of spine/extremities. Required musculoskeletal case study from clinical internships, prereq: Enrolled in Physical Therapy MS program

PMED 7410. Rehabilitation Medicine for Adults. (4 cr.; H-N only; Every Fall, Spring & Summer) The student learns to evaluate a patient with chronic illness and/or a disability and then helps plan a rehabilitation team's problem-oriented approach to total patient management. Medical student responsibility includes inpatient work-ups and management as well as the opportunity to participate in a variety of specialty clinics.

PMED 7412. Rehabilitation Medicine for Adults: Orthopedics, Neurology. (4 cr.; H-N only; Every Fall, Spring & Summer) This course is designed for students who are interested in pursuing residency in Physical Medicine and Rehabilitation, Orthopedics, Neurology. Student-physicians will be responsible for inpatient work-ups and management as well as having the opportunity to participate in a variety of specialty clinics (EMG and Botox, traumatic brain injury, spinal cord injury, amputee, musculoskeletal pain, cardiac rehab) and inpatient consults.


PMED 7416. Pediatric Rehabilitation Medicine. (2 cr.; H-N only; Every Fall, Spring & Summer) Student works on inpatient service, outpatient clinics working with pediatric patients with traumatic brain injury, cerebral palsy, ventilatory dependent children, spinal cord injury, and developmental disabilities.

PMED 7417. Research in Physical Medicine and Rehabilitation. (6 cr.; H-N or Audit; Every Fall) This elective provides an opportunity for the interested student to pursue a clinical or laboratory problem related to physical medicine and rehabilitation.

PMED 7418. Rehabilitation Medicine: Trauma Rehab, Med-Spine. (4 cr.; H-N only; Every Fall, Spring & Summer) Adult rehabilitation management emphasizing traumatic brain injury, major multiple trauma, acute and chronic burns, musculoskeletal ultrasound, stroke, ALS, and EMG.

PMED 7420. Rehabilitation Medicine Research. (2-8 cr. [max 16 cr.]; H-N only; Every Fall, Spring & Summer) PM&R is an underrepresented field in terms of academic contribution to clinical research.

PMED 7910. Physical Medicine and Rehabilitation Medical Residency. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Physical medicine and rehabilitation medical residency.

PMED 7930. Physical Medicine and Rehabilitation Medical Fellowship. (6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Physical medicine and rehabilitation medical fellowship.

PMED 8200. Physical Medicine and Rehabilitation Service. (1-15 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled in PMed residency training program

PMED 8207. Basic and Applied Psychiatry. (1 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled in PMed residency training program

PMED 8210. Research in Physical Medicine. (1-15 cr.; Student Option; Every Fall & Spring) N/A prereq: enrolled in PMed residency training program

PMED 8212. Electromyography. (1-15 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled in PMed residency training program

PMED 8214. Readings in Electromyography. (1-3 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled in PMed residency training program

PMED 8220. Seminar: Physical Medicine and Rehabilitation. (1-15 cr.; Student Option; Every Fall, Spring & Summer) TBD prereq: enrolled in PMed residency training program

Physical Therapy (PT)

PT 1002. Orientation to Physical Therapy. (1 cr.; S-N or Audit; Every Fall & Spring) Introduction to the profession of physical therapy through lectures, discussions, patient presentations, clinic visit, videotapes, and exposure to treatment equipment.

PT 6002. Ethics in Public Health: Research and Policy. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall) Moral/ethical analysis. Issues in physical therapy research/practice. Ethical decisions in a practice and in professional training. WebCT lectures, in-class discussions/instruction, exams.


PT 6213. Clerkship I. (2 cr.; A-F or Audit; Every Fall) Practical aspects of clinical education and professional behavior. Psychological, sociological, and cultural needs of diverse patient populations. Students complete a three hrs/week clinical affiliation at University Good Samaritan Center. Patient/therapist observations, concurrent didactic coursework. Facilitation of group exercise, restorative ambulation, range of motion programs, and resident assessment instrument, prereq: Registered PT student

PT 6214. Clerkship II. (2 cr.; A-F or Audit; Every Spring) Documentation of physical therapy exams, progress, discharge services. Regulatory agencies responsible for outcomes/ accreditation, third party reimbursement, coding, peer review. Complete three hrs/ wk clinical affiliation at Good Samaritan Center under supervision of clinical faculty. Observations/documentation, group exercise, restorative ambulation, range of motion programs, resident assessment instrument. prereq: Registered first year PT student

PT 6215. Clerkship III. (1 cr. [max 2 cr.]; A-F or Audit; Every Fall) Roles of physical therapist, in orthopedic outpatient setting, as educator and promotor of health/wellness. Students are assigned to a community outpatient orthopedic clinic. Patient evaluations/treatment. Instructing patients,
therapists, student physical therapists, and community members to promote physical therapy, health, and wellness. Students assess, prepare, and provide educational experiences. prereq: Registered PT student

**PT 6216. Clerkship IV.** (1 cr.; A-F or Audit; Periodic Spring) Role of physical therapist in acute care or rehabilitation setting, as clinical educator of physical therapy students. Students are assigned to a local hospital or rehabilitation facility. Patient evaluations, treatment, discharge planning. Students prepare for full time clinical experiences and for their role as potential clinical instructors. prereq: Registered 2nd yr PT student

**PT 6217. Clerkship V.** (2 cr.; A-F or Audit; Periodic Fall) Second-year clerkship. Role of physical therapist in acute care or rehabilitation setting. Students observe/participate in patient evaluation, treatment/discharge planning, client consultation, and community service evaluation/planning. Sites are selected in conjunction with CUDES. Students keep journal, shared with site supervisor and academic coordinator. prereq: Registered 2nd-year PT student

**PT 6219. Foundations in Interprofessional Communication and Collaboration.** (1 cr.; S-N only; Every Fall) Foundations of Interprofessional Communication & Collaboration (FIPCC) is the first interprofessional course in Phase I of the 1Health curriculum. More than 1,000 health and health care students from allied health, dentistry, dietetics, health coaching, medicine, nursing, pharmacy, physical therapy, public health, social work, speech-language-hearing sciences, and veterinary medicine will be enrolled in this course. The course will be delivered to interprofessional groups of approximately 30-35 students in each room.

**PT 6220. Clinic Volunteer.** (1 cr. [max 6 cr.]; No Grade Associated; Every Fall, Spring & Summer) Functioning evening clinics supervised by licensed physical therapists. Students perform physical therapy exams, provide treatment various conditions, under supervision of a licensed physical therapy clinical instructor.

**PT 6221. Therapeutic Procedures.** (4 cr.; A-F or Audit; Every Spring & Summer) Theory/application of physical agents and therapeutic techniques. Therapeutic massage, ultraviolet radiation, thermotherapy, hydrotherapy, photopic pressure devices, transcutaneous electrical nerve stimulation, neuromuscular electrical stimulation, biofeedback, iontophoresis, high volt pulsed current. prereq: Registered PT student

**PT 6231. Clinical Biomechanics.** (5 cr.; A-F or Audit; Periodic Fall) Principles of biomechanics. Forces/structures internal/external to body responsible for normal human movement. Muscle, joint, and tissue mechanics. Joint-specific normal function, whole body posture, gait mechanics. Focuses on normal mechanics as foundation for abnormal mechanics and pathology. Lecture, laboratory. prereq: Intro calculus, physics, registered PT student

**PT 6250. Acute Care in Physical Therapy.** (2 cr.; A-F only; Every Summer) General care of acute and critically ill patient. Disease/disorders common to acute care environment. Integration of evaluation, treatment, and client management skills. prereq: Registered physical therapy student

**PT 6251. Integument.** (2 cr.; A-F or Audit; Every Summer) Response of integument to injury, disease, and aging. Emphasizes wound management, burn care, amputee care, and rehabilitation of persons with acute/chronic integument disorders. Integrating elements of physiology, pathophysiology, and therapeutic procedures to evaluate, treat, and manage clients. prereq: Registered PT student

**PT 6252. Pathophysiology.** (3 cr.; A-F only; Every Summer) General and organ system pathology. Complicating pathological factors that affect patients. Implications of pathology on patient’s clinical presentation. prereq: Enrolled PT student

**PT 6280. Clinical Assessment.** (4 cr.; A-F or Audit; Periodic Fall) Clinical assessment techniques of goniometry, manual muscle testing, range of motion, gait analysis, physical/sensory examination, and anthropometrics. Basic intervention approaches, including stretching techniques and resistive exercise. Weekly integration assignments with first clinical clerkship. Lecture, discussion, lab. prereq: Registered PT student

**PT 6281. Scientific Foundations I: Theory of Therapeutic Exercise.** (3 cr.; A-F or Audit; Every Fall) Principles of skeletal muscle physiology as basis for therapeutic exercise. Exercise physiology and related microanatomy of musculoskeletal system as they relate to rehabilitation problems. Tissue response to treatment for loss of mobility. Endurance/strength training. prereq: Registered PT student

**PT 6282. Scientific Foundations II: Neuromotor Control.** (3 cr. [max 45 cr.]; A-F or Audit; Every Spring) Principles of neurophysiology, neurology, motor control, and motor learning as basis for therapeutic intervention in motor dysfunction. Practical application of kinesiologic electromyography and nerve conduction. prereq: Registered PT student

**PT 6283. Musculoskeletal I.** (7 cr.; A-F or Audit; Every Fall & Spring) First of two-course sequence. Problem-solving approach to evaluating, treating, and preventing selected musculoskeletal conditions across the life span. Chart review, history taking, strength testing, functional testing, gait and posture examination, special orthopedic tests. Therapeutic exercises, orthopedic ambulation, joint mobilization, splinting, patient education. prereq: enrolled PT student

**PT 6284. Musculoskeletal Rehabilitation II.** (4 cr.; A-F or Audit; Periodic Fall) Second of two-course sequence. Problem-solving approach to evaluating, treating, and preventing selected musculoskeletal conditions across life span. Practice evaluations, clinic visits, case examples. Integrates diagnostic procedures, medical/surgical management, and tissue response to injury/intervention for selected orthopedic conditions. Screening for recognition of non-musculoskeletal causes of complaints. prereq: Regis PT student

**PT 6287. Neurorehabilitation.** (8 cr.; A-F or Audit; Every Spring) Assessment/rehabilitation of patients with neuromotoric disorders (e.g., cerebral vascular disease traumatic brain injury, multiple sclerosis, Parkinson’s disease, amyotrophic lateral sclerosis). Using treatment procedures, orthotics, and equipment to improve function and prevent, stabilize, or decrease impairments. prereq: Regis PT student

**PT 6288. Pediatric Rehabilitation.** (8 cr.; A-F or Audit; Every Summer) Pediatric assessment/rehabilitation for neurological, orthopedic, cardiac, prematurity, transplant, and behavioral conditions. Preparation for adult assessment/treatment with neurological, general medical, and vascular disease. Students use etiologic knowledge to assess patients in clinic and establish treatment plans/goals. prereq: Registered PT student

**PT 6290. Administration.** (4 cr.; A-F or Audit; Periodic Fall) Learning experiences, special assignments related to physical therapy administration, management, supervision, consultation, private practice, and health care issues. Foundations for regulatory compliance and fiscal responsibility. Interpersonal skills for delivery of direct care service. prereq: Regis PT student

**PT 6293. Essentials of Rehabilitation Research.** (4 cr.; A-F or Audit; Every Fall) Predictive research, statistical concepts, scientific literature. Tools to design experiments and analyze data. Risk analysis, multivariate regression analysis. Designs of reliability studies, traditional group designs. Students give preliminary presentation of analysis. prereq: Registered 2nd yr PT student

**PT 6295. Clinical Internship I.** (10 cr. [max 30 cr.]; S-N or Audit; Every Fall, Spring & Summer) Communication skills, team participation, and evaluation/treatment. Predicting outcomes. Managing patient diagnoses/problems. Selected specialty area of physical therapy practice. Prereq: Registered 3rd yr PT student

**PT 6296. Clinical Internship II.** (10 cr.; S-N only; Every Fall, Spring & Summer) Second of four courses. Students must demonstrate proficiency in communication, team participation, evaluation and treatment, predicting outcomes, and managing patient
diagnoses and problems. Selected specialty area of physical therapy practice.

PT 6297. Clinical Internship III. (10 cr.; S-N only; Every Fall, Spring & Summer) Third of four courses. Students must demonstrate proficiency in communication, team participation, evaluation and treatment, predicting outcomes, and managing patient diagnoses and problems. Selected specialty area of physical therapy practice. prereq: Registered PT student

PT 6298. Clinical Internship IV. (10 cr.; S-N only; Every Fall, Spring & Summer) Fourth of four courses. Students must demonstrate proficiency in communication, team participation, evaluation and treatment, predicting outcomes, and managing patient diagnoses and problems. Selected specialty area of physical therapy practice.

PT 6310. Physiology for Physical Rehabilitation. (5 cr. [max 10 cr.]; A-F only; Every Spring) This course is designed to convey foundational information regarding human basic physiology and more advanced integrative physiology to provide the physical therapist a broad range of knowledge on how the human body works at rest, exercise, and as we age.

PT 6340. Human Growth and Development. (3 cr.; A-F or Audit; Every Fall) Developmental process throughout life span. Physical, motor, social, and personality development. Theories of development. Factors that influence a child's development. prereq: Registered PT student

PT 6400. Health Activism. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) Joint Medical School-School of Public Health course. Series of skill-building workshops. Hands-on community project completed by small group of public health and medical students in cooperation with a community organization and a faculty mentor. Projects focus on issues of health disparities, environmental justice, and access to care. prereq: Enrolled DPT student

PT 6813. Cardiopulmonary Physical Therapy. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Theory and techniques of cardiopulmonary evaluation and treatment. Principles of exercise response and adaptations to training. prereq: enrolled PT student

PT 7000. Neurological Theory and Neurosciences in Physical Therapy. (1-6 cr.; A-F only; Fall Odd, Spring Even Year) Recent/current updates in neurological theory/intervention supported by neuroanatomical science. Students explore evidence supporting clinical decision making process. One-six selected weekends. Prereq Admitted to Transitiostional Doctor of Physical Therapy Program.

PT 7001. Topics in Musculoskeletal PT. (1-6 cr.; A-F only; Every Fall & Spring) Evidence base for evaluation/treatment techniques. Manual/exercise treatment skills. Common radiologic assessments for musculoskeletal client. Special requirements of select client populations such as athletes, industrial workers, musicians/dancers. Topics in women's health. Pathologic processes in common musculoskeletal conditions. One-six weekends. Prereq Admitted in transitional doctor of physical therapy program.

PT 7002. Topics in Cardiopulmonary Physical Therapy. (2 cr.; A-F only; Fall Even Year) Principles of cardiac/pulmonary systems as applied to physical therapy. Principles of normal/abnormal responses to exercise, pathophysiology, and training. Theory/techniques of cardiopulmonary assessment, evaluation, rehabilitation, and clinical decision making of patients with cardiopulmonary disorders. Two selected weekends. Prereq Admitted in transitional doctor of physical therapy program.

PT 7003. Topics in Integumentary Physical Therapy. (2 cr.; A-F only; Spring Odd Year) Response of integument to injury, disease, and aging. Advances in wound management, rehabilitation of wounds in acute/chronic integument disorders. Physiology, pathophysiology, and therapeutic procedures to evaluate, treat, and manage clients with disorders of integument. Two selected weekends. Prereq Admitted in transitional doctor of physical therapy program.

PT 7004. Topics in Biomechanics and Pathokinesiology in Physical Therapy. (3 cr.; A-F only; Fall Odd Year) Principles of human biomechanics applied to physical therapy. Biomechanics/pathokinesiology of selected joint complexes. Three selected weekends. Prereq Admitted in transitional doctor of physical therapy program.


PT 7006. Anatomy for Physical Therapy. (2 cr.; A-F only; Fall Odd Year) Dissection of bones, muscles, nerves, vessels, connective tissue, and selected internal organs. Joint structures of limbs, spinal column, head, and pelvis. Histology, embryology. Correlation of content to clinical practice. Lecture, human cadaver lab. Two selected weekends. Prereq Admitted in transitional doctor of physical therapy program.

PT 7007. Administration and Legal Issues. (2 cr.; A-F only; Fall Even Year) Ethical/legal analysis applied to clinical/administrative decision making in contemporary practice environments. Theoretical frameworks, concepts, and case analysis to address challenges in practice. Two selected weekends. Prereq Admitted in transitional doctor of physical therapy program.

PT 7008. Scientific Basis of PT Practice. (2 cr.; A-F only; Spring Even Year) Role of science/research in physical therapy as it relates to critical thinking and decision making in practice. Statistical terminology, research design, hypothesis testing. Two selected weekends. Prereq Admitted in transitional doctor of physical therapy program.

PT 7009. Capstone Experience. (3 cr.; A-F only; Every Summer) How case studies are conducted/written. Importance of case studies to a profession. Basics of case report, literature review. Measurement technique, writing techniques. Student projects are evaluated by instructor or core or adjunct faculty. prereq: Must be a DPT student

PT 7010. Topics in Geriatric Rehabilitation I. (2 cr.; S-N only; Every Fall) Demographics of aging population, psychosocial issues with aging, clinical research in the area of geriatrics. How to write patient case report. Lecture, discussion, literature review. prereq: Licensed physical therapist enrolled in geriatric clinical residency

PT 7011. Topics in Geriatric Rehabilitation II. (2 cr.; S-N only; Every Spring) Providing physical therapy to geriatric clients. Pathophysiology, pathokinesiology, and therapeutic procedures to evaluate, treat, and manage clients. How clinical issues vary in geriatric population vs. younger patients. Lecture, discussion, literature review. prereq: Licensed physical therapist enrolled in geriatric clinical residency

PT 7012. Topics in Geriatric Rehabilitation III. (2 cr.; S-N only; Every Summer) Management/reimbursement issues in geriatric health care system. Body systems/pathological processes common in geriatric client. How physical therapy is reimbursed through Medicare system. Lecture, discussion, literature review. prereq: Licensed physical therapist enrolled in geriatric clinical residency

PT 8131. Research Elective. (1 cr.; max 2 cr.; S-N or Audit; Every Fall, Spring & Summer) Research elective guided by the research advisor. prereq: Grad PT major

PT 8132. Research Seminar. (1 cr.; S-N only; Spring Odd Year) This initial course for the research series provides a foundation for future guided projects on components of the research cycle. Students explore why research is important and how it can be translated to improvements in clinical care. Basic research designs and reporting venues, literature search strategies and tools, critical review of literature, responsible conduct of research, and reference management are discussed. Pre-req: Grad PT major

PT 8193. Research Problems. (2-6 cr.; Student Option; Every Fall, Spring & Summer) Process of developing/completing a scholarly project or literature review related to rehabilitation science/Physical Therapy education and practice. Students work directly with faculty participating in research in guided small group experience. Type of research experience is determined by adviser. prereq: Grad PT major
PHYS 1001W. Energy and the Environment. (ENV,WI,PHYS; 4 cr.; Student Option; Every Fall & Spring) Fundamental laws and principles governing the physical world, discussed in the context in which encountered in modern science and technology. Lab. prereq: 1 yr high school algebra

PHYS 1011. Physical World. (; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Fundamental laws and principles governing the physical world, discussed in the context in which encountered in modern science and technology. Lab. prereq: 1 yr high school algebra

PHYS 1021. Intro Phys. (5 cr.; S-N only;)

PHYS 1101W. Introductory College Physics I. (PHYS, WI; 4 cr.; Student Option; Every Fall & Spring) Fundamental principles of physics in the context of everyday world. Use of kinematics/dynamics principles and quantitative/qualitative problem solving techniques to understand natural phenomena. Lecture, recitation, lab. prereq: 1 yr high school algebra

PHYS 1102W. Introductory College Physics II. (PHYS, WI; 4 cr.; Student Option; Every Fall & Spring) Fundamental principles of physics in context of everyday world. Use of conservation principles and quantitative/qualitative problem solving techniques to understand natural phenomena. Lecture, recitation, lab. prereq: 1101W or 1107

PHYS 1107. Introductory Physics Online I. (PHYS; 4 cr.; Student Option; Every Fall & Spring) Principles of physics in context of everyday world. Use of kinematics/dynamics principles together with quantitative/qualitative problem solving techniques to understand natural phenomena. Lecture content, recitation, lab. prereq: 1101W or 1107; primarily for students interested in technical areas

PHYS 1181. Introductory College Physics I. (3 cr.; S-N only; Every Fall & Spring) Intended only to be used to recognize proficiency in material of PHYS 1101W. prereq: Proficiency in the material of PHYS 1101W

PHYS 1182. Introductory College Physics II. (3 cr.; S-N only; Every Spring) Intended only to be used to recognize proficiency in material of PHYS 1102W. prereq: Proficiency in the material of PHYS 1102W

PHYS 1201W. Introductory Physics for Biology and Pre-medicine I. (PHYS, WI; 5 cr.; Student Option; Every Fall, Spring & Summer) Fundamental principles of physics. Description of motion, forces, conservation principles, structure of matter. Applications to mechanical systems, including fluids, waves, heat. Lab. prereq: [High school or college calculus], trigonometry, algebra

PHYS 1202W. Introductory Physics for Biology and Pre-medicine II. (PHYS, WI; 5 cr.; Student Option; Every Fall, Spring & Summer) Fundamental principles of physics. Motion, forces, conservation principles, structure of matter. Applications to electromagnetic phenomena, including optics, atomic structure. Lab. prereq: 1201W

PHYS 1281. Introductory Physics for Biology and Pre-medicine I. (4 cr.; S-N only; Every Fall, Spring & Summer) Intended only to be used to recognize proficiency in material of PHYS 1201W. prereq: Proficiency in the material of PHYS1201W

PHYS 1282. Introductory Physics for Biology and Pre-medicine II. (4 cr.; S-N only; Every Fall & Spring) Intended only to be used to recognize proficiency in material of PHYS 1202W. prereq: Proficiency in the material of PHYS1202W

PHYS 1301W. Introductory Physics for Science and Engineering I. (PHYS, WI; 4 cr.; Student Option; Every Fall, Spring & Summer) Use of fundamental principles to solve quantitative problems. Motion, forces, conservation principles, structure of matter. Applications to mechanical systems. prereq: concurrent registration is required (or allowed) in Math 1271 or concurrent registration is required (or allowed) in Math 1371 or concurrent registration is required (or allowed) in Math 1571

PHYS 1302W. Introductory Physics for Science and Engineering II. (PHYS, WI; 4 cr.; Student Option; Every Fall & Spring) Use of fundamental principles to solve quantitative problems. Motion, forces, conservation principles, fields, structure of matter. Applications to electromagnetic phenomena. prereq: 1301W, concurrent registration is required (or allowed) in Math 1272 or Math 1372 or Math 1572

PHYS 1381. Introductory Physics for Science and Engineering I. (3 cr.; S-N only; Every Fall, Spring & Summer) Intended only to be used to recognize proficiency in material of PHYS 1301W. prereq: Proficiency in the material of PHYS1301W

PHYS 1382. Introductory Physics for Science and Engineering II. (3 cr.; S-N only; Every Fall, Spring & Summer) Intended only to be used to recognize proficiency in material of PHYS 1302W. prereq: Proficiency in the material of PHYS1302W

PHYS 1401V. Honors Physics I. (PHYS, WI; 4 cr.; A-F only; Every Fall) Comprehensive, calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Description of motion, forces, conservation principles. Structure of matter, with applications to mechanical systems.

PHYS 1402V. Honors Physics II. (PHYS, WI; 4 cr.; A-F only; Every Fall) Principles of mechanics for those with full year of calculus/equivalent of one year of high-school physics. Introduction to kinematics, forces, momentum/energy, conservation laws, angular momentum, rigid body motion, gravity, simple harmonic motion, waves. prereq: One year of high school physics, one year of college-level calculus (or a grade of 5 on the BC-level AP calculus exam), Honors, permission of UHP

PHYS 1502V. Honors Introduction to Electricity and Magnetism. (PHYS, WI; 4 cr.; A-F only; Every Fall) Principles of electricity/magnetism for those with full year of calculus/equivalent of one year of high-school physics. Introduction to electrostatics, magnetostatics, electromagnetic properties of materials, circuits, Maxwell's equations, electromagnetic waves. prereq: 1501V, honors

PHYS 1901. Global Warming Solutions. (; 2 cr.; A-F or Audit; Periodic Fall) In this seminar, we will consider various possible solutions to the current and future global warming problem. This is a topic of intense global importance. Topics will include efficiency and conservation, reduced carbon in electricity production and transportation, wind and solar power, nuclear power, policy changes, third world solutions, reforestation, and more.

PHYS 1903. Quantum Mechanics for Everyone. (; 2 cr.; A-F only; Periodic Fall) One of the greatest intellectual accomplishments of the twentieth century was the development of quantum mechanics, a field of physics which describes the counter-intuitive behavior of molecules, atoms, light, and subatomic particles. Can you pass through a solid wall without disturbing yourself or the wall? An electron can and does repeatedly in many common semiconductor devices. Without an understanding of quantum mechanics, neither the transistor nor the laser could have
Thermodynamics and its underlying statistical nature. prereq: [1302W or 1402V or 1502V]. [concurrent registration is required (or allowed) in MATH 1272 or MATH 1372 or MATH 1572H]

PHYS 2303. Physics III: Physics of Matter. (4 cr.; Student Option; Every Spring) Thermodynamics, mechanical/electromagnetic waves, optics, quantum theory. Applications of quantum nature of solids. prereq: 1302. [MATH 1272 or MATH 1372 or MATH 1572H]. [MatSci or EE] student

PHYS 2311. Modern Physics. (4 cr.; Student Option; Every Fall, Spring & Summer) Broad overview of physical concepts developed in twentieth century. Special relativity, wave-particle duality, Schrodinger equation, Bohr atom, hydrogen atom in wave mechanics, many-electron atoms, x-rays, nuclear structure, radioactivity, nuclear reactions, statistical physics. prereq: [1302 or 1402]. Chem 1022, Math 2243

PHYS 2503. Physics III: Intro to Waves, Optics, and Special Relativity. (4 cr.; Student Option; Every Fall) Third semester of introductory physics. Mechanical/electromagnetic waves, optics, special relativity. prereq: 1302W. [MATH 1272 or MATH 1372 or MATH 1572H]

PHYS 2503H. Honors Physics III. (4 cr.; A- only; Every Fall) The third semester of a calculus-based introductory physics sequence. Topics include: relativistic kinematics and dynamics, mechanical and electromagnetic waves, light, interference, diffraction, wave-particle duality and topics in modern physics. Course emphasizes the use of fundamental problems to solve quantitative problems. Intended primarily for those who have completed 1401V/1402V, although those students with outstanding performance in 1301W/1302W may be granted permission to enroll. prereq: 1402V or 1502V. honors student or permission of University Honors Program or instr consent

PHYS 2601. Quantum Physics. (4 cr.; Student Option; Every Spring) Introduction to quantum mechanics. Applications to atomic, molecular, condensed-matter, nuclear, elementary-particle, and statistical physics. Associated lab is 2605. prereq: [2503H or 2503H]. [concurrent registration is required (or allowed) in Math 2243 or Math 2373 or Math 2574H]

PHYS 3022. Introduction to Cosmology. (3 cr.; Student Option; Spring Odd Year) Large-scale structure and history of universe. Dark matter, cosmic microwave background. Newtonian relativistic world models. Physics of early universe. Cosmological tests. prereq: 2601

PHYS 3041. Mathematical Methods for Physicists. (3 cr.; Student Option; Every Spring) This course introduces additional mathematical topics that physics majors need to properly handle upper division physics classes. prereq: PHYS 1302, MATH 2373 (or equivalent courses)

PHYS 3071W. Laboratory-Based Physics for Teachers. (PHYS, WI; 4 cr.; Student Option; Every Fall & Spring) Laboratory-based introductory physics. Topics selected to apply to elementary school curriculum: earth's motion, properties of matter, heat and temperature, kinematics, and electric current. prereq: College algebra; no credit for CSE students or students who have completed PHYS 1201/1202, PHYS 1301/1301, PHYS 1401/1402, or PHYS 1501/1502.

PHYS 3605W. Modern Physics Laboratory. (WI; 3 cr.; Student Option; Every Fall & Spring) Laboratory experiments in atomic, solid state, and nuclear physics. Introduction to data analysis techniques as well as the communication of scientific results through maintaining a logbook and writing papers. Prerequisites: completion (or concurrent registration) in PHYS 2503 or 2503H.

PHYS 3993. Directed Studies. (1-5 cr. max 10 cr.; Student Option; Every Fall, Spring & Summer) Directed study in Physics in areas arranged by the student and a faculty member. prereq: instr consent, dept consent

PHYS 3994. Directed Research. (1-5 cr. max 10 cr.; Student Option; Every Fall, Spring & Summer) Independent, directed study in physics in areas arranged by the student and a faculty member. prereq: instr consent, dept consent

PHYS 4001. Analytical Mechanics. (4 cr.; Student Option; Every Fall) Analytic Newtonian mechanics. Mathematics beyond prerequisites developed as required. prereq: [2303 or 2601 or Chem 3501 or Chem 3502]. two sems soph math

PHYS 4002. Electricity and Magnetism. (4 cr.; Student Option; Every Spring) Classical theory of electromagnetic fields using vector algebra and vector calculus. prereq: [2303 or 2601 or Chem 3501 or Chem 3502]. two sems soph math

PHYS 4041. Computational Methods in the Physical Sciences. (4 cr.; Student Option; Periodic Fall & Spring) Introduction to using computer programs to solve problems in physical sciences. Selected numerical methods, mapping problems onto computational algorithms. Arranged lab. prereq: Upper div or grad student or instr consent

PHYS 4051. Methods of Experimental Physics I. (5 cr.; Student Option; Every Fall) Contemporary experimental techniques. Introduction to modern analog and digital electronics from an experimental viewpoint. Use of computers for data acquisition and experimental control. Statistics of data analysis. prereq: concurrent registration is required (or allowed) in 2605 or equiv lab experience or instr consent

PHYS 4052W. Methods of Experimental Physics II. (WI; 5 cr.; Student Option; Every Spring) Second semester of laboratory sequence. Contemporary experimental techniques
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

PHYS 4101. Quantum Mechanics. (3 cr.; Student Option; Every Fall)
Mathematical techniques of quantum mechanics. Schrödinger Equation and simple applications. General structure of wave mechanics. Operator methods, perturbation theory, radiation from atoms. prereq: [2303 or 2601 or Chem 3502], two sems soph math

PHYS 4112W. History of 20th-Century Physics. (WI; 3 cr.; Student Option; Periodic Spring)
The transition from classical to modern physics (relativity, quantum) and its architects (from Planck and Einstein to Heisenberg and Schrödinger). The WWII bomb projects in the US and Germany. Post-war developments (solid state, particle physics).

PHYS 4201. Statistical and Thermal Physics. (3 cr.; Student Option; Every Fall)
Principles of thermodynamics and statistical mechanics. Selected applications such as kinetic theory, transport theory, and phase transitions. prereq: 2601

PHYS 4211. Introduction to Solid-State Physics. (3 cr.; Student Option; Every Spring)
A modern presentation of the properties of solids. Topics include vibrational and electronic properties of solids; diffraction of waves in solids and electron band structure. Other possible topics include optical properties, magnetic phenomena, and superconductivity. prereq: 4101, 4201

PHYS 4303. Electrodynamics and Waves. (3 cr.; Student Option; Every Fall & Spring)
Analytical mechanics, Electricity/magnetism, including mechanical/electromagnetic wave phenomena. Physical/geometrical optics. prereq: 4001, 4002

PHYS 4501. Experimental Project. (1-5 cr.; Student Option; Every Fall, Spring & Summer)
Research project in physics area of contemporary interest. Project must be approved by faculty coordinator before registration. prereq: 4052, instr consent

PHYS 4511. Introduction to Nuclear and Particle Physics. (3 cr.; Student Option; Every Spring)
Fundamental particles and Standard Model. Symmetries/quarks, models of nuclei, interactions between particles/nuclei, tests of conservation laws, fission/fusion. prereq: 4101

PHYS 4611. Introduction to Space Physics. (3 cr.; Student Option; Fall Odd Year)

PHYS 4621. Introduction to Plasma Physics. (3 cr.; Student Option; Fall Odd Year)
Basic properties of collisionless, magnetized plasmas, single particle motion, plasmas as fluids, magnetohydrodynamics, waves in plasmas, equilibrium, instabilities, kinetic theory/shocks. prereq: [4001, 4002] or equiv or instr consent

PHYS 4811. Introduction to General Relativity. (3 cr.; Student Option; Spring Odd Year)
Introduction to general relativity for undergraduate students. The course will introduce basic concepts of differential geometry and use them to motivate Einstein's Equation. It will then solve Einstein's equation to study particle orbits, gravitational lensing of light, black holes, and gravitational waves. Brief introduction to cosmology and evolution of the universe will be included. prereq: PHYS 4001 and (PHYS 2503 or 2503H)

PHYS 4911. Introduction to Biopolymer Physics. (3 cr.; Student Option; Every Spring)
Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials. Elements of thermodynamics and statistical mechanics are presented as needed. prereq: [2303, 2403H, 2503] or Chem 3501 or instr consent

PHYS 4950H. Senior Thesis. (1-3 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring)
Independent project with adviser. prereq: instr consent

PHYS 4960H. Honors Seminar. (1 cr. [max 2 cr.]; Student Option No Audit; Every Fall & Spring)
Designed to prepare students for senior honors thesis projects and provide guidance in choice of future careers. prereq: Upper div honors, instr consent

PHYS 4993. Directed Studies. (1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Directed study in Physics in areas arranged by student and faculty member. prereq: instr consent

PHYS 4994. Directed Research. (1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Independent, directed study in physics in areas arranged by student and a faculty member. prereq: instr consent

PHYS 5001. Quantum Mechanics I. (4 cr.; Student Option; Every Fall)
Schrödinger equation: bound state and scattering problems in one dimension. Spherically symmetric problems in three dimensions, angular momentum, and the hydrogen atom. Approximation methods for stationary states. Time-dependent perturbation theory. Operators and state vectors: general formalism of quantum theory. prereq: 4101 or equiv or instr consent

PHYS 5002. Quantum Mechanics II. (4 cr.; Student Option; Every Spring)
Symmetry in quantum mechanics, space-time symmetries and the rotation group, Clebsch-Gordan coefficients and the Wigner-Eckart theorem. Scattering theory. Method of second quantization with elementary applications. Relativistic wave equations including Dirac equation. prereq: 5001 or equiv

PHYS 5011. Classical Physics I. (4 cr.; Student Option; Every Fall)
Classical mechanics: Lagrangian/Hamiltonian mechanics, orbital dynamics, rigid body motion, special relativity. prereq: 4001, 4002 or instr consent

PHYS 5012. Classical Physics II. (4 cr.; Student Option; Every Spring)
Classical electromagnetism: electrostatics, magnetostatics, Maxwell's equations, electromagnetic waves, radiation, interaction of charged particles with matter. prereq: 5011 or instr consent

PHYS 5022. Relativity, Cosmology, and the Universe. (4 cr.; Student Option; Periodic Fall)
Large-scale structure and history of universe. Introduction to Newtonian and relativistic world models. Physics of early universe. Cosmological tests. Formation of galaxies. prereq: 2601 or instr consent

PHYS 5041. Mathematical Methods for Physics. (4 cr.; Student Option; Every Fall)
Survey of mathematical techniques needed in analysis of physical problems. Emphasizes analytical methods. prereq: 2601 or grad student

PHYS 5071. Physics for High School Teachers: Experimental Foundations and Historical Perspectives. (3 cr.; Student Option; Periodic Fall)
In-depth examination of a conceptual theme in physics, its experimental foundations and historical perspectives. Kinematics and dynamics from Aristotle through Einstein; nature of charge and light; energy and thermodynamics; electricity, magnetism, and quantized fields; structure of matter. prereq: Gen physics, instr consent; no cr for physics grad or grad physics minor

PHYS 5072. Best Practices in College Physics Teaching. (1-3 cr. [max 5 cr.]; Student Option; Every Fall & Spring)
Pedagogies for introductory physics classes. Topics from educational research/practice as applied to classroom.

PHYS 5081. Introduction to Biopolymer Physics. (3 cr.; Student Option; Periodic Fall)
Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials. prereq: working knowledge of [thermodynamics, statistical mechanics]

PHYS 5201. Thermal and Statistical Physics. (3 cr.; A-F or Audit; Every Fall)
PHYS 5400. Introduction to Plasma Physics. (2 cr.; Student Option; Every Fall & Spring)
Basic properties of collisionless, magnetized plasmas, single particle motion, plasmas as fluids, magnetohydrodynamics, waves in plasmas, equilibrium, instabilities, kinetic theory/shocks. prereq: CSE grad student, working knowledge of waves/electromagnetism

PHYS 5401. Physiological Physics. (4 cr.; Student Option; Fall Even Year)
Musculoskeletal system, circulatory system/membrane transport, biological control systems, propagation/action potential in nervous system, biomagnetism, electromagnetism at cellular level, prereq: One semester of introductory calculus-based physics, such as PHYS1301W. Students not sure if they meet prerequisites should consult instructor.

PHYS 5451. Radiological Physics. (2 cr.; Student Option; Spring Even Year)
Signal analysis, medical imaging, medical x-rays, tomography, radiation therapy, nuclear medicine, MRI, similar topics. prereq: Two semesters of introductory calculus-based physics, such as PHYS1302W. Students not sure if they meet prerequisites should consult instructor.

PHYS 5621. Introduction to Plasma Physics. (; 3 cr.; Student Option; Periodic Fall)
Basic properties of collisionless, magnetized plasmas, single particle motion, plasmas as fluids, magnetohydrodynamics, waves in plasmas, equilibrium, instabilities, kinetic theory/shocks. prereq: CSE grad student, working knowledge of waves/electromagnetism

PHYS 5701. Solid-State Physics for Engineers and Scientists. (; 4 cr.; Student Option; Periodic Fall)
Crystal structure and binding; diffraction; phonons; thermal and dielectric properties of insulators; free electron model; band structure; semiconductors. prereq: Grad or advanced undergrad in physics or engineering or the sciences.

PHYS 5950. Colloquium Seminar. (; 1 cr.; S-N or Audit; Every Fall & Spring)
Colloquium of School of Physics and Astronomy. prereq: [Grad student or advanced undergrad in physics], dept consent.

PHYS 5970. Physics Journal Club. (; 1-3 cr.; S-N only; Every Fall & Spring)
Weekly student-led presentation, discussion, and critical analysis of important papers. prereq: 2601, 2605 or equiv; intended for 2nd-yr grad students in physics

PHYS 5980. Introduction to Research Seminar. (; 1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Introduction to the research activities of the School of Physics and Astronomy. prereq: Grad or upper div phys major

PHYS 5993. Directed Studies. (; 1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer)
Independent, directed study in physics in areas arranged by the student and a faculty member. prereq: instr consent, dept consent

PHYS 5994. Directed Research. (; 1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer)
Problems, experimental or theoretical, of special interest to students. Written reports. prereq: Jr, dept consent

PHYS 8000. Advanced Quantum Mechanics. (; 3 cr.; Student Option; Every Fall)
Topics in non-relativistic quantum mechanics; second quantization. Introduction to Diagrammatic and Green's function techniques and to relativistic wave equations. Application of relativistic perturbation theory to particle interactions with electromagnetic field. Invariant interactions of elementary particles. prereq: 5002 or instr consent

PHYS 8011. Quantum Field Theory I. (; 3 cr.; Student Option; Every Fall)
Second quantization of relativistic wave equations: canonical quantization of the free scalar and Dirac fields. Fields in interaction: interaction picture. Quantum electrodynamics: quantization of the electromagnetic field, propagators and Feynman rules, tree-level processes. Higher-order processes and renormalization. prereq: 8001 or instr consent

PHYS 8012. Quantum Field Theory II. (; 3 cr.; Student Option; Every Fall)
Aspects of general theory of quantized fields, including space-time and discrete transformation properties, the CPT theorem, and the spin-statistics connection. Introduction to functional and path-integral methods. Renormalization group and asymptotic freedom. Semi-classical methods and instantons in gauge theories. prereq: 8011 or instr consent

PHYS 8013. Special Topics in Quantum Field Theory. (; 3 cr.; Student Option; Spring Even Year)
Includes non-perturbative methods in quantum field theory, supersymmetry, two-dimensional quantum field theories and their applications, lattice simulations of quantum fields, topological quantum field theories, quantum field theory methods applied to condensed matter physics, and string theory. prereq: 8012 or instr consent

PHYS 8100. Seminar: Problems of Physics Teaching and Higher Education. (; 1 cr. [max 3 cr.]; Student Option; Every Spring)
Lectures and informal discussions of courses and curricula, techniques, and materials important in undergraduate physics instruction; relation to general problems of higher education.

PHYS 8161. Atomic and Molecular Structure. (; 3 cr.; A-F only; Fall Odd Year)
Emphasizes interpretation of quantum numbers and selection rules in terms of symmetry. Experimental data summarized and compared with theoretical predictions. prereq: Level of mathematics associated with BS in physical sciences

PHYS 8200. Seminar: Cosmology and High Energy Astrophysics. (; 1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring)
Current topics in cosmology and high energy astrophysics. prereq: instr consent

PHYS 8300. Seminar: Biological and Medical Physics. (; 1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring)
Current research in biological and medical physics prereq: instr consent

PHYS 8301. Symmetry and Its Application to Physical Problems. (; 3 cr.; Student Option; Periodic Fall)
Fundamental invariance principles obeyed by laws of physics. Group theory as tool for using symmetry and invariance to help understand behavior of physical systems. Applications made to atomic, molecular, nuclear, condensed-matter, and elementary particle physics. prereq: 5002 or instr consent

PHYS 8311. Biological Physics of Single Molecules. (; 3 cr.; Student Option; Spring Odd Year)
Biological molecules, based on statistical mechanics, kinetics, optics, and other physics ideas. Physics of DNA/proteins, their interactions. Force spectroscopy (optical tweezers, atomic force microscopy). Concepts of optical spectroscopy. Single molecule fluorescence/imaging. prereq: [5201 or Chen 4707], 5011 or instr consent

PHYS 8312. Biological Physics of Macroscopic Systems. (; 3 cr.; Student Option; Spring Even Year)
Macroscopic systems, based on physics such as fluid dynamics, statistical mechanics, non-linear dynamics, and chaos theory. Supermolecular aggregates. Biological physics of the cell. Biological physics of populations/evolution. prereq: [5201 or CHEN 4707], 5011 or instr consent

PHYS 8333. FTE: Master's. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Master's student, adviser and DGS consent

PHYS 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
No description prereq: Doctoral student, adviser and DGS consent

PHYS 8500. Plan B Project. (; 4 cr.; Student Option; Every Fall, Spring & Summer)
Project topic arranged between student and instructor. Written report required. prereq: instr consent; may be taken once to satisfy Plan B master's project requirement; no cr toward PhD

PHYS 8501. General Relativity and Cosmology I. (3 cr.; Student Option; Periodic Fall & Spring)
Tensor analysis and differential geometry. Special relativistic leading to formulation of principles of general relativity and Einstein's equations. Tests of general relativity and thorough discussion of various black hole solutions, including Schwarzschild, Reissner-Nordstrom, and Kerr solutions. prereq: 5012 or instr consent

PHYS 8502. General Relativity and Cosmology II. (; 3 cr.; Student Option; Periodic Fall)
Gravitational radiation. Applications of general relativity to stellar structure of white dwarfs and neutron stars, action principle, and symmetric spaces. Big-bang cosmology.
PHYS 8650. Advanced Topics in Space and Plasma Physics. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Topics in plasma waves and instabilities, solar physics, including radiation and magnetic effects; solar wind and magnetospheric physics; physics of radiation belts. prereq: 5012 or instr consent

PHYS 8652. Plasma Physics II. (3 cr.; Student Option; Periodic Fall) Theory of plasma waves and instabilities, collisions, radiation, transport, nonlinear wave-particle and wave-wave interactions, instabilities in inhomogeneous plasmas. prereq: 8601 or instr consent

PHYS 8661. Cosmic Rays and Plasma Astrophysics. (3 cr.; Student Option; Periodic Fall & Spring) Properties of energetic particles in heliosphere and in astrophysical environments; solar physics, including radiation and magnetic effects; solar wind and magnetospheric physics; physics of radiation belts. prereq: 5012 or instr consent

PHYS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

PHYS 8700. Seminar: Condensed Matter Physics. (1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring) Research topics. prereq: instr consent

PHYS 8702. Statistical Mechanics and Transport Theory. (3 cr.; Student Option; Every Spring) Equilibrium properties of macroscopic classical and quantum systems. Phase transitions and Renormalization Group. Transport theory. Applications to soft condensed matter systems. prereq: 5201 or instr consent

PHYS 8711. Solid-State Physics I. (3 cr.; Student Option; Every Fall) Fundamental properties of solids. Electronic structure and transport in metals and semiconductors. Properties of disordered materials. prereq: 4211, 5002 or instr consent

PHYS 8712. Solid-State Physics II. (3 cr.; Student Option; Every Spring) Fundamental properties of solids. Electronic structure and transport in metals and semiconductors. Properties of disordered materials. prereq: 8711 or instr consent

PHYS 8750. Advanced Topics in Condensed Matter Physics. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Sample research topics: magnetism, superconductivity, low temperature physics, superfluid helium. prereq: 8712 or instr consent

PHYS 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

PHYS 8800. Seminar: Nuclear Physics. (1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring) Current research topics.


PHYS 8802. Nuclear Physics II. (3 cr.; Student Option; Periodic Fall) Properties of nuclei based on hadronic and quark-gluon degrees of freedom. Relativistic field theory at finite temperatures and density applied to many-body problems, especially nuclear matter and quark-gluon plasma. Applications to lepton and hadron scattering, nucleus-nucleus collisions, astrophysics and cosmology. prereq: 8801 or instr consent

PHYS 8850. Advanced Topics in Nuclear Physics. (3 cr. [max 9 cr.]; Student Option; Fall Odd Year) Research topics. prereq: 8802 or instr consent

PHYS 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

PHYS 8900. Seminar: Elementary Particle Physics. (1 cr. [max 6 cr.]; S-N or Audit; Every Fall & Spring) Elementary particle physics, high energy physics, particle astrophysics and cosmology.

PHYS 8901. Elementary Particle Physics I. (3 cr.; Student Option; Every Fall) Types of fundamental interactions. Exact and approximate symmetries and conservation laws. Gauge quanta: gluons, photons, W and Z bosons, gravitons. Fundamental fermions: leptons and quarks. Isotopic and flavor SU(3) symmetries of strong interaction. Heavy hadrons. Amplitudes and probabilities. Quantum chromodynamics. prereq: 8001 or instr consent


PHYS 8950. Advanced Topics in Elementary Particle Physics. (3 cr. [max 9 cr.]; Student Option; Periodic Fall) Research topics. prereq: 8902 or instr consent

PHYS 8994. Research in Physics. (1-12 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer) Research under faculty direction. prereq: instr consent

Physiology (PHSL)

PHSL 3050. Physiology From Cells to Systems. (3 cr.; A-F only; Every Summer) Basic physiology of human cells and organ systems, including nerve, muscle, cardiovascular, respiratory, renal, digestive, endocrine, metabolic and reproductive systems. Critical thinking about physiological concepts through active learning exercises involving analysis and manipulation of ideas. Apply concepts in basic research or clinical settings. prereq: BIOL 1009 or equiv [including eukaryotic cellular biology], [CHEM 1021, CHEM 1022] or 1 yr of college-level chemistry

PHSL 3051. Human Physiology. (4 cr.; Student Option; Every Fall & Spring) How major organ systems function (nerve, muscle, circulation, respiration, endocrine, renal, gastrointestinal, temperature regulation and energy metabolism). Three one-hour lectures, two-hour lab. prereq: [BIOL 1009 or 1 yr college bio], 1 yr college chem

PHSL 3061. Principles of Physiology. (4 cr.; Student Option; Every Fall) Human physiology with emphasis on quantitative aspects. Organ systems (circulation, respiration, gastrointestinal, renal, endocrine, muscle, peripheral and central nervous systems), cellular transport processes, and scaling in biology. prereq: 1 year college chem and physics and math through integral calculus

PHSL 3062W. Research Paper for Physiology Majors. (WI; 1 cr.; A-F or Audit; Every Fall & Summer) Students write a research paper on a topic of interest, mentored by a faculty member. prereq:
PHSL 3095. Problems in Physiology. (1-5 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Individualized study in physiology. Students address a selected problem in physiology through library or lab research, supervised by physiology faculty. PreReq: concurrent registration is required (or allowed) in college physiology, instr consent

PHSL 3701. Physiology Laboratory. (2 cr.; A-F or Audit; Every Fall) Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems. PreReq: Physiology major

PHSL 4021. Advanced Physiology and Bioengineering: Bionic Human. (3 cr.; A-F only; Every Spring) Is "Iron Man" technology just around the corner? This course will examine how, and if, biomedical devices can address the needs of humans suffering from various pathologies and/or disabilities, or enhance human performance. Advanced discussion of the physiology of organs/organ systems and relevant devices past, present, and future. Emphasis will be on an in-depth understanding of normal physiology including cardiovascular, respiratory, renal, liver, motor, sensory, and pancreatic physiology. Classes will involve review of the physiology of organ systems, design considerations for medical devices, and discussions of published papers about basic science and clinical trials. Classes will be a combination of content presentation and discussion.

PHSL 4031. Physiological Discussions: Contemporary Topics. (2 cr.; A-F only; Every Spring) Students read, critically evaluate, present, and discuss research in cellular and organ system physiology. Journal club setting led by faculty members. PreReq: 3061 or 3063 or 5061 or instr consent

PHSL 4095H. Honors Problems in Physiology. (2-4 cr.; A-F or Audit; Every Fall, Spring & Summer) Students pursue a selected topic in physiology through library or lab research supervised by physiology faculty. PreReq: 3061, physiology honors candidate, approval of director of undergraduate studies in physiology.

PHSL 4242. Professional Skills Development for Biomedical Scientists. (2 cr.; A-F only; Spring Even Year) Students will gain valuable experience in professional development for bio-medical science, applicable to academic, clinical, biotech, pharma, medical and other career paths. This course features essential professional skills development, including critical evaluation of the scientific literature, oral short presentations, development of research project specific aims, and development of individual WOW statements (aka the Bill Gates elevator pitch). Students will gain knowledge of grant mechanisms and on strategies and mechanics to writing a winning grant. Students will evaluate funded research projects, develop and write their own grant, (possibly based on their previous PHSL 3062W paper or other experiences) and perform peer review critiques of their submitted grants. There are no conventional tests in this class. PreReq: PHSL 3062W is recommended.

PHSL 4700. Cell Physiology. (3 cr.; A-F or Audit; Every Fall) Critical cell functions. Regulation of pH, volume, intracellular electrolyte composition, calcium signaling, membrane potential dynamics, motility, aspects of intercellular communication. PreReq: [PHSL 3061 or 3061 or 3061 or 3061 or BIOL 3211], [CHEM 1022 or equiv], [MATH 1272 or equiv]

PHSL 4900. Advanced Physiology Teaching Laboratory. (1-6 cr. [max 12 cr.]; A-F only; Every Fall & Spring) Teaching in undergrad physiology labs. Instructional sessions, hands-on teaching experiences. PreReq: [PHSL 3061 or [3061, 3071]], instr consent

PHSL 5061. Principles of Physiology for Biomedical Engineering. (4 cr.; Student Option; Every Fall) Human physiology with emphasis on quantitative aspects. Organ systems (circulation, respiration, renal, gastrointestinal, endocrine, muscle, central and peripheral nervous systems), cellular transport processes, and scaling in biology. PreReq: Biomedical engineering grad, one yr college chem and physics and math through integral calculus

PHSL 5094. Research in Physiology. (1-5 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Independent lab research project in physiology, supervised by physiology faculty. PreReq: instr consent

PHSL 5095. Problems in Physiology. (1-5 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Individualized study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty. PreReq: instr consent

PHSL 5096. Integrative Biology and Physiology Research Advances. (1 cr. [max 4 cr.]; A-F only; Every Fall & Spring) Attend/participate in IBP Fall/Spring seminar series. Seminars given by faculty, invited speakers, students. Exposure to key topics. How to present seminars, PreReq: instr consent

PHSL 5101. Human Physiology. (5 cr.; Student Option; Every Spring) Survey of human physiology: Cardiovascular, muscle, respiratory, gastrointestinal, nutrition, renal physiology. Integrative, systems approach. Emphasizes normal function. PreReq: Grad student

PHSL 5115. Clinical Physiology I. (3 cr.; A-F or Audit; Every Fall) Cellular mechanisms, disease states and clinical applications of excitable tissues: cellular transport, neurophysiology, skeletal muscle physiology, cardiovascular physiology. PreReq: instr consent

PHSL 5116. Clinical Physiology II. (3 cr.; A-F or Audit; Every Spring) Cellular mechanisms, disease states and clinical applications of metabolic systems: respiratory physiology, renal physiology, acid base physiology, metabolism, gastrointestinal physiology, endocrine physiology, physiology of pregnancy and labor. PreReq: instr consent

PHSL 5197. Stress Physiology. (1 cr.; A-F only; Every Spring) Journal club format. Meets weekly to examine foundations of stress, historical progress, development of stress, modern stress physiology. Focus on stress-induced pathology with attention to cardiovascular, metabolic, neuroendocrine disorders. PreReq: instr consent, grad student standing or physiology undergraduate major are recommended. Undergraduates are strongly encouraged to have taken 3061 or equivalent.

PHSL 5201. Computational Neuroscience I: Membranes and Channels. (3 cr.; Student Option; Every Fall) Neural excitation (ion channels, excitation models, effects of neural morphology) using UNIX workstations to simulate empirical results. Includes the Hodgkin-Huxley model, nonlinear dynamic systems analysis, voltage and ligand gated ion channels, ion transport theories, and impulse initiation and propagation. PreReq: calculus through differential equations

PHSL 5350. Humans in Extreme Environments. (2 cr.; Student Option; Every Spring) Physiological systems, human factors, psychological reactions. Countermeasures to enhance performance and prevent negative health consequences. Readings, required paper, final exam. PreReq: [3061 or equiv], instr consent

PHSL 5444. Muscle. (3 cr.; Student Option; Every Spring) Muscle membranes: structures, mechanisms, and physiological roles of channels/pumps. Muscle contraction: force generation by actin/myosin. PreReq: 3061 or 3071 or 5061 or BioC 3021 or BioC 4331 or instr consent

PHSL 5510. Advanced Cardiac Physiology and Anatomy. (2-3 cr.; Student Option; Every Spring) Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course. PreReq: instr consent

PHSL 5511. Advanced Neuromuscular Junction Physiology. (2-3 cr. [max 2 cr.]; Student Option; Every Summer) Fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course. PreReq: instr consent

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
PHSL 5255. Anatomy and Physiology of the Pelvis and Urinary System. (1-2 cr. A-F only; Every Spring)
Two-day intensive course. Pelvis, perineum, and urinary system with cadaveric dissection. Structure/function of pelvic and urinary organs, including common dysfunction and pathophysiology. Laboratory dissections, including kidneys, ureters, urinary bladder, pelvic viscera and perineum (male or female), pelvic floor, vascular and nervous structures. Grad round sections. prereq: One undergrad anatomy course, one undergrad physiology course, instr consent

PHSL 5540. Advanced Exercise Medicine: Physiology and Bioenergetics. (1-2 cr. Student Option; Periodic Fall)
Three-day intensive course. Physiology, bioenergetics, nutrition, and sports medicine. Focuses on application of principles to treatment of diseases and functional deficits. Lectures, demonstrations, hands-on experiences in an exercise medicine facility. prereq: [Grad student or practicing health professional], instr consent

PHSL 5700. Cell Physiology. (4 cr. A-F only; Every Fall) Control mechanisms in maintaining homeostasis with respect to critical cell functions. Regulation of pH, volume, nutrient transport, intracellular electrolyte composition, membrane potential. Aspects of intercellular communication, prereq: [Two semesters of physics/chemistry, calculus, one semester of systems-level physiology] or instr consent

PHSL 5701. Physiology Laboratory. (1-2 cr. A-F or Audit; Every Fall & Spring) Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems. prereq: instr consent

PHSL 6051. Systems Physiology. (4 cr. A-F or Audit; Every Spring & Summer) General physiology, endocrine, circulatory, respiratory, digestive, energy metabolism, and renal physiology examined at molecular, cellular, and organ level. Emphasizes homeostasis and basic regulatory aspects of physiological processes of organ systems. prereq: [Prev or current] neuroscience course; [biochemistry, human anatomy] recommended

PHSL 8216. Selected Topics in Autonomic and Neuroendocrine Regulation. (1 cr. S-N or Audit; Advanced seminar.

PHSL 8222. Central Regulation of Autonomic Function. (3 cr. A-F or Audit; Periodic Fall) Neural/hormonal sensory pathways affecting central autonomic nuclei involved in maintenance of homeostasis. Current research on physiological control systems at cellular, organ, and integrative levels. Offered fall of odd-numbered years. prereq: NSC 5561 or instr consent

PHSL 8232. Critical Reading of Journal Articles in Physiology. (2 cr. [max 4 cr.]; A-F only; Every Spring) Integrative physiology, critical reading of current scientific literature related to lecture topics in the Human Physiology course. prereq: concurrent registration is required (or allowed) in PHSL 5101, instr consent

PHSL 8242. Professional Skills Development For Biomedical Scientists. (2 cr. A-F only; Periodic Fall, Spring & Summer) Professional skills development, including critical evaluation of the scientific literature, short oral presentations, development of research project specific aims and grant writing. Students will become familiar with strategies/mechanics of writing a grant proposal, NIH study section grant reviews, scientific presentations, dissecting scientific literature, and PubMed/NIH Reporter tools. prereq: instr consent

PHSL 8294. Research in Physiology. (1-18 cr.; Student Option; Every Fall, Spring & Summer) Directed laboratory research. prereq: Grad cellular and integrative Phsl major, instr consent

PHSL 8310. Advanced Topics in Cellular Physiology. (1 cr. max [4 cr.]; Student Option; Every Fall & Spring) Discussion of primary research publications. Topics vary by semester. prereq: instr consent

PHSL 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) [No description] prereq: Master’s student, adviser and DGS consent

PHSL 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) [No description] prereq: Doctoral student, adviser and DGS consent

PHSL 8666. Doctoral Pre-Thesis Credits. (1-6 cr. max [12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

PHSL 8777. Thesis Credits: Master’s. (1-18 cr. max [50 cr.]; No Grade Associated; Every Fall, Spring & Summer) [No description] prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

PHSL 8888. Thesis Credit: Doctoral. (1-24 cr. max [100 cr.]; No Grade Associated; Every Fall, Spring & Summer) [No description] prereq: Max 18 cr per semester or summer; 24 cr required

Plant Pathology (PLPA)


PLPA 1902. Sequencing Plants, Pets, and Pathogens: The Genomics of Non-Humans. (3 cr.; A-F only; Every Fall) This seminar will examine genomic insights into plants, animals, and microbes. Students will explore DNA sequencing of crop varieties, animal breeds and disease pathogens, the genomes of primates, the genetic basis of domestication, genome engineering, synthetic genomes, and the sequencing of microbial communities; primarily through readings taken from contemporary, popular press articles as well as in-class practicums, activities, and debates.

PLPA 2001. Introductory Plant Pathology. (3 cr.; Student Option; Every Spring) Biology of the major groups of plant pathogens, symptoms and signs of plant disease, plant disease diagnosis, and principles of disease management. Lecture and laboratory. prereq: BIOL 1009 or equiv

PLPA 2003. Plague, Famine, and Beer: The Impact of Microscopic Organisms on Human Civilization. (HSIS; 3 cr.; Student Option; Every Fall) Impacts that microbes have made on course of human civilization. Negative influences of major human/plant infectious disease. Positive benefits attained by harnessing power of microbes. Scale of history includes prehistoric to present day. Projected future impacts.

PLPA 3003. Diseases of Forest and Shade Trees. (3 cr.; Student Option; Every Spring) This course provides an overview of tree diseases in urban and forested areas. It covers diseases that have had a significant impact on society such as Dutch Elm disease; oak wilt, chestnut blight, white pine blister rust, sudden oak death and many others. It also provides an overview of important cankers, leaf diseases, wilts, rusts, root rots and other tree problems. Laboratory sessions enable students to get hands-on experience identifying disease agents, examining symptoms and learning appropriate control procedures. Emphasis will also be placed on ecological processes, biological and cultural control, and host-parasite interactions. This course should be of value to anyone interested in biological sciences, natural resources or ecology. It is a must for individuals that will have a career in natural resources but should also be useful to those interested in maintaining healthy trees at home, in urban areas or woodlands. Alumni of the University working with trees or woody ornamentals indicate this is one of the most important courses you can take as a student.

PLPA 3090. Research in Plant Pathology. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Assignment of special problems to undergraduates desiring opportunity for independent research in plant pathology.

PLPA 4096. Professional Experience Program: Internship. (1-3 cr. max [6 cr.]; S-N or Audit; Every Fall & Spring) Supervised practicum with professional experience in plant pathology and related industries including the Plant Disease and "Dial-U" clinics. Evaluative reports and
PLPA 5003. Diseases of Forest and Shade Trees. (3 cr.; Student Option; Every Spring)
This course provides an overview of tree diseases and landscape management. It covers diseases that have had a significant impact on society such as Dutch Elm disease; oak wilt, chestnut blight, white pine blister rust, sudden oak death and many others. It also provides an overview of important cankerers, leaf diseases, wilts, rusts, root rots and other tree problems. Laboratory sessions enable students to get hands-on experience identifying disease agents, examining symptoms and learning appropriate control procedures.
Emphasis will also be placed on ecological processes, biological and cultural control, and host-parasite interactions. This course should be of value to anyone interested in biological sciences, natural resources or ecology. It is a must or individuals that will have a career in natural resources but should also be useful to those interested in maintaining healthy trees at home, in urban areas or woodlands. Alumni of the University working with trees or woody ornamentals indicate this is one of the most important courses you can take as a student.

PLPA 5090. Issues in Plant Pathology. (1-4 cr.; Student Option; Every Fall, Spring & Summer)
See Class Schedule or department for current offerings.

PLPA 5100. Topics in Plant Pathology. (1-4 cr.; A-F or Audit; Every Fall & Spring)
Topics in Plant Pathology

PLPA 5103. Plant-Microbe Interactions. (3 cr.; Student Option; Every Fall)
Genetics, physiology, molecular biology of plant-microbe interactions. Communication between plant/microbes, signal transduction, control of gene expression, symbiosis/parasitism, plant host response mechanisms, plant disease physiology. prereq: Intro course in plant pathology or molecular biology or equiv

PLPA 5202. Field Plant Pathology. (2 cr.; Student Option; Every Summer)
Characteristics of a variety of plant diseases. Field trips to observe symptoms and effects of diseases, and to learn about prevention and control of diseases in field, forest, golf course, greenhouse, nursery, orchard, and urban environments.

PLPA 5203. Introduction to Fungal Biology. (3 cr.; Student Option; Spring Odd Year)
Fungi are a critical component of the diversity and function of terrestrial ecosystems, affecting decomposition, plant nutrient uptake, and agricultural practices. Key components of fungal biology, including ecology, genetics, life cycles and diversity. Labs provide hands on experience with a diverse range of organisms. prereq: BIOL 1009 or equiv

PLPA 5300. Current Topics in Molecular Plant Pathology. (1 cr. [max 2 cr.]; S-N only; Every Spring)
Interactive class. Students read, discuss, and critique publications in molecular plant pathology. Focus on articles, examining from different dimensions (underlying principles, experimental strategies, data analysis, impact on the broader discipline). prereq: instructor consent

PLPA 5301. Large Scale Omic Data in Plant Biology. (3 cr.; Student Option; Every Fall)
Introduction to large scale data in plant biology. Emphasizes model plants and important agricultural crops focusing on new approaches and technologies in the field. Fundamentals, acquisition, and analysis of high-throughput DNA and RNA sequencing, high-throughput plant phenotyping, functional and comparative genomics, epigenomics, proteomics, metabolomics, and microbiomics. prereq: Intro course in genetics or instructor consent

PLPA 5444. Ecology, Epidemiology, and Evolutionary Biology of Plant-Microbe Interactions. (3 cr.; A-F or Audit; Every Fall)
Concepts and recent research in the ecology, epidemiology, and evolutionary biology of plant-microbe interactions spanning the range from parasitic to mutualistic in agricultural and natural habitats. prereq: Intro to plant pathology or advanced biology coursework recommended

PLPA 5480. Principles of Plant Pathology. (3 cr.; Student Option; Every Fall)
This course is intended for graduate students and undergraduate students in their third or fourth year that are interested in learning about principles of plant pathology, diseases that affect plants, microbiology and microbial and plant interactions. In this course students will learn principles of plant pathology through lectures and demonstrations and exercises in laboratory. Students will gain knowledge of mycology and select diseases caused by fungi within Ascomycota, Basidiomycota and the fungal-like Oomycota. Diseases caused by bacteria, nematodes, viruses, parasitic plants and abiotic damage are also examined. Lectures will include information concerning the history and importance of plant pathology, mycology, bacteriology, nematology, virology, infection process, genetics of host and microorganism interactions, epidemiology of diseases and disease control strategies. In the hands-on laboratory period the student will learn laboratory skills, gain experience using the microscope, work with microorganisms, learn diagnostic skills, and be able to recognize 30 plant diseases. prereq: BIOL 1009 or equiv

PLPA 5560. Plant Disease Resistance and Applications. (3 cr.; A-F or Audit; Every Spring)
Fundamentals of disease resistance in plants and the genetics of host-parasite interactions as they relate to the sustainable control of plant diseases. Examples explored at the Mendelian, populational, and molecular level of organization. prereq: 2001, BIOL 4003

PLPA 5999. Special Topics in Plant Pathology. (1 cr.; Student Option; Every Fall, Spring & Summer)
Workshops on topics in plant pathology. See Class Schedule or department for current offerings.

PLPA 8005. Supervised Classroom or Extension Teaching Experience. (1-2 cr.; S-N only; Every Fall & Spring)
Teaching experience in Plant Pathology. Discussions about effective teaching to strengthen skills and develop a personal teaching philosophy. prereq: instructor consent

PLPA 8090. Research and Teaching in Plant Pathology. (1-8 cr.; Student Option; Every Fall, Spring & Summer)
Special assignment in teaching or lab and field problems in pathological research. If taking for PLPA teaching requirement: 2 credits = 1 full semester of teaching experience; 1 credit = 1/2 semester of teaching experience

PLPA 8103. Plant-Microbe Interactions. (3 cr.; Student Option; Every Fall)
Genetics, physiology, and molecular biology of plant-microbe interactions. Communication between plants/microbes. Signal transduction, control of gene expression, symbiosis/parasitism, plant host response mechanisms, plant disease physiology. prereq: Intro course in plant pathology or molecular biology or equiv

PLPA 8104. Plant Virology. (2 cr.; A-F only; Every Spring)
Characteristics, biology, epidemiology, and control of plant diseases caused by viruses. prereq: 5480

PLPA 8105. Plant Bacteriology. (2 cr.; Student Option; Every Spring)
For graduate students interested in bacteria that cause plant diseases. Disease cycles, epidemiology, pathogenesis, and means of disease control. The lab section will focus on techniques used to identify bacteria, for inoculating plants, and isolating bacteria from plant material. prereq: 5480

PLPA 8123. Research Ethics in Plant and Environmental Sciences. (0.5 cr.; S-N or Audit; Every Spring)

PLPA 8200. Seminar. (1 cr.; A-F only; Every Fall & Spring)
Critical review and presentation of current problems and progress in plant pathology.

PLPA 8300. Plant Pathology Project. (1-6 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer)
Laboratory or library projects for Plan B master's students in plant pathology.

PLPA 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

PLPA 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature. prereq: instr consent

**PMB 4994. Directed Research.** (1.6 cr. [max 42 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Lab or field investigation of selected areas of research. prereq: instr consent

**PMB 5109. Current Questions in Fungal Biology.** (2 cr.; A-F or Audit; )
Diversity of fungi and their interactions with other organisms. Pathogenic/mutualistic interactions with animals/plants. Use of fungal systems for drug discovery and understanding pathogenicity, signal transduction, morphogenesis, and evolution.

**PMB 5111. Microbial Physiology and Diversity.** (3 cr.; Student Option; Every Fall)

**PMB 5412. Plant Physiology.** (3 cr.; Student Option; Every Fall)
Plant Physiology is the study of how plant cells, tissues and whole organisms function.

**PMB 4412/5412 is a classic Plant Physiology course that covers plant water relations, mineral nutrition, membrane transport, photosynthesis, respiration, vascular function, metabolism, growth and development, and hormone responses. The physics underlying our understanding of these physiological systems will be addressed as much as possible. Classical and modern approaches to studying these physiological systems will be covered. There are no enforced prerequisites for this course. The following preparation is recommended:** PMB 2022 General Botany or PMB 3007W Plant Algal and Fungal Diversity; General Chemistry and Introductory Physics.

**PMB 5500. Special Topics in Plant Biology.** (1-3 cr.; Student Option; Every Spring)
Topics Shell

**PMB 5516. Plant Cell Biology.** (3 cr.; Student Option; Periodic Fall)
Structure, function, and dynamic properties of plant cellular components such as organelles, cytoskeleton, and cell wall. How cellular structures are assembled, how it contributes to cell growth/division. Cell fate/development. Responses to hormones and external signals. prereq: [Biol 2022 or Biol 3007 or Biol 3032], [Biol 3021 or BioC 3021 or Biol 4003]

**PMB 5601. Topics in Plant Biochemistry.** (3 cr.; A-F or Audit; Every Spring)
Biochemical analysis of processes unique to photosynthetic organisms. Photosynthesis and carbon dioxide fixation. Synthesis of carbohydrates, lipids, and derivatives. Aromatic compounds such as lignin, other natural products. Functions of natural products. prereq: [Biol 1002 or Biol 1009 or Biol 2003], CHEM 2301

**PMB 5960. Special Topics.** (1-3 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer)
Topics vary, see Class Schedule.

**PMB 8081. Integrative Plant Biology: Connecting Molecules to Ecosystems.** (3 cr.; A-F only; Every Fall)
Fundamental questions in plant/fungal biology. Research approaches. Students read/evaluate primary literature. Critical analysis, written summaries, oral presentations. Research in plant/fungal biology, ranging from molecular to ecosystem levels. prereq: Plant biological sciences grad student or instr consent

**PMB 8082. Current Topics in Plant Biology: Structure-Evolution-Ecology.** (1 cr.; S-N or Audit; Every Spring)
Background information and review of selected current literature. For first-year students in plant biological sciences and other biological science graduate programs.

**PMB 8123. Research Ethics in the Plant and Environmental Sciences.** (0.5 cr.; S-N or Audit; Every Spring)

**PMB 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
FTE: Master's prereq: Master's student, adviser and DGS consent

**PMB 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**PMB 8666. Doctoral Pre-thesis Credits.** (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Doctoral Pre-thesis Credits prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**PMB 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring)
Thesis Credits: Master's prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**PMB 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Thesis credit: doctoral. prereq: Passed prelim oral or adviser approval

**PMB 8900. Seminar.** (1-2 cr. [max 4 cr.]; S-N or Audit; Every Fall & Spring)
Current scientific research.

**PMB 8901. Preparation of Research Proposals.** (2 cr.; S-N only; Every Fall)
Grant writing process. Strategies and ethical standards for research proposal preparation/review. Students prepare an original proposal and critique work of others. prereq: Plant biological sciences PhD student

**PMB 8910. Journal Club.** (1 cr. [max 4 cr.]; S-N or Audit; Periodic Fall, Spring & Summer)
Critical evaluation of selected current literature.

**PMB 8993. Directed Studies.** (1-5 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer)
Directed Studies prereq: PBio grad student, instr consent

**PMB 8994. Research.** (1-5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Independent research determined by student's interests, in consultation with faculty mentor. prereq: PBio grad student, instr consent

**Political Science (POL)**

**POL 1001. American Democracy in a Changing World.** (SOCS; 4 cr.; Student Option; Every Fall, Spring & Summer)
Introduction to politics/government in the United States. Constitutional origins/development, major institutions, parties, interest groups, elections, participation, public opinion. Ways of explaining politics, nature of political science. Emphasizes recent trends.

**POL 1001H. Honors Course: American Democracy in a Changing World.** (SOCS; 4 cr.; A-F only; Every Fall & Spring)
Introduction to politics/government in the United States. Constitutional origins/development, major institutions, parties, interest groups, elections, participation, public opinion. Ways of explaining politics, nature of political science. Emphasizes recent trends.

**POL 1019. Indigenous Peoples in Global Perspective.** (GP; 3 cr.; A-F or Audit; Every Fall & Spring)
Colonial experiences of selected indigenous peoples in Americas, Euroasia, Pacific Rim.

**POL 1025. Global Politics.** (GP; SOCS; 4 cr.; Student Option; Every Fall, Spring & Summer)
Study of international relations and issues in contemporary world affairs. Forms of state interaction from violent conflict to cooperation and integration; activities of international institutions; transnational relations involving non-state actors such as international businesses, human rights networks, and environmental movements.

**POL 1025H. Honors: Global Politics.** (GP; SOCS; 4 cr.; A-F or Audit; Every Fall & Spring)
Introduction to international relations/issues in contemporary world affairs. War, peace, nuclear proliferation. Politics of humanitarian intervention. Global monetary/trading systems. Activities of international institutions/non-governmental organizations. prereq: Honors student
POL 1026. U.S. Foreign Policy. ( ; 3 cr.; Student Option; Every Fall & Spring)
The United States is the most powerful country in the world. This makes the question of what the role in the U.S. is in the world and how the United States interacts with other countries, international organizations, and other actors in international politics a question of real importance. US foreign policy will play a crucial role in determining the world we live in four, ten, and fifty years as a result. As a result, we should all try to better understand how the United States behaves in international politics, why it behaves in that way, how it should behave, and how it has behaved in the past. These are the questions that this class tackles. For example, we’ll ask: why does the United States play such an active role in world politics? Might this change in the future and how has US foreign policy varied in the past? What do past conflicts in which the United States has been involved tell us about current U.S. foreign policy? Why is the United States so often at war despite being so militarily secure? Does the rise of China pose a threat to the United States and if so, what should the United States do about it? How serious is the threat of cyber war? Why does the United States care so much about stopping other countries from getting nuclear weapons?

POL 1054. Puzzles in World Politics. (GP, SOCS; 4 cr.; Student Option: Every Fall, Spring & Summer)
Political life. Repression, democracy, rights, corruption, gender, political change. Guest lectures by political science professors.

POL 1054H. Honors: Puzzles in World Politics. (GP, SOCS; 4 cr.; A-F only; Every Fall & Spring)
Political life. Repression, democracy, rights, corruption, gender, political change. Guest lectures by political science professors who are experts on different parts of world. prereq: Honors student

POL 1201. Political Ideas and Ideologies. (CIV, HIS; 4 cr.; Student Option: Every Fall, Spring & Summer)
Analysis of key concepts and ideas (e.g., freedom, equality, democracy) as they are constructed by major theories and ideologies (liberalism, conservatism, socialism, etc.).

POL 1234. Citizen U: Building Tomorrow’s Citizens Today. ( ; 3 cr.; A-F only; Every Spring)

POL 1914. Generation Now: Young Adult Political Action in America. ( ; 3 cr.; A-F only; Periodic Fall & Spring)
There is no shortage of difficult issues which young adult Americans are confronting in the twenty-first century. In this seminar, we will learn the tools of policy analysis to become more capable actors within the American political and policy space. The course will not focus just on problems, but also solutions and activism by young adult Americans. We will examine, as a learning community, questions and solutions about topics such as American public education, the roots of and responses to the protests following the tragic events of Ferguson, federalism and medical and recreational marijuana, DACA and American dreamers, sexual violence on college campuses, student debt, and the opioid epidemic.

POL 1915. Contemporary Civil Wars. ( ; 3 cr.; A-F only; Periodic Fall & Spring)
Why did civil war erupt in Syria, but not Jordan? Why has the Syrian regime targeted civilians so brutally? How will the rise of the Islamic State affect the conduct and conclusion of the civil war? How will the fractured nature of the rebels affect the possibilities for peace? Will additional international intervention prolong war or bring it to a close more quickly? Will the Kurdish minority that populates parts of Syria, Iraq, and Turkey finally gain an independent state? We will address these and other questions in this class, keeping in mind the effects that civil wars have on ordinary citizens in war-torn countries. We will focus particularly on developing an operational definition of civil war, understanding causes of civil war, examining strategies of violence employed in civil war, and civil war termination. Current events, such as those in Syria, Yemen, Colombia, Ukraine, South Sudan, and the Central African Republic will be brought into the class throughout the semester.

POL 3065. Political Engagement Careers: Planning and Preparing For Your Future. (CIV; 3 cr.; Student Option; Every Spring)
Exploration of careers in public service or political engagement; theories of political engagement; case studies of challenges and opportunities in public service careers; ethics of political engagement; development of resume, cover letter, informational interview, and networking skills; development of individual public service career plan.

POL 3070. Distinguished Undergraduate Research Internship. (2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Interns work closely with a faculty mentor on supervised projects related to faculty research. Through these activities, interns will deepen research, organizational, and communication skills that will prove useful for further training in political science or for other careers. Interns are chosen through a highly competitive online application the semester prior to registration. Students should check with Political Science advising for details about the application process. This course is only open to Political Science majors.

POL 3080. Faculty-Supervised Individual Internships. ( ; 3-13 cr. [max 15 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Internship with government or community organizations arranged by the department and awarded competitively each spring semester. prereq: instr consent, dept consent

POL 3085. Quantitative Analysis in Political Science. (MATH; 4 cr.; A-F or Audit; Every Fall & Spring)
Empirical research techniques. Testing a political hypothesis using data. Topics such as setting up research question in political science, research design, and techniques of data analysis.

POL 3085H. Honors Course: Quantitative Analysis in Political Science. (MATH; 4 cr.; A-F only; Every Fall & Spring)
Empirical research techniques/how one tests a political hypothesis using data. Topics such as setting up a research question in political science, proper research design, and basic techniques of data analysis. prereq: Honors student

POL 3108H. Honors Tutorial: Thesis Preparation and Political Science Inquiry. ( ; 3 cr. [max 18 cr.]; Student Option; Every Fall & Spring)
Topics in Political Theory, as specified in the Class Schedule.

POL 3225. American Political Thought. (CIV; 3 cr.; Student Option; Every Fall, Spring & Summer)
Puritans, American Revolution, Constitution, pro- and anti-slavery arguments, civil war/reconstruction, industrialism, westward expansion, Native Americans, immigration, populism, socialism, social Darwinism, women's suffrage, red scares, Great Depression, free speech, pluralism, multiculturalism. prereq: Suggested prerequisite POL 1201

POL 3235W. Democracy and Citizenship. (CIV, WI; 3 cr.; Student Option; Every Fall & Spring)

POL 3251W. Power, Virtue, and Vice: Ancient and Early Modern Political Theory. (WI, WI; 3 cr.; Student Option; Periodic Fall)
Ancient and early modern political thinking confronts basic questions of political order.

POL 3252W. Revolution, Democracy, and Empire: Modern Political Thought. (AH, WI, CIV; 3 cr.; Student Option; Spring Each Year)
Thinkers, discourses, events that craft understanding of revolution, democracy, empire. Emergence of democracy/democratic institutions alongside problems of religious zealotry, political hierarchy/exclusion, market economies, cultural marginalization. prereq: Suggested prerequisite 1201

POL 3265. Ideas and Protest in French Postwar Thought. (AH, CIV; 3 cr.; Student Option; Every Fall & Spring)
Examine events, political/ethical challenges, intellectuals who shaped France in its century
of politics/protest. Historical documents, cultural media, philosophical texts. Thinkers range from film-maker Gillo Pontecorvo to philosopher-playwright Jean-Paul Sartre to intellectual Michel Foucault.

POL 3272. What Makes Political Community?. (CIV; 3 cr. ; Student Option; Periodic Fall & Spring) We will explore different ways to think political community. Many contemporary political challenges are not just thorny problems but transform the very institutions, engagements, and concepts through which we understand what the activity of politics is and might be. Other societies and thinkers have faced drastically new challenges to their politics. So, we propose a course that would explore how political actors make and remake community. Our first unit, Polis and Empire, turns to the ancient world to reexamine the scope of politics, as it experimented with small city-states and large empires. Second, Colonial Encounters will analyze the movements of ideas, trades, and people back and forth across the Atlantic. Third, Revolution Reimagined treats incendiary moments of cultural and political contact. This course speaks to humanist concerns of how humans forge meanings and communities even from conditions of injustice and inequality.

POL 3308. Congressional Politics and Institutions. (SOC; 3 cr. ; Student Option; Every Fall, Spring & Summer) Origin/development of U.S. congressional institutions, parties, committees, leaders, lobbying/elections, and relations between Congress/executive branch. Relationship of campaign/governing, nature of representation, biases of institutional arrangements.

POL 3309. Justice in America. (; 3 cr. ; Student Option; Every Fall & Spring) American judiciary. Selection of judges. How/why these individuals/institutions behave as they do. What influences judicial decisions. What impact decisions have. Why people comply with them. prereq: 1001 or 1002 or instr consent

POL 3310. Topics in American Politics. (; 3 cr. [max 15 cr. ]; Student Option; Every Fall, Spring & Summer) Topic in American politics, as specified in Class Schedule.

POL 3310H. Topics in American Politics. (; 3 cr. ; A-F only; Periodic Fall & Spring) Topics in American politics.

POL 3317. Food Politics: Actors, Arenas, and Agendas. (SOC; 3 cr. ; A-F or Audit; Every Fall & Spring) How food is grown, transported, processed, consumed, and enjoyed. How various political actors interact in complex policy arena that is food. Explore various resources, arguments, evidence used by participants in food politics. Investigate institutional, cultural, moral rules of engagement that provide structure in which political contenders attempt to advance economic interests/ideological agendas.

POL 3319. Education and the American Dream. (DSJ, SOCS; 3 cr. ; A-F or Audit; Every Fall) Introduction to politics and education in the United States. Equality of educational opportunity, educating democratic citizens, school finance, role of political institutions in making educational policy. Efforts to reform/ remake American education, including charter schools and private school vouchers.

POL 3321. Issues in American Public Policy. (; 3 cr. ; Student Option; Periodic Fall) Politics of policy process. Agenda formation, formulation, adoption, implementation, evaluation. Attention to selected policy areas.

POL 3323. Political Tolerance in the United States. (; 3 cr. ; Student Option; Periodic Spring) Political importance of civil liberties in American society. Tolerance as a political phenomenon. Issues such as free speech, privacy, religion, race, gender.


POL 3327. Suburbs, Stadiums, and Scandals: The Politics of American Cities. (3 cr. ; Student Option; Periodic Fall & Spring) Study of politics and policy in the contemporary American city; role of local government in a federal system; evolution of cities in the United States; forms and structures of local government; local politics and patterns of power and influence; special topics in Minnesota local politics. prereq: 1001, non-pol sci grad major or equiv or instr consent

POL 3365. Government and Medicine. (; 3 cr. ; Student Option; Periodic Fall, Spring & Summer) Why is the United States the only industrialized nation that lacks national health insurance? Should the government regulate health care? Who should address these issues? Introduction to American government. Health care policy, constitution, elections, congress, the presidency.

POL 3410. Topics in Comparative Politics. (; 3 cr. [max 9 cr. ]; Student Option; Every Fall, Spring & Summer) Topics of current analytical or policy importance to comparative politics. Topics vary, as specified in Class Schedule.

POL 3423. Politics of Disruption: Violence and Its Alternatives. (GP; 4 cr. ; Student Option; Periodic Fall & Spring) Political struggles aimed at undermining the existing political order have been a pervasive feature of global politics. Modern states have constantly been sites of relentless challenges from their citizenry, which sometimes take the form of non-violent action while on other occasions manifest in terrorism and violence. This course introduces students to the politics of disruption and violent and non-violent struggles targeted at bringing about political change. We will study a range of manifestations of such struggles focusing on some well-known cases such as the US civil rights movement, the Arab Springs, the Ferguson riots and the Islamic State (ISIS). Can non-violent resistance succeed against a coercive state? Why do individuals and groups participate in high-risk political struggles? What explains patterns of violence in civil conflicts? What are the effects of violence? What facilitates peace? This course will enable you to answer these questions.

POL 3431. Politics of India. (GP; 4 cr. ; Student Option; Every Spring) The course introduces students to the politics of India: a non-Western, parliamentary political system that stands out as a bastion of democracy in the developing world, despite underdevelopment & significant ethnic-religious divisions. By focusing on India, we offer an understanding of the problems of democratization, underdevelopment, governance & political violence. We examine India's political institutions & challenges confronting the institutions such as socio-economic inequalities, social exclusion, social divisions, ethnic-religious & ideological insurgencies, criminalization of politics & rampant corruption. The course enables students to answer important questions: Why did democracy endure in post-colonial India when much of the developing world endured authoritarian regimes? What accounts for the persistence of ethno-religious conflict & violence? What determines a country's approach to socio-economic development? What accounts for India's economic development over the last few decades? How do we explain the existence of political democracy and rampant corruption?

POL 3451W. Politics and Society in the New Europe. (GP; WI; 3 cr. ; Student Option; Fall Even, Spring Odd Year) Changing politics/society of Europe. Generational change/values, political parties, welfare state, future of European integration, political stability, democratization.

POL 3464. Politics of Inequality. (; 3 cr. ; A-F or Audit; Every Fall & Spring) Causes/consequences of economic inequality in the USA and Europe. America and European countries in contrast to one another. What differences there are and whether they matter.

POL 3474. Russian Politics: From Soviet Empire to Post-Soviet State. (3 cr. ; A-F or Audit; Every Fall & Spring) Twenty five years ago, Russia appeared to be democratizing and was even on friendly relations with the US and NATO. Now Vladimir Putin runs the state with the FSB (KGB), and US-Russian relations are at their worst point since the 1970s. This course examines major themes and periods in Soviet and Post-Soviet Russian politics. It begins with the Russian Revolution of 1917, and continues with a study of the creation of the USSR and Soviet rule under Lenin, Stalin, and later decades. We look in depth at the economic and political system set up by the Communist Party, and
at the causes of its collapse in 1991, which has had profound legacies for the post-Soviet development of Russia. Then in the second half of the course we turn to themes of political, economic, social and civic development under Yeltsin and Putin. We will pose the following questions: Why does democratization begin and why does it fail? How is economic reform undermined? What type of state and regime is Russia now? What caused the Chechen wars and the massive bloodstream in the Caucasus during this period? Is Putin trying to recreate the Soviet Union and retake control of its neighbors? Are US-Russian relations improving as a result of Obama’s “Reset,” or are we now in an era of a new Cold War? What is Russia’s goal in Syria, Iran, or Central Asia? Is Putin rebuilding Russia, or driving it to disaster, and how will this impact the West?

POL 3475. Islamists Politics. ( ; 3 cr. ; A-F or Audit; Every Fall) Islamic faith and its historical relationship to politics. Rise of Islamist politics in the Middle East and North Africa and south central Asia from the 1950s-80s. Failure of many Islamist revolutions. Spread/rebirth of Islam in less traditional areas of the Muslim world. Rise of global jihadists. New jihadi being waged in Iraq. Implications for Middle East. Possibility of synthesizing Islam and democracy.

POL 3477. Political Economy of Development. (GP,SOCS; 3 cr. ; Student Option; Every Fall, Spring & Summer) How can the vast disparities of wealth between countries be explained? Why have some countries in the post-colonial world, in particular, those of East Asia, experienced stunning economic growth, while those in others parts have not? We will explore inequality among nations through an engagement with competing explanations from multiple disciplines. Do free markets, the legacies of colonialism, state power, culture, or geography offer the most persuasive account of current patterns of global inequality? The course also examines what we mean by “development” and exposes students to cutting-edge debates in contemporary development studies. By the end of the course, students will have a better understanding of the causes of and possible solutions to global inequality.


POL 3481H. Comparative Political Economy: Governments and Markets. ( ; 3 cr. [max 4 cr. ] ; A-F only; Periodic Fall & Spring) This course analyzes the compatibility of democracy and markets—whether democratic institutions undermine (enhance) the workings of market institutions and vice versa. Competing theoretical perspectives in political economy are critically evaluated. And the experiences of countries with different forms of democratic market systems are studied. Among the topics singled out for in-depth investigation are the economics of voting, producer group politics, the politics of monetary and fiscal policy, political business cycles, and trade politics.

POL 3489W. Citizens, Consumers, and Corporations. (CIV, WI; 3 cr. ; Student Option; Spring Even Year) Corporations are among the most powerful actors in the global political economy. They employ millions of people, produce a variety of goods, and have massive effects on the ecological and social environments in which they do business. How do ordinary people act in order to hold corporations accountable for the effects that their activities have on communities and individuals? This course focuses on two ways that people have mobilized to counter corporate power—as citizens and as consumers. When people mobilize as citizens, they put pressure on corporations through the political system—e.g. through mass protests, lobbying politicians, and pursuing claims through the courts. When people mobilize as consumers, they use the power of their purchasing decisions to encourage corporations to change their behavior. We will explore these different modes of action through an examination of corporate social responsibility/sweatshops, the industrial food system in the US, and the privatization of life (e.g. genes), water, and war.

POL 3701. American Indian Tribal Governments and Politics. (DSJ,HIS; 3 cr. ; A-F or Audit; Fall Even Year) History, development, structure, politics of American Indian Governments. North American indigenous societies from pre-colonial times to present. Evolution of aboriginal governments confronted/affected by colonizing forces of European/Euro-American states. Bearing of dual citizenship on nature/powers of tribal governments in relation to states and federal government.

POL 3733. From Suffragettes to Senators: Gender, Politics & Policy in the U.S.. (DSJ; 3 cr. ; A-F or Audit; Every Spring) Overview to field of gender/politics. Examine role women play in U.S. policy process. How public policies are “gendered.” How policies compare to feminist thinking about related issue area. Theories of role(s) gender plays in various aspects of politics.

POL 3739. Politics of Race, Class, and Ethnicity. ( ; 3 cr. ; Student Option; Every Fall, Spring & Summer) How race/ethnicity/class interact in political process. Political conflict through comparative analysis of United States, South Africa, Brazil.

POL 3752. Chicana/o Politics. (DSJ,SOCS; 3 cr. ; Student Option; Every Fall & Spring) Theory/practice of Chicana/o politics through analysis of Mexican American experience, social agency. Response to larger political systems/behaviors using social science methods of inquiry. Unequal power relations, social justice, political economy.

POL 3766. Political Psychology of Mass Behavior. (SOCS; 3 cr. ; Student Option; Every Fall & Spring) How political behavior of citizens and political elites is shaped by psychological factors, including personality, attitudes, values, emotions, and cognitive sophistication. Political activism/ apathy, leadership charisma, mass media, group identifications, political culture.

POL 3767. Political Psychology of Elite Behavior. (CIV; 3 cr. ; Student Option; Periodic Spring) Intersections of politics, personality, and social psychology. Focuses on political leaders and elites. Usefulness of psychological theories for conducting political analysis. Role of individual, of group processes, of political/social cognition, and of context in political decision-making.

POL 3769. Public Opinion and Voting Behavior. (SOCS; 3 cr. ; Student Option; Every Fall & Spring) Major factors influencing electoral decisions/ political attitude formation/change.

POL 3785. Persuasion and Political Propaganda. ( ; 3 cr. ; A-F or Audit; Every Fall & Spring) Introduction to persuasion and political propaganda. Persuasion theories relevant to designing effective political propaganda. Applying theories to analyze WWI/WWII propaganda posters, films, and political campaign commercials. Use of fiction as propaganda tool.

POL 3785H. Persuasion and Political Propaganda. ( ; 3 cr. ; A-F only; Fall Even, Spring Odd Year) Persuasion theories relevant to designing effective political propaganda. Applying theories to analyze WWI/WWII propaganda posters, films, and political campaign commercials. Use of fiction as propaganda tool.

POL 3810. Topics in International Relations and Foreign Policy. ( ; 3 cr. [max 6 cr. ]; Student Option; Every Fall & Spring) Analysis of selected issues in contemporary international relations. Topics vary, as specified in Class Schedule.

POL 3833. The United States and the Global Economy. (3 cr. ; Student Option; Periodic Fall & Spring) Domestic and international politics of the United States, foreign economic policy (trade, aid, investment, monetary, and migration policies). Effects of policies and international economic relations on the U.S. economy and U.S. politics.

POL 3835. International Relations. (GP,SOCS; 3 cr. ; Student Option; Every Fall, Spring & Summer) Introduction to theoretical study of international relations. How theoretical perspective shapes one’s understandings of structure/practices of global politics.

POL 4010. Topics in Methods. ( ; 4 cr. [max 8 cr. ] ; A-F or Audit; Every Spring) Advanced undergraduate course is statistical methods for political research. Topics vary as specified in class search. It is recommended.
Students take POL 3085 or equivalent before enrolling in POL 4010.

**POL 4085. Advanced Political Data Analysis.** (4 cr.; A-F only; Every Spring) In this course, students learn how to use statistical methods to answer a wide variety of questions in political science. More specifically, students will focus on how to test hypotheses where the dependent variable is dichotomous, ordered categories, unordered categories, counts, and more. The course covers advanced topics in linear regression, including time series data, multilevel modeling, and interaction terms. Assignments focus on how to convey statistical results in many different ways, ranging from technical reports, to blog posts, to personal communication. Students will learn and improve their skills in the R statistical software package. Prior knowledge of R is not required. This class is especially recommended for students completing an undergraduate thesis with a quantitative component as well as students who want to pursue graduate studies in political science.

**POL 4210. Topics in Political Theory.** (3 cr. [max 9 cr.]; A-F or Audit; Every Fall & Spring) Topics in political theory, as specified in Class Schedule.

**POL 4253. Modernity and Its Discontents: Late Modern Political Thought.** (3-4 cr.; Student Option; Fall Even, Spring Odd Year) Theoretical responses/interpretations of Western economy, society, politics, democratic culture. Theories of history. Class struggle. End of metaphysics, death of God. Technology/bureaucracy. Psychology of culture in Hegel, Marx, Tocqueville, Mill, Nietzsche, Weber, Freud. Prereq: Suggested 1201, [3225 or 3235W or 3251 or 3252]

**POL 4267. Imperialism and Modern Political Thought.** (CIV,HIS; 3 cr.; Student Option; Periodic Fall & Spring) How has political theory been shaped by imperialism? We will investigate this question through a study of such key thinkers as Kant, Mill, Marx, Lenin, Ch'aine, Fanon, and Gandhi, reading them through the lens of empire. Our goal is to analyze how such thinkers reflected upon, problematized and, at times, justified forms of Western imperialism. We will look at their explicit reflections on empire, as well as more tangential or ostensibly separate themes that may have only been shaped by the imperial context in indirect ways. Finally, we will reflect upon our contemporary location in the imperial context in indirect ways. Finally, as more tangential or ostensibly separate forms of Western imperialism. We will look upon, problematized and, at times, justified goals is to analyze how such thinkers reflected upon, problematized and, at times, justified.

**POL 4280. Topics in Political Theory.** (3-4 cr.; [max 8 cr.]; Student Option; Periodic Fall & Spring) Topics in historical, analytical, or normative political theory. Topics vary.

**POL 4310. Topics in American Politics.** (3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) See Class Schedule for description. Prereq: 1001 or equiv or instr consent

**POL 4315W. State Governments: Laboratories of Democracy.** (WI; 4 cr.; Student Option; Periodic Fall & Spring) Political behavior, governmental institutions, and public policies in American states; comparison among states, between state and national government, with special attention given to Minnesota. Prereq: 1001 or equiv, non-pol sci grad major or instr consent

**POL 4317. Becoming Stupid: Anti-Science in American Politics.** (3 cr.; Student Option; Every Fall) (1) Political attacks on basic science, including climatology & global warming, vaccines, the Big Bang, evolution, human reproduction, sexuality, and much more. (2) Pseudoscience and anti-intellectualism in American political culture. (3) Money, political interests, and propaganda that drive attacks on science.

**POL 4335. African American Politics.** (3 cr.; Student Option; Periodic Fall & Spring) This course examines the historical and contemporary politics of African Americans to gain full inclusion as citizens in the U.S. political system. The course focuses on topics such as the politics of the civil rights movement; black presidential bids including the historic election of Barack Obama; and racialized voting in federal and state elections.

**POL 4403W. Constitutions, Democracy, and Rights: Comparative Perspectives.** (GP, WI; 3 cr.; Student Option; Fall Even, Spring Odd Year) Theory/practice of constitutionalism in different countries. Conceptual/normative inquiry between constitutionalism, rule of law, and democracy. Origins/role of constitutions. Relevance of courts with constitutional review powers: U.S., Germany, Japan, Hungary, Russia, South Africa, Nigeria.

**POL 4410. Topics in Comparative Politics.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Topics of current analytical or policy importance to comparative politics. Topics vary, as specified in Class Schedule.

**POL 4461W. European Government and Politics.** (GP, WI; 4 cr.; Student Option; Fall Odd, Spring Even Year) European political institutions in their social settings; power and responsibility; governmental stability; political decision making, government and economic order. Prereq: 1054 or 3051 or non-pol sci grad or instr consent

**POL 4463. The Cuban Revolution Through the Words of Cuban Revolutionaries.** (GP; 3 cr.; Student Option; Every Fall) Cuban Revolution. Leadership/strategy. Perspectives of Cubans/leaders, prereq: 1025 or 1054 or equiv

**POL 4465. Democracy and Dictatorship in Southeast Asia.** (GP; 3 cr.; Student Option; Every Fall, Spring) A fundamental question of politics is why some regimes endure for many years while others do not. This course examines the "menu of manipulation" through which dictators and democrats claim and retain power, and the conditions under which average citizens mobilize to challenge their governments, despite the risks and in the face of what may seem to be insurmountable odds. We will explore these political dynamics in Southeast Asia, one of the most culturally and politically diverse regions of the globe. Composed of eleven countries, Southeast Asia covers a wide geographical region stretching from India to China. With a rich endowment of natural resources, a dynamic manufacturing base, and a strategic location on China's southern flank, the region has come to play an increasingly important role in the political and economic affairs of the globe. Culturally and ethnically diverse, hundreds of languages are spoken, and the religions practiced include Buddhism, Catholicism, Hinduism, and Islam. This region is similarly diverse in its political systems, which range from democratic to semi-democratic to fully authoritarian.

**POL 4473W. Chinese Politics.** (GP, WI; 3 cr.; Student Option; Every Fall) Focuses on fundamental conflicts in Chinese society; the democracy movement, human rights, class divisions, gender struggles, environmental issues, and capitalist vs. socialist development strategies. Secondary topics include Chinese foreign relations and domestic and foreign political issues in Taiwan.

**POL 4477. Struggles and Issues in the Middle East.** (3 cr.; Student Option; Periodic Fall) Turkey, Iran, Israel, and selected Arab states. Domestic politics of religious/secular, ethnic, economic, environmental, and other policy/identity issues. Regional politics of water access, Israeli/Palestinian/Arab world relationships, oil and the Persian/Arabian Gulf, and human rights. Prereq: 1054 or 3051 or non-pol sci grad or instr consent

**POL 4478W. Contemporary Politics in Africa and the Colonial Legacy.** (GP, WI; 3 cr.; Student Option; Every Spring) Examines how current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by the pre-colonial and colonial processes. Reality of independence; recurrent political and economic crises, global context and prospects for effective democracy. Prereq: 1054 or 3051 or non-pol sci grad or instr consent

**POL 4481. Comparative Political Economy: Governments and Markets.** (3 cr.; Student Option; Periodic Fall & Spring)
This course analyzes the compatibility of democracy and markets - whether democratic institutions undermine (enhance) the workings of market institutions and vice versa. Competing theoretical perspectives in political economy are critically evaluated. And the experiences of countries with different forms of democratic market systems are studied. Among the topics singled out for in-depth investigation are the economics of voting, producer group politics, the politics of monetary and fiscal policy, political business cycles, and trade politics.

**POL 4487. The Struggle for Democratization and Citizenship.** (4 cr.; Student Option; Periodic Fall & Spring)
Origins of democratic process. Emphasizes how disenfranchised fought to become included. History of democratic movement from its earliest moments to present. Attempts to draw a balance sheet.

**POL 4492. Law and (In)Justice in Latin America.** (3 cr.; A-F or Audit; Every Spring)
How law and justice function in contemporary Latin America. Similarities/differences within/between countries and issue areas. Causes behind varied outcomes. Effectiveness of different reform efforts. Transitional justice, judicial review, judicial independence, access to justice, criminal justice (police, courts, and prisons), corruption, non-state alternatives. Issues of class, race/ethnicity, and gender.

**POL 4494W. US-Latin American Relations.** (WI; 3 cr.; Student Option; Periodic Fall, Spring & Summer)
US foreign policy toward Latin America. Immigration, trade policy, relations with Cuba, drug war, relations with Venezuela.

**POL 4495. Politics of Family, Sex, and Children.** (DSJ; 3 cr.; A-F or Audit; Every Fall & Spring)

**POL 4501W. The Supreme Court and Constitutional Interpretation.** (CIV;WI; 3 cr.; Student Option; Every Fall)
Historical/analytical approaches to Court's landmark decisions. Theory/techniques of judicial review. Relates Court's authority to wider political/social context of American government.

**POL 4502W. The Supreme Court, Civil Liberties, and Civil Rights.** (CIV;WI; 3 cr.; Student Option; Every Spring)
Supreme Court's interpretation of Bill of Rights, 14th amendment. Freedom of speech, press, religion; crime/punishment; segregation/desegregation, affirmative action; abortion/privacy.

**POL 4507. Law, Sovereignty, and Treaty Rights.** (3 cr.; Student Option; Periodic Fall, Spring & Summer)
History of American Indian law and the post-contact effects of colonial and U.S. law on American Indians through the 20th century.

**POL 4525W. Federal Indian Policy.** (WI; 3 cr.; Student Option; Periodic Fall, Spring & Summer)
Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance of new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature on policies.

**POL 4737W. American Political Parties.** (WI; 4 cr.; Student Option; Fall Odd, Spring Even Year)
The American two-party system; party influence in legislatures and executives; decline of parties and their future. prereq: 1001 or equiv or instr consent

**POL 4766. America, the Unusual?: American Political Culture in Comparative Context.** (CIV; 3 cr.; Student Option; Fall Even, Spring Odd Year)
Empirical analysis of basic political values. Individualism, freedom, equality. Democratic principles, materialism, capitalism, citizenship, patriotism, heroism. prereq: suggested 1001 or equiv

**POL 4771. Race and Politics in America: Making Sense of Racial Attitudes in the United States.** (DSJ; 3 cr.; Student Option; Periodic Fall)
Race continues to be one of the defining fault lines in American politics. Most obviously, the existence of racial inequality has enormous consequences for any given individual's social and economic standing. However, it also has had an enormous impact on the pattern of attitudes and beliefs which have served as the backdrop for many of society's most pressing political debates and conflicts. The purpose of this course is to provide students with an introduction to how political scientists have studied racial attitudes and the larger problem of inter-ethnic conflict in American society. We will begin with a look at the historical circumstances which have given rise to the major research questions in the area. From there, we'll look at the major research perspectives in the area, and see how well they actually explain public opinion on matters of race. In doing so, we'll also get a look at some of the major controversies in this area of study, particularly the issues of whether the "old-fashioned racism" of the pre-civil-rights era has been replaced by new forms of racism; and the degree to which debates over policy matters with no apparent link to race - such as crime and social welfare - may actually have a lot to do with racial attitudes. Finally, we will conclude by taking an informed look at racial attitudes in recent American history, focusing on how racial attitudes and their political consequences of have changed - and not changed - over the course of the Obama presidency and the tumultuous 2016 election.

**POL 4773W. Advocacy Organizations, Social Movements, and the Politics of Identity.** (DSJ;WI; 3 cr.; Student Option; Every Fall & Spring)
Advocacy organizations/social movements as agents of democratic representation/political change in American politics/policy-making. Organizations/movements that represent racial/ethnic minorities, women, religious conservatives, lesbian, gay, bisexual, transgender people, low-income people.

**POL 4810. Topics in International Politics and Foreign Policy.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Analysis of selected issues in contemporary international relations. Topics vary, as specified in Class Schedule.

**POL 4867W. United States Foreign Policy Toward the Middle East.** (GP;WI; 4 cr.; Student Option; Every Fall)
U.S. foreign policy toward Israeli-Palestinian issue in Turkey, Iran, Iraq, etc. Mideast politics, debates, actions. Rationales for U.S. engagement with region. Readings of Middle East authors. prereq: Jr or sr

**POL 4878W. Israeli-Palestinian Situation.** (GP;WI; 4 cr.; Student Option; Every Fall & Spring)
Situation as clash of two communities. History, politics, respective narratives of each community. Divisions within each community that are consequential for reconciliation. Examples of reconciliation literature from both communities.

**POL 4881. The Politics of International Law and Global Governance.** (GP; 3 cr.; Student Option; Periodic Fall & Spring)
A dense and expanding network of international rules and regulations now covers the globe. These laws seek to regulate almost every activity that takes place across and sometimes within borders. How and to what extent have they been helpful in resolving conflicts between countries or in facilitating the achievement of common goals? How does international law impact government, foreign policies, domestic politics or national legal systems? In addressing these questions, this course provides an introduction to public international law for students of world politics. Throughout, we emphasize the relationship between law and politics and seek to understand why international law operates as it does. We will draw from historical and recent developments to explore these issues, including: the use of drones; the issue of war crimes and the formation of an International Criminal Court; the use of force for humanitarian purposes; the domestic impact of international human rights treaties; foreign investment disputes; and the relationship between international trade, development, and the environment.

**POL 4883W. Global Governance.** (WI; 3 cr.; Student Option; Periodic Fall, Spring & Summer)
Seminar discussions and class simulations examine the rise and role of inter-governmental organizations such as the United Nations...
POL 4885W. International Conflict and Security. (GP, WI; 4 cr.; Student Option; Fall Odd, Spring Even Year) An examination of alternative theories of the sources of militarized international conflict. Apply these theories to one or more past conflicts and discuss their relevance to the present.

POL 4887. Thinking Strategically in International Politics. (MATh; 3 cr.; A-F or Audit; Fall Odd, Spring Even Year) Survey of applications of game theory to international politics; conflict and cooperation, global environmental commons, deterrence and reputation.

POL 4891. The Politics of Nuclear Weapons. (3 cr.; Student Option; Periodic Fall & Spring) Nuclear weapons have been a feature of international politics since the first use of nuclear weapons against Hiroshima and Nagasaki at the end of World War II. But how exactly do nuclear weapons affect international politics? Are they a force for peace or for instability and war? How likely is nuclear war or nuclear terrorism? How dangerous is nuclear proliferation? Why does the United States have so many nuclear weapons? Is nuclear disarmament possible or desirable? This course examines these questions. We will first examine the technologies that underpin nuclear weapons and their effects and the major theories used to understand the ways in which nuclear weapons affect international politics. Second, we will examine the major historical episodes of the nuclear age, including the Manhattan Project and bombings of Hiroshima and Nagasaki; the evolution of nuclear strategy and the arms race between the Soviet Union and the United States; the proliferation of nuclear weapons to regional powers and the development of the global non-proliferation regime; nuclear crises including the Cuban Missile Crisis and Korean War; and the rise of arms control. Finally, we will consider a range of contemporary issues, including nuclear terrorism; the role nuclear energy will (and should) play in the future, the feasibility of nuclear disarmament; the role of nuclear weapons in India-Pakistan and future US-China relations; and the possibility of nuclear deals with so-called “rogue states” like Iran or North Korea.

POL 4900H. Honors Thesis. (; 1-6 cr.; max 12 cr.; A-F only; Every Fall, Spring & Summer) Individual research/writing of departmental honors thesis.

POL 4900W. Senior Paper. (WI; 1 cr.; A-F or Audit; Every Fall, Spring & Summer) Can be attached to any 3xx or 4xx course (with the agreement of that course’s instructor). A 10-15 page paper is submitted for evaluation/advice by instructor, then revised for final submission. prereq: Pol sr, instr consent

POL 4970. Individual Reading and Research. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq instr consent, dept consent, college consent.

POL 4991. Political Science Capstone. (3 cr.; A-F only; Every Fall & Spring) The Political Science Capstone is a required course that provides students with a unique opportunity to reflect on, articulate, share, and build on their individual experiences in the major. It invites students to reflect on what they have learned as political science majors; to demonstrate their knowledge through the preparation of a portfolio of materials; and to think about how the knowledge, skills, and insights acquired in their major experience can be used and applied outside of the University. Students double majoring in Political Science and another discipline may choose to take this course public service track in their other major. Political Science majors who are writing an Honors thesis are exempt from this capstone requirement, as the department will recognize the senior thesis as the capstone experience.

POL 5005. Political Engagement: Theories and Practice. (4 cr.; A-F only; Every Fall) Theories of political and civic engagement; case studies of challenges and opportunities in public service careers; ethics of political engagement.

POL 5065. Mentorship in Political Engagement. (3 cr.; A-F only; Every Summer) Open only for students admitted to the Master’s in Political Engagement program. Individual practical public service research project to fulfill capstone requirement for the BA/MPP program. Design and implement unique innovative public service project in a professional policymaking or political setting. Weekly direct consultation with faculty adviser and professional mentor. Must perform a minimum of 320 hours of work in a public service setting.

POL 5210. Topics in Political Theory. (; 3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Topics specified in the Class Schedule.

POL 5280. Topics in Political Theory. (; 3-4 cr. [max 3 cr.]; Student Option; Periodic Fall & Spring) Topics in historical, analytical, or normative political theory. Topics vary, see Class Schedule. prereq: grad student

POL 5306. Presidential Leadership and American Democracy. (; 3 cr.; Student Option; Periodic Fall) Examines whether president's political and constitutional powers are sufficient to satisfy citizens' high expectations and whether president should be expected to dominate American politics. prereq: grad student or instr consent

POL 5310. Topics in American Politics. (; 3 cr.; Student Option; Every Fall & Spring) See Class Schedule for description.

POL 5315. State Governments: Laboratories of Democracy. (WI; 4 cr.; Student Option; Periodic Fall) Political behavior, governmental institutions, and public policies in American states. Comparison among states, between state and national government. Emphasizes Minnesota. prereq: grad student or instr consent

POL 5322. Rethinking the Welfare State. (3-4 cr. [max 3 cr.]; Student Option; Periodic Fall & Spring) Competing arguments about welfare states in advanced industrial countries. Whether welfare states result from sectional interests, class relations, or citizenship rights. Compares American social policy with policies in other western countries. prereq: grad student

POL 5325. Political Actors in the American Policy Process. (3 cr.; Student Option; Every Fall) The role of political actors in the American policy process, focusing on actors within government (Congressional representatives, the President, bureaucrats, federal judges, state and local elected officials) and outside government (the public, interest groups, social movements, and the media). Theories of agenda setting, policymaking, and policy change. Graduate standing.

POL 5327. Politics of American Cities and Suburbs. (; 3 cr.; Student Option; Periodic Fall) Development/role of American local government. Forms and structures. Relationships with states and federal government. Local politics and patterns of power/influence. prereq: Credit will not be granted if credit has been received for: 4327; [[1001 or 1002], [non-pol sci grad major or equiv]] or instr consent

POL 5331. Thinking Strategically in Domestic Politics. (; 3-4 cr. [max 3 cr.]; Student Option; Periodic Fall) Applications of rational-choice and game theoretic to important features of domestic politics in the United States and elsewhere. prereq: Credit will not be granted if credit has been received for: 4331; grad student


POL 5410. Topics in Comparative Politics. (; 1-3 cr.; Student Option; Every Fall & Spring) Topics of current analytical or policy importance. Topics vary, see Class Schedule. prereq: grad student

POL 5461. European Government and Politics. (WI; 4 cr.; Student Option; Every Spring) European political institutions in their social settings. Power and responsibility.
Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance of new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature on policies. prereq: Credit will not be granted if credit has been received for: 4525, AmIn 4525; grad student

POL 5737. American Political Parties. (3 cr.; Student Option; Periodic Fall) American two-party system. Party influence in legislatures/executives. Decline of parties, their future. prereq: grad student or instr consent

POL 5767. Public Opinion and Voting Behavior. (3 cr.; Student Option; Every Fall & Spring) Major factors influencing electoral decisions. Political attitude formation/change. Data analysis lab required. prereq: grad student or instr consent

POL 5810. Topics in International Politics and Foreign Policy. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Selected issues in contemporary international relations. Topics vary, see Class Schedule.

POL 5833. The United States in the Global EconomyUS For Econ Policy. (3 cr. [max 3 cr.]; Student Option; Periodic Fall) Domestic/international politics of United States. Foreign economic policy (trade, aid, investment, monetary, migration policies). Effects of policies and international economic relations on U.S. economy/politics. prereq: Credit will not be granted if credit has been received for: 4833; grad student; 3835 recommended

POL 5885. International Conflict and Security. (3 cr.; Student Option; Periodic Fall) Alternative theories of sources of militarized international conflict. Theories applied to past conflicts. Theories' relevance to present. prereq: grad student

POL 5970. Individual Reading and Research. (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq instr consent, dept consent, college consent.

POL 8060. Research Proseminar in Political Science. (2 cr. [max 8 cr.]; Student Option No Audit; Every Fall & Spring) Readings, discussion, guest speakers. Topics vary by semester.

POL 8070. Advanced Research and Writing in Political Science. (2 cr. [max 4 cr.]; S-N only; Every Fall & Spring) Commentary/guidance at all stages of dissertation research process, from conceptualization of topic/project to editing of nearly final drafts.

POL 8101. Introduction to Political Science. (3 cr.; A-F or Audit; Every Fall & Spring) History, scope, and methods of political science as a discipline; current subfields; major research programs (including statism, pluralism, institutionalism, realism, behavioralism, rational choice, and critical theory); problems of theory, interpretation, concept-formation, comparison, measurement and experimentation; designs for research. prereq: Grad pol sci major or instr consent

POL 8104. Professional Development I. (2 cr. [max 4 cr.]; S-N only; Every Spring) The objectives of this course are as follows: (1) to provide students with professional advice that will help them move with dispatch through the graduate program; (2) to learn the formal and informal norms of the discipline; and (3) to help them prepare to do independent research and dissertation research. prereq: 1st year Pol graduate student

POL 8105. Professional Development II. (1 cr. [max 2 cr.]; S-N or Audit; Every Spring) Research ethics. Skills for teaching undergraduate courses in political science. Completion of dissertation prospecti or early chapters. prereq: Pol sci student, ABD, dept consent

POL 8106. Quantitative Political Science I. (3 cr.; Student Option; Every Fall) This course provides a thorough grounding in the quantitative analysis of political science data. The emphasis is on how to analyze such data, interpret statistical results, and summarize and report the findings. By the end of the term you will (1) know how to describe variables; (2) test hypotheses; (3) use measures of association to quantify the relationship between two variables while holding a third variable constant; (4) understand bivariate regression and the basics of multiple regression; (5) understand reliability and validity and how to assess these properties empirically; and (6) know how to use the STATA statistical software program. prereq: political science grad major or instr consent

POL 8107. Quantitative Political Science II. (3 cr.; A-F only; Every Spring) Multiple linear regression model applied to political science data. How to use regression techniques to analyze data, interpret statistical results, and summarize/report the findings. Estimation of model. Underlying assumptions. Inference. Model diagnostics. Extensions of model. prereq: Political science grad major or instr consent

POL 8108. Maximum Likelihood Estimation. (3 cr.; Student Option; Every Fall) This course presents an overview of the likelihood theory of statistical inference, and its wide range of uses in applied quantitative political science. When dependent variables take the form of ordered or unordered categories, event counts, or otherwise violate the traditional assumptions of the linear regression model, models estimated by maximum likelihood provide an essential alternative. Topics covered include binary, multinomial, and ordered logit/probit, Poisson regression, and multilevel models. We will rely heavily on computational methods of analysis using the R statistical computing environment, and instruction on how to use R for applied
research will be provided throughout the length of the course.

POL 8120. Core Course in Political Methodology: Modeling Political Processes. (3 cr.; Student Option; Fall Odd, Spring Even Year)
Methods used and potential for creating models of political processes. Designing political institutions, discerning/forecasting election outcomes, producing early warnings of international conflicts, increasing turnout in elections. Using mathematics to study political strategy and collective decision making in committees/legislatures. Using statistics to measure political variables, design experiments with human subjects, and test micro/macro political theories. prereq: Pol sci grad major or instr consent

POL 8122. Positive Theory. (3 cr.; Student Option; Every Fall)
Survey of positive political theory and rational-choice models. Information and transaction costs; institutions; models of elections, voting, coalitions. prereq: Grad pol sci major or instr consent

POL 8124. Game Theory. (3 cr.; Student Option; Every Spring)
Application of noncooperative game theory in political science. Equilibrium concepts, bargaining, repeated games, games of incomplete information, signaling games, reputation, learning in games. prereq: [8122, grad pol sci major] or instr consent

POL 8125. Dynamic Analysis. (3 cr.; Student Option; Periodic Fall & Spring)
Time series method, its application in political science. prereq: Pol sci grad student or instr consent

POL 8126. Qualitative Methods. (3 cr.; Student Option; Fall Even, Spring Odd Year)
Qualitative methods in social science. Hands-on training through fieldwork projects. Interview, participant observation, narrative interpretation, ethical problems. Issues of gender/race in fieldwork. prereq: Grad student

POL 8127. Survey Research Methods: Measuring Public Opinion. (3 cr.; Student Option; Fall Even, Spring Odd Year)
Theoretical/empirical issues in survey research methodology aimed at assessing political attitudes/behavior (including questionnaire design, scientific sampling). Skill areas necessary to analyze, design, or conduct surveys to examine political phenomena. prereq: Pol sci grad major

POL 8131. Advanced Methods and Models. (3 cr.; Student Option; Every Fall)
Intersection of statistical methodology and deductive modeling; issues in merging inductive and deductive research. Sample topics: parties and elections, probabilistic voting, strategic modeling of international relations. prereq: Grad pol sci major, 6 or 81xx seminars or instr consent

POL 8160. Topics in Models and Methods. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Seminars on selected topics, as specified in Class Schedule.

POL 8201. Understanding Political Theory. (3 cr.; Student Option; Every Fall & Spring)
Key concepts/major approaches. prereq: Grad student or instr consent

POL 8215. Philosophy of Political Inquiry. (3 cr.; Student Option; Every Fall)
Major schools in philosophy of science as applied to political inquiry: pragmatism, positivism, hermeneutics, critical rationalism, critical theory, realism. Themes of political inquiry: explanation, interpretation, theory, criticism. Political issues raised by philosophy of science: liberalism, democracy, control, multiculturalism. prereq: Grad pol sci major or instr consent

POL 8225. American Political Thought. (3 cr.; Student Option; Every Fall)
Colonial era to present: Puritans, American Revolution, Constitution, rise of individualism, pro- and anti-slavery arguments, civil war and reconstruction, industrialism, westward expansion, Native Americans, immigration, populism, socialism, social Darwinism, growth of corporations and unions; Great Depression; growth of American power at home and abroad. prereq: Grad pol sci major or instr consent

POL 8235. Democratic Theory. (3 cr.; Student Option; Periodic Fall & Spring)
Competing models of democracy: classical, republican, liberal, radical, Marxist, neo-Marxist, pragmatist, populist, pluralist, postmodern, participatory. Domestic and international struggles over meaning of "democracy"; social science models of and findings on democracy. prereq: Grad pol sci major or instr consent

POL 8251. Ancient and Medieval Political Thought. (3 cr.; Student Option; Every Fall)
Politics and ethics in Greece, Rome, Christendom: Thucydides, Socrates, Plato, Aristotle, Cicero, Augustine, Aquinas, Marsilius. prereq: Grad pol sci major or instr consent

POL 8252. Early Modern Political Thought. (3 cr.; Student Option; Every Fall)
Theorists and texts from Renaissance to French Revolution. Selectively includes Machiavelli, More, Calvin, Luther, Grotius, Bodin, Hobbes, Winstanley, Harrington, Locke, Montesquieu, Rousseau, Hume, Smith, Burke, and Wolstonecraft; key debates over liberty, law, power, and knowledge. prereq: Grad pol sci major or instr consent

POL 8253. Late Modern Political Thought. (3 cr.; Student Option; Every Fall & Spring)
Theoretical responses to and rival interpretations of Western economy, society, politics, and democratic culture in the modern age; theories of history; class struggle; the end of metaphysics and the death of God; technology and bureaucracy; psychology of culture, in Hegel, Marx, Tocqueville, Mill, Nietzsche, Weber, Freud. prereq: Grad pol sci major or instr consent

POL 8260. Topics in Political Theory. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Readings and research in special topics or problems.

POL 8275. Contemporary Political Thought. (3 cr.; Student Option; Every Fall)
From approximately World War II to the present. Survey of range of texts or intensive focus on such authors as Adorno, Arendt, Derrida, Foucault, Habermas, Horkheimer, Rawls, Said. Sample topics: feminism, postmodernism, communitarianism, Frankfurt School, postcolonialism. prereq: Grad pol sci major or instr consent

POL 8301. American Politics. (3 cr.; Student Option; Periodic Fall & Spring)
Seminar on main themes of theory and research in American politics, institutions, law, and policy. Major works on individual, mass, elite, and institutional behavior and their relationship to each other. Foundation for advanced seminars in American politics. prereq: Grad pol sci major or instr consent

POL 8302. Public Opinion and Political Behavior. (3 cr.; Student Option; Every Fall)
Major theoretical perspectives/research on political participation, voting behavior, public opinion. Voter turnout, importance of party identification, effects of campaigns, long-term change in public opinion, designing/conducting research. prereq: Grad pol sci major or instr consent

POL 8303. Political Parties. (3 cr.; Student Option; Every Fall)
Party systems and subsystems; party organizational characteristics, goals, and incentives; distribution of power and authority within the party; chief party functions; party as an organizer of governmental power; determinants of party structure and role. prereq: Grad pol sci major or instr consent

POL 8305. Interest Groups and Social Movements. (3 cr.; Student Option; Every Fall & Spring)
Theoretical/empirical work on role of interest groups and social/political movements in American politics and policy-making processes. Theories of interest group and social/political movement formation, maintenance, and decline. How interest groups and social/political movements attempt to influence public policy. Impact/effectiveness groups/movements as agents of democratic representation, particularly for marginalized groups. prereq: Grad pol sci major or instr consent

POL 8307. Proseminar in Political Psychology I. (2 cr.; S-N or Audit; Every Fall)
Readings, discussion, and guest speakers. Topics vary by semester. prereq: Grad pol sci major or pol psych minor or instr consent

POL 8308. Proseminar in Political Psychology II. (2 cr.; Student Option; Every Spring)
Readings, discussion, and guest speakers. Topics vary by semester.

POL 8311. Political Psychology and Socialization. (3 cr.; A-F or Audit; Every Fall & Spring)
Introduction to political psychology. Personality and politics; political cognition, emotion, and political behavior; political expertise; media and politics; aggression, authoritarianism, and political behavior; altruism and politics. prereq: Grad pol sci major or pol psych minor or instr consent

POL 8312. Legislative Process. (3 cr.; Student Option; Every Fall & Spring) Introduction to study of legislative politics; theories of legislative institutions and individual behavior; congressional elections; congressional committees, parties, and leaders. prereq: Grad pol sci major or instr consent

POL 8313. Executive Process. (3 cr.; Student Option; Every Fall) Tension between leadership and democracy in context of American presidency in terms of President's relationship with federal bureaucracy, Congress, and making of diplomatic and military policy. prereq: Grad pol sci major or instr consent

POL 8314. Judicial Process. (3 cr.; Student Option; Every Fall) Judicial systems and roles; selection of judges; organizing and supporting litigation; influences on judicial decisions; impact and enforcement of judicial decisions; courts and other institutions of government. prereq: Grad pol sci major or instr consent

POL 8320. Social Psychology of Prejudice and Intergroup Relations. (3 cr.; A-F or Audit; Every Fall) Approaches, findings, and controversies in research on social psychology of prejudice, racial attitudes, and intergroup relations. Focuses on approaches based in social psychology and on related work from political science and sociology.

POL 8321. Urban Politics. (3 cr.; A-F or Audit; Every Fall) Selection of local leadership; relationship of political system to governmental forms and social institutions; role and impact of political institutions; policymaking at local level; studies in policy problems; the emerging metropolis. prereq: Grad pol sci major or instr consent

POL 8325. State Politics and Intergovernmental Relations. (3 cr.; Student Option; Every Fall) Theoretical approaches to comparative study of state politics: study of political culture and behavior, governmental institutions, and public policy at state level; federalism. prereq: Grad pol sci major or instr consent

POL 8331. Constitutional Law. (3 cr.; Student Option; Every Fall) Overview of substantive and theoretical debates in American constitutional law; role of law and constitutional interpretation in shaping American political institutions and American politics. prereq: Grad pol sci major or instr consent

POL 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

POL 8335. Public Policy. (3 cr.; Student Option; Every Fall) Theoretical approaches: incrementalism, innovation and policy learning, comparative policy outputs, policy process models, interest groups, and selected areas of public policy. prereq: Grad pol sci major or instr consent

POL 8337. Welfare State Theories and American Social Policy. (3 cr.; Student Option; Every Fall) Rival theoretical explanations for cause and nature of welfare state development in context of four American social policies: social security, welfare, education, and healthcare. prereq: Grad pol sci major or instr consent

POL 8360. Topics in American Politics. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Readings and research in special topics or problems. prereq: instr consent

POL 8401. International Relations. (3 cr.; Student Option; Every Fall & Spring) Basic theories/approaches to study of international politics. Surveys representative work/central issues of scholarship. prereq: Grad pol sci major or dept consent

POL 8402. International Security. (3 cr.; Student Option; Spring Odd Year) Introduction to contending theories of international conflict/security. prereq: Grad pol sci major or instr consent

POL 8403. International Norms and Institutions. (3 cr.; Student Option; Periodic Fall & Spring) Origins, roles, and effectiveness of international norms and institutions; theoretical explanations and debates. Institution of sovereignty; rational choice versus constructivist perspectives; role of international law, international organizations, and non-governmental organizations; and international society and transnational cultural norms. prereq: Grad pol sci major or instr consent

POL 8404. International Hierarchy. (3 cr.; Student Option; Periodic Fall) Asymmetric structures and processes of international relations; systemic conditions and implications of informal empire and structures of hegemony; cultural productions of difference and inequality. prereq: Grad pol sci major or instr consent

POL 8405. International Political Economy. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theoretical and policy issues in international economic relations. Different approaches for understanding outcomes in international economy. Trade, finance, labor markets, creation and maintenance of international regimes, and "globalization" of economic liberalism. prereq: Grad pol sci major or instr consent

POL 8406. Politics of International Finance. (3 cr.; Student Option; Periodic Fall & Spring) Relationship between workings of the international political system and that of international markets for currency and capital. prereq: Grad pol sci major or instr consent

POL 8407. Morality in World Politics. (3 cr.; Student Option; Periodic Fall & Spring) Approaches to normative theorizing and empirical research on moral norms in world politics. Theoretical topics: realism, communitarianism, consequentialism, constructivism, postmodernism, cultural relativism. Substantive issue areas: famine and foreign aid, just war theory, nuclear weapons, moral implications of technology, case study on war (Gulf War). prereq: Grad pol sci major or instr consent

POL 8408. International Relations of the Environment. (3 cr.; Student Option; Periodic Fall) Theory and practice of international environmental politics. Emergence of environment as major issue of international relations. Diversities of agendas and politics. Imperatives, templates, resistance in global efforts to forge an applied politics of environmental sustainability. Selected cases. prereq: Grad pol sci major or instr consent

POL 8411. Political Psychology and Foreign Policy. (3 cr.; Student Option; Periodic Fall & Spring) Foreign policy theories about decision makers and audiences. Impact of human nature, formal institutions, cultural and cross-cultural settings, and kinds of issues on foreign policy choice, control, and justification. prereq: Grad pol sci major or instr consent

POL 8412. American Foreign Policy. (3 cr.; Student Option; Periodic Fall & Spring) U.S. policy toward foreign states and peoples: heritage, motivations, policy processes, what the public generally knows and wants, specific policies. Rise of intermix of issues and decline of enemy-focused internationalism; implications for process and content of U.S. foreign policy. prereq: 8410 or instr consent

POL 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and director of graduate studies consent

POL 8460. Topics in International Relations. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Readings and research in advanced topics or problems. Recent topics: global environmental issues, morality in world politics, and norms and institutions in world politics.

POL 8601. Introduction to Comparative Politics. (3 cr.; Student Option; Periodic Fall & Spring) Main theoretical approaches and issues: comparative method, the state and class; political culture; development, democratization, rational choice, social movements. prereq: Grad pol sci major

POL 8602. Families, Children, and the State. (3 cr.; A-F or Audit; Periodic Fall) Politics of family, sex, and children. Comparative perspective. Family autonomy vs. state authority. Political struggles over the definition of family, sex, and marriage. Crisis in fatherhood. Children's rights. Globalization
of Western ideology of childhood. Political realities of third-world childhood. Theories of political efficacy in family/child advocacy.

POL 8603. European Government and Politics. (3 cr.; A-F or Audit; Periodic Fall & Spring) Main theories and approaches used to interpret European politics. Many of these theories have broad relevance for comparative politics, for example, theories about the state, cleavages and coalitional bases, parties and social movements, and constitutional structures and institutions have broad relevance for the field of comparative politics. prereq: Grad pol sci major or instr consent

POL 8605. Government and Politics in Africa. (3 cr.; A-F or Audit; Periodic Fall & Spring) Theoretical and methodological approaches to study of African politics, focusing on pre-colonial and colonial legacies for post-colonial reality. Local politics, social construction of identities, political economy of peasantry and working class, political development and decay, social movements, and prospects for democracy. prereq: Grad pol sci major or instr consent

POL 8608. Government and Politics of Russia and the Commonwealth of Independent States. (3 cr.; A-F or Audit; Periodic Fall & Spring) Framework for understanding politics of change underway in the former Soviet Union. Roots of current transformation, including causes and legacy of the Russian revolution and creation of the Soviet Union. Issues in current transformation, including nationalism, economic reform, and democratization. Prior knowledge of basic Soviet politics is assumed. prereq: Grad pol sci major or instr consent

POL 8611. Chinese Politics. (3 cr.; Student Option; Periodic Fall & Spring) Major issues since 1949: democratization, dissent, violence, gender, capitalist and socialist development strategies, inequality, effect of culture on politics, status of Taiwan. Current scholarly debates on Chinese politics. Professional methods for research on contemporary China. prereq: Grad pol sci major or instr consent

POL 8615. The Political Economy of Contemporary Japan. (3 cr.; Student Option; Periodic Fall & Spring) Major political and economic issues confronting the Japanese system: situation of Japanese case within comparative politics literature concerning role of the state in formulating economic and social policy making. Review of literature. Deregulation in key industries, welfare reform, tax reforms. prereq: Grad pol sci major or instr consent

POL 8619. Latin American Politics. (3 cr.; Student Option; Periodic Fall & Spring) Major bodies of theory on development, democracy and democratization, social movements, civil society, the state, and transnational linkages. prereq: Grad pol sci major or instr consent

POL 8621. Comparative and Case Study Methods. (2 cr. [max 4 cr.]; Student Option No Audit; Every Fall & Spring) This course will provide students with a basic introduction to methodological debates surrounding comparative and case study methods in political science. Although the course is designed primarily with an eye to the needs of students in comparative politics, this course will also be useful to students in other subfields who wish to learn more about comparative and/or case study methods.

POL 8633. Comparative Sociopolitical Change. (3 cr.; Student Option; Periodic Fall & Spring) Critical evaluation of literature and theoretical perspectives; comparative examination of social and political change and interrelationship between both processes; structure/agency nexus. prereq: Grad pol sci major or instr consent

POL 8637. Comparative Political Economy. (3 cr.; Student Option; Periodic Fall & Spring) Connections between democracy and markets, emphasizing experiences of countries in North America and Europe. prereq: Grad pol sci major or instr consent

POL 8641. Comparative Mass Political Behavior. (3 cr.; A-F or Audit; Fall Even, Spring Odd Year) Examined from a cross-national perspective. Development of political participation, mobilization and its effects, development of political cleavages and political parties as vehicles of conflict, modes of political behavior in varied systems of representation and varied party systems. prereq: Grad pol sci major or instr consent

POL 8643. Comparative Political Institutions. (3 cr.; A-F or Audit; Periodic Fall & Spring) Structure/operation of various political institutions in different settings. Theoretical approaches, comparative frameworks. Introduction to literature on political institutions. Preparation for comparative research on political institutions. prereq: Pol sci grad student or instr consent

POL 8660. Topics in Comparative Politics. (3 cr.; [max 9 cr.]; Student Option; Every Fall & Spring) Readings in advanced topics or problems. Supervised research/training. Topics specified in Class Schedule.

POL 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral, up to 24 combined cr. permission number required for registration, doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

POL 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

POL 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

POL 8990. Directed Readings and Research in Political Science. (1-7 cr.; Student Option; Every Fall, Spring & Summer) TBD prereq: 16 cr 8xxx pol sci courses, instr consent, dept consent

Portuguese (PORT)

PORT 1101. Beginning Portuguese. (5 cr.; Student Option; Every Fall & Summer) Listening, speaking, reading, writing. Cultures of Portugal, Brazil, or Portuguese-speaking Africa. Workbook assignments, paired/small group activities.

PORT 1102. Beginning Portuguese. (5 cr.; Student Option; Every Spring) Reading, writing, speaking, listening. Cultures of Portugal, Brazil, or Portuguese-speaking Africa. Workbook assignments, paired/small group activities. prereq: 1101 or instr consent

PORT 1103. Intermediate Portuguese. (5 cr.; Student Option; Every Fall) Emphasizes speaking, comprehension. Reading/writing skills based on Portuguese-language materials. Cultures of Portugal, Brazil, or Lusophone Africa. prereq: 1102 or instr consent

PORT 1104. Intermediate Portuguese. (5 cr.; Student Option; Every Spring) Emphasizes speaking, comprehension. Reading/writing skills based on Portuguese-language materials. Cultures of Portugal, Brazil, or Lusophone Africa. Grammar review. Compositions, short presentations. prereq: 1103 or instr consent

PORT 3001. Portuguese for Spanish Speakers. (4 cr.; Student Option; Every Fall, Spring & Summer) Listening, reading, speaking, writing. Uses communicative approach. prereq: [SPAN 1004 or SPAN 1014 or SPAN 1044, SPAN LPE pass] or instr consent

PORT 3003. Portuguese Conversation and Composition. (4 cr.; Student Option; Every Fall & Spring) Development of oral/written skills. Cultural information from Portuguese-speaking world. prereq: 1104 or 3001 or Port LPE

PORT 3501W. Global Portuguese. 1300-1900. (WI; 3 cr.; Student Option; Every Fall) Expressions of medieval/renaissance Portuguese culture/colonial Brazilian culture through independence. Nineteenth century developments. Relation to new African empire, abolition of slavery, institution of Brazilian republic. prereq: 3003

PORT 3502W. Global Portuguese: 1900-present. (WI; 3 cr.; Student Option; Every Spring) Significant expressions of Brazilian culture, from colonial period to present. Emphasizes
PORT 3800. Film Studies in Portuguese. (3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Spring)
Films from Portuguese-speaking world in their historical, (geo)political, and socioeconomic contexts. Films from Brazil, Portugal, or Lusophone Africa analyzed under interdisciplinary framework, noting aspects related to cinematography/rhetoric. prereq: 3003 or instr consent or dept consent

PORT 3910. Topics in Lusophone Literatures. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Issues studied through literature, visual, sound, media culture from one or more Portuguese-speaking countries. Topics may include gender/sexuality, postcolonialism globalization, transatlantic studies. prereq: 3003

PORT 3920. Topics in Lusophone Cultures. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Critical studies of various aspects of Portuguese-speaking cultures (Portugal, Brazil, or Lusophone Africa). Topics may include popular music, visual/media culture, religion, diaspora, and Amazon. prereq: [1101, 1102, 1103, 1104] or [3001, 3003] or equiv

PORT 4001. Portuguese for Spanish Speakers and Graduate Student Research. (5 cr. ; Student Option; Every Fall, Spring & Summer)
Listening, reading, speaking, writing. Uses communicative approach. prereq: [SPAN 1004 or SPAN 1014 or SPAN 1044, SPAN LPE pass] or instr consent

PORT 4101. Beginning Portuguese for Graduate Student Research. (5 cr. ; Student Option; Every Fall)
Listening, speaking, reading, writing. Cultures of Portugal, Brazil, or Portuguese-speaking Africa. Workbook assignments, paired/small group activities. Meets concurrently with 1101.

PORT 4102. Beginning Portuguese for Graduate Student Research. (5 cr. ; Student Option; Every Spring)
Reading, writing, speaking, listening. Cultures of Portugal, Brazil, or Portuguese-speaking Africa. Workbook assignments, paired/small group activities.

PORT 4103. Intermediate Portuguese for Graduate Student Research. (5 cr. ; Student Option; Every Fall)
Emphasizes speaking, comprehension. Reading/writing skills based on Portuguese-language materials. Cultures of Portugal, Brazil, or Lusophone Africa. Meets concurrently with 1103.

PORT 4104. Intermediate Portuguese for Graduate Student Research. (5 cr. ; Student Option; Every Spring)

PORT 5520. Portuguese Literary and Cultural Studies. (3 cr. [max 9 cr.]; Student Option; Periodic Fall)
Origins/development of modern Portuguese nation (late 16th to 20th century) using literature, cultural and literary criticism, history, sociology, and various media (film, art, music, Internet). Main cultural problematics pertaining to Portugal as well as fundamental literary texts.

PORT 5530. Brazilian Literary and Cultural Studies. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Study of origins and development of modern Brazilian nation (late 16th to 20th century) using literature, cultural and literary criticism, history, sociology) and various media (film, art, music, Internet). Main cultural problematics pertaining to Brazil as well as fundamental literary texts. prereq: Grad student or instr consent

PORT 5540. Literatures and Cultures of Lusophone Africa. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Origins/development of Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, Sao Toma, Principe). Literature, cultural/literary criticism, history, sociology, media (film, art, music). prereq: Grad student or instr consent

PORT 5590. Topics in Lusophone Cultures and Literatures. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Cultural manifestations in Portuguese-speaking world (Portugal, Brazil, Lusophone Africa). Literature, history, film, intellectual thought, critical theory, popular culture. Topics may include writers (e.g. Machado de Assis) groups of writers (e.g. Lusophone women writers), or problematics such as (post-)colonialism or Luso-Brazilian modernities.

PORT 5930. Topics in Brazilian Literature. (3 cr. [max 9 cr.]; Student Option; Every Fall)
Major issues of Brazilian literature; focuses on important authors, movements, currents, and genres. Problems, socioeconomic questions, and literary techniques related to Brazilian themes. Topics specified in Class Schedule.

PORT 5970. Directed Readings. (1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer)
Lusophone studies (Portuguese-speaking Africa, Brazil, Portugal). Areas not covered in other courses. Students submit reading plans for particular topics, figures, periods, or issues. Prereq MA or PhD candidate, instr consent.

PORT 5990. Directed Research. (1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer)
Graduate-level research in literatures and cultures of the Portuguese-speaking world. Topics vary. Prereq Grad student or instr consent.

PORT 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

PORT 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

PSTL 1211. Sociological Perspectives: A Multicultural America. (DSJ,SOCS; 4 cr.; Student Option; Every Fall & Spring)
Introduction to sociological thinking through engaged, active learning, including service in community. Interaction of race, class, gender, age with greater societal institutions. Apply foundational understanding of sociology to real world situations.

PSTL 5306. College Student Mental Health. (2 cr.; A-F only; Every Spring)
Mental health of college students, ways colleges provide support for students with mental health concerns, basic skills all college faculty/staff need to provide support to students experiencing distress, self-care strategies for support givers.

Power Systems, Pwr Electronics (PSE)

PSE 6011. Electric Machines and Drives. (3 cr.; A-F or Audit; Every Fall & Spring)
Students learn various aspects of electric machines and drives under a steady state operation. Course provides overview of the components and control and a basic fundamental understanding for further learning. This course describes the principles behind how electric machines operate, in a way that they can be controlled in adjustable speed and position applications. In order to do so, power-electronics based converters are described in their functionality as well as the feedback control of speed and position in a system. prereq: Circuit analysis ??? dc and sinusoidal ac in steady state using phasors; basic idea of diode, transistor and thyristor operation; Fourier analysis; Laplace Transform: Bode Plots, gain and phase margin; Electromagnetic-field concepts, magnetic-circuit concepts

PSE 6021. Power Systems. (3 cr.; A-F or Audit; Every Fall & Spring)
Students will learn various aspects of electric power systems and receive an overview of the various components and control and a basic fundamental understanding for further learning. Course begins with examining various means of generating electricity and then transmitting it over power lines and cables; calculating power flow in an interconnected grid; various components such as transformers, synchronous generators, etc. that make up power systems. The middle-part of the course describes the requirements for voltage stability and keeping the generators operating synchronously under transient fault conditions. The last part of the course deals with the protection of power systems
against transmission line faults using protective relaying, and under transient over-voltages by means of insulation coordination using surge arresters. prerequisites: Circuity analysis ??? dc and sinusoidal ac in steady state using phasors; basic idea of diode, transistor and thyristor operation; Fourier analysis; Laplace Transform; Electromagnetic field concepts, magnetic-circuit concepts

PSE 6031. Power Electronics. (3 cr.; A-F or Audit; Every Fall & Spring) Course on power electronics, an enabling technology, with a focus on its various applications, basic converter structures and how these converters are used and controlled in these applications. By exploiting the commonality of various converters, students get a much deeper and broader understanding. The concentration of this course will be on switch-mode power electronics where the transistors such as MOSFETs and IGBTs are used as semiconductor switches - either ON or OFF. The terminal characteristics of these devices will be discussed for designing converters in which they are used in order to calculate conduction and switching losses for thermal management and design trade-offs; however, in analyzing the voltage transfer ratios in various converter topologies and in their feedback control, these semiconductor devices and the associated passive components will be considered ideal. The last part of the course will discuss thyristor-based converters used at very high power levels in electric-utility applications. prerequisites: Circuit analysis ??? dc and sinusoidal ac in steady state using phasors; basic idea of diode, transistor and thyristor operation; Fourier analysis: Laplace Transform: Bode Plots; gain and phase margin; Electromagnetic field concepts, magnetic-circuit concepts

PSE 6041. Power Generation Operation and Control. (3 cr.; A-F or Audit; Every Fall & Spring) Power system operations and economics is a topic important to understanding how decisions are made in hour by hour control of a power system and in planning of new power system facilities. The cost of power starts with acquiring fuel and in buying and selling power with neighboring electric companies and in markets. The course builds on the characteristics of large generating facilities to include how they are operated to minimize cost while meeting the requirement to supply load and keep equipment operating within safe margins. This necessarily brings into focus the transmission system which connects generators to loads and several sections of the course are devoted to transmission system operation and analysis. Students will be introduced to new optimization methods and new analysis methods used in the power industry. prerequisites: Advanced calculus, linear algebra, Laplace transforms, circuit analysis - dc and sinusoidal ac in steady state using phasors; basic power systems analysis including three phase per unit systems, real and reactive power calculations, power flow calculations, basic probability and statistics, basic time series analysis of signals.

Preventive Science Minor (PREV)


PREV 8002. Prevention Science Research Methodology. (3 cr.; A-F or Audit; Every Fall) This course is intended to provide students with broad exposure to topics in research methodology within the field of prevention science. Prevention science as a discipline focuses on the etiology and prevention of social, physical and mental health problems and the translation of that information to promote health and well-being. This course will emphasize research methodology as it pertains to preventive interventions in youth and family contexts. The course is intended to serve as a survey of a wide range of topics within these areas, with research design, measurement issues, and analytic methods representing the major foci. Topics will be covered with attention to the community contexts within which prevention research often occurs as well as the ethical and human subjects issues that may arise. Students who successfully complete the course are expected to be able to interpret and critically evaluate prevention research methodology as well as identify appropriate methodological strategies to address research questions within prevention science.

PREV 8003. New Topics in Prevention: Implementation and Dissemination. (3 cr.; A-F or Audit; Every Spring) This is an interdisciplinary course focused on the new science of implementation and dissemination of evidence-based/empirically-supported family-focused psychosocial prevention programs. Course content will include an overview of conceptual and theoretical foundations of implementation research, key research questions, methods for evaluating implementation and dissemination efforts, and case examples from the empirical literature. The course will take an ecological perspective to the implementation of family-based prevention programs, addressing questions such as how widespread efforts to install programs in communities can ensure that programs create change in children and families.

Product Design (PDES)

PDES 2701. Creative Design Methods. (3 cr.; A-F only; Every Fall) This class is an introduction to a variety of tools and methods used in developing new product concepts. The focus of the class is on the early stage of product development which includes user research, market research, idea generation methods, concept evaluation, concept selection, intellectual property, and idea presentation. Students work individually applying the content taught in lecture to a semester-long design project. Students meet in teams bi-weekly to present and critique their work.

PDES 2702. Concept Sketching. (3 cr.; A-F only; Every Fall) This class is an introduction to manual sketching techniques, specifically for the communication of conceptual product ideas. The focus of this class is on free-hand perspective drawing. Students begin with basic principles, simple shapes, light and shadow, and later learn how to combine forms to create conceptual objects with realistic perspective. In this class, there are weekly drawing assignments and presentations.

PDES 2703. Concept Visualization and Presentation 1. (3 cr.; A-F only; Every Spring) This class builds upon the fundamentals taught in PDES 2702 Concept Sketching. Students learn to draw complex geometries and organic forms and how to add shading, shadow, texture and backgrounds to enhance their drawings. Markers and other physical tools are introduced in this class as a means of further refining a sketch. In the second half of the semester, students learn to digitally improve their sketches and are introduced to the fundamentals of digital sketching with a drawing tablet and digital sketching software. As this class is taught in smaller sections, there are many opportunities for students to present and critique work. The basics of design portfolios are covered at the end of this class.

PDES 2704. Concept Visualization and Presentation 2. (3 cr.; A-F only; Every Fall) Building upon the principles taught in PDES 2703 Concept Visualization and Presentation 1, this course covers advanced digital sketching and 2D rendering techniques for product designers. The emphasis of this class is placed on refining sketches for professional presentation. As this class is a co-requisite with PDES 2771 Product Design Studio 1, some assignments will compliment projects assigned in studio.

PDES 2771. Product Design Studio 1. (4 cr.; A-F only; Every Fall) This is the first design studio for product design majors. It is an introduction to user-centered design using industry-standard practices. Students will apply skills learned in their prior core classes towards a semester-long individual product design challenge. The deliverables focus on user research, market research, concept development, lo-fidelity prototyping, and concept presentation.

PDES 2772. Product Design Studio 2. (4 cr.; A-F only; Every Spring) This is the second studio course for product design majors. Emphasis will be placed on
PDES 2777. Product Form and Model Making. (2 cr.; A-F only; Every Fall & Spring) This class is a hands-on introduction to prototyping tools, materials, and techniques for product design. Students learn the basics of working with foam-board, foam, and wood to create physical models and will be introduced to different surface treatments and finishes. Assignments are designed to build a sense of craftsmanship and attention to detail. There are multiple individual projects focusing on different materials and techniques. Each project involves practicing oral presentation and group critique.

PDES 3196. Product Design Internship. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Supervised work experience relating activity in business, industry, or government to the student’s area of study. Integrative paper or project may be required. prereq: PDes major, completion of at least one-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, inst consent

PDES 3704. Computer-Aided Design Methods. (3 cr.; A-F only; Every Fall) This class provides an overview of computer-aided design (CAD) methods for product designers. The primary software covered in this course include Solidworks and Keyshot. These programs are used to make three-dimensional computer generated models of product concepts and render the models to appear photo-realistic. This class may also cover additional 2D and interaction design software.

PDES 3705. History and Future of Product Design. (3 cr.; A-F only; Every Spring) This class covers critical milestones in the history, evolution, and trajectory of modern product design as well as the human relationships to consumer goods, including production and consumption. In some assignments, students have the opportunity to apply the topics discussed towards imagining the future of the product design industry.

PDES 3706. Designing for Manufacture. (4 cr.; A-F only; Every Spring) This class is a hands-on overview of common manufacturing methods, tools, and considerations for product designers. The focus is placed on plastic and metal related processes specifically machining, forming, casting, and molding. Throughout the course students apply the theory of design for manufacturing (DFM) and design for assembly (DFA) to a series of design projects. This course also covers related topics such as material identification, bill of material, cost estimation, part drawings, tolerances, fasteners, part finishing, and sourcing parts.

PDES 3711. Toy Product Design. (4 cr.; A-F only; Every Spring) Toy Product Design is an introduction to integrated product design process in which elements of industrial design, engineering, business, and humanities are combined and applied to a semester-long design project. Cross-functional teams of six students work together to design and prototype new toy product concepts with help from industry mentors.

PDES 3715. Design and Food. (4 cr.; A-F only; Every Fall) This class is a hands-on introduction to principles of design applied to the food industry. Students develop new food concepts working in a kitchen classroom with regular advising from local chefs and food industry experts. The class is structured into four modules: creative design process, flavor and texture, visual aesthetics, and user experience. In each module students learn different design and food preparation methods and apply them to a design challenge. Several restaurant outings are incorporated into the curriculum.

PDES 3771. Product Design Studio 3. (4 cr.; A-F only; Every Fall) This is the third studio course for product design majors. This studio explores design for user experience using industry-standard practices. Students will apply skills learned in their prior core classes towards several individual product design challenges. The projects in this studio cover topics in service design, digital/physical integration, smart products, formative and summative testing, and presentation skills.

PDES 4193. Directed Study in Product Design. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent study in product design under tutorial guidance. prereq: Undergrad, instr consent

PDES 4701W. Capstone Research Studio. (WI; 4 cr.; A-F only; Every Fall) Students synthesize and apply design and research techniques to a senior capstone project. Projects can be student-directed or client-sponsored and are intended to demonstrate competency in fundamental design skills, communicating and documenting design processes, and the ability to apply design processes to develop new products and services while addressing real-world constraints. The first course of the two-course sequence focuses on problem/opportunity identification, user research methodologies, ideation and conceptual design, and early stage prototyping.

PDES 4702W. Capstone Design Studio. (WI; 4 cr.; A-F only; Every Spring) Students synthesize and apply design and research techniques to a senior capstone project. Projects can be student-directed or client-sponsored and are intended to demonstrate competency in fundamental design skills, communicating and documenting design processes, and the ability to apply design processes to develop new products and services while addressing real-world constraints. The second course of the two-course sequence focuses on concept refinement, advanced prototyping, detailed design and engineering, user testing, manufacturing, and business and distribution considerations.

PDES 5193. Directed Study in Product Design. (1-4 cr. [max 8 cr.]; A-F or Audit; Every Fall, Spring & Summer) Independent study in product design under tutorial guidance. prereq: Grad, instr consent

PDES 5701. Creativity, Idea Generation, and Innovation. (3 cr.; A-F only; Every Fall) Introduction to a variety of creativity and idea generation tools with an emphasis on innovative product concept development. Students apply different tools to an ongoing project. Starting with a general theme, students explore problems and concepts, practice using a variety of idea generation tools, and learn methods of evaluating/selecting concepts. Customer needs, benchmarking, and intellectual property.

PDES 5702. Concept Sketching and Rendering. (3 cr.; A-F only; Every Fall) Sketching and marker rendering for communication of conceptual product design. Free-hand 2-point perspective. Weekly drawing assignments/presentations. Students keep a sketchbook to develop ideas/drawings.


PDES 5704. Computer-Aided Design Methods. (3 cr.; A-F only; Every Fall) Overview of how to make well-modeled, properly illuminated, and carefully composed digital models of existing/conceptual objects. prereq: Senior or grad student

PDES 5705. History and Future of Product Design. (3 cr.; A-F only; Every Spring) This class covers critical milestones in the history, evolution, and trajectory of modern product design as well as the human relationships to consumer goods, including production and consumption. In some assignments, students have the opportunity to apply the topics discussed towards imagining the future of the product design industry.

PDES 5706. Designing for Manufacture. (4 cr.; A-F only; Every Fall) Hands-on exposure to a number of common manufacturing methods and the considerations in product design. Students will be able to apply the theory of design for manufacturing (DFM) and design for assembly (DFA) to other methods that may not be taught in this course. prereq: PDes 5704 or CAD experience.

PDES 5711. Toy Product Design. (4 cr.; A-F only; Every Spring) Toy Product Design is an introduction to integrated product design process in which elements of industrial design, engineering, business, and humanities are combined and
Prostodontics (PROS)

PROS 7110. Classic Prostodontic Literature Review. (2 cr.; A-F only; Every Fall & Spring) Selected historical literature. Current research, its implications for present-day restorative dental therapy. prereq: instr consent

PROS 7120. Current Literature Review. (1 cr.; max 6 cr.; A-F or Audit; Every Summer) Historical development of maxillofacial prosthetics, interdisciplinary relationships in treatment of maxillofacial patient.

PROS 7161. Applied Biomaterials. (2 cr.; A-F or Audit; Every Summer) Principles governing manipulation of materials used in restorative dental practice. The physical and mechanical properties and the biocompatibility of dental materials to oral tissues. prereq: instr consent

PROS 7171. Principles of Maxillofacial Care. (2 cr.; A-F only; Every Fall & Summer) Treatment, biomechanics, and technical procedures associated with fabrication, fitting, and servicing of various types of oral and facial prostheses.

PROS 7200. Advanced Clinical Prosthodontics I. (5 cr.; A-F only; Every Fall, Spring & Summer) Practical clinical experience in examination, diagnosis, treatment planning, and various phases of treatment of patients with complex restorative dental problems. New and unfamiliar concepts and techniques. prereq: instr consent

PROS 7210. Advanced Technical Restorative Dentistry. (2 cr.; A-F or Audit; Every Summer) Residents are exposed to technical aspects of complete denture, removable partial denture, fixed partial denture construction, associated use of implants, considerations related to temporomandibular dysfunction (TMD). prereq: instr consent; offered concurrently with course on dental materials, head/neck anatomy

Psychology (PSY)

PSY 1001. Introduction to Psychology. (SOCS; 4 cr.; Student Option; Every Fall, Spring & Summer) Scientific study of human behavior. Problems, methods, findings of modern psychology.

PSY 1001H. Honors Introduction to Psychology. (SOCS; 4 cr.; A-F only; Every Fall & Spring) Scientific study of human behavior. Problems, methods, findings of modern psychology. prereq: Honors

PSY 1911. Psychological Perspectives on Women and Work. (3 cr.; Student Option. No Audit; Periodic Fall & Spring) Are you male or female? Your answer to this simple question will influence your experiences in the workplace. In this seminar, we will examine the empirical studies that document important gender differences in work. We will begin by learning about gender differences, with a focus on personality traits and cognitive abilities. Next, we will focus on specific issues such as the wage gap, prejudice and discrimination in the workplace, gender differences in leadership, the impact of motherhood on women's careers, and the influence of child care on psychological development. The seminar will provide all students with an important perspective on their upcoming experiences as members of the workforce.

PSY 1912. Brain Science, Drugs, and Society. (3 cr.; Student Option No Audit; Periodic Fall & Spring) This course will examine substance use and misuse from the perspective of brain science. Mental health and societal issues surrounding drug and alcohol use will be covered including information from the popular media, government, and scientific research. Viewpoints surrounding each topic will be scrutinized through the lens of current brain and behavioral research. Students will gain a deeper ability to think critically and scientifically about popular beliefs regarding substance use. For instance, despite decades of study, existing research does not make clear whether brain deficits in human substance users are caused by misuse of substances, or caused by pre-existing factors (e.g., genetics, home environment) that predate substance use and predispose individuals to misuse in the first place. The course will draw from interesting new research conducted by faculty at the University of Minnesota and elsewhere to gain insight into this uncertainty. Although we will discuss these topics from a neurobiological standpoint, a background in neuroscience is not expected or necessary.

PSY 1916. Race in Everyday Space. (DSJ; 3 cr.; Student Option No Audit; Periodic Fall & Spring) This seminar examines the nature and meaning of being racial and ethnic minorities in the United States, with a particular focus on immigrant, refugee, second-generation, and adoptee communities that are unique to Minnesota and the Midwest. Students will learn about the unique and common histories, struggles, and successes of Blacks, Asian Americans, Latinx, and American Indians. Drawing upon psychological theory and research, as well as interdisciplinary ethnic studies scholarship, the seminar engages students in a critical analysis of the ways in which race, ethnicity, and migration affect the everyday lives of racial/ethnic minority individuals and families.

PSY 1919. Re-wired: Addiction and the Brain. (3 cr.; Student Option; Periodic Fall & Spring) This course examines current research and theory on the role of the brain in drug addiction. What challenges do biopsychologists and neuroscientists face when investigating addiction? What opportunities for innovative therapies will these investigations make possible? Our path to address these questions will take us through: basic principles of neuroanatomy and neural function; experimental techniques used in brain studies; historical perspectives on drug abuse and treatment; discussions with experts in the field and visits to laboratories using cutting-edge research tools. No prior knowledge of the topic is required or assumed.

PSY 1921. Uncovering "Fake" News: Deciphering Science in the Media. (3 cr.; Student Option; Every Fall) This course investigates the role of the psychological scientist in the age of "fake" news. How do we responsibly digest, interpret and communicate scientific findings in a world of pay-to-publish scientific articles and social media outlets capable of spreading misinformation far and wide? Students will be introduced to basic knowledge of statistics and scientific method; responsible research communication and dissemination procedures; and the rhetoric and ethics of science. No previous knowledge of Psychology is required.

PSY 3001V. Honors Introduction to Research Methods. (WI; 4 cr.; A-F only; Every Spring) Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Evaluating scientific claims. prereq: [1001, 2081/3801 or equiv] for dept consent, PSY major, honors student

PSY 3001W. Introduction to Research Methods. (WI; 4 cr.; Student Option; Every Fall, Spring & Summer) Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Evaluating scientific claims. prereq: [1001, 2081 or 3801 or equiv] or dept consent

PSY 3011. Introduction to Learning and Behavior. (3 cr.; Student Option; Every Fall) Methods/findings of research on learning and behavior change. Twentieth-century theoretical perspectives, including contemporary models. Emphasizes animal learning and behavioral psychology. prereq: 1001

PSY 3031. Introduction to Sensation and Perception. (3 cr.; Student Option; Every Fall & Spring) Psychological, biological, and physical bases of sensory experience in humans and animals. Emphasizes senses of vision/hearing. prereq: PSY 1001

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
PSY 3051. Introduction to Cognitive Psychology. (3 cr.; Student Option; Every Fall, Spring & Summer) Scientific study of the mind in terms of representation and processing of information. Research and theory on cognitive abilities such as perception, attention, memory, language, and reasoning. Aspects of computational modeling and neural systems. prereq: 1001

PSY 3061. Introduction to Biological Psychology. (3 cr.; Student Option; Every Fall, Spring & Summer) Neurophysiology/neuroanatomy, neural mechanisms of motivation, emotion, sleep-wakefulness cycle, learning/memory in animals/humans. Neural basis of abnormal behavior, drug abuse. prereq: 1001 or BIOL 1009 or NSci 1100

PSY 3101. Introduction to Personality. (3 cr.; Student Option; Every Fall & Spring) Covers the major issues in personality psychology, including personality traits, their assessment, and their roots in genetic and environmental influences; personality development and the effects of personality on life outcomes; psychological and biological processes related to personality; and the importance of goals, roles, and narrative identity. Various contemporary and historical perspectives are considered, including psychodynamic, humanistic, behaviorist, and evolutionary approaches. prereq: 1001

PSY 3121. History and Systems of Psychology. (3 cr.; Student Option; Every Spring) Survey of the history, methods, and content of modern psychological theory, research, and application. Schools of psychology (e.g., structuralism, functionalism, behaviorism, Gestalt psychology) and central theories of psychology reviewed in their historical and philosophical context. prereq: PSY 1001

PSY 3135. Introduction to Individual Differences. (3 cr.; Student Option; Every Fall & Spring) Differential methods in studying human behavior. Psychological traits. Influence of age, sex, heredity, environment in individual/group differences in ability, personality, interests, social attitudes, prereq: [1001, [3801 or equiv]] or instr consent

PSY 3201. Introduction to Social Psychology. (3 cr.; Student Option; Every Fall, Spring & Summer) Overview of theories/research in social psychology. Attitudes/persuasion, social judgment, the self, social influence, aggression, prejudice, helping, and applications. prereq: 1001 or instr consent

PSY 3206. Introduction to Health Psychology. (3 cr.; Student Option; Every Spring) Theories/research in health psychology. Bi-directional relationships between psychological factors and physical health. Stress/coping, adjustment to chronic illness. Psychological factors in etiology/course of disease. Health behavior change. prereq: 1001

PSY 3301. Introduction to Cultural Psychology. (3 cr.; A-F or Audit; Every Fall & Spring) Theories/research on how culture influences basic psychological processes (e.g., cognition, psychopathology) in domains that span different areas of psychology (e.g., social, clinical, developmental, industrial-organizational) and of other disciplines (e.g., anthropology, public health, sociology). prereq: 1001

PSY 3311. Introduction to Counseling Psychology. (3 cr.; Student Option; Every Fall, Spring & Summer) History, theories, and research related to counseling psychology. Development/application of counseling theories to diverse populations. Psychological research on counseling process. Psychological mechanisms that promote change in people's lives. prereq: 1001

PSY 3304. Introduction to Abnormal Psychology. (3 cr.; Student Option; Every Fall, Spring & Summer) Diagnosis, classification, etiologies of behavioral disorders. prereq: 1001

PSY 3617. Introduction to Clinical Psychology. (3 cr.; Student Option; Every Fall & Spring) Historical developments, contemporary issues. Trends in psychological assessment methods, intervention strategies, and clinical psychology research. Theories behind, empirical evidence for, usefulness of psychological intervention strategies. prereq: 3604 or 5604H

PSY 3633. Happiness: Integrating Research Across Psychological Sciences. (3 cr.; Student Option; Every Fall) Nature of human happiness/fulfillment. Insights from cognitive, personality, and social psychology, and from biology and economics. Integrative approach to feelings that make life worth living. prereq: 3001W or 3001V or instr consent

PSY 3666. Human Sexuality. (3 cr.; Student Option; Periodic Fall & Spring) Overview of theories, research, and contemporary issues in human sexual behavior from an interdisciplinary perspective. Sexual anatomy/physiology, hormones/sexual differentiation, cross-cultural perspectives on sexual development, social/health issues, and sexual dysfunction/therapy. prereq: 1001

PSY 3711. Psychology in the Workplace. (3 cr.; Student Option; Every Fall & Spring) Application of psychological theory/research to recruitment, personnel selection, training/development, job design, work group design, work motivation, leadership, performance assessment, job satisfaction measurement. prereq: 1001, [2801/3801 or equiv] or SOC 2550 or instr consent

PSY 3801. Introduction to Psychological Measurement and Data Analysis. (MATH; 4 cr.; Student Option; Every Fall, Spring & Summer) Descriptive/basic inferential statistics used in psychology. Measures of central tendency, variability, t tests, one-way ANOVA, correlation, regression, confidence intervals, effect sizes. Psychological measurement. Graphical data presentation. Statistical software. prereq: High school algebra, [PSY 1001 or equiv]; intended for students who plan to major in psychology

PSY 3801H. Honors Introduction to Psychological Measurement and Data Analysis. (MATH; 4 cr.; A-F only; Every Fall) Descriptive/basic inferential statistics in psychology. Measures of central tendency, variability, t tests, one-way ANOVA, correlation, regression, confidence intervals, effect sizes. Psychological measurement. Graphical data presentation. Statistical software. prereq: [1001 or equiv]; intended for students who plan to major in psychology

PSY 3896. Internship in Psychology. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) The purpose of this applied course is to integrate students' academic, personal, and career development in the context of an applied community internship. Focus will be on self-reflection and professional development, as well as application of psychological principles to internship experiences. Students must have secured an approved internship to enroll. prereq: Psychology BA/BS, Department Permission

PSY 3901W. Major Project - Research Laboratory. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer) Completion of undergraduate major project. prereq: [3801 or equiv], 3001W, completion of five courses from three distribution areas, PSY major, senior

PSY 3902W. Major Project - Individual Interests. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer) Completion of undergraduate major project. prereq: [3801 or equiv], [3001W], completion of five courses from three distribution areas, PSY major, sr

PSY 3903W. Major Project - Community Engagement. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer) Completion of undergraduate major project. prereq: [3801 or equiv], 3001W, completion of five courses from three distribution areas, PSY major, senior

PSY 3960. Undergraduate Seminar in Psychology. (1-5 cr. [max 45 cr.]; Student Option; Every Fall, Spring & Summer) Undergraduate seminars in subjects of current interest in psychology. prereq: 1001

PSY 3993. Directed Study. (1-6 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer) Independent reading leading to paper or to oral or written exam. Prereq instr consent, dept consent, college consent.

PSY 3996. Undergraduate Fieldwork and Internship in Psychology. (1-4 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Supervised fieldwork/internship in community/industry pertinent to formal academic training in

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psychology. prereq: 1001, instr consent, dept consent

PSY 4011. Applied Behavior Analysis. (3 cr.; Student Option; Every Spring)
Fundamental concepts of applied behavior analysis. Practical techniques of behavior modification with humans/animals. Emphasizes functional analyses of behavioral deficits/ excesses, development/implementation of programs to bring about meaningful behavior change. prereq: 3011 or instr consent

PSY 4016. Behavior Analysis and Autism. (4 cr.; A-F or Audit; Every Fall)
Off-campus work with autistic children, under professional supervision. Professional ethics, social responsibility, scientific methods, moral philosophy. At least eight hours per week, for 12 weeks, at service-learning site. One on-campus evening meeting per week. prereq: Individual auto transportation, instr consent

PSY 4021. Creativity Sciences: Minds, Brains, and Innovation. (3 cr.; A-F only; Spring Odd Year)
Creativity and innovation play a pivotal role in our individual and collective lives. How do our minds, brains, and environments together enable the generation of useful novel ideas? This course investigates this question, using empirical findings and methods from the cognitive and brain sciences and other disciplines. Both close readings of original empirical research articles and active hands-on/minds-on within-class experiments and collaborative activities are core parts of the course. Two integrative themes throughout the course are the need for dynamically adaptive (contextually sensitive) variation in both levels of cognitive control and goal guidance (deliberate to spontaneous to automatic) and our level of representational specificity (concrete and specific to mid-level to abstract).

PSY 4021. Creativity Sciences: Minds, Brains, and Innovation. (3 cr.; A-F only; Spring Odd Year)
Creativity and innovation play a pivotal role in our individual and collective lives. How do our minds, brains, and environments together enable the generation of useful novel ideas? This course investigates this question, using empirical findings and methods from the cognitive and brain sciences and other disciplines. Both close readings of original empirical research articles and active hands-on/minds-on within-class experiments and collaborative activities are core parts of the course. Two integrative themes throughout the course are the need for dynamically adaptive (contextually sensitive) variation in both levels of cognitive control and goal guidance (deliberate to spontaneous to automatic) and our level of representational specificity (concrete and specific to mid-level to abstract).

Primary research. prereq: Grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or instr consent

PSY 4036. Perceptual Issues in Visual Impairment. (3 cr.; Student Option; Periodic Fall)
Challenges/capabilities of people who are blind or have low vision. Reading, space perception, mobility. Strengths/weaknesses of adaptive technology. prereq: 1001 or instr consent

PSY 4207. Personality and Social Behavior. (3 cr.; A-F or Audit; Every Fall)
Conceptual/methodological strategies for scientific study of individuals and their social worlds. Applications designed to maximize the negative effects of stress and trauma. The course focuses on both research methods and personal application of research findings. prereq: PSY 1001 and 3001W

PSY 4521. Psychology of Stress and Trauma. (3 cr.; A-F only; Every Spring)
This course covers the major theories and research findings related to stress and trauma, including the effects of stress and trauma on mental and physical health, factors related to more effective coping with stress/trauma and interventions designed to decrease the negative effects of stress and trauma. The course focuses on both research methods and personal application of research findings. prereq: PSY 1001 and 3001W

PSY 4902V. Honors Project. (WI; 1-6 cr.; A-F or Audit; Every Fall, Spring & Summer, Off-campus work with autistic children, under professional supervision. Professional ethics, social responsibility, scientific methods, moral philosophy. At least eight hours per week, for 12 weeks, at service-learning site. One on-campus evening meeting per week. prereq: Individual auto transportation, instr consent

PSY 4906. Seminar in Psychology. (1-4 cr.; max 16 cr.; Student Option; Periodic Fall & Spring)
Seminars in subjects of current interest in Psychology. prereq: [1001, psych major] or instr consent

PSY 4983. Directed Research: Special Areas of Psychology and Related Sciences. (1-6 cr.; max 48 cr.; Student Option; Every Fall, Spring & Summer)
Directed research projects in psychology. prereq: instr consent, dept consent

PSY 4994V. Honors Research Practicum. (WI; 4 cr.; A-F only; Every Spring)
Practical experience conducting psychological research. Preparation for completion of honors thesis. Research ethics, practical aspects of conducting psychological research, writing research reports. Students assist faculty and advanced graduate students in research. prereq: [3001W or 3001V], psych major, honors

Supervised internship/externship experience in a community-service or industrial setting relevant to formal academic training/objectives. prereq: Honors, instr consent, dept consent, college consent

PSY 5011. Applied Behavior Analysis. (3 cr.; Student Option No Audit; Every Spring)
Fundamental concepts of applied behavior analysis. Practical techniques of behavior modification with humans/animals. Emphasizes functional analyses of behavioral deficits/ excesses, development/implementation of programs to bring about meaningful behavior change.

PSY 5014. Psychology of Human Learning and Memory. (3 cr.; A-F only; Spring Odd Year)

PSY 5015. Cognition, Computation, and Brain. (3 cr.; Student Option; Spring Even Year)
Human cognitive abilities (perception, memory, attention) from different perspectives (e.g., cognitive psychological approach, cognitive neuroscience approach), prereq: [Honors or grad] or [jr or sr], [3011 or 3031 or 3051 or 3061] or instr consent

PSY 5016. Behavior Analysis and Autism. (4 cr.; A-F or Audit; Every Fall)
Off-campus work with autistic children, under professional supervision. Professional ethics, social responsibility, scientific methods, moral philosophy. At least eight hours per week, for 12 weeks, at service-learning site. One on-campus evening meeting per week. prereq: Individual auto transportation, instr consent

PSY 5018H. Mathematical Models of Human Behavior. (3 cr.; A-F only; Periodic Fall)
Mathematical models of complex human behavior, including individual/group decision making, information processing, learning, perception, and overt action. Specific computational techniques drawn from decision theory, information theory, probability theory, machine learning, and elements of data analysis. prereq: Math 1271 or instr consent

PSY 5031W. Perception. (WI; 3 cr.; Student Option; Fall Odd Year)
Cognitive, computational, and neuroscience perspectives on visual perception. Topics include color vision, pattern vision, image formation in the eye, object recognition, reading, and impaired vision. prereq: 3031 or 3051 or instr consent

PSY 5036W. Computational Vision. (WI; 3 cr.; Student Option; Fall Even Year)
Applications of psychology, neuroscience, computer science to design principles underlying visual perception, visual cognition, action. Compares biological/physical processing of images with respect to image formation, perceptual organization, object
Perception, recognition, navigation, motor control. Prereq: [3031 or 3051], [Math 1272 or equiv] or instr consent

PSY 5037. Psychology of Hearing. (3 cr.; Student Option; Periodic Fall)
Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech. Clinical/other applications. Prereq: [Math 1271, [3031 or 3051]] or grad student

PSY 5038W. Introduction to Neural Networks. (WI; 3 cr.; Student Option; Fall Odd Year)
Parallel distributed processing models in neural/cognitive science. Linear models, Hebbian rules, self-organization, non-linear networks, optimization, representation of information. Applications to sensory processing, perception, learning, memory. Prereq: [3061 or NSC 3102], [Math 1282 or 2243] or instr consent

PSY 5054. Psychology of Language. (3 cr.; Student Option; Every Fall)
Theories/experimental evidence in past/present conceptions of psychology of language. Prereq: Grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or instr consent

PSY 5062. Cognitive Neuropsychology. (3 cr.; Student Option; Every Fall)
Consequences of different types of brain damage on human perception/cognition. Neural mechanisms of normal perceptual/cognitive functions. Vision/attention disorders, split brain, language deficits, memory disorders, central planning deficits. Emphasizes function/phenomenology. Minimal amount of brain anatomy. Prereq: Grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or instr consent

PSY 5063. Introduction to Functional MRI. (3 cr.; A-F only; Every Fall)
How to understand and perform a brain imaging experiment. Theory and practice of functional MRI experimental design, execution, and data analysis. Students develop experimental materials/analyze their own functional MRI data. Lectures/lab exercises. Prereq: Jr or sr or grad or instr consent

PSY 5064. Brain and Emotion. (3 cr.; A-F; Spring Odd Year)
Introduction to affective neuroscience. How brain promotes emotional/motivated behavior in animals/humans. Biological theories of emotion in historical/current theoretical contexts. Fundamental brain motivational systems, including fear, pleasure, attachment, stress, and regulation of motivated behavior. Implications for emotional development, vulnerability to psychiatric disorders. Prereq: 3061 or 5061 or instr consent

PSY 5065. Functional Imaging: Hands-on Training. (3 cr.; Student Option; Every Spring)
Basic neuroimaging techniques/functional magnetic resonance imaging (fMRI). First half of semester covers basic physical principles. Second half students design/executes fMRI experiment on Siemens 3 Tesla scanner. Prereq: [3801 or equiv], [3061 or NSCI 3101], instr consent

PSY 5066. Neuroscience, Philosophy and Ethics. (3 cr.; Student Option; Every Spring)
Neuroscience increasingly allows us to explain the human experience in terms of mechanistic, electrochemical processes. The current course explores philosophical issues sparked by these developments in two modules. The first module examines the ways in which human neuroscience may shed new light on age-long philosophical quandaries such as mind-body dualism, free-will, and consciousness. For example, will neuroscience solve the mind-body problem by providing a wholly physical account of human nature? Is the neural view of decision making as a logical consequence of brain states incompatible with free-will? Can all of conscious experience (qualia) be reduced to neurobiology? The second module turns to neuro-ethical questions regarding the potential benefits and harms neuroscience might bring to the moral fabric of society.

PSY 5101. Personality: Current Theory and Research. (3 cr.; Student Option; Spring Odd Year)
Current theory and research on personality functioning and personality structure. Descriptive, biological, evolutionary, cognitive, developmental, cultural, and narrative perspectives on personality. Prereq: Psy 3001W and either Psy 3101 or Psy 3135 OR Psychology PhD student

PSY 5135. Psychology of Individual Differences. (3 cr.; Student Option; Periodic Spring)
Differential methods in study of human behavior. Psychological traits. Influence of age, sex, heredity, and environment in individual/group differences in ability, personality, interests, and social attitudes. Prereq: [3001W or equiv] or [5862 or equiv] or instr consent

PSY 5136. Human Abilities. (3 cr.; Student Option; Every Spring)
Theory, methods, and applications of research in human abilities. Intelligence, aptitude, achievement, specific abilities, information processing/learning and intelligence, aptitude/treatment interactions, and quantitative measurement issues. Prereq: [3001W or 3011V], [3135 or 5135], [5862 or equiv] or instr consent

PSY 5137. Introduction to Behavioral Genetics. (3 cr.; Student Option; Every Fall)
Genetic methods for studying human/animal behavior. Emphasizes nature/origin of individual differences in behavior. Twin and adoption methods. Cytogenetics, molecular genetics, linkage/association studies. Prereq: 3001W or equiv or instr consent

PSY 5138. Adult Development and Aging. (3 cr.; Student Option; Spring Even Year)
Theories/findings concerning age-related changes in mental health, personality, cognitive functioning, productivity are reviewed/interpreted within context of multiple biological, social, and psychological changes that accompany age. Prereq: Junior, Senior or Graduate Student

PSY 5202. Attitudes and Social Behavior. (3 cr.; Student Option; Periodic Spring)
Theory/research on social psychology of beliefs/attitudes. Persuasion principles. Prereq: 3201 or instr consent

PSY 5204. Psychology of Interpersonal Relationships. (3 cr.; A-F; Periodic Fall)
Introduction to interpersonal relationship theory/research findings. Prereq: Honors or grad student or instr consent

PSY 5205. Applied Social Psychology. (3 cr.; Student Option; Spring Odd Year)
Applications of social psychology research/theory to domains such as physical/mental health, education, the media, desegregation, the legal system, energy conservation, public policy. Prereq: 3201 or grad student or instr consent

PSY 5501. Vocational and Occupational Health Psychology. (3 cr.; Student Option; Every Spring)
Survey of history, concepts, theories, methods, and findings of vocational/occupational health psychology. Burnout, personality, violence, stressors/stress-relations, counter productive behaviors, coping in workplace. Vocational development/assessment, career decision-making/counseling, person-environment fit. Prereq: 3001W or equiv or instr consent

PSY 5701. Employee Selection and Staffing. (3 cr.; Student Option; Periodic Fall & Spring)
Application of psychological research/theory to issues in personnel recruitment/selection and to measurement of job performance. Applying principles of individual differences, psychological measurement to decision making in organizations (recruitment, selection, performance appraisal). Prerequisite: Psy 3001W, Psy 3711 or Instructor Permission

PSY 5707. Personnel Psychology. (4 cr.; Student Option; Every Fall)
Application of psychological research/theory regarding individual differences, psychological measurement, decision making, and learning to personnel selection, performance assessment, and occupational training. Job analysis, recruitment, selection decisions, performance appraisals, and training design, evaluation, and practice. Prereq: [3001W or equiv], 3711 or instr consent

PSY 5708. Organizational Psychology. (3 cr.; Student Option; Every Spring)
Psychological causes of behavior in work organizations. Consequences for individual fulfillment and organizational effectiveness. Individual differences, social perception,
PSY 5862. Psychological Measurement: Theory and Methods. (3 cr.; Student Option; Every Fall)
Types of measurements (tests, scales, inventories) and their construction. Theory/measurement of reliability/validity. prereq: 3801H or MATH 1271 or grad student consent

PSY 5865. Advanced Psychological and Educational Measurement. (4 cr.; Student Option; Spring Odd Year)

PSY 5860. Topics in Psychology. (1-4 cr.; max 8 cr.; Student Option; Periodic Fall, Spring & Summer)
Special course or seminar. Topics listed in Class Schedule. prereq: PSY 1001, [or cr or grad student]

PSY 5993. Research Laboratory in Psychology. (3 cr.; max 18 cr.; Student Option; Every Fall & Spring)
Laboratory instruction and seminars in faculty research areas. prereq: instr consent, dept consent

PSY 8004. Philosophical Psychology. (3 cr.; S-N or Audit; Periodic Spring)
Selected philosophical/methodological problems. prereq: Grad student or instr consent

PSY 8010. Advanced Topics in Learning. (3 cr.; max 12 cr.; S-N or Audit; Periodic Spring)
Contemporary topics in learning and behavior theory. prereq: 5012 or instr consent

PSY 8026. Neuro-Immune Interactions. (3 cr.; Student Option; Periodic Fall)
Regulatory systems (neuroendocrine, cytokine, and autonomic nervous systems) linking brain and immune systems in brain-immune axis. Functional effects of bidirectional brain-immune regulation. prereq: MicB 4131 or equiv, Nsc 5111 or equiv

PSY 8031. Seminar: Visual Perception. (2 cr.; max 3 cr.; Student Option; Every Fall & Spring)
Cognitive, psychological, neurophysiological determinants of visual perception. Current research. prereq: 5031 or instr consent

PSY 8036. Topics in Computational Vision. (3 cr.; max 12 cr.; Student Option; Every Spring)
Recent research in visual psychophysics, visual neuroscience, and computer vision. prereq: 5031 or 5036 or equiv or instr consent

PSY 8037. Psychophysics and Audition. (3 cr.; Student Option; Periodic Spring)
Modern/classical psychophysics. Psychophysical/physiological correlates of audition. Theories of hearing. prereq: instr consent

PSY 8041. Proseminar in Perception. (3 cr.; A-F or Audit; Fall Odd Year)
Seminar. Advanced topics in auditory and visual perception. Lecture, discussion, and student-led presentations of research papers on core topics of the peripheral visual and auditory systems, cortical representations, behavioral and brain-imaging methods, and computational approaches to understanding/simulating perception. prereq: Psy grad student or instr consent

PSY 8042. Proseminar in Cognition, Brain, and Behavior. (3 cr.; A-F or Audit; Fall Even Year)
Advanced topics in cognition, brain, and behavior. Lecture, discussion, and student-led presentations of research papers on core topics of attention, memory, emotion, categorization, thinking, and language, and intersections between these areas. prereq: Psy grad student or instr consent

PSY 8055. Seminar: Cognitive Neuroscience. (3 cr.; Student Option; Spring Odd Year)
Recent advances in analysis of neural bases of cognitive functions. prereq: 5015 or instr consent

PSY 8056. Seminar: Psychology of Language. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Selected topics in psycholinguistics. prereq: Grad psych major or instr consent

PSY 8061. Neuropsychopharmacology. (3 cr.; A-F or Audit; Fall Even Year)
Relationships between biochemical, neurophysiological, psychological, and behavioral effects of drugs. Research in neuropharmacology, behavioral pharmacology, and pharmacology of addiction. prereq: Sxxx coursework in biological psych or neuroscience or pharmacology or instr consent

PSY 8070. Seminar: Psychopharmacology. (1-3 cr.; max 12 cr.; Student Option; Every Fall & Spring)
Basic issues, contemporary research. Lectures, student presentations. prereq: instr consent

PSY 8111. Biological, Cognitive, Affective, Social, Developmental and Historical Aspects of Psychopathology. (4 cr.; A-F or Audit; Every Fall)
Descriptive psychopathology. Theory/research. Evaluation of current experimentation in various behavior disorders. prereq: Clinical psych grad student, instr consent

PSY 8201. Social Cognition. (3 cr.; A-F or Audit; Periodic Fall)
Social psychological theory/research on social inference and reasoning processes. Psychology of prejudice/stereotyping. prereq: Psych PhD candidate

PSY 8202. Close Relationships. (3 cr.; Student Option; Periodic Spring)
Classic/contemporary theory/research on close relationships. Emphasizes romantic relationships. prereq: 8204 or instr consent

PSY 8203. Impression Management. (3 cr.; Student Option; Periodic Fall)
Classic and contemporary theory and research concerning interpersonal strategies of impression management and interplay between private and public self. prereq: Grad psych major; 8208 recommended; instr consent

PSY 8204. Social Psychology of Prejudice and Intergroup Relations. (3 cr.; A-F or Audit; Periodic Fall)
Approaches, findings, and controversies in research on social psychology of prejudice, racial attitudes, and intergroup relations. Focuses on approaches based in social psychology and on related work from political science and sociology.

PSY 8205. Principles of Social Psychology. (3 cr.; max 15 cr.; Student Option; Every Fall)
Contemporary theoretical positions and related research. prereq: Psy PhD student

PSY 8206. Proseminar in Social Psychology. (1 cr.; max 5 cr.; S-N only; Every Spring)
Current research topics in social psychology. prereq: (PSY 8205, Social Psych PhD student) or instr consent

PSY 8208. Social Psychology: The Self. (3 cr.; A-F or Audit; Every Spring)
Social psychological theory and research concerning the self and social behavior. prereq: Psych background especially in personality and soc psych

PSY 8209. Research Methods in Social Psychology. (3 cr.; A-F only; Fall Odd Year)
Experimental/quasi-experimental methods for research in social psychology. Statistical, interpretive, operational, and ethical issues. prereq: Psych PhD student

PSY 8210. Law, Race, and Social Psychology. (3 cr.; A-F only; Periodic Fall)
Interdisciplinary seminar. Scientific foundations for and legal implications of implicit (vs. explicit) racial or gender bias in four socio-legal domains: criminal law, affirmative action, employment discrimination, and legislative redistricting. prereq: 2nd or 3rd yr law student or PhD student in social science doctoral program

PSY 8211. Proseminar in Political Psychology I. (2 cr.; S-N or Audit; Periodic Fall & Spring)
Readings, discussion, and guest speakers. Topics vary each semester.

PSY 8212. Proseminar in Political Psychology II. (2 cr.; S-N or Audit; Periodic Fall & Spring)
Readings, discussion, and guest speakers. Topics vary each semester.

PSY 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

PSY 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent
PSY 8501. Counseling Psychology: History and Theories. (3 cr.; Student Option; Every Fall)
Introduction to history of counseling psychology and to primary theoretical orientations used by counseling psychologists. For each theory: basic principles, application to counseling practice, and research support. prereq: Counseling psych grad student or instr consent

PSY 8502. Assessment in Counseling Psychology. (3 cr.; Student Option; Every Spring)
Principles and practice. Emphasizes psychometric assessment. History, foundations in measurement, basic methods, survey of instruments, test interpretation evaluation, ethics. prereq: Counseling psych grad student or instr consent

PSY 8503. Interviewing and Intervention. (3 cr.; Student Option; Every Fall)
Skills-based course: conceptualization of counseling process, stages of counseling, development of counseling skills, and strategies for behavior change. prereq: Counseling Psy grad student or instr consent

PSY 8510. Counseling Psychology Beginning Practicum: General. (1-6 cr.; S-N only; Every Fall)
Beginning applied experiences in counseling psychology settings. prereq: Counseling Psy grad student

PSY 8511. Counseling Psychology Beginning Practicum: General. (1-6 cr. [max 18 cr.]; S-N only; Every Spring)
Beginning applied experiences in counseling psychology settings. prereq: Counseling Psy grad student

PSY 8512. Counseling Psychology Beginning Practicum: General. (1-6 cr. [max 18 cr.]; S-N only; Every Summer)
Beginning applied experiences in counseling psychology settings. prereq: Counseling Psy grad student

PSY 8514. University Counseling Practicum I. (4-6 cr.; S-N only; Every Fall)
Integrates science with supervised practice in University Counseling and Consulting Services (UCCS) involving career, academic, and personal counseling clientele. prereq: Counseling Psy grad student, instr consent

PSY 8515. University Counseling Practicum II. (4-6 cr.; S-N only; Every Spring)
Integrates science with supervised practice in University Counseling and Consulting Services (UCCS) involving career, academic, and personal counseling clientele. prereq: Counseling Psy grad student

PSY 8541. Multicultural Psychology. (3 cr.; Student Option; Spring Odd Year)
Approaches, findings, and controversies in research on psychology of ethnic/racial minorities and other cultural populations. Emphasizes counseling/community applications of theory/research. Lecture, discussion, lab. prereq: instr consent

PSY 8542. Professional Standards and Ethics in Clinical Psychology. (3 cr.; A-F only; Every Fall)
Ethical principles/codes of conduct for psychologists. Ethical dilemmas faced by researchers, practitioners, teachers. prereq: Counseling or clinical psych grad student or instr consent

PSY 8544. Vocational and Occupational Health Psychology Research. (3 cr.; Student Option; Spring Odd Year)
Research problems specific to special populations, vocational research, assessment/testing, findings in these areas useful to counseling psychology practice. prereq: [8501, 8502, 8503] or equiv, counseling psych grad student, instr consent

PSY 8545. Counseling Psychology Process and Outcome Research. (3 cr.; Student Option; Spring Even Year)
Research methods, empirically-supported interventions, assessing treatment outcomes in practice, research on the counseling process, applying counseling research in counseling practice and in non-counseling contexts in the "real world." Ethics and standards of research, history of counseling process and outcome research. prereq: [8501, 8502, 8503] or equiv, counseling psych grad student, instr consent

PSY 8546. Counseling Psychology Advanced Practicum I: General. (1-3 cr.; S-N only; Every Fall)
Applied practice experience in counseling psychology settings and seminars. May include group leaders, readings, and student presentations. prereq: Counseling psy grad student, instr consent

PSY 8560. Counseling Psychology Advanced Practicum II: General. (1-3 cr.; S-N only; Every Spring)
Applied practice experience in counseling psychology settings and seminar that may include group leaders, readings, and student presentations on topics relevant to clients and settings of practice experiences. prereq: Counseling psy grad student, instr consent

PSY 8562. Counseling Psychology Advanced Practicum III: General. (1-3 cr.; S-N only; Every Summer)
Applied practice experience in counseling psychology settings and seminar that may include group leaders, readings, and student presentations on topics relevant to clients and settings of practice experiences. prereq: Counseling psy grad student, instr consent

PSY 8563. Counseling Psychology Advanced Practicum I: Career Counseling and Assessment Clinic. (1-6 cr.; S-N only; Every Fall)
Applied practice experience in vocational assessment clinic of Department of Psychology. Career/vocational testing, assessment, decision making. prereq: Counseling psy grad student, instr consent

PSY 8566. Counseling Psychology Advanced Practicum II: Career Counseling and Assessment Clinic. (1-6 cr.; S-N only; Every Spring)
Applied practice experience in Vocational Assessment Clinic of Department of Psychology. Career/vocational testing, assessment, decision making. prereq: Counseling psy grad student, instr consent

PSY 8567. Counseling Psychology Advanced Practicum III: Career Counseling and Assessment Clinic. (1-6 cr.; S-N only; Every Summer)
Applied practice experience in Vocational Assessment Clinic of Department of Psychology. Career and vocational testing, assessment, and decision making. prereq: Counseling psy grad student, instr consent

PSY 8570. Counseling Psychology Internship I. (1-12 cr. [max 36 cr.]; S-N only; Every Fall)
First part of counseling psychology internship. prereq: Counseling psy PhD candidate, instr consent

PSY 8571. Counseling Psychology Internship II. (1-12 cr. [max 36 cr.]; S-N only; Every Spring)
Second part of counseling psychology internship. prereq: Counseling psy PhD candidate, instr consent

PSY 8572. Counseling Psychology Internship III. (1-12 cr. [max 36 cr.]; S-N only; Every Summer)
Third part of counseling psychology internship. prereq: Counseling psy PhD candidate, instr consent

PSY 8611. Intellectual and Neuropsychological Assessment: Measurement, Methodology, and Development. (5 cr.; A-F or Audit; Every Fall)
Theory/practice in clinical application of assessment techniques/interviewing. Lab observations, administration, scoring, interpretation, prerequisites: Counseling Psych grad student

PSY 8612. Assessment of Personality and Psychopathology: Interviewing, Diagnosis, and Cultural Diversity. (5 cr.; A-F or Audit; Every Spring)
Theory/practice in clinical application of assessment techniques/interviewing. Lab observations, administration, scoring, interpretation, prerequisite: Counseling Psych grad student

PSY 8620. Clinical Practicum: Consultation, Supervision, Professional Standards, and Lifelong Learning. (1-6 cr. [max 36 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Field experience in professional work in clinical psychology settings. prerequisite: instr consent

PSY 8621. Foundations in Therapeutic Intervention Applying Theory to Clinical Practice. (3 cr.; A-F or Audit; Every Fall)
Professional methods in clinical psychology. Individual and group treatment techniques. Lectures and demonstrations of contemporary theories of methods of intervention with adults and children. prerequisite: Clinical Psych grad student

PSY 8622. Theories and Methods of Effective Intervention. (3 cr.; A-F or Audit; Spring Even Year)
Methodological issues in treatment research, theories of change/motivation. Empirically supported therapies for anxiety, mood,
personality disorders, psychosis, addiction. Simulating therapeutic interactions to prepare students to provide therapy. prereq: 8111, CSPR grad student

PSY 8664. Personality Assessment. (3 cr.; Student Option; Spring Even Year) Concepts/issues concerning individual differences in personality and their assessment; content, reality, and significance of personality traits; classification of personality traits; major approaches to measurement of personality. prereq: Psy grad student or instr consent

PSY 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]: No Grade Associated; Every Fall, Spring & Summer) tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

PSY 8701. Seminar in Industrial and Organizational Psychology I. (3 cr.; A-F or Audit; Periodic Fall) Application of research and theory in psychological measurement and individual differences to problems in job analysis, personnel selection and classification, performance assessment, and individual training. prereq: instr consent

PSY 8702. Seminar in Industrial and Organizational Psychology II. (3 cr.; A-F or Audit; Periodic Fall) Determinants of behavior, performance, job satisfaction that can be influenced after an individual enters an organization. Application of research/theory in attitudes, motivation, leadership, group/team dynamics, and job design to enhancement of job performance/satisfaction. prereq: instr consent

PSY 8703. Seminar in Industrial and Organizational Psychology III. (3 cr.; A-F or Audit; Periodic Spring) Developing issues/trends in current research, research methodological advances, and implementation practices. Recent important/controversial developments. prereq: instr consent

PSY 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]: No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required


PSY 8881. Seminar: Quantitative and Psychometric Methods. (3 cr. [max 15 cr.]: Student Option; Every Fall) Reviews individual research on current topics in psychological measurement.

PSY 8882. Seminar: Quantitative and Psychometric Methods. (3 cr. [max 15 cr.]: Student Option; Every Spring) Reviews, individual research on current topics in psychological measurement.

PSY 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]: No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

PSY 8935. Readings in Behavioral Genetics and Individual Differences Psychology. (1 cr. [max 10 cr.]: S-N or Audit; Every Fall & Spring) Each week participants read and discuss one or two primary research articles. prereq: 5135, 5137 or instr consent

PSY 8937. Seminar in Human Behavioral Genetics. (3 cr. [max 9 cr.]: Student Option; Every Spring) Advanced topics vary with each offering. Sample topics: gene identification in complex human traits, behavioral genetics of alcoholism, twin-family methodology. prereq: 5137 or instr consent

PSY 8960. Graduate Seminar in Psychology. (1-4 cr. [max 36 cr.]: Student Option; Every Fall & Spring) Graduate seminar in subject of current interest in psychology. prereq: Psychology grad student or instr consent

PSY 8993. Directed Studies: Special Areas of Psychology and Related Sciences. (1-6 cr. [max 36 cr.]: Student Option; Every Fall & Spring) Special area of psychology or a related science. prereq: instr consent

Public Affairs (PA)


PA 1401. Public Affairs: Community Organizing Skills for Public Action. (CIV; 3 cr. : A-F only; Every Spring) Public affairs work, roles of citizens in democratic way of life. Community organizing skills, their importance for public affairs. Negotiations among diverse audiences, understanding different interests, mapping power relationships. Relevant public affairs and governance theory.

PA 3001. Changing the World: Contemporary Public Policy. (3 cr.: A-F only; Every Spring) Foundation for understanding the what, who, where, and how of public policy making. These components are explored from different perspectives while delving into questions such as: What is public policy good for? Who decides policy priorities? What effect does public policy actually have in solving public problems? How can we improve public policy making? After successfully completing this course, students will understand the process, structure, and context of policymaking; identify who, how, and what influences the policy process; and apply knowledge of public policy and the policymaking process to a specific policy issue. A strong understanding of the American political system is encouraged.


PA 3481. Cedar Riverside: Where The World Meets MN. (2 cr.: A-F only; Periodic Spring) The Cedar Riverside Neighborhood: Where the World Meets Minnesota is an immersion course in our Cedar Riverside neighborhood that parallels the immersion experience of study abroad. The course encourages civic engagement and will provide opportunity to learn and work in the Cedar Riverside community while examining questions of leadership, power, cultural diversity and social change. Students will participate in class-based discussion seminars, neighborhood excursions and community work. Throughout the immersion experience, students are challenged to question, think, and respond thoughtfully to current issues facing the Cedar-Riverside community and cultivate leadership skills. Students can expect to gain new frameworks for understanding leadership and civic engagement in a domestic cultural context, deepened skill in identifying complex problems, strategic questioning, reflection and meaning making, as well as consciousness of relationship between self, world and text/theory.
PA 3969. Survey of Election Administration. (3 cr.; Student Option No Audit; Every Fall & Spring)
Survey of building blocks of election administration, from voter registration to recounts.

PA 3972. Elections and the Law. (3 cr.; Student Option No Audit; Every Fall)
Theories and basic structure of the American legal system. Experience with basic tools and skills for using the law to understand and analyze issues facing election administrators across the nation. Use of election-related and non-election related materials to prepare election administrators for interacting with counsel, legislators and the courts in carrying out their responsibilities.

PA 3973. Strategic Management of Election Administration. (2 cr.; Student Option No Audit; Every Fall)
Strategic management for election administrators in the political environment. Election official tools and challenges. The role of the lawmaking process in budgeting and organizational planning.

PA 3974. Election Administration Capstone Project. (2 cr.; A-F only; Every Fall & Spring)
Application of interdisciplinary methods, approaches, and perspectives from core courses. Written report of an election administration issue or problem in jurisdiction of student's choice. Research best practices and possible solutions. Final paper or presentation with findings.

PA 3975. Election Design. (2 cr.; Student Option No Audit; Every Spring)
Election administration design principles, including ballot and polling place design and poll worker training materials. Application of principles of field.

PA 3976. Voter Participation. (1 cr.; Student Option No Audit; Every Fall & Summer)
Voter participation issues and challenges including historical survey of voter participation in US and methods to increase voter turnout.

PA 3982. Data Analysis for Election Administration. (2 cr.; Student Option No Audit; Every Spring)
Evidence-based election administration. Collection and analysis of quantitative data to solve problems and identify opportunities for improvement. Emphasis on pre-election forecasting for planning purposes and post-election auditing of election results.

PA 3983. Cybersecurity and Elections. (1 cr.; Student Option No Audit; Every Fall)
This course will examine the history of cyberattacks on the United States and the American election system, with special attention to the 2016 election cycle. Students will explore the types of cybersecurity threats that exist and strategies to protect against them; understand the roles different levels of government can play in the process, and hear from key officials about the issues raised by the official response to election security threats at the federal, state and local levels as well as in related private sector communities.

PA 3990. General Topics in Public Policy. (1-3 cr. [max 9 cr.]; Student Option; Every Spring & Summer)
General topics in public policy.

PA 3991. Independent Study. (1-3 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Independent study. Prereq: instr consent

PA 4101. Nonprofit Management and Governance. (3 cr.; Student Option; Every Fall & Spring)
Managing/governing nonprofit/public organizations. Theories, concepts, real-world examples. Governance systems, strategic management practices, effect of different funding environments, management of multiple constituencies.

PA 4144. Social Entrepreneurship. (3 cr.; A-F only; Every Fall)
Introduction to field of social entrepreneurship. Prepares current/future managers/leaders to create, develop, lead socially entrepreneurial organizations/initiatives. Prereq: Junior or senior

PA 4190. Topics in Public and Nonprofit Leadership and Management. (1-3 cr. [max 9 cr.]; Student Option; Periodic Fall, Spring & Summer)
Topics in public/nonprofit leadership/management.

PA 4200. Urban and Regional Planning. (3 cr.; Student Option; Every Fall & Spring)
Fundamental principles of urban/regional land-use planning. Introduction to planning theory and its applications. Political-economic context of urban/regional planning.

PA 4290. Topics in Planning. (1-3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Topics in social policy.

PA 4790. Topics in Science, Technology, and Environmental Policy. (1-3 cr. [max 6 cr.]; Student Option; Periodic Spring)
Selected topics in the field of science, technology, and environmental policy. Topics vary.

PA 4890. Topics in Global Policy. (1-3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
Topics in global policy. Topics vary.

PA 4997. Topics in Public Affairs & Politics. (1-3 cr.; Student Option; Periodic Fall & Spring)
Topics in public policy, with emphasis on the politics of public affairs. One topic uses the

PA 4998. The Politics of Public Affairs. (3 cr.; A-F or Audit; Every Spring)
Challenges facing higher-level managers in public and nonprofit organizations in mixed economy and democratic republic. Distinctive features of public and nonprofit management, skills necessary for effective management, manager's role as creator of public value. Lectures, case discussions.

PA 5001. Intellectual Foundations of Public Action. (1.5 cr.; Student Option; Periodic Fall & Spring)
Evolution of intellectual approaches that underlie public planning, management, and policy analysis in a democratic society. How decision making is shaped by knowledge/values. Role of rationality. Conceptual, descriptive/normative, and structure/process approaches.

PA 5002. Introduction to Policy Analysis. (1.5 cr.; A-F or Audit; Every Fall & Spring)
Process of public policy analysis from problem structuring to communication of findings. Commonly used analytical methods. Alternative models of analytical problem resolution.

PA 5003. Introduction to Financial Analysis and Management. (1.5 cr.; A-F or Audit; Every Fall, Spring & Summer)

PA 5004. Introduction to Planning. (3 cr.; A-F or Audit; Every Fall)
History/institutional development of urban planning as profession. Intellectual foundations, planning theory. Roles of urban planners in U.S/international settings. Scope, legitimacy, limitations of planning/planning process. Issues in planning ethics/settings of diverse populations/stakeholders. Prereq: Major/minor in urban/regional planning or instr consent

PA 5011. Management of Organizations. (3 cr.; A-F or Audit; Every Fall & Spring)
Challenges facing higher-level managers in public and nonprofit organizations in mixed economy and democratic republic. Distinctive features of public and nonprofit management, skills necessary for effective management, manager's role as creator of public value. Lectures, case discussions.

PA 5012. The Politics of Public Affairs. (3 cr.; A-F or Audit; Every Spring)
Stages of policy making from agenda setting to implementation. Role and behavior of political institutions, citizens, social movements, and interest groups. Concepts of political philosophy. Theories of state. Team taught, interdisciplinary course. Small discussion sections.

PA 5013. Law and Urban Land Use. (1.5 cr.; A-F or Audit; Every Fall)
Role of law in regulating/shaping urban development, land use, environmental quality, local/regional governmental services. Interface between public/private sector. prereq: Major or minor in urban/regional planning or instr consent

PA 5021. Microeconomics for Policy Analysis. (3 cr.; A-F or Audit; Every Fall)
Introduction to tools useful for public policy. Intermediate microeconomics.

PA 5022. Applications of Economics for Policy Analysis. (1.5-3 cr. [max 9 cr.]; A-F or Audit; Every Spring)
Application of economic reasoning to a wide range of contemporary public policy issues. The following topically-focused courses also fulfill the MPP economics requirement: PA 5431: Public Policies on Work and Pay, PA 5503: Economics of Development, PA 5521: Development Planning and Policy Analysis, PA 5722: Economics of Natural Resource and Environmental Policy, and PA 5805: Global Economics. prereq: 5021 or equiv

PA 5031. Statistics for Public Affairs. (4 cr.; A-F or Audit; Every Fall)

PA 5032. Applied Regression. (2 cr.; A-F or Audit; Every Spring)
Bivariate/multivariate models of regression analysis, assumptions behind them. Problems using these models when such assumptions are not met. prereq: [5031 or equiv] or instr consent

PA 5033. Multivariate Techniques. (2 cr.; A-F or Audit; Every Spring)
Use of bivariate and multivariate statistical approaches for analyzing and evaluating public affairs issues and the assumptions behind the analytical approaches. Designed to help students read, understand, interpret, use, and evaluate empirical work used in social sciences by policy analysts and policy makers. prereq: [5032 or 5044 or equiv] or instr consent. May fulfill stats requirements in other programs.

PA 5035. Survey Research and Data Collection. (1.5 cr.; A-F only; Every Spring)
Introduction to survey research methods. Emphasizes applications to policy/applied research. Research design choices (e.g., descriptive, experimental, case studies), sampling, variable specification, measurement. Conducting interviews, self-administered questionnaires. Qualitative techniques.
PA 5102. Organization Performance and Change. (3 cr.; Student Option; Spring Odd Year)

PA 5103. Leadership and Change. (3 cr.; Student Option; Every Fall)
Models of change/leadership. How leaders can promote personal, organizational, and societal change. Case studies, action research. Framework for leadership and change.

PA 5104. Strategic Human Resource Management. (3 cr.; A-F or Audit; Every Fall)
Theory/practice of developing, utilizing, and aligning human resources to improve culture/outcomes of nonprofit/public organizations. HR strategy, individual diversity, leadership, selection, training, compensation, classification, performance appraisal, future HR practices. prereq: Grad student or instr consent

PA 5105. Integrative Leadership Seminar. (3 cr.; Student Option No Audit; Every Spring)
Basic concepts, practices, people, and organizations associated with integrative leadership. Case materials, related readings, presentations, and interactive discussion. prereq: Grad student or instr consent

PA 5106. Government, Ethics and the Public Will. (1-3 cr.; Student Option No Audit; Every Spring)
Links between core ethical values/formation documents that have shaped democracy in United States or student’s homeland. Ethics/agency. Ethics in context of leadership development. Compose narrative of ethical practice. prereq: Grad student or instr consent

PA 5107. Leadership, Reflective Practice, and Critical Theory: A Practicum. (2 cr.; Student Option; Every Fall)
For students immersed in a cultural shift, organization, or leadership form who wish to learn how to negotiate international, cross-cultural/political contradictions. Critical approach to understanding adult learning. How to perceive and challenge dominant ideology, unmask power, contest hegemony, overcome alienation, and practice democracy. prereq: Grad student or instr consent

PA 5108. Board leadership development. (1 cr.; S-N only; Every Fall & Spring)
Nonprofit board governance. Governance models, roles/responsibilities, ethics/dynamics. Current research/concepts along with students’ current board experiences to illuminate challenges/explore solutions that build board leadership competencies. prereq: Grad student or instr consent

PA 5111. Financing Public and Nonprofit Organizations. (3 cr.; Student Option No Audit; Every Spring)

PA 5112. Public Budgeting. (3 cr.; Student Option; Every Spring)

PA 5113. State and Local Public Finance. (3 cr.; Student Option; Every Spring)
Theory/practice of financing. Providing public services at state/local level of government. Emphasizes integrating theory/practice, applying materials to specific policy areas, and documenting wide range of institutional arrangements across/within the 50 states. prereq: Grad or instr consent

PA 5114. Budget Analysis in Public and Nonprofit Orgs. (1.5 cr. [max 3 cr.]; Student Option; Every Spring)
Techniques, terminology, concepts and skills for developing and analyzing operating and capital budgets in public and nonprofit organizations. Budget analysis using case studies, problem sets, and spreadsheets. Time value of money, cost-benefit analysis, break-even analysis, sensitivity analysis, and fiscal analysis. prereq: PA 5003

PA 5116. Financing Public and Nonprofit Organizations. (1.5 cr.; Student Option; Every Spring)
Financial resource management for public and nonprofit organizations. Short-term and long-term debt management, retirement financing, and endowment investing. Conceptual frameworks and analytical techniques applied to real-world problems. Financial management in context of national and regional economies. prereq: PA 5003; credit will not be granted if credit already received for: PA 5111

PA 5122. Law and Public Affairs. (3 cr.; Student Option; Every Spring)
Overview of evolution of American legal system. Role of courts, legislatures, and political actors in changing law. How law is used to change public policy. prereq: Grad or instr consent

PA 5123. Philanthropy in America: History, Practice, and Trends. (3 cr.; Student Option; Periodic Fall)

PA 5124. Social Entrepreneurship. (3 cr.; A-F only; Periodic Fall & Spring)
Introduction to field of social entrepreneurship. Prepares current/future managers/leaders to create, develop, lead socially entrepreneurial organizations/initiatives. prereq: Grad student or instr consent

PA 5145. Civic Participation in Public Affairs. (3 cr.; A-F only; Every Spring)
Critique/learn various approaches to civic participation in defining/addressing public issues. Readings, cases, classroom discussion, facilitating/experiencing engagement techniques. Examine work of practitioner, design engagement process. prereq: Grad student or instr consent

PA 5151. Organizational Perspectives on Global Development & Humanitarian Assistance. (3 cr.; A-F only; Every Fall)
Organizational analysis of international development and humanitarian assistance, including perspectives from sociology, political science, psychology, public administration, and management. Examines efforts of multiple organizational players, including NGOs, governments, bi-lateral and multi-lateral organizations, corporations, foundations, and international organizations. Critical analysis of...
aid organizations, especially regarding ways in which they reflect and create power and privilege, the manner in which individuals' needs and desires interact with, support, or challenge the goals of the organization, and how all of this is influenced by forces outside the boundary of the organization. Students practice developing actionable recommendations to improve the effectiveness of international aid organizations in the context of multiple (and often contested) understandings of global development needs and conflicting stakeholder demands. Readings, class discussions, mini-lectures, simulations, case analyses, group projects, oral presentations, memoir writing, opinion writing.

**PA 5152. Leadership to Address Global Grand Challenges.** (1.5 cr.; Student Option No Audit; Every Spring)

Global grand challenges are novel, emergent, complex, and beyond the resources of any single sector to address. Skills-based course that introduces participants to integrative leadership strategies effective in addressing such challenges, with specific focus on leadership practices that foster collective action across diverse groups of people.

**PA 5161. Human-Centered Service Redesign.** (3 cr.; A-F or Audit; Every Fall)

This course helps to frame the significance of human-centered redesign to improve service provision and outcomes. It explores how public, nonprofit, and philanthropic structures create unique operational realities and cultures that must be navigated to lead change across institutional boundaries. It also systematically investigates contributors to disparities in the human services system—particularly race. The use of frameworks such as human-centered design, human services value curve, and an equity lens will help us on this exploration. Course learning materials take students through a design process to highlight strategies for systems change and improvement grounded in outcomes. Design processes are iterative and involve understanding and engaging the people and context in problem solving. Through project-based learning approach, students will understand the various constraints that need to be navigated in design: feasibility, viability, and desirability. Students gain experience using design to help appreciate these constraints and develop strategies for overcoming them.

**PA 5162. Public Service Redesign Workshop.** (3 cr.; A-F only; Every Spring)

Public service delivery innovation and redesign in health and human services fields to improve outcomes. Study and application of theories of organizational development, leadership, and system change. Social system dynamics analysis. Engaging diverse stakeholders. Effects and influence of implicit bias on current and redesigned efforts. Models and tools for public service redesign.

**PA 5180. Topics in Executive Leadership.** (0.5-3 cr.; Max 6 cr.; A-F only; Every Fall & Spring)

Selected topics in executive leadership. prerequisite: consen

**PA 5181. Executive Public Safety Leadership I.** (2-3 cr.; Student Option No Audit; Every Fall)

Public safety executive leadership, citizen engagement, and organizational change. Understanding the self and community. Leadership foundations and methods. Public trust and legitimacy. Community participation, inclusion and problem solving. This hybrid course meets 1-2 days per month with all other coursework completed online. It is a prerequisite for PA 5182: Public Safety Leadership II.

**PA 5182. Executive Public Safety Leadership II.** (2-3 cr.; Student Option No Audit; Every Spring)

Public safety executive leadership, citizen engagement, and organizational change. Applying Executive Leadership in Complex Situations. Collaboration. Leadership, bias, and diversity. Decision-making and public communications during crisis. Employee wellness and human resources leadership. Application of executive leadership in building teams. This hybrid course meets 1-2 days per month with all other coursework completed online. It is the second in a series with Public Safety Leadership I offered fall term. prerequisite: Public or nonprofit officials with experience in or with public safety agencies, including law enforcement, fire, emergency management/medical services, or military.

**PA 5189. Topics in Public and Nonprofit Leadership and Management.** (1.5 cr.; Student Option; Periodic Fall & Spring)

Selected topics.

**PA 5204. Urban Spatial and Social Dynamics.** (3 cr.; Student Option; Every Spring)

Behavioral theories of internal spatial arrangement, functioning, characteristics of cities at macro level/how they produce system of cities. Factors influencing urban spatial structure over time. Urban form, land use/rent. Spatial expression of economic, social, political forces. prerequisite: urban/regional planning major/minor in or public affairs PhD or instr consent

**PA 5205. Statistics for Planning.** (4 cr.; A-F only; Every Fall)

Basic statistical tools for empirical analysis in urban and regional planning, including descriptive statistics, frequency distributions, elementary probability theory, research design and sampling, statistical inference, hypothesis testing, cross-tabulation/chi-square distribution, correlation, and simple/multiple regression analysis.

**PA 5209. Urban Planning and Health Equity.** (3 cr.; Student Option; Every Spring)

This interdisciplinary course examines the causes and consequences of place-based health disparities in cities, explores how health disparities can be mitigated and exacerbated by urban planning decisions, and introduces best practices in urban planning for achieving community health equity. The course will involve extensive readings, guest lectures, field-based assignments, data-collection activities, and local community involvement. Twin Cities has one of the largest disparities in health outcomes in the nation and local practitioners are pioneering new urban planning solutions to reduce place-based health disparities. The course will utilize this location advantage and use the region as an immersive learning environment. Students are expected to apply knowledge and skills learned in the class locally in the Twin Cities region. At the end of the course, students will be able to: Understand the historical foundations, current trends and challenges, and international perspectives in connecting urban planning to health equity issues; investigate how various planning sectors and urban environment dimensions, including land use, transportation, open space, housing, food systems, and community social capital, interact to affect health disparities in cities; critically evaluate how existing planning processes and decisions respond to the needs of vulnerable populations and contribute to health equity; and develop skills to engage communities and identifying community-sensitive solutions for reducing place-based health disparities. Fulfills a requirement for graduate Health Equity Minor (http://www.sph.umn.edu/academics/minor/health-equlity/).

**PA 5211. Land Use Planning.** (3 cr.; A-F only; Every Spring)

Physical/spatial basis for land use planning at community/regional level. Role of public sector in guiding private development. Land use regulations, comprehensive planning, growth management, innovative land use planning/policies. prerequisite: Major or minor in urban/regional planning or instr consent

**PA 5212. Managing Urban Growth and Change.** (3 cr.; Student Option; Fall Even Year)

Theory/practice of planning, promoting, and controlling economic growth/change in urban areas. Economic development tools available to state/local policymakers, historic context of their use in the United States. Legal, social, and economic implementation constraints. Interactions among economic, social, and demographic trends. prerequisite: Grad student or instr consent

**PA 5213. Introduction to Site Planning.** (3 cr.; Student Option; Every Spring)

Analyzing/preparing graphic plans for development or redevelopment of property. Site planning issues, process, opportunities, details, and techniques. Hands-on preparation of a site plan. Site visits, lectures, research, presentations, exam, in-class exercises. prerequisite: Grad student or instr consent

**PA 5215. Computer Applications in Land Use Planning.** (3 cr.; Student Option; Every Spring)

Geographical information system software, simulation modeling of land use/development, 3D software, the Internet. Project applications in citizen participation/decision-making. Meets weekly in mostly lab setting. prerequisite: Grad student or instr consent

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
PA 5216. Digital Graphics for Planning and Public Policy Makers. (1 cr.; A-F only; Every Fall & Spring)
Concepts, tools, and techniques of graphic representation software tools commonly used in urban planning and basic fundamentals of information design for public policy (InDesign, AutoCAD, Illustrator, PhotoShop). Workflow among programs and production of posters. Course project utilizes individual and group work.

PA 5221. Private Sector Development. (3 cr.; Student Option; Every Spring)
Roles of various participants in land development. Investment objectives, effects of regulation. Overview of development process from private/public perspective.

PA 5231. Transit Planning and Management. (; 3 cr.; Student Option; Every Fall)

PA 5232. Transportation Policy, Planning, and Deployment. (; 3 cr.; Student Option; Periodic Fall & Spring)
Development of transportation policy, making of transportation plans, deployment of transportation technologies. Lectures, interactive case studies, role playing.

PA 5233. Sustainable Transportation. (3 cr.; A-F or Audit; Spring Odd Year)
Concepts of sustainability in movement of people/goods in cities. Techniques/best practices/methods for planning/implementing interventions to improve social, economic, environmental sustainability of communities. prereq: Grad or instr consent

PA 5242. Environmental Planning, Policy, and Decision Making. (; 3 cr.; A-F only; Periodic Spring)
Theory and practice. Ethical, legal, and institutional frameworks relative to a range of environmental issues. Innovative environmental decision making informed by collaboration, conflict resolution, adaptive management, and resilience thinking. prereq: Grad or instr consent

PA 5251. Strategic Planning and Management. (; 3 cr.; Student Option No Audit; Periodic Spring)
Theory and practice of strategic planning and management for public and nonprofit organizations and networks. Strategic planning process, management systems; stakeholder analyses. Tools and techniques such as purpose expansions, SWOT analyses, oval mapping, portfolio analyses, and logic models.

PA 5253. Designing Planning and Participation Processes. (3 cr.; A-F only; Every Fall)
Theory/practice of design, implementation, evaluation of planning/participation processes. Types of planning. Stakeholders, including underrepresented groups. Costs/benefits of participation. Participant roles. Planning/participation tools/techniques. prereq: Major or minor in urban/regional planning or instr consent

PA 5261. Housing Policy. (; 3 cr.; A-F or Audit; Every Spring)
Institutional/environmental setting for housing policy in the United States. Competing views of solving housing problems through public intervention in the market. Federal/local public sector responses to housing problems. prereq: Grad or instr consent

PA 5271. Geographic Information Systems: Applications in Planning and Policy Analysis. (; 3 cr.; Student Option; Every Fall)
Introduction to GIS. Applications in public planning and policy analysis. Operational skills in GIS software. Mapping analysis of U.S. Census material. Local/state government management/planning. Spatial statistical analysis for policy/planning. prereq: Major in urban/regional planning or instr consent

PA 5281. Immigrants, Urban Planning and Policymaking in the U.S.. (3 cr.; A-F or Audit; Every Fall)
Social, political, economic experiences of contemporary U.S. immigrants. Draws from sociology, economics, demography, political science, public affairs. Local government policies/plans. Cities/suburbs as contexts for immigrants. Interactions between immigrant communities/urban planners/policymakers. prereq: Grad student or instr consent

PA 5290. Topics in Planning. (; 0.5-4 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Selected topics.

PA 5301. Population Methods & Issues for the United States & Global South. (3 cr.; Student Option; Periodic Spring)
Basic demographic measures/methodology. Demographic transition, mortality, fertility. Perspectives on nonmarital fertility, marriage, divorce, cohabitation. Cultural differences in family structure, aging, migration, refugee movements, population policies. Discussion of readings. prereq: Grad student or instr consent

PA 5311. Program Evaluation. (; 3 cr.; Student Option; Periodic Fall & Spring)
Principal methods, primary applications of evaluation research as applied to policies/programs in health/human services, education, or the environment. Conducting evaluations. Becoming a critical consumer of studies. prereq: Grad student or instr consent

PA 5390. Topics in Advanced Policy Analysis Methods. (; 1-4 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Topics in advanced policy analysis methods.

PA 5401. Poverty, Inequality, and Public Policy.. (3 cr.; Student Option; Every Fall)
Nature/extent of poverty/inequality in the United States, causes/consequences, impact of government programs/policies. Extent/causes of poverty/inequality in other developed-developing countries. prereq: Grad or instr consent

PA 5405. Public Policy Implementation. (; 3 cr.; A-F or Audit; Every Fall)
Theory, tools, and practice of the implementation of public policy, particularly in areas involving public, private, and nonprofit organizations. Analytical approach focuses on multiple levels in policy fields to pinpoint and assess implementation challenges and levers for improvement.

PA 5412. Aging and Disability Policy. (; 3 cr.; Student Option; Periodic Fall & Spring)
Policy debates concerning populations that are aging or disabled. Students learn/practice analyses in context of important health, social, and economic policy debates. Readings on current theory/evidence. prereq: Grad or instr consent

PA 5413. Early Childhood and Public Policy. (3 cr.; Student Option; Every Fall)
State/federal/int'l policies/legislation touching first 5 years of child's life. Family, community, institutional roles in promoting children's social/cognitive/emotional development. Health, mental health, poverty, special needs, economic/social justice. Part of Early Childhood Pol cert. prereq: Grad or instr consent

PA 5414. Child Human Rights: Work and Education. (; 3 cr.; Student Option; Periodic Spring)
International child labor issues. Options for improving child well-being, including policies/programs that have potential to affect the lives of millions of children. prereq: Grad student or instr consent

PA 5415. Economics of Early Childhood Development. (1.5-3 cr.; A-F only; Periodic Fall)
Early childhood development (ECD) is examined from an economic perspective. Course focuses on the role of government in helping to promote ECD for purposes of social welfare and economic growth. Readings include studies of brain development as well as longitudinal studies of ECD. Students will become familiar with the importance of rigorous impact evaluations and the use of cost-benefit analysis as a tool for efficient resource allocation of child policies.

PA 5421. Racial Inequality and Public Policy. (; 3 cr.; Student Option No Audit; Periodic Fall & Spring)
Historical roots of racial inequality in American society. Contemporary economic consequences. Public policy responses to racial inequality. Emphasizes thinking/analysis that is critical of strategies offered for reducing racism and racial economic inequality. prereq: Grad or instr consent

PA 5422. Diversity and Public Policy. (; 3 cr.; A-F only; Periodic Fall)

PA 5426. Research and Policy with Marginalized Groups. (3 cr.; Student Option; Every Spring)
PA 5431. Public Policies on Work and Pay. (3 cr.; Student Option; Every Spring) Public policies affecting employment, hours of work, and institutions in labor markets. Public programs impacting wages, unemployment, training, collective bargaining, job security, and workplace governance. Policy implications of the changing nature of work. prereq: [PA 5031 or equiv], grad student or instr consent

PA 5441. Education Policy and the State Legislature. (3 cr.; Student Option; Periodic Fall) How Minnesota legislature decides K-12 issues. Implications for higher education. How to increase one's influence in process. Discussions with persons who influence statewide educational policy. Presentations. Field trip to state legislature. prereq: Grad or instr consent

PA 5442. Education Law and Policy. (3 cr.; Student Option No Audit; Periodic Fall) Education law and policy with focus on elementary/secondary. Topics include governance; interplay of federal, state and local law and policy; reform efforts; desegregation; achievement gap; role of teachers unions; and finance. Early childhood education discussed in connection with K-12 issues. prereq: Grad or instr consent

PA 5451. Immigration, Health and Public Policy. (3-4 cr.; A-F only; Every Fall & Spring) How to access demographic, health, and background information on US immigrants. Characteristics and health needs of immigrants. Designing culturally competent health programs. How to advocate for needed policy changes to promote immigrant health and wellbeing. Community visits required. Online course.

PA 5452. Immigration and Public Policy. (3 cr.; Student Option; Periodic Fall & Spring) How to employ an analytical framework to analyze a current immigration policy proposal. Topics vary (e.g., president's guest worker proposal, democratic alternative proposals). prereq: Grad student or instr consent

PA 5480. Topics in Race, Ethnicity, and Public Policy. (1-3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Link between race/ethnicity and public policy. How to identify/measure racial/ethnic disparities and their historical/cultural origins and policy impacts and to craft politically feasible remedies. Topics may include criminal justice, housing, child welfare, and education. prereq: Jr or sr or grad student or instr consent

PA 5490. Topics in Social Policy. (1-4 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Selected topics.

PA 5501. Theories and Policies of Development. (3 cr.; Student Option; Every Fall) What makes some countries wealthier than others, one group of people healthier and more educated than another? How does the behavior of rich nations affect poor nations? Origins of development thought, contemporary frameworks and policy debates. Economic, human, and sustainable development. prereq: Grad student or instr consent

PA 5503. Economics of Development. (3 cr.; A-F or Audit; Every Fall) Economic growth, inequality, poverty, rural/urban labor markets, risk/insurance. Investments in human capital, credit markets, gender/household economics, governance/ institutional issues. Microfinance, conditional cash transfers, labor/education policies. prereq: PA 5501 or concurrent registration is required (or allowed) in PA 5501

PA 5511. Community Economic Development. (3 cr.; Student Option; Every Fall) Contexts/motivations behind community economic development activities. Alternative strategies for organizing/initiating economic development projects. Tools/techniques for economic development analysis/ planning (market analysis, feasibility studies, development plans). Implementation at local level. prereq: Grad or instr consent

PA 5512. Workforce and Economic Development. (3 cr.; A-F or Audit; Spring Every Year) Economic and workforce development examined from a U.S. context, exploring how rural and urban regional economies grow, why industries/employers locate where they do, and how workers decide where to live and work. Government and economic development practices related to businesses and innovation will also be addressed. prereq: Grad or instructor consent

PA 5521. Development Planning and Policy Analysis. (4 cr.; Student Option; Every Spring) Techniques of development planning/policy analysis at national, regional, and project levels. Effects of external shocks and government interventions on national/regional economies. Macroeconomic modeling, input-output analysis, social accounting matrices/multipliers, project evaluation, prereq: 5031 or equiv recommended or instr consent


PA 5561. Gender and International Development. (3 cr.; Student Option; Periodic Spring) Women and men are affected differently by development and participate differently in policy formulation and implementation. Gender-sensitive perspective. Historical, political context. Global South. Policy, practice, and experience (theory and measurement; international, national, local stakeholders; effects of policy and practice on development). prereq: Grad or instr consent

PA 5590. Topics in Economic and Community Development. (1-3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Selected topics.

PA 5601. Global Survey of Gender and Public Policy. (3 cr.; Student Option; Periodic Fall) Introduction to the key concepts and tools necessary for gender policy analysis. Survey of the major findings in the field of gender and public policy in policy areas such as poverty alleviation, health, international security, environment and work-family reconciliation. Scope includes local, national, and global policy arenas as well as exploration of gender and the politics of policy formulation.

PA 5605. Service Learning Project. (0.5-3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Selected topics. prereq: Grad student or instr consent

PA 5690. Topics in Women, Gender and Public Policy. (0.5-3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Students serve as full members of a board of directors for a women's movement organization. Organizational leadership. How to be an effective board member. Twin Cities feminist nonprofit organizations. prereq: instr consent

PA 5701. Science and State. (3 cr.; Student Option; Periodic Fall & Spring) Relationship between science and contemporary society. Nature of science: its values, processes, and ways of knowing. How science has influenced U.S. political institutions and political/judicial processes. Issues in current debate over U.S. science policy. prereq: Grad or instr consent

PA 5711. Science, Technology & Environmental Policy. (3 cr.; Student Option; Every Fall) Interplay of science, technology, the environment, and society. Approaches from across the social sciences will cover how science and technology can create new environmental pressures as well as policy challenges in a range of spheres from climate change to systems of intellectual property and international development.

PA 5712. Science to Action: All Paths. (1.5 cr.; Student Option No Audit; Every Spring) Understanding best practices for translating science to action for the common good, integrating action across multiple sectors: i.e., coordinating action by communities, government, for-profit, non-profit/NGO and academia. Case studies and theories are discussed to address societal grand challenge topic.
PA 5715. Survey of Current Issues in Science, Technology, and Environmental Policy. (1.5 cr.; A-F only; Every Spring) Current topics in science, technology, and environmental policy. prereq: Grad or instr consent

PA 5721. Energy Systems and Policy. (3 cr.; Student Option; Every Fall) Impact of energy production/consumption choices on environmental quality, sustainable development, and other economic/social goals. Emphasizes public policy choices for energy/environment, linkages between them.

PA 5722. Economics of Natural Resource and Environmental Policy. (3 cr.; Student Option; Every Spring) Public policy associated with natural resource use and environmental protection. Develops applies economic concepts/methodologies/policy mechanisms. Principles of environmental/resource economics. Issues related to renewable/nonrenewable resources and environmental pollution. Focuses on scientific/political aspects of policy. prereq: Intermediate microeconomics, intermediate policy analysis, grad student) or instr consent

PA 5723. Water Policy. (3 cr.; Student Option; Every Spring) Sociocultural, legal, economic, and environmental forces affecting supply/use of water by individuals, sectors, and governance institutions. Historical trends; water laws in United States and internationally. Institutional structures for managing water at federal, state, and local levels. Current water-related issues/policies. prereq; Grad student or instr consent

PA 5724. Climate Change Policy. (3 cr.; Student Option; Every Fall) Existing and proposed approaches to mitigate and adapt to climate change through policies that cross scales of governance (from local to global) and impact a wide range of sectors. Exploration of climate change policy from a variety of disciplinary approaches and perspectives, emphasizing economic logic, ethical principles, and institutional feasibility. How policy can be shaped in the face of a variety of competing interests to achieve commonly desired outcomes. Students develop a deep knowledge of climate change in particular countries through a team final project. prereq: Intro microecon (such as Econ 1101 or equiv)

PA 5731. Emerging Sciences and Technologies: Law, Ethics and Policy. (3 cr.; A-F only; Periodic Fall) This interdisciplinary course will examine issues at the nexus of law, ethics, public policy, and emerging sciences and technologies (ES&T) including nanotechnology, genetic and biomedical engineering, cognitive science, synthetic biology, and robotics. Topics we will explore include the role of science and technology as both a tool for and the subject of law and policy; the legal, ethical, economic, and policy implications of ES&T research and development; environmental and human health risk analysis and regulation (e.g., EPA, FDA, OSHA, and state and local regulatory mechanisms); intellectual property issues; liability issues; and global impacts. Topics will be approached from the perspective of different stakeholders (e.g., federal agencies, industry, academic researchers, the environment, international organizations, and the public) and in the context of different application areas (e.g., drugs, devices, food, agriculture, energy, environmental remediation) using a variety of interdisciplinary approaches. Students with a broad range of interests are encouraged to enroll.

PA 5741. Risk, Resilience and Decision Making. (1.5 cr.; max 3 cr.; Student Option No Audit; Every Spring) Interplay between risk analysis, decision making, and policy in the context of new and emerging technologies, environmental and human well-being, risk and resilience. Assessment methods; risk management processes, issues and methods; role/treatment of uncertainty; factors in decision making; risk-based rule making; public values; risk communication and perception. Scientific, technical, social, political, and ethical issues. prereq: Grad student or instr consent

PA 5742. Interdisciplinary Environmental Study: Practice and Design. (1.5 cr.; Student Option No Audit; Every Fall) Practice & design of interdisciplinary study to support environmental policy-making. Research design (models, experiments, quasi-experiments, case studies & meta-analysis) from a range of disciplines. Their integration in an overarching framework to address pressing STEP issues (e.g., climate change, food security, energy, future cities).

PA 5743. Acara Impact Venture Launchpad - Moving Your Idea to Impact. (1.5 cr.; A-F only; Every Spring) Introduction to design thinking, problem definition, communication, change management and leadership, non-profit and business models, and social entrepreneurship frameworks for purpose of developing idea to address environment or social problem. Presentation at end of class to panel of experts. Projects may be used in Acara Challenge competition. To register, students must submit project proposal.

PA 5751. Urban Infrastructure Systems for Sustainable and Healthy Cities. (3 cr.; A-F or Audit; Every Summer) Study social actors, engineered infrastructures/natural systems as they, together, shape health/sustainability outcomes for cities. Understand role of infrastructure design, planning, policy in sustainable cities. Learn sustainability systems concepts, local-to-global linkages, inter-disciplinary, inter-cultural skills. prereq: Grad student or instr consent

PA 5752. Material-Energy Flows & Sustainable Development. (3 cr.; A-F only; Every Fall) How do material and energy flows shape the development of a sustainable society? Part I introduces concepts of human wellbeing, sustainable development, the role of natural resources and key physical infrastructure in advancing Sustainable Development Goals (SDGs). Part II describes ways to measure progress toward SDGs, particularly those related to material and energy flows. Part III highlights pathways to work toward SDGs, emphasizing principles and concepts from environmental economics.

PA 5790. Topics in Science, Technology, and Environmental Policy. (1-3 cr. [max 9 cr.] Student Option; Periodic Fall & Spring) Selected topics.

PA 5801. Global Public Policy. (3 cr.; Student Option; Every Spring) Creation of rules, norms, institutions to regulate global activities. Policy making. How global policy making regulates interstate, national, transnational activities. Creation/enforcement of global rules. Applications to international security, political economy. prereq: Grad or instr consent

PA 5802. Global Economic Policy. (3 cr.; Student Option; Every Fall) Economic logic of globalization, national policy objectives, international finance/financial institutions, international trade and agreements including regional pacts and the WTO, global environmental and resource governance, immigration and emigration, and development challenges. prereq: Major in [public affairs or public policy] or instr consent

PA 5805. Global Economics. (3 cr.; A-F only; Every Fall) Global trade, exchange rates, finance, international business, and migration in context of theories and evidence that inform the policies pursued at national level. Operation of main international organizations dealing with these issues will also be examined. prereq: [5021 or equivalent] or instr consent

PA 5813. US Foreign Policy: The Institutional Basis. (3 cr.; Student Option No Audit; Every Fall) The institutions that shape, influence and manage U.S. foreign policy including their origins and culture. Structure and function of key foreign policy institutions. Academic and policy critiques of the evolving institutional realities, including the State Department decision-making process; how institutions relate to one another, the changing role of institutions such as the Department of Defense, intelligence agencies, and the Department of Homeland Security in foreign policy. Assessment of the role played by Congress, the media, and the public, including non-governmental organizations and lobbying groups, as they seek to influence Executive Branch foreign policy institutions. Meetings virtually or in person with current or former Washington policy-makers who provide insights on real time issues and institutional realities.

PA 5814. Bilateral and Multilateral Diplomacy. (3 cr.; Student Option No Audit; Every Spring) Theory, practice and profession of bilateral & multilateral diplomacy. History of diplomacy; norms, practices and international legal bases; impact of technology, cultural changes on diplomacy. Readings, discussions and
Role of women in recent armed conflicts/ how women are affected by wartime as combatants, civilians, victims, and perpetrators of war violence. Conflicts in Sierra Leone, Liberia and El Salvador, where women participated in fighting forces in large numbers, as well as women's roles in the Abu Ghraib scandal, female suicide bombers, wartime sexual violence. Policy solutions offered by policymakers and NGOs to deal with problems of gender-based violence. prereq: Grad student or instr consent

PA 5821. Humanitarianism. (3 cr.; Student Option; Periodic Fall & Spring) Foundations, logic, dynamics, dilemmas, and consequences of humanitarianism, a form of governance that operates in the name of—and for—the international community. prereq: Grad student or instr consent


PA 5823. Managing Humanitarian and Refugee Crises: Challenges for Policymakers & Practitioners. (1 cr.; max 3 cr.; Student Option No Audit; Periodic Fall & Spring) Examines response of governments, international organizations, NGOs, and others to global humanitarian and human rights challenges posed by civil conflict and other complex emergencies in places such as Syria, the Middle East region, South Sudan, Somalia, Burma, and elsewhere. Course will also consider and assess UN and other institutions established to address these issues (like UNOCHA and UNHCR). In addition, course will examine US policy toward humanitarian issues and refugees (including US refugee admissions).

PA 5824. International Humanitarian Crisis Simulation. (1 cr.; S-N or Audit; Every Fall) Students learn/practice humanitarian crisis response skills reflecting international standards through a multi-day, humanitarian dynamic crisis simulation. Includes training in international crisis response standards (SPHERE) and population assessment, WASH (water, sanitation and hygiene) for refugee camps, nutrition, interactive shelter design/planning, the international legal basis for humanitarian response, safety and security issues, psychosocial trauma awareness, and field hospital scenarios. Composed of class meetings and an on-site sector skill training and field crisis simulation.

PA 5825. Crisis Management in Foreign Affairs. (1.5 cr.; Student Option; Every Spring) Crisis decision making in foreign policy. Examination of the organization and structure of crisis decision-making within U.S. national security apparatus. Analysis of in-depth four foreign policy crises (Cuban Missile Crisis, Vietnam War, Tet, Iraq, and a current crisis). Crisis simulation with students in the role of national security leaders.

PA 5841. Women, Violence, and Armed Conflict. (3 cr.; A-F only; Periodic Fall & Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
Policymaking/politics of planning in housing, community development, social policy. Connecting policy to local/regional politics. Role of institutional decision-making structures on policy outcomes. Importance of citizens, social movements, interest groups in policymaking process. prereq: Major/minor in urban and regional planning or PA PhD or instr consent

PA 8204. Creating Good Work: Economic and Workforce Development. (4 cr.; A-F or Audit; Every Spring) Job-oriented economic development. Theories on how/why jobs are created. Tools used by communities and economic developers (e.g., tax abatement, infrastructure, job training, entrepreneurship). Strategy, politics, effectiveness.

PA 8206. Planning Theory. (3 cr.; A-F only; Every Spring) An overview of the major theories that have shaped the field of urban and regional planning, including the analysis of theories related to the process and substance of urban planning. prereq: Public Affairs Ph.D. student, urban planning subplan

PA 8290. Advanced Topics in Planning. (1-3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring) Selected topics.


PA 8312. Analysis of Discrimination. (4 cr.; Student Option; Periodic Fall & Spring) Policy analysis/other applied social sciences as tools for measuring/detecting discrimination in market/non-market contexts. Application of modern tools of labor economics/race relations research to specific problems of market/non-market discrimination.

PA 8331. Economic Demography. (3 cr.; A-F or Audit; Every Spring) Classical theory, advanced econometric methods, recent empirical work, and available datasets for research in economic demography. Topics include the economics of mortality, fertility, migration, marriage, women's labor supply, intra-family bargaining, and age structure. Students develop critical analysis and academic discourse skills through in-depth discussions and replications of papers, presentations, referee-style writing assignments, and a term paper. prereq: Grad-level economic theory (PA 5021 or equiv) and econometrics (PA 5033 or equiv) and instructor permission

PA 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

PA 8386. Research Methods in Public Policy. (2 cr.; Student Option; Every Fall) Social science research methods to analyze and develop public policies. Nature of the research process in analyzing public policies. Qualities of policy analysis and other types of research. Major data sources available to examine public policy issues in the U.S. and abroad. Statistical approaches to examining public policies. prereq: A semester statistics class focusing on advanced applied topics in regression analysis (e.g. PA 5033, Multivariate Techniques).

PA 8390. Advanced Topics in Advanced Policy Analysis Methods. (1-3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring) Selected topics.

PA 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) FTE: Doctoral prereq: Doctoral student, adviser and DGS consent

PA 8461. Global and U.S. Perspectives on Health and Mortality. (3 cr.; Student Option No Audit; Every Fall) The health of populations in developing and developed countries is very different. Within countries, great health disparities exist between more advantaged and more disadvantaged populations. When crafting policies that aim to improve population health, it is crucial to know how to measure health and how to think about the health needs of the specific population in question. This course will provide an overview to the factors driving health, mortality, and aging across different populations. In addition, students will learn the best sources of data and measures to use to describe the health status of a population. They will also be able to assess policy options that address the health of their population.

PA 8490. Advanced Topics in Social Policy. (1-3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring) Selected topics.

PA 8590. Advanced Topics in Economic and Community Development. (1-3 cr.; max 6 cr.; Student Option; Periodic Fall & Spring) Selected topics.

PA 8666. Doctoral Pre-Thesis Credits. (1-6 cr.; max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) Doctoral Pre-Thesis Credits prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr.

PA 8686. Feminist Organizations. (3 cr.; A-F or Audit; Periodic Spring) Uses social movement literature and histories of U.S. second-wave feminism to study feminist organizations. Recurring issues and conflicts within organizations and movements examined through comparative studies of feminism in Latin America, Eastern Europe, Britain, and Italy. Methods and sources for studying feminism.

PA 8687. Women and Electoral Politics. (3 cr.; A-F or Audit; )
PA 8803. Advanced Topics in Foreign Policy and International Affairs. (3 credits; max 6 cr.) [Student Option; Periodic Fall & Spring]
Selected topics.

PA 8921. Master's: Professional Paper (Individual Option). (1-3 credits; Student Option; Every Fall, Spring & Summer)
Students work under guidance of paper adviser and committee members to complete their Professional Paper (individual option). prereq: inst consent

PA 8922. Master's: Paper: Plan B. (1-3 credits; Student Option; Every Fall, Spring & Summer)
Masters of science in science, technology, and environmental policy majors work under guidance of paper adviser to complete their Plan B. prereq: inst consent

PA 8931. PhD Public Affairs Professional Skills I. (1 credit; S-N or Audit; Every Summer)
First of three professional skills workshops to prepare Public Affairs PhD students to be engaged scholars and public policy practitioners. Develop skills and tactics for leadership in public affairs scholarship.

PA 8932. PhD Public Affairs Professional Skills II. (1 credit; S-N or Audit; Every Summer)
Second of three professional skills workshops to prepare Public Affairs PhD students to be engaged scholars and public policy practitioners. Communicate complex policy problems and solutions with a wide variety of audiences.

PA 8933. PhD Public Affairs Professional Skills III. (1 credit; S-N or Audit; Every Summer)
Third of three professional skills workshops to prepare Public Affairs PhD students to be engaged scholars and public policy practitioners. Utilize communication platforms to engage diverse audiences. Build a digital portfolio to share research and accelerate teaching impact.

PA 8991. Independent Study. (0.5-3 credits; max 6 cr.) [Student Option; Every Fall, Spring & Summer]
Independent study. Limit of 6 credits applied toward a Humphrey School of Public Affairs degree or post-baccalaureate certificate program.

Public Health (PUBH)

PUBH 20. Community Engagement. (0 credits; No Grade Associated; Every Fall, Spring & Summer)
Registration for course is officially documented on transcript. prereq: Academic faculty adviser consent

PUBH 1001. Success Over Stress (SOS). (1 credit; Student Option; Every Fall & Spring)
Increases students' understanding of stress/how to manage it and empower them to help others manage their stress. Holistic health perspective/impact of stress on all aspects of life. Causes, effects, and consequences of stress for students and society at large. Tools and resources to manage stress during college and throughout life. prereq: Undergrad or PSEO student

PUBH 1003. Alcohol and College Life (ACL). (1 credit; Student Option; Every Fall, Spring & Summer)
How alcohol affects college life. Personal prevention strategies. Maximizing campus safety. Students receive instructions at their umn.edu e-mail accounts on how to access/start course. Due dates for assignments. prereq: Fr or soph or PSEO

PUBH 1004. Sexuality Matters. (1 credit; Student Option; Every Fall, Spring & Summer)
Knowledge/skills to lead healthy sexual lives. Unbiased, medically accurate, evidence-based information/programs. Communication skills. Dispel sexuality/relationships myths. prereq: Undergrad or PSEO student

PUBH 1005. Sleep, Eat, and Exercise. (1 credit; Student Option; Every Fall & Spring)
Living a balanced life while in college. Nutrition, sleep, physical activity. Techniques to promote self-awareness, reflection, goal setting, and action toward wellness. prereq: Undergrad or PSEO student

PUBH 3001. Personal and Community Health. (2 credits; Student Option; Every Fall & Spring)
Fundamental principles of health conservation and disease prevention.

PUBH 3003. Fundamentals of Alcohol and Drug Abuse. (2 credits; Student Option; Every Fall & Spring)
Scientific, sociocultural, and attitudinal aspects of alcohol and other drug abuse problems. Emphasizes incidence, high-risk populations, prevention, and intervention.

PUBH 3004. Basic Concepts in Personal and Community Health. (4 credits; Student Option; Every Fall & Spring)
Scientific, sociocultural, and attitudinal aspects of communicable and degenerative diseases, environmental and occupational health hazards, and alcohol and drug problems. Role of education in health conservation, disease control, and drug abuse.

PUBH 3005. Fundamentals of Alcohol and Drug Abuse for Teacher Education. (1 credit; Student Option; Every Fall, Spring & Summer)
Scientific/socio-cultural aspects of alcohol/drug problems. Emphasizes role of education in health conservation and drug abuse prevention. prereq: Undergrad in Agricultural Educ or Career/Technical Educ or DirectTrack to Teaching or Early Childhood Educ or Elementary Educ Foundations or Music Educ or Special Educ

PUBH 3010. Public Health Approaches to HIV/AIDS. (2 credits; Student Option; Every Fall)
Primary, secondary, and tertiary prevention. Community responses to HIV/AIDS in Minnesota. Medical, social service, and political responses.

PUBH 3040. Dying and Death in Contemporary Society: Implications for Intervention. (2 credits; Student Option; Every Spring)
Concepts, attitudes, ethics, and lifestyle management in relation to dying, death, grief, and bereavement. Emphasizes intervention/educational aspects for community health/helping professionals and educators. prereq: Jr or sr or inst consent

PUBH 3050. Practicum in Peer Education I. (2 credits; A-F or Audit; Every Fall)
Multiple factors that influence health. Through various health promotion strategies, students
PUBH 3052. Practicum in Peer Education II. (2 cr.; A-F or Audit; Every Spring) Multiple factors that influence health. Through health promotion strategies, students gain/ build skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation. prereq: Selected to serve as a health advocate, instr consent

PUBH 3093. Directed Study: Public Health. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Directed study in selected public health problems or current issues. prereq: instr consent

PUBH 3100. Topics: Environmental Health. (1-3 cr. [max 40 cr.]; Student Option No Audit; Every Fall, Spring & Summer) Topics of interest in environmental health.

PUBH 3102. Issues in Environmental and Occupational Health. (3 cr.; Student Option; Every Fall & Spring) This course is an introduction to the field of Environmental and Occupational Health (EOH), the impact of environmental and occupational hazards on individuals and communities, the approaches taken to address EOH issues at the community level, and the challenges that must be overcome to ensure success in dealing with EOH issues. Students will review scientific literature to learn about interventions for environmental health problems, and practice identifying environmental health problems and interventions in their communities. The focus of this course will be on the interaction between humans and the environment and how this interaction affects human health. Online Course.

PUBH 3104. Environmental Health Effects: Introduction to Toxicology. (2 cr.; Student Option; Every Spring) This course is designed for students who are interested in public health and environmental issues. Toxicology is a multidisciplinary experimental science that combines chemistry, biology, and physiology to determine whether substances we are exposed to in the environment are likely to harm our health. Students will learn how toxicology is used to understand how humans respond to chemicals in the environment. In addition, students will learn how toxicology is applied to protect human health through safety evaluation. prereq: Previous coursework in biology and chemistry; biochemistry is recommended. Ability to analyze data, and understand the basic functions of DNA, enzymes and other proteins, and lipids.

PUBH 3106. Making Sense of Health Studies. (2 cr.; Student Option; Every Fall & Spring) How to critically evaluate health news (and the health research reports on which they are based) to make good, well-informed decisions about your health and well-being.

PUBH 3107. Global Public Health and the Environment. (2 cr.; A-F only; Every Fall) Environmental determinants of health and or well-being of populations. Role of environment in public health. Population burden of disease. Variation of environmental public health determinants across globe. Interconnectedness of activities and actions of people in different countries. prereq: public health minor, instr consent

PUBH 3120. Injury Prevention in the Workplace, Community, and Home. (2 cr.; Student Option; Every Spring) Injury Epidemiology: Analyses of major injury problems, affecting the public in the workplace, community, and home, using the epidemiologic model and conceptual framework; emphasis on strategies/program development for prevention and control. For students involved in the field of Occupational Health and Safety, this course provides a foundation essential to the development of programs for Occupational Injury Prevention and Control. prereq: Basic epidemiology course preferred but not required

PUBH 3123. Violence Prevention and Control: Theory, Research and Application. (2 cr.; Student Option No Audit; Every Spring) The course will cover a range of topics including: definitions and characteristics of various forms of violence, prevalence and risk factors, health effects, and prevention initiatives. Sources and limitations of existing epidemiologic data, analytic challenges, research quality and ethics will be examined throughout the course. prereq: None

PUBH 3193. Environmental Health: Directed Studies or Directed Readings. (1-3 cr.; S-N only; Every Fall, Spring & Summer) Directed study, directed readings, and directed research offers opportunities for students to work individually with a faculty member and to earn credit for individually designed content. The instructor and the student must have a written contract in place that specifies the student’s responsibilities for the courses and the name of the instructor who is responsible for turning in the student’s grade for the course, as part of the enrollment in the course. Instructors must provide a copy of the contract to the academic department in which the registration for the course occurs. Expected student academic work per credit: at least 3 hours of work per week per credit for undergraduate students; only one Directed Study, Directed Readings, or Directed Research is allowed per semester.

PUBH 3202. What is Public Health?. (2 cr.; Student Option No Audit; Every Fall) Overview of public health: what it is, its origins, evolution, how it is structured/administered in the U.S. Mission, concepts, principles, and practices of population-based public health. Case studies. Career opportunities.

PUBH 3205. The Matrix of Global Health. (2 cr.; A-F only; Every Summer) Basic principles of global health, including social influences on health/health disparities. How health is measured, how global burden of morbidity/mortality varies throughout world. Investigate relationship between social, political, economic, health systems that interface to influence health outcomes, prereq: [3001 or 3202 or 3004], 3350 or 3106 strongly recommended

PUBH 3350. Epidemiology: People, Places, and Disease. (2 cr.; Student Option; Every Spring) How diseases are distributed among us. Epidemiology terminology, methods, critical thinking, and analysis. Intended for students interested in a health science career or in a career that may need to evaluate epidemiologic evidence such as health journalism or public policy or litigation. prereq: Undergrad statistics course is recommended

PUBH 3365. Microbes, Maps and Models: Introduction to Infectious Disease Epidemiologic Methods. (2 cr.; Student Option; Every Fall) Infectious disease epidemiology is a topic within the field of epidemiology that covers: 1) Principles and concepts of infectious disease transmission dynamics necessary to understand how and why diseases spread, and 2) Epidemiologic methods, including study designs, needed to quantify key aspects of an infectious disease. This course will also discuss: 1) How to use modeling to gain insight into the spread and control of infectious disease, and 2) The role that geography and GIS plays in gaining insights into the emergence and spread of an infectious disease. In this undergraduate course, students will learn key epidemiologic concepts that determine who is at risk for acquiring an infectious disease, how infectious diseases spread and what measures can be taken to prevent or control the spread of an infectious disease. We will also learn how simulation models can provide insights into the spread and control of an infectious disease as well as learn about the use of geographic information systems software for identifying in whom and where a disease occurs. This course will focus on principles, concepts, and methods in epidemiology with an application to infectious diseases. In addition, students will learn how to read and critically review peer-reviewed publications on infectious disease epidemiology, and understand how models and geographic information systems software are used to identify populations. This course will include examples that are from the local, national and international literature.

PUBH 3415. Introduction to Clinical Trials - Online. (3 cr.; A-F only; Every Fall & Summer) Phases of trials, hypotheses/endpoints, choice of intervention/control, ethical considerations, blinding/randomization, data collection/monitoring, sample size, analysis strategies. Protocol development/implementation, interactive discussion boards. prereq: PUBH 3415 enrollees must have one semester of undergraduate level introductory biostatistics or statistics (STAT 3011, EPSY 3264, SOC...
PUBH 3639. Prevention: Theory, Practice, and Application in Public Health Services. (3 cr.; Student Option; Every Spring) Current issues/controversies centered on prevention and health promotion. How they relate to health services and program implementation. prereq: Jr or sr

PUBH 3801. Health Economics and Policy. (3 cr.; Student Option; Every Spring) Economics of health care markets. Problems faced by consumers/health care services. Builds on principles of supply/demand for health, health care, insurance, and role of government. Theoretical/empirical models/applications. prereq: Course on microeconomics, course on basic statistics

PUBH 3893. Directed Study: Health Services Research and Policy. (1-4 cr.; max 16 cr.; Student Option; Periodic Fall, Spring & Summer) tbd prereq: instr consent

PUBH 3905. Nutrition for Public Health Promotion and Disease Prevention. (2 cr.; Student Option; Every Fall) Topics of contemporary interest. Concepts; facts about science of human nutrition discussed in relation to personal/community nutrition problems/concerns. Applied introductory course with labs. prereq: Jr or sr or instr consent

PUBH 3940. Concepts and Controversies in Public Health Nutrition and Health Promotion. (1 cr.; Student Option; Every Fall) Societal issues around public health nutrition and health promotion. Socioecological framework. Levels of influence on dietary intake, food choices, related health outcomes. Policy initiatives related to public health nutrition, health promotion and disease prevention. prereq: Jr or sr or instr consent

PUBH 3950. From Kid to Community: Personal, Social and Environmental Influences on Youth Obesity. (2 cr.; Student Option; Every Fall) Public health strategies for prevention of pediatric obesity. Includes overview of epidemiology of child/adolescent obesity focusing on social-ecological risk factors. Discussion of implications of risk factors for developing environmentally-focused interventions/programs. prereq: Students should have completed one basic, introductory nutrition course or equivalent or permission by instructor

PUBH 3955. Using Policy to Address Child & Adolescent Obesity Prevention. (1 cr.; Student Option; Every Spring) Overview of federal, state, local policy approaches. National initiatives for prevention of child/adolescent obesity. Specific policies will be discussed at local, state, federal levels. Extensive discussion on evidence of impact of policies on child/adolescent weight. prereq: basic nutrition course or instr consent

PUBH 4010. Summer Institute in Biostatistics. (4 cr.; A-F only; Every Summer) Introduction to biostatistics for undergraduate students. Meets every weekday, all day, for six weeks during the summer. prereq: Undergraduate major in Public Health, major or minor in Statistics, or major in Economics. Credit toward A-F only option at University of Minnesota Twin Cities

PUBH 4410. Summer Institute in Biostatistics. (4 cr.; A-F only; Every Summer) Introduction to biostatistics for undergraduate students. Meets every weekday, all day, for six weeks during the summer. prereq: Undergraduate major in Public Health, major or minor in Statistics, or major in Economics. Credit toward A-F only option at University of Minnesota Twin Cities

PUBH 5099. Topics: Epidemiology and Community Health. (1-4 cr.; max 8 cr.; Student Option; Periodic Fall, Spring & Summer) New courses or topics of interest in epidemiology, community health promotion, public health nutrition or maternal and child health. prereq: specified by course section

PUBH 5231. Emergency Preparedness: A Public Health Perspective. (2 cr.; A-F only; Every Spring) Public health emergency preparedness, response, recovery. Introduction to field's core competencies. Various components of course, including online modules, intended to stimulate interactions among learners. Purpose, history, organization, functions, tools, activities used in field. prereq: Undergraduate level, health care services experience. Credit toward A-F only option at University of Minnesota Twin Cities

PUBH 5999. Topics: Community Health Promotion. (0.5-4 cr.; Student Option; Every Fall) New course offerings or topics of interest in Community Health Promotion

PUBH 6000. Topics: Community Health Promotion. (0.5-4 cr.; Student Option; Every Fall) New course offerings or topics of interest in Community Health Promotion

PUBH 6003. Fundamentals of Alcohol and Drug Abuse for Teacher Education. (1 cr.; Student Option; Every Fall, Spring & Summer) Scientific/socio-cultural aspects of alcohol/drug problems. Emphasizes role of education in health conservation and drug abuse prevention. prereq: Master of education student or instr consent

PUBH 6010. Public Health Approaches to HIV/AIDS. (3 cr.; Student Option; Every Fall) Survey of public health approaches to AIDS epidemic. Epidemiological/clinical features of HIV infection. Impact of AIDS on certain communities/populations. Behavior change principles as they apply to AIDS interventions. prereq: Grad student or professional school student or instr consent

PUBH 6015. HIV/AIDS: Epidemiology and Public Health Interventions. (2 cr.; Student Option; Every Fall) Current/controversial issues related to HIV/AIDS. Primary, secondary, and tertiary prevention. HIV/AIDS in resource-limited countries (including sub-Saharan Africa and Southeast Asia) and in marginalized populations. Evaluation of government policy for control of HIV/AIDS. prereq: [6320 or 6341 or equiv]; [Epi or CHE or MCH or PubH Nutr] MPH student or Epi PhD student or instr consent

PUBH 6020. Fundamentals of Social and Behavioral Science. (2 cr.; max 3 cr.; A-F only; Every Fall, Spring & Summer) Four major approaches to public health problems: psychosocial, economic, community, policy. Theory, implementation. Small groups practice skills.

PUBH 6025. Designing e-Interventions for Public Health. (2 cr.; Student Option; Spring) An overview of how technology may be used as a recruitment, assessment, and intervention tool in public health research and practice.
and the strategic use of media messages to accomplish public health goals. To this end, we will explore large-scale public health campaigns in the context of tobacco, obesity, and cancer screening. We also will explore news media coverage of controversial health issues, such as the human papillomavirus (HPV) vaccine, and health information in entertainment media, such as smoking in movies. This course seeks to understand whether media messages have had intended and/or unintended effects on public attitudes and behavior. Although our focus is on mass media, interpersonal, medical, and digital media sources will be considered as well.

**PUBH 6078. Public Health Policy as a Prevention Strategy.** (2 cr.; Student Option; Every Fall)
Philosophical, ethical, economic, political, efficacy rationale for policy approach to prevention. Historical/current application of prevention policy to public health problems. Prereq: 2nd yr MPH or public health MS student or [Epi, Biostats, Env Hlth, HSRP] concurrent registration is required (or allowed) in a PhD student) or instr consent

**PUBH 6081. Sex, Sexuality, and Sexual Health.** (2 cr.; Student Option; Every Fall)
This course is a graduate-level class for students preparing for careers in public health research and practice where sex, sexuality, and sexual health are key components. It is a highly applied, highly interactive course focused on developing skills needed in sex research and sexual health practice. The teaching pedagogical approach is a "flipped classroom" where students are expected to learn the content from the assigned audiotaped lectures, movies and readings, and to come to class ready to participate in exercises, discuss case studies, complete assignments and immerse themselves in public health practice and research focused on sex, sexuality, and sexual health. The purpose of this graduate level course is to prepare health professionals for a professional career addressing community and population sexual health concerns by deepening their knowledge of and exposure to research practice in the field, increasing comfort familiarity and ability to speak on sexual health topics, and by practicing their skills. The assignments focus on hot topics in sex and sexual health, and are designed to increase knowledge of the field of sexual health, while developing skills in conceptualization, measurement, intervention design, and evaluation. Please note this course addresses the greatest challenges in sexual health facing our world, including such hot topics as the Zika virus and HIV prevention, clergy sexual abuse, campus sexual climate, sexual harassment, LGBT health disparities, contraception, abortion, women's rights, teen sex, and unplanned pregnancy.

**PUBH 6085. Alcohol and Tobacco: Ongoing Threats to Global Health.** (2 cr.; Student Option; Every Spring)
Strategies to prevent and control tobacco and alcohol problems. Policy and community and individual strategies to reduce burden of tobacco and alcohol problems locally, nationally, and globally. Similarities and differences in public health approaches to tobacco and alcohol prevention and control.

**PUBH 6094. Obesity and Eating Disorder Interventions.** (2 cr.; Student Option; Every Spring)
Examine obesity epidemic, eating disorders, prevention and treatment approaches at multiple levels (individual, social, environmental, policy), links between obesity and eating disorders.

**PUBH 6100. Topics: Environmental Health.** (1-4 cr. [max 20 cr.]; Student Option No Audit; Every Fall, Spring & Summer)
New course offerings/topics in environmental health.

**PUBH 6101. Environmental Health.** (2 cr.; A-F only; Every Fall & Spring)
Principles of environmental health relating to macro/micro-environments and to products consumed or used by people. Prereq: Public health [MPH or MHA or certificate] student or instr consent

**PUBH 6102. Issues in Environmental Health Studies.** (2 cr.; A-F only; Every Fall, Spring & Summer)
Current issues, principles, and methods of environmental/occupational health practice. Prereq: Public health [MPH or MHA or certificate] student or health journalism MA major or nursing MS student or instr consent

**PUBH 6106. Making Sense of Health Studies.** (2 cr.; Student Option No Audit; Every Fall & Spring)
How to critically evaluate health news/health research reports on which they are based to make good, well informed decisions about health/well-being.

**PUBH 6107. Excel? and Access? skills in public health settings.** (0 cr.; Student Option; Every Spring)
Hands-on course on computer skills to learn a wide range of methods to manipulate public health data. Students will be given "raw" datasets and practice computer methods to clean, filter, recode, combine, tabulate and report data within the Excel and Access environments. The course is ideal for students who may not pursue more advanced quantitative training but still want to feel comfortable using these widely available programs to produce quality datasets for further analysis, and to generate summary results or reports in their work as public health practitioners. No prerequisites

**PUBH 6108. Foundations of Global Health.** (0-2 cr.; A-F only; Every Fall)
This course provides an introduction to key principles and topics in global health including measures of global burden of disease, identification of key health problems around the world and the main determinants, health systems and international public health organizations. In addition, we will discuss cross-cutting and timely issues in health promotion, disease control programs, and operational research in international settings.
Class exercises and discussions will focus on challenging global health problems, and strategies to address them. This course is required for those students enrolled in the School of Public Health Global Health Certificate program, and is also open to other qualified students (see Course Prerequisites). Examples of diseases and illustrations of global health problems in this class will include both infectious and non-infectious diseases and should be of interest to students in various programs.

**PUBH 6111. Preventing Pollution: Innovative Approaches to Environmental Management.** (3 cr.; Student Option; Periodic Fall & Spring)

Interdisciplinary approach to pollution problems, including sustainability, pollution prevention, risk assessment, regulatory reform, and strategic environmental management. Prereq: Public health student or grad student or instr consent

**PUBH 6112. Environmental Health Risk Assessment: Application to Human Health Risks from Exposure to Chemicals.** (2 cr.; Student Option; Every Fall)

Introduction to risk in context of regulatory decision making. Prereq: PUBH 6102 and PUBH 6109 or Intro courses in toxicology/exposure analysis (e.g., PUBH 6104 Environmental Health Effects: Introduction to Toxicology, PUBH 6103 Exposure to Environmental Hazards) or equivalent or instructor permission.

**PUBH 6113. Public Policy and Risk: Strategies for Effective Decisions and Discourse.** (3 cr.; Student Option; Periodic Fall & Spring)

Introduction to policy making in public health, environment characterized by substantial risk/uncertainty. Basic mathematics of decision making under risk/uncertainty. Cognitive psychology of how people react to risk. Methods of risk communication. Prereq: Public health student or grad student or instr consent

**PUBH 6115. Worker Protection Law.** (1 cr.; Student Option; Every Spring)

Role of government in protecting rights of citizens. Labor movement history as starting point for discussion of systems for protecting workers in unsafe workplaces and compensating them for injuries. Laws against class-based discrimination.

**PUBH 6116. Environmental Law.** (1 cr.; Student Option; Every Spring)

Questions when pollution protection law conflicts with policy encouraging the use of natural resources. Conflicts when government restricts use of property without compensating its owner. Increasing authority of government to audit businesses.

**PUBH 6120. Injury Prevention in the Workplace, Community, and Home.** (2 cr.; Student Option; Every Spring)

Injury epidemiology: analyses of major injury problems affecting the public in the workplace, community, and home using epidemiologic model and conceptual framework; emphasis on strategies/program development for prevention and control.

**PUBH 6121. Topics: Injury Prevention in the Workplace, Community, and Home.** (1-2 cr.; Student Option; Every Fall, Spring & Summer)

Selected projects in injury prevention.

**PUBH 6122. Seminar: Safety in the Workplace.** (1 cr.; Student Option; Every Spring)

Realm of and potential risk factors for occupational safety problems. Strategies for prevention/control.

**PUBH 6123. Violence Prevention and Control: Theory, Research, and Application.** (2 cr.; Student Option; Every Spring)

Analysis/critique of major theories and of epidemiological research pertinent to violence, including characteristics of violence and relevant risk factors, reporting/treatment protocols, and current/potential intervention efforts and prevention initiatives. Emphasizes interdisciplinary contributions to violence prevention/control.

**PUBH 6130. Occupational Medicine: Principles and Practice.** (2 cr.; S-N only; Every Spring)

Pathogenesis of diseases caused by occupational hazards. Evaluating work-related illnesses. Overall regulatory framework governing occupational health/safety. Prereq: Environmental health major; toxicology course recommended or instr consent

**PUBH 6131. Working in Global Health.** (2 cr.; Student Option; Every Spring)


**PUBH 6132. Air, Water, and Health.** (2 cr.; A-F only; Every Spring)

Issues related to providing adequate levels of clean air/water. Local water quantity/quality, air quality in developed/developing world, global air/water quality, policies meant to protect these resources.

**PUBH 6133. Global Health Seminar.** (1 cr.; S-N only; Every Spring)

Aspects of global health from public health perspective. Faculty/students from different backgrounds/programs lead/discuss presentations on global health topics. Prereq: Public health student or instr consent

**PUBH 6134. Sustainable Development and Global Public Health.** (2 cr.; Student Option; Every Spring)

Effects of globalization on social/sustainable development. Population, war, economics, urbanization, environment, water/sanitation, communicable/non-communicable conditions. New infectious/chronic diseases, food security/environmental health. Prereq: Credit will not be granted if received for 6100 or 6365

**PUBH 6140. Occupational and Environmental Epidemiology.** (2 cr.; Student Option; Every Spring)

Principles/concepts in identifying health effects in workplace. Strategies for identifying excess risk, evaluating strengths/weaknesses of research techniques, assessing bias/confounding. Prereq: Coursework in epidemiology, biostatistics

**PUBH 6150. Interdisciplinary Evaluation of Occupational Health and Safety Field Problems.** (3 cr.; Student Option; Every Spring)

Guided evaluation of potential health/safety problems at work site, recommendations and design criteria for correction/evaluation of occupational health/safety programs. Prereq: 6170 or instr consent

**PUBH 6151. Occupational and Environmental Health Nursing Seminar.** (1 cr. [max 6 cr.]; S-N only; Every Fall & Spring)

Synthesize information from coursework/fieldwork, develop questioning skills, develop critical thinking, and apply knowledge in practice. Prereq: Enrollment in OEHN program, MS, MPH, PhD degrees

**PUBH 6154. Climate Change and Global Health.** (3 cr.; Student Option; Every Spring)

Interconnected relationships between global climate change/human health. Develop computer models to predict climate change from natural/anthropogenic forces, predict human health outcomes as result of changing climate. Prereq: Students must have elementary computer skills.

**PUBH 6159. Principles of Toxicology I.** (2 cr.; A-F only; Every Fall)

This is the first of two courses that covers fundamental principles of exposure, uptake and metabolism. This course focuses on identifying the mechanisms and effects of chemical, biological, and physical agents on human health. Discussions will focus on the action of environmental agents and how they interact with humans to cause disease. Emphasis is on understanding the principles of toxicology as they apply to understanding toxicant-human interactions.

**PUBH 6160. Systems Toxicology.** (3 cr.; Student Option; Every Spring)

Application of information regarding basic pharmacokinetic principles/metabolic systems to elucidate mechanisms of toxicity induced by xenobiotic compounds. Prereq: [Coursework in biochemistry, molecular biology, organic chemistry] or instr consent

**PUBH 6161. Regulatory Toxicology.** (2 cr.; Student Option; Every Spring)

In-depth introduction to laws (and associated regulations) of U.S. federal regulatory agencies, such as CPSC, EPA, FDA, OSHA, DOT, that require use toxicological data information in their mission of protecting human/environmental health. Prereq: Background in toxicology or pharmacology or related field is recommended

**PUBH 6162. Biomarkers.** (2 cr.; A-F only; Every Spring)

Introduce current status of molecular biomarker research, including biomarkers of chemical exposures, genetic toxicity markers, genomics-based biomarkers of susceptibility, organ systems biomarkers. Progression of biomarker development/application from laboratory
environment to clinical or population-based settings/development of public health policies/interventions. Prereq: Introductory courses in toxicology and exposure analysis recommended.

**PUBH 6164. Toxicological Analysis.** (2 cr.; A-F only; Every Fall)
Methods in molecular toxicology. Research facilities at University. Field trips to local organizations employing modern toxicological methods. Prereq: Enrollment in toxicology concentration of Environmental Health PhD program. Instr consent

**PUBH 6167. Grant Writing for Toxicological Sciences.** (2 cr.; A-F only; Every Summer)
Principles of writing an NIH-style grant proposal. Prereq: Toxicological analysis, toxicology, experience in toxicological research. Instr consent

**PUBH 6170. Introduction to Occupational Health and Safety.** (3 cr.; Student Option; Every Fall & Summer)
Concepts/issues in occupational health/safety. Application of public health principles/decision-making process in preventing injury/disease, promoting health of adults, protecting worker populations from environmental hazards. Observational visit to manufacturing facility. Prereq: Environmental health major or instr consent

**PUBH 6172. Industrial Hygiene Applications.** (2 cr.; Student Option; Spring Odd Year)
Recognition, evaluation, and control of occupational health/safety hazards. Practice application to specific industrial hygiene problems related to gases/vapors, aerosols, and physical agents.

**PUBH 6173. Exposure to Physical Agents.** (2 cr.; Student Option; Spring Even Year)

**PUBH 6174. Control of Workplace Exposure.** (3 cr.; Student Option; Spring Odd Year)
Hierarchy of options for controlling human exposures to airborne contaminants, both gaseous/aerosol. Science/practice of process control/exhaust ventilation in workplaces/other indoor air spaces/air cleaning. Control of emissions to ambient environment.

**PUBH 6175. Environmental Measurements Laboratory.** (2 cr.; A-F only; Spring Even Year)
Measuring exposures to potentially hazardous agents in air or water. Sampling the agent. Preparing sample for analysis. Conducting analysis. Interpreting results. Prereq: EH or instr consent

**PUBH 6176. Hazardous Materials and Waste Management.** (2 cr.; Student Option; Fall Even Year)
Generation, control, and disposal of hazardous materials/wastes. Recognizing, evaluating, controlling, and preventing hazards from chemicals that threaten occupational/environmental health. Lectures, case studies, workshops, field trips. Prereq: [6170, courses in [chemistry, organic chemistry] or equiv] or instr consent

**PUBH 6177. Nanotechnology Health and Safety.** (0-3 cr.; Student Option; Every Fall)
As defined by ASTM, nanotechnology is the emerging field of "technologies that measure, manipulate, or incorporate materials and/or features with at least one dimension between approximately 1 and 100 nm". Toxicology studies have indicated that exposures to nanomaterials present unique health risks not encountered with their parent materials. After completing this course, students will understand how the fundamental concepts and methods of occupational hygiene are applied specifically to nanomaterials. Students will learn to use aerosol science, toxicology, product lifecycle assessment, exposure assessment, and occupational hygiene data interpretation methods comprehensively to evaluate workers' disease risks from nanomaterial exposures and to guide intervention efforts. Emphasis will be placed on control measures appropriate for nanomaterials, and control banding approaches when data are lacking. Participants will study the handling of waste products and potential impacts of released nanoparticles on the public and the ambient environment. The course is aimed at graduate and upper-level undergraduate students in the health and basic sciences, engineering, public health, and industrial hygiene.

**PUBH 6181. Surveillance of Foodborne Diseases and Food Safety Hazards.** (2 cr.; Student Option; Every Fall)

**PUBH 6182. Emerging Infectious Disease: Current Issues, Policies, and Controversies.** (3 cr.; Student Option; Every Spring)

**PUBH 6183. Theory and Practice in Foodborne Disease Outbreak Detection, Investigation and Control.** (1 cr.; S-N only; Every Spring)
This course focuses on the practical basis for developing and implementing methods for foodborne disease outbreak detection, investigation and control; using recent outbreaks to highlight underlying principles. The course will review biological characteristics of major foodborne disease pathogens, clinical features of the illnesses they cause and epidemiologic presentations of foodborne outbreaks. The implications of these characteristics will be discussed in a problem solving, seminar format that examines theory and practice in the context of recent outbreaks. Strategies to promote timely decision-making will be emphasized.

**PUBH 6190. Environmental Chemistry.** (3 cr.; Student Option; Every Fall)
Overview air, water, and soil chemistry. Pertinent environmental problems. Human/ecological multimedia exposures to chemicals in the environment. Prereq: One course each in [gen chem, org chem] or instr consent

**PUBH 6191. Air Pollution.** (3 cr.; A-F or Audit; Every Spring)
Overview of many facets of air pollution. Primary/secondary sources. Transport mechanisms, including meteorological effects, atmospheric transformations of pollutants, and deposition processes involved in removal of pollutants. Human/ecosystem health effects, nuisance effects. Regulations/standards in place and under review that affect air pollution management. Prereq: [General, organic chemistry] or instr consent

**PUBH 6192. Measurement and Properties of Air Contaminants.** (2 cr.; A-F or Audit; Every Fall)
Gaseous/particulate air contaminants, their occurrence in workplaces. Factors governing generation/dispersal. Criteria, rationales, and standards for measurement in workplace. Industrial hygiene measurement. Aerosol-related illness. Prereq: Good grasp of [elementary physics, chemistry, mathematics including calculus]

**PUBH 6193. Advanced Topics in Human Exposure Science.** (2 cr.; A-F only; Every Fall)
Designing exposure studies for epidemiologic investigations and health risk assessments. Techniques to measure/estimate human exposures to hazardous agents in non-occupational and occupational environments. Prereq: 6192 or instr consent

**PUBH 6200. Topics: Foundations of Interprofessional Communication and Collaboration.** (0.5-4 cr. [max 80 cr.]; S-N only; Periodic Fall)
First of three phases of the Center for Interprofessional Education's 1 HEALTH curriculum. Online hybrid course requiring students to attend small group face-to-face sessions. Prereq: [MHA or MPH or MS] student

**PUBH 6210. Public Health Medicine Seminar.** (1 cr.; S-N or Audit; Every Fall & Spring)
Links between medical practice and public health practice. Emphasizes interdisciplinary public health interventions. Two relatively common medical problems serve to focus discussion about intersection of medicine and public health. Prereq: [Public health medicine program MPH major or ([MD degree or equiv], instr consent]

**PUBH 6231. Global Health Capstone.** (1 cr.; Student Option; Periodic Fall & Spring)
This course is designed to facilitate learners' synthesis of the skills, knowledge, and attitudes learned throughout the Global Health Certificate courses and practiced during field experience. Each student will be
guided through the creation of a portfolio of carefully selected assignments, reflections, and experiences completed during the Certificate program, along with a resume and a final reflection. Each student will then present a portfolio at the end of the course.

**PUBH 6241. American Indian Public Health and Wellness, Health Policy, Law, Health Services Administration.** (2 cr.; A-F only; Every Fall)
This course provides a general basis for understanding American Indian public health and wellness. Central to this area of study, is an appreciation to understand the unique governmental relationship based on how the federal government relates to tribal nations as distinct sovereign political entities, not as a racial classification. The trust responsibility is a government to government relationship as established in the U.S. Constitution. In this course students will learn about the legal responsibility of the United States to the 573 federally recognized tribes, to provide health services to American Indians. Students will examine the public health issues facing American Indian communities; review historical implications, analyze legislation, apply specific financing requirements, and gain an understanding of the unique American Indian public health system and the complex set of services, activities, collaborations and stakeholders that varies by tribe and region. It is designed to help students understand how to work respectfully and effectively with tribes and American Indian communities, to understand the basis of health services and implications of specific tribal (local and federal) law to help improve the devastating health issues currently experienced by American Indians.

**PUBH 6250. Foundations of Public Health.** (; 2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
In this course we will examine values, contexts, principles, and frameworks of public health. We will provide an introduction to public health, consider the history of public health, social/political determinants, impact of health disparities on race, class and gender, moral and legal foundations, public health structures, historical trauma and cultural competence, health and human rights, advocacy and health equity, communication and financing, and the future of public health in the 21st century. Grounded in theory and concepts, we will incorporate core competencies and skills for public health professionals and will focus on team solving and decision-making skills through critical analysis, reflection, case studies, readings, and paper assignments.

**PUBH 6271. Management and Organization Within the Ambulatory Care Facility.** (4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Ten-month program of on-campus residential (two-weeks) and off-campus study that includes periodic seminars and monthly sessions with clinical preceptors. Management, organizational behavior, problem solving, executive role. Personnel management,

**financial management, governance, clinicians, productivity, efficiency, prerequisite: Certificate of Management Studies in Health Services Administration ISP-I student or inst consent**

**PUBH 6272. Management and Organization in Hospital and Health Care Systems.** (4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Ten-month program of on-campus (two-weeks) and off-campus study, seminar and monthly local classes with preceptors on management principles, organizational behavior, executive roles, problem solving, health care delivery, human resources, information systems, financial management, support, and patient care services/governance. prerequisite: Certificate of Management Studies in Health Services Administration ISP-I student or inst consent

**PUBH 6273. Patient Care Management and Organization Within the Hospital and Health Care Organization.** (4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Ten-month program including on-campus (two weeks) and off-campus study, seminar and monthly local classes with preceptors on management principles, organizational behavior, executive roles, problem solving, health care delivery, human resources, information systems, financial management, resource allocation, productivity/efficiency, and governance. prerequisite: Certificate of Management Studies in Health Services Administration ISP-I student or inst consent

**PUBH 6274. Administrative and Professional Relationships Within the Ambulatory Care Facility.** (4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Ten-month program. On-campus (two weeks), off-campus study. Seminar. Monthly local classes with preceptors on ethics, change theory, managed care, strategic planning, law capital finance, integrated services, joint ventures, financial planning, community health systems, prerequisite: Certificate of Management Studies in Health Services Administration ISP-II student or inst consent

**PUBH 6275. Administrative and Professional Relationships Within the Health Care Facility.** (4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Ten-month program. On-campus (two weeks), off-campus study. Seminar. Monthly local classes with preceptors on ethics, change theory, managed care, strategic planning, medical staff, law, capital finance, integrated services, joint ventures, financial planning, community health systems, prerequisite: Certificate of Management Studies in Health Services Administration ISP-II student or inst consent

**PUBH 6276. Administrative and Professional Relationships of Patient Care Administration.** (4 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Ten-month program. On-campus (two weeks), off-campus. Seminar. Monthly local classes with preceptors on ethics, change theory, managed care, strategic planning, law, capital finance, integrated services, joint ventures, financial planning, community health system.

**prerequisite: Certificate of Management Studies in Health Services Administration ISP-II student or inst consent**

**PUBH 6283. Perspectives: Interrelationships of People and Animals in Society Today.** (2 cr.; S-N only; Every Spring)
Aspects of the interrelationships of people/animals in society today. Ecological, environmental, cultural, economic, social, psychological, and health/medical dimensions. Human-animal bond. Ethical/moral dimension of human-animal relationships.

**PUBH 6290. International Humanitarian Crisis Simulation.** (1 cr.; S-N only; Every Fall)
This three day simulation will be carried out using a ?field exercise? format. The goal will be to learn skills-through-doing in a dynamic crisis scenario, applying concepts and developing understanding in practice, through readings and in interactive didactic sessions. This will be a challenging experience that will require students to put into practice skills and teamwork recognized in humanitarianism classes and in the literature. The simulation will involve active team work, intense interaction with role players, and on-the-spot decision making in a way that closely resembles how field work is done in international humanitarian crises. Besides the pre- and post sessions, the first day on site will include content sessions. At the conclusion of the course students will write a final reflection paper. Please contact an instructor should you have concerns regarding physical challenges presented in extended outdoor activity in an extensive (but walkable) site, rain or shine. (For the field experience, equipment suggestions will be provided as will meals.)

**PUBH 6299. Public Health is a Team Sport: The Power of Collaboration.** (0.5 cr.; S-N only; Every Summer)
Cohesive group of interdisciplinary faculty/students develop innovative public health strategies. Students discuss books pertinent to public health and participate in case analysis utilizing core competencies of public health practice. Dual degree students are waived if they have taken: CVM 6005 or DVS 6511, or PA 6051 or Pharm 7310 or Nurs 7100.

**PUBH 6300. Topics: Clinical Research.** (0.5-4 cr. [max 20 cr.]; Student Option; Periodic Fall, Spring & Summer)
New courses or topics of interest in clinical research.

**PUBH 6301. Fundamentals of Clinical Research.** (3 cr.; Student Option; Every Fall)
Concepts of clinical research design/implementation/analysis. Students will learn skills needed for research in humans.

**PUBH 6303. Clinical Research Project Seminar.** (2 cr.; S-N only; Every Spring)
Students will present their thesis and give and receive feedback. Students must have their project underway.

**PUBH 6305. Introduction to Clinical Research for Health Professionals.** (2 cr.; Student Option; Every Spring)
Design/implementation of clinical research protocols. IRB, FDA, and other regulations. Practical tools for survey management. prereq: [Bachelors degree or degree from health professional program or grad student in [dentistry or medicine or nursing or pharmacy or public health or veterinary medicine]], instr consent

PUBH 6320. Fundamentals of Epidemiology. (2 cr.; A-F only; Every Fall, Spring & Summer) This course provides an understanding of basic methods and tools used by epidemiologists to study the health of populations.

PUBH 6325. Data Processing with PC-SAS. (1 cr.; Student Option; Every Spring) Introduction to methods for transferring/processing existing data sources. Emphasizes hands-on approach to pre-statistical data processing and analysis with PC-SAS statistical software with a Microsoft Windows operating system.

PUBH 6333. Principles of Human Behavior I. (2 cr.; A-F or Audit; Fall Even Year) Theoretical perspective on etiology/modification of health behavior in individuals/communities. prereq: Epi PhD student or instr consent

PUBH 6334. Human Behavior II. (2 cr.; A-F or Audit; Spring Even Year) Critical evaluation of major behavioral public health intervention research. Experience in research designs/methods in health behavior intervention, prereq: [6333, Epidemiology grad student in behavioral track] or instr consent

PUBH 6336. Advanced Seminar in Infectious Disease Epidemiology. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall) Real-world applications of infectious-disease epidemiologic principles to contemporary/controversial issues. Development of prevention/control strategies. prereq: 6341, 6385

PUBH 6341. Epidemiologic Methods I. (3 cr.; A-F only; Every Fall) Introduction to epidemiologic concepts and methods: (1) Study design (randomized trials and observational studies); (2) Measures of exposure-disease association; (3) Casual inference and bias; (4) Confounding and effect modification.

PUBH 6342. Epidemiologic Methods II. (3 cr.; Student Option; Every Spring) Methods and techniques for designing, implementing, analyzing, and interpreting observational epidemiologic studies, including cohort, case-control, and cross-sectional studies.

PUBH 6343. Epidemiologic Methods III. (4 cr.; Student Option; Every Fall) Analysis/interpretation of data from various epidemiological study designs. SAS used to demonstrate epidemiological/statistical concepts in data analysis. prereq: [6342, 6451] with a grade of at least B- or instr consent

PUBH 6344. Completing the Culminating Experience: Secondary Data Analysis. (2 cr.; Student Option; Every Spring) Opportunity to start and finish MPH project. Secondary data analysis of cross-sectional, case-control, or cohort studies. Develop study question. Describe methods of study. Writing and interpreting results of analyzed data.

PUBH 6348. Writing Research Grants. (2 cr.; A-F or Audit; Every Fall) Focuses on NIH research grants. Mechanisms of grant writing: specific aims, hypotheses, innovation, background, approaches, evaluation analyses, principles of informed consent, budget development, and grant-review process.

PUBH 6350. Epidemiologic Methods III: Lab. (1 cr.; Student Option; Every Fall) Skills-based course in which students get hands-on experience in analysis of a variety of epidemiologic datasets using SAS programming to apply epidemiologic methods. (2 cr.; A-F only; Every Fall, Spring & Summer) Chance.
reimbursement for clinical screening services. The aim of this course, then, is to provide a comprehensive overview of screening methods and evaluation, and to examine the efficacy, benefits versus harms, population uptake, screening promotion, and controversies surrounding specific screening tests for various health conditions. These include, but are not limited to, cancer, cardiovascular disease, infectious disease, mental health and newborn metabolic and genetic defects. Such controversies can range from overdiagnosis and unnecessary treatment, informed decision-making, screening policies, and ethical issues. The course is designed to appeal to students in Public Health, Nursing, Pharmacy, Medicine, genetic counseling and public policy.

**PUBH 6380. Ecology of Infectious Diseases.** (2 cr.; A-F: Audit; Every Fall) Ways in which host, agent, and environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/control, evolution of virulence, analytical/molecular tools.

**PUBH 6381. Genetics in Public Health in the Age of Precision Medicine.** (2 cr.; Student Option: Every Fall) Mechanisms of molecular genetics. Issues related to medical/public health genetics, including basis of human diversity, Human Genome Project, novel genetic mechanisms underlying diseases, ethical/legal issues. Prereq: Grad student or professional school student or instr consent.

**PUBH 6385. Epidemiology and Control of Infectious Diseases.** (2 cr.; Student Option: Every Spring) Principles and methods. Strategies for disease control and prevention, including immunization. Relevance of modes of transmission of specific agents for disease spread and prevention. Public health consequences of infectious diseases at local, national, and international levels.


**PUBH 6388. Foundations of Global Health.** (2 cr.; Student Option: Every Fall) This course provides an introduction to key principles and topics in global health including measures of global burden of disease, identification of key health problems around the world and the main determinants, health systems and international public health organizations. In addition, we will discuss cross-cutting and timely issues in health promotion, disease control programs, and operational research in international settings. Class exercises and discussions will focus on challenging global health problems, and strategies to address them. This course is required for those students enrolled in the School of Public Health Global Health Certificate program, and is also open to other qualified students (see Course Prerequisites). Examples of diseases and illustrations of global health problems in this class will include both infectious and non-infectious diseases and should be of interest to students in various programs.

**PUBH 6389. Nutritional Epidemiology.** (2 cr.; Student Option: Every Fall) Nutrition/disease relationships through application of epidemiologic methods. Characterization of various exposures to food/nutrient intakes, biological basis for nutrition/disease relationships. Studies of specific chronic diseases and nutritional intake. Design/interpretation of studies using nutritional measures. Prereq: [6320 or 6330 or 6341]. [Epidemiology MPH or Public Health Nutrition MPH or Epidemiology PhD student] or instr consent.

**PUBH 6390. Topics: Epidemiology.** (0.5-4 cr.; max 80 cr.; Student Option: Periodic Fall, Spring & Summer) New course offerings or topics of interest in epidemiology.

**PUBH 6400. Topics: Biostatistics.** (0.5-4 cr.; max 80 cr.; Student Option No Audit: Periodic Fall, Spring & Summer) New course offerings or topics of interest in biostatistics.

**PUBH 6414. Biostatistical Literacy.** (3 cr.; A-F: only; Every Fall, Spring & Summer) Develop ability to read/interpret statistical results in primary literature. Minimal calculation. No formal training in any statistical programming software. Biostatistical Literacy will cover the fundamental concepts of study design, descriptive statistics, hypothesis testing, confidence intervals, odds ratios, relative risks, adjusted models in multiple linear, logistic and Poisson regression, and survival analysis. The focus will be when to use a given method and how to interpret the results, not the actual computation or computer programming to obtain results from raw data. Prereq: MPH or certificate student or environmental health or instr consent.


**PUBH 6420. Introduction to SAS Programming.** (1 cr.; Student Option: Periodic Fall & Summer) Use of SAS for analysis of biomedical data. Data manipulation/description. Basic statistical analyses (t-tests, chi-square, simple regression).

**PUBH 6431. Topics in Hierarchical Bayesian Analysis.** (1 cr.; Student Option No Audit; Every Summer) Hierarchical Bayesian methods combine information from various sources and are increasingly used in biomedical and public health settings to accommodate complex data and produce readily interpretable output. This course will introduce students to Bayesian methods, emphasizing the basic methodological framework, real-world applications, and practical computing.

**PUBH 6432. Biostatistical Methods in Translational and Clinical Research.** (1 cr.; Student Option No Audit; Periodic Summer) This short course on translational and clinical research will focus on the topics of diagnostic medicine and designing clinical research methods, application of regression models and early phase clinical trials. Prereq: Students will benefit from having taken one or two semester courses in biostatistics or applied statistics covering up to and including multiple regression and introductory logistic regression.

**PUBH 6450. Biostatistics I.** (4 cr.; A-F: only; Every Fall & Spring) Descriptive statistics. Gaussian probability models, point/interval estimation for means/proportions. Hypothesis testing, including t, chi-square, and nonparametric tests. Simple regression/correlation. ANOVA. Health science applications using output from statistical packages. Prereq: [College-level algebra, health sciences grad student] or instr consent.

**PUBH 6451. Biostatistics II.** (4 cr.; Student Option; Every Fall & Spring) Two-way ANOVA, interactions, repeated measures, general linear models. Logistic regression for cohort and case-control studies. Loglinear models, contingency tables, Poisson regression, survival data, Kaplan-Meier methods, proportional hazards models. Prereq: [PUBH 6450 with grade of at least B, health sciences grad student] or instr consent.

**PUBH 6460. Essential Skills for Biostatistical Practic.** (1 cr.; S-N only; Every Fall) The Essential Skills for Biostatistical Practic seminar will teach career development skills and ?job-relevant? computing and communications skills. Students will learn about MS-level job opportunities from biostatistics professionals from a wide range of occupational settings locally, nationally or internationally. Students will also learn practical skills needed both for their (optional) field experience and for the capstone experience course, including principles of reproducible research, how to integrate statistical output in reports, searching the literature, and research ethics. The format and course topics will vary from week to week, as described below. Some lectures will be shared with an existing seminar course for PhD students, PUBH 8403 Research Skills in Biostatistics. Attendance will be mandatory, and there will be weekly homework assignments to reinforce skills presented in class.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
PUBH 6470. SAS Procedures and Data Analysis. (3 cr.; Student Option; Every Fall) SAS procedures, how they are used in various health-related datasets to answer specific problems regarding estimation, testing, or prediction. prereq: 6450, 6451 or 7405, 7406 or [Stat 5101, Stat 5102]

PUBH 6525. Introduction to Population Health: A Health System. (1 cr.; A-F only; Every Fall) Population health is the field of practice and research concerned with the health of groups of individuals and the equitable distribution of health within these groups. Populations may be defined by geographic area, by social and economic characteristics such as gender, socio-economic status, and race/ethnicity, by disease states such as persons with mental illness or diabetes, or by enrollment in a health care plan or utilization of a specific health care organization. Population health takes an upstream approach, focusing on the social determinants of health and fundamental issues of health equity. While improving population health requires the involvement of multiple sectors such as public health agencies, health departments, education, housing, faith-based organizations and criminal justice, here we focus on how population health can be addressed from within the health system through partnerships with other sectors. Using case studies, we will explore how population health innovations are applied by health systems.

PUBH 6527. Healthcare Leadership and Effecting Change. (2 cr.; A-F only; Every Spring) How to become effective change leader in organization. prereq: MBA student

PUBH 6535. Managerial Accounting for Health Services. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Differential, absorption, activity-based costing. Budgeting, variance analysis. Financial accounting, including transaction data and accrual accounting. Developing financial statements. Ration analysis, prereq: AHC student or instr consent; experience with spreadsheets such as Excel or Lotus recommended

PUBH 6540. Health care Organizational Behavior. (2 cr.; A-F or Audit; Every Fall) Human behavior in organizations. Motivation, leadership, influence of organizational structure, informal group behavior, interpersonal relations, supervision. Emphasizes preventing/solving problems among individuals/groups in organizations. prereq: Health care admin student or instr consent

PUBH 6541. Statistics for Health Management Decision Making. (3 cr.; Student Option; Every Fall) Variation. Frequency distribution, measurement, probability, graphing. Significance tests, estimation, trends; data handling. Modeling, odds ratios. Prevalence, incidence and vital statistics. Research applications. Statistical approach to rational administrative decision making. Inductive teaching, lectures, computer/lab exercises. prereq: Health care admin student or instr consent

PUBH 6542. Management of Health Care Organizations. (3 cr.; A-F or Audit; Every Fall & Spring) Role of hospital in health services delivery. Relationships with other systems and the community, governance, medical staff, and role of administrator. Lectures, on-site visits to health services organizations. prereq: Health care admin student

PUBH 6544. Principles of Problem Solving in Health Services Organizations. (3 cr.; A-F only; Every Spring) Problem-solving theory/technique. Solving a management problem within a health services organization. Presenting a report. Lectures, seminars, demonstrations. prereq: 6541, completed 30 hours of MHA coursework, health care administration student

PUBH 6545. Advanced Problem Solving in Health Services Organizations. (4 cr.; A-F or Audit; Every Fall & Spring) Concepts in human resources management as applied to health services organizations. Relationship between human resources management and general management. Work and human resources. Compensation/benefits, personnel planning, recruitment/selection, training/development. Employee appraisal/discipline. Union-management relations. prereq: Health care admin student or public health admin student or instr consent

PUBH 6547. Health Care Human Resources Management. (2 cr.; A-F or Audit; Every Fall & Spring) Overview of physicians group management in integrated delivery systems. Physician/administrative roles, operational/strategic issues, alternative organizational models, risk-contracting, provider payment methods, managing change, effective communication, refereeing. prereq: Health care admin student or instr consent

PUBH 6548. Medical Group Management. (2 cr.; A-F or Audit; Every Spring) Overview of physicians group management in integrated delivery systems. Physician/administrative roles, operational/strategic issues, alternative organizational models, risk-contracting, provider payment methods, managing change, effective communication, refereeing. prereq: Health care admin student or instr consent

PUBH 6551. Contemporary Problems in Health Care. (1-2 cr.; Student Option; Every Fall & Spring) Current concepts, problems, principles, and future developments of health and health care, selected by students. Developing models based on current literature and research. Oral/written presentations from policy/issue perspectives. prereq: Grad student

PUBH 6553. Health Care Management Ethics. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring) Ethical issues faced by health care managers as leaders of an organization, members of a profession, and coordinators of clinical processes. Perspectives of managerial, organizational, professional, and clinical ethics. prereq: Public health MPH or MHA or certificate student or instr consent

PUBH 6554. Healthcare Strategy and Marketing. (3 cr.; A-F or Audit; Every Spring) Managing the marketing function, marketing planning, strategy, management concepts. Identifying marketing problems/opportunities. Constructing, evaluating, and managing a marketing plan. prereq: Health care admin student or public health admin student or instr consent

PUBH 6555. Topics in Health Economics. (2 cr.; A-F only; Every Fall, Spring & Summer) General principles of health economics applied to issues in health. Implications for health policy.

PUBH 6556. Health and Health Systems. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) U.S. health care system and health policy process, including current challenges in the areas of health care delivery, financing, and policy.

PUBH 6557. Health Finance I. (3 cr.; Student Option; Every Fall & Spring) Principles of corporate/not-for-profit finance. Net present value, financial analysis, capital budgeting, financing options/decisions, capital structure, capital asset pricing model, financial planning, working capital management. prereq: [Health care admin or public health admin/policy major], familiarity with computerized spreadsheets or instr consent

PUBH 6558. Health Finance II. (3 cr.; A-F only; Every Fall & Spring) Principles of corporate/not-for-profit finance and insurance concepts integrated/applied to health care. Capital/operating budgets, Medicare's payment systems for hospitals/physicians, risk-adjusted capitation payment systems. Population-based health care finance, managed care. Financing aspects of public health policy and health care reform. prereq: [Health care admin or PUBH admin/policy] student, familiarity with computerized spreadsheets or instr consent

PUBH 6560. Operations Research and Quality in Health Care. (3 cr.; A-F only; Every Fall) Using a systems perspective to develop models to analyze/improve health care operations. Identifying data needs/sources to model structures, processes, and outcomes of care. Applying quality improvement, management sciences/operations research techniques to real world health care problems. prereq: Grad-level statistics/management coursework

PUBH 6561. Quantitative Methods Applied to Health Administration Problems. (2 cr.; A-F or Audit; Every Spring) Application of Quantitative methods to secondary data, including analysis, data handling, stepwise multiple linear regression and discriminate analysis, pert, queuing, scheduling, inventory and simulation used to solve health administrative problems.
Group research thesis with verbal/written presentations. prereq: Health care admin student or instr consent

**PUBH 6562. Information Technology in Health Care.** (2 cr.; Student Option; Every Fall)
Managing information as a strategic resource within health care organizations. Designing information technology systems to capture, combine, and transform information to measure processes/outcomes of care, support collaborative clinical decision making, support management decisions, empower patients, and improve health care operations.

**PUBH 6563. Integrated Delivery Systems.** (2 cr.: A-F only; Every Fall & Spring)
Integrated models of health care delivery. Emphasizes organizational design, governance, operations, strategy, resource deployment, and the role of the "embedded medical practice." prereq: Health care admin student or instr consent

**PUBH 6564. Private Purchasers of Health Care: Roles of Employers and Health Plans in U.S. Health Care System.** (2 cr.; A-F or Audit; Every Fall)
Development and organization of HMOs and PPOs: risk sharing, provider contracts, utilization management, quality improvement, marketing, and new product development; employer relations; Medicare and Medicaid contracting; budget processing; financial performance; pricing; government regulations. prereq: MHA or MBA or HSRP or PHA student or instr consent

**PUBH 6565. Innovation of Healthcare Services.** (2 cr.; A-F only; Every Fall)
Designing/creating new care delivery services Exploting opportunities for innovation. Overcoming obstacles. Capturing value. prereq: MHA student only

**PUBH 6568. Interprofessional Teamwork in Health Care.** (2 cr.; Student Option; Every Fall & Summer)
Leading/participating in interdisciplinary teams. Team communication, problem solving, conflict management, organizational support. prereq: [Public health MPH or MHA or certificate student] or [health services research, policy/admin] MS student or instr consent

**PUBH 6569. Healthcare Policy.** (1 cr. [max 2 cr.]; A-F only; Every Fall)
Public policy environment surrounding health care and public health systems. Political context of health policy. Approaches to policy formulation/analysis. Tools/strategies for influencing health policy outcomes. prereq: Public health [MPH or MHA or certificate] student or instr consent

**PUBH 6570. Healthcare Administration.** (1-4 cr. [max 8 cr.]; Student Option; Periodic Fall, Spring & Summer)
Selected readings in healthcare administration. Discussion based on readings. prereq: dept consent

**PUBH 6571. Leading Performance Improvement in Health Care.** (2 cr.; A-F only; Every Spring)
Introduction to concepts of performance improvement in health care institutions. prereq: MHA or MPH or certificate student or instr consent

**PUBH 6572. Management for Clinical Research.** (2 cr.; Student Option; Every Fall)
Management for clinical research. prereq: Pursuing clinical research recommended

**PUBH 6573. The Nature of Clinical Care.** (2 cr.; A-F only; Every Spring)
Discussing clinical matters with colleagues. Students participate as peers in managing health care performance in hospitals, medical groups, and other health care delivery and public health institutions. prereq: School of Public Health student

**PUBH 6574. Managing Medical Practices as Components of Integrated Health Systems.** (2 cr.; max 4 cr.; A-F only; Every Spring)
Management of medical practices owned/operated by integrated health systems. Design, strategy, and operation of medical practices integrated with hospitals and other components of comprehensive systems of health care. Embedded medical practice. prereq: MHA student or instr consent

**PUBH 6577. Advanced Problem Solving in Health Services Administration.** (2 cr.; A-F only; Every Spring)
Capstone course. Students integrate/synthesize knowledge, attitudes, and skills acquired in curriculum and apply them to resolve management problem. prereq: MHA student

**PUBH 6578. Negotiation Strategies.** (2 cr.; A-F only; Every Spring)
The central issues of this course deal with understanding the behavior of individuals, groups and organizations on the context of competitive situations. prereq: MHA student or instructor permission

**PUBH 6589. Medical Technology Evaluation and Market Research.** (2 cr.; Student Option; Every Spring)
Analytical tools for formulating evaluations of innovations in medical technologies. Disseminating results to get a new product to market.

**PUBH 6596. Legal Considerations in Health Services Organizations.** (2 cr.; A-F or Audit; Every Fall, Spring & Summer)
Laws affecting administration of hospitals and other healthcare organizations. Administrative law, corporate/business law, labor law, civil liability, tax-related issues. Legal issues relevant to administration, decision making, and planning. prereq: Health care admin student

**PUBH 6600. Topics: Maternal and Child Health.** (0.5-4 cr. [max 20 cr.]; Student Option; Periodic Fall, Spring & Summer)
New courses or topics of interest.

**PUBH 6601. Born a Girl: Global Women's Health.** (1 cr.; Student Option; Every Summer)
Women's health conditions, programs, services, and policies in developed/developing countries. Social, economic, environmental, behavioral, and political factors affecting health behaviors, reproductive health, chronic and acute diseases, premature mortality and longevity. prereq: Grad level student

**PUBH 6605. Reproductive and Perinatal Health.** (2 cr.; Student Option; Spring Even Year)
Epidemiology, programs, services, and policies. Social, cultural, psychological, physiologic, environmental, economic, and political factors that affect reproductive health, pregnancy, and childbearing. prereq: Public health student or grad student or instr consent

**PUBH 6606. Children's Health: Issues, Programs, and Policies.** (2 cr.; Student Option; Periodic Spring & Summer)
Overview of public health issues related to children in the United States. Focus on identifying and planning public health strategies, policies, and programs to improve health of infants and children.

**PUBH 6607. Adolescent Health: Issues, Programs, and Policies.** (2 cr.; Student Option; Spring Even Year)
Major public health issues of adolescents in the United States. Emphasizes prevention and health promotion strategies and effectiveness of programs and policies.

**PUBH 6613. Children and Youth With Special Health Care Needs.** (2 cr.; Student Option; Fall Even Year)
Principles, programs, policies, and practices for identifying/meeting needs of children/youth with special health care needs in the United States. Epidemiology, historic/current legislation, organization/delivery. Readings, online discussions, written assignments. prereq: Graduate-level student in [AHC programs or education or social work or psychology]

**PUBH 6617. Practical Methods for Secondary Data Analysis.** (3 cr.; Student Option; Every Fall)
Introduction to methods for finding, transferring, and processing existing data sources. Focuses on practical approaches to pre-statistical data processing and analysis with STATA using a PC with an MS Windows operating system. Complex survey samples, other survey biases. prereq: Graduate level student or instr consent

**PUBH 6627. Sexuality Education: Criteria, Curricula, and Controversy.** (1 cr.; Student Option; Every Fall & Spring)

**PUBH 6630. Foundations of Maternal and Child Health Leadership.** (3 cr.; Student Option; Every Fall)
Historical/current principles, programs, policies, and practices related to women, children, adolescents, and families. Articulating a personal leadership style/plan for development of leadership competencies. Leadership
principles, skills, and models applied to improving health of MCH populations. prereq: Public Health MCH major or instr consent

PUBH 6634. Children and Families: Public Health Policy and Advocacy. (2 cr.; Student Option; Every Spring) The course will focus on how public policies at the federal, state, and local level influence children's health. Students will develop practical skills to understand, analyze, communicate, and advocate on children's policy issues. The course will include presentations and discussions with Minnesota's current leaders in children's health policy including legislators, advocates, and state commissioners. Instructor information: Lauren Gilchrist is the Senior Policy Advisor to Governor Mark Dayton. In this role, she works with commissioners, legislators, local government and stakeholders to advance health and human services policy issues for the state of Minnesota. She previously served as an advisor to the late Senator Ted Kennedy and Senator Al Franken.

PUBH 6636. Qualitative Research Methods in Public Health Practice. (2 cr.; Student Option; Every Fall) Qualitative inquiry, selected data collection, management, analysis methods for qualitative research in public health. Current approaches to assess strength of evidence of qualitative studies in public health. Provision of practical skills that can be applied in public health settings.

PUBH 6638. Excel and Access in Public Health Settings. (1 cr.; Student Option; Every Spring) This is a hands-on course on computer skills to learn a wide range of methods to manipulate public health data. Students will be given raw datasets and practice computer methods to clean, filter, recode, combine, tabulate and report data within the Excel and Access environments. The course is ideal for students who may not pursue more advanced quantitative training but still want to feel comfortable using these widely available programs to produce quality datasets for further analysis, and to generate summary results or reports in their work as public health practitioners.

PUBH 6655. Principles and Programs in Maternal and Child Health. (2 cr.; A-F only; Every Summer) Public health perspective for assessing/meeting health needs of women, children, adolescents, and families. Historical/current principles, programs, policies, and practices related to these populations. prereq: Maternal/child health MPH major enrolled in online program or instr consent

PUBH 6673. Grant Writing for Public Health. (1 cr.; Student Option; Every Spring) Hands-on workshop. Identifying successful elements of a grant application. Grant review process. Critiquing a grant. Writing an application.

PUBH 6675. Women's Health. (2 cr.; Student Option; Fall Odd Year) Programs, services, and policies that affect women's health in the United States. Methodological issues in research. Emphasizes social, economic, environmental, behavioral, and political factors. Measurement/interpretation of factors, how they translate into interventions, programs, and policies.

PUBH 6702. Integrative Leadership Seminar. (3 cr.; Student Option; Every Spring) Explore, investigate, discuss, develop basic concepts/practices for people/organizations associated with "integrative leadership", prereq: University of Minnesota doctoral student or master's student, Integrative Leadership minor.

PUBH 6703. Health Impact Assessment: A Tool to Promote Health Equity. (1.5 cr.; A-F or Audit; Every Fall) Health is largely influenced by the upstream social determinants of health, and yet policy decision makers rarely consider health. As a result, our social and physical environments often benefit certain groups over others, leading to health disparities. Health Impact Assessment (HIA) tool that uses the best-available evidence to uncover the health impacts of policies, plans and projects in order to influence decisions before they are finalized. Strong community engagement grounds the HIA in the health issues and topics important to those who will be impacted by the decision, leading to more equitable, healthier communities. This is a skills focused course that introduces students to the six steps of an HIA, along with relevant data sources and methods. With each step, students will be given the opportunity to practice and apply key concepts. Throughout the semester, students will work in interdisciplinary teams to develop a plan for an HIA, culminating in a group presentation. Students will also critique an HIA of their choice to see how HIAs have been used in the real world. This course will also cover emerging topics and challenges in the HIA field, including data gaps, funding, intersections with government decision making processes, and public engagement in HIAs. Students will have a chance to hear from several practitioners who will share their insights and experiences conducting HIAs in Minnesota.

PUBH 6705. Community Health Assessment. (3 cr.; Student Option; Every Spring) Two of the three core functions of public health: health assessment, assurance. Lectures, discussion, group activities, oral presentations. prereq: concurrent registration is required (or allowed) in 6341, public health management prerequisites: MPH or HHA or Grad student or instr consent

PUBH 6711. Public Health Law. (2 cr.; Student Option; Every Spring & Summer) Basic concepts of law, legislative process, and legal bases for existence/administration of public health programs. Legal aspects of current public health issues/controversies, regulatory role of government in health services system. prereq: Grad student or professional school student or instr consent

PUBH 6713. Global Health in a Local Context. (3 cr.; Student Option; Every Fall) Global Health in a Local Context: An experiential course on the social determinants, health equity, and leading change in Minnesota immerses students in the study of health equity, the social determinants of health, the principles and practice of global health in a local setting, and community-based healthcare. The discipline of social medicine provides a theoretical and practical framework to explore these topics. This course draws on the social sciences and social epidemiology to forge understandings of the social determinants of health; integrates the voice and decision-making power of individuals, families, and communities; is multidisciplinary and multisectoral in its responses; ensures an equity agenda; and is guided by deep, multi-faceted encounters with local contexts.

PUBH 6717. Decision Analysis for Health Care. (2 cr.; Student Option; Every Fall) Introduction to methods/range of applications of decision analysis and cost-effectiveness analysis in health care technology assessment, medical decision making, and health resource allocation.

PUBH 6721. Leading Collaborations. (1 cr.; Student Option; Every Spring) How mental health care providers located in individual organizations coordinate their activities so that care of clients is integrated. Coordination of labs and county health departments. Organizations such as rural health networks and community health information networks to achieve community-based goals. prereq: 6752 or instr consent

PUBH 6723. Lean Management in Health Care. (2 cr.; Student Option; Every Spring) Organizing to maximize customer value while minimizing waste. Lean management applied in Phillips Neighborhood Clinic. Observing waste. Developing basic value flow diagrams. Using problem-solving techniques to improve quality continuously. prereq: instr consent

PUBH 6724. The Health Care System and Public Health. (3 cr.; Student Option; Periodic Fall & Spring) Overview of health care delivery, finance systems within public health context. Components of health care system: financing, role of employers/public programs, health care delivery system, managed care. Collaborative interventions between managed care, public health. prereq: Public health or grad student or instr consent

PUBH 6726. Medical Device Industry: Business and Public Policy. (3 cr.; Student Option; Every Spring) Business, public policy, regulatory, technology management issues concerning medical device/biotechnology industries. Nature/effects of private-public sector interactions. Involvement by leaders in Minnesota organizations. prereq: MPH or MHA or grad student or instr consent

PUBH 6727. Health Leadership and Effecting Change. (2 cr.; Student Option; Every Fall, Spring & Summer)
Analysis of leadership models and competencies, particularly as applied to organizational change. Applications to individual self-development and to health care organizations. Preprq: MPH or MHA or certificate student or [health services research, policy/admin] MS student or instr consent

PUBH 6729. Public Health Leadership. (1 cr.; Student Option No Audit; Every Fall) Designed for MPH students interested in enhancing ability to improve public's health by inspiring/mobilizing others. Core concepts of leadership theory/key competencies of effective public health leaders. prereq: School of Public Health grad student or instr consent

PUBH 6730. International Comparative Health Systems. (2 cr.; Student Option; Spring Odd Year) History and development of health systems from a socio-political perspective. Overview of relative importance and meaning of health outcomes data. Role of WHO. Students use OECD health database.

PUBH 6732. Topics and Methods in Global Health Assessment. (2 cr.; Student Option; Spring Odd Year) Evaluation of health populations relative to specific topics important to global health, including methodology appropriate to particular issue. Focuses on developing countries. prereq: [6705, concurrent registration is required (or allowed) in PUBH 6705 or concurrent registration is required (or allowed) in PUBH 6320 or concurrent registration is required (or allowed) in PUBH 6341 or concurrent registration is required (or allowed) in grad course in epidemiology], [public health MPH or environmental health [MS or PhD] or health services research/policy/administration [MS or PhD] or epidemiology PhD or clinical research MS] or instr consent

PUBH 6734. International Project Planning and Management. (2 cr.; Student Option No Audit; Every Spring) Practical skills for work as international project manager. Key international public health issues. Students practice management and work with local nonprofit that works internationally or domestically with refugee and immigrant populations in Minnesota. prereq: PHAP grad student or instr consent

PUBH 6735. Principles of Health Policy. (3 cr. [max 6 cr.]; A-F only; Every Fall) The purpose of this course is to introduce students to the policy environment that influences and shapes public health and the provision of health care services, to enhance understanding of the historical and political context of health policy, to develop strategies for analysis of health policy issues, and to communicate effectively in the policy environment. Credit will not be granted if credit has been received for PUBH 6835.

PUBH 6741. Ethics in Public Health: Professional Practice and Policy. (1 cr.; A-F only; Every Fall, Spring & Summer) Introduction to ethical issues in public health practice/policy. Ethical analysis, recognizing/analyzing moral issues. prereq: Public health [MPH or MHA or certificate] student or environmental health [MS or PhD] major or instr consent

PUBH 6742. Ethics in Public Health: Research and Policy. (1 cr.; A-F only; Every Fall, Spring & Summer) Introduction to ethical issues in public health research/policy. Ethical analysis. Recognizing/analyzing moral issues. prereq: Public health [MPH or certificate] student or [clinical research MS or Environmental health [MS or PhD] or epidemiology PhD or [health services research, policy/admin] [MS or PhD]] major or instr consent

PUBH 6744. State Health Policy and Politics. (2 cr.; Student Option; Every Spring) Half semester. Federal health reform debate and debate over reinstituting the MN General Assistance Medical Care program. Intergovernmental relationship between the federal and state governments in health policy and finance; role of state and local policy makers and policy advocates. Political context for state health policy development.

PUBH 6751. Principles of Management in Health Services Organizations. (2 cr.; A-F only; Every Fall, Spring & Summer) Understanding of and improvement in the competencies of managers in organizations, particularly as applied to health services and public health organizations. prereq: [Public health MPH or MHA or certificate] student or [environmental health MS or PhD] student or dentistry MS student or instr consent

PUBH 6755. Planning and Budgeting for Public Health. (2 cr.; Student Option Audit; Every Fall & Summer) Principles of budgeting, planning, forecasting, and analyzing in nonprofit/government organizations applied to health care administration and public health. prereq: Academic Hlth Ctr grad student or instr consent

PUBH 6758. Managing Public Health Systems. (2 cr.; A-F only; Every Fall, Spring & Summer) Problem solving, process management, quality improvement, collaboration/partnership management. Organizing public health core functions and essential services. prereq: [6751 or concurrent registration is required (or allowed) in 6751], [public health MPH or certificate] student or environmental health [MS or PhD] major or HSRPA [MS or PhD] major

PUBH 6762. Health Finance Applications. (2 cr.; Student Option; Every Spring) Top management perspective of healthcare financial management responsibility in context of strategic issues. Emphasizes balancing theory and applications. Capstone course. prereq: [6558, [grad or professional school] student] or instr consent

PUBH 6765. Continuous Quality Improvement: Methods and Techniques. (3 cr.; Student Option; Every Fall) Theory/practical applications of concepts, tools, techniques of continuous quality improvement (QI) in public health/health care.

PUBH 6772. Health Disparities Capstone Seminar. (1 cr. [max 2 cr.]; Student Option No Audit; Every Spring) Readings and discussion-based seminar. Readings emphasize practice and policy solutions to health disparities. prereq: [CSPH 5115, 2d yr MPH student completing SPH health disparities interdisciplinary concentration] or instr consent

PUBH 6780. Topics: Public Health Administration and Policy. (1-3 cr. [max 60 cr.]; A-F only; Periodic Fall & Spring) New courses or topics of interest in public health administration/policy.

PUBH 6800. Topics: Health Services Research and Policy. (0.5-4 cr. [max 80 cr.]; Student Option; Periodic Fall, Spring & Summer) New courses or topics of interest in health services research and policy.

PUBH 6801. Health and Human Rights. (3 cr.; Student Option; Every Fall) Relationship of health and human rights in public health context. Philosophical frameworks/groundings. Nexus between health and human rights. Historical/contemporary topics. prereq: Grad student or professional student or instr consent


PUBH 6803. Conducting a Systematic Literature Review. (3 cr.; Student Option No Audit; Every Spring) Developing skills built on evidence-based practice. Draws on staff of Minnesota Evidence-based Practice Center. prereq: Basic knowledge of epidemiology

PUBH 6804. Community Mental Health. (2 cr.; Student Option; Fall Even Year) Social-psychological processes that shape experience of mental health/illness. Consequences of disorders for individuals, families, and communities. Epidemiology research, theories of mental health/illness. Effect of policies related to organizing/financing services.

PUBH 6805. Introduction to Project Management for Health Professionals. (2 cr. [max 4 cr.]; A-F only; Every Summer) Core concepts/skills for managing projects effectively, making sure they are completed on time, within budget, meeting performance objectives. prereq: Matriculation in master's program in School of Public Health, or instr consent

PUBH 6806. Principles of Public Health Research. (2 cr.; Student Option; Every Fall)
PUBH 6808. Professional and Research Practice in Health Services Research, Policy and Administration. (1 cr.; S-N only; Every Summer) Institutional rules related to funder requirement compliance (CMS, NSF, etc.), regulatory compliance (HIPAA, FISMA), risk management related to data management. Integrating/normalizing data from disparate data sources, managing very large scale projects, organizing data warehouses, supporting collaboration with stakeholders. Professional practice and research issues. prereq: MS in HSRP&A or MPH in PHI, PubH 6450, 6451, & 6806, or instr consent.

PUBH 6809. Advanced Methods in Health Decision Science. (3 cr.; Student Option No Audit; Every Spring) Methods applicable to issues of medical decision making. Analyses of environmental/safety decisions. How to apply methods at cutting-edge of clinical decision science. prereq: 6717 or intro course in decision analysis, some facility with mathematical notation/reasoning.

PUBH 6810. Survey Research Methods. (3 cr.; Student Option No Audit; Every Spring) Theory/application of survey research in data collection. Sampling, item development, instrument design/administration to conduct surveys or be aware of issues related to design/implementation. Identification of sources of error in survey research.

PUBH 6811. Health Disparities Research: Measures, Methods, and Data. (2 cr.; Student Option No Audit; Fall Even Year) Methods for conducting health disparities research using publicly available data sources. Interrelated issues such as conceptualization of disparities, measurement, analytic choices, and available data sources. prereq: Grad or professional student, introductory research methods course or instr consent.

PUBH 6812. Applied Projects in Health Intelligence and Analytics. (2 cr.; S-N only; Every Summer) How to translate academic skills, research methods, data management, substantive areas to real world Health Intelligence & Analytics tasks. Complete two-five week long analytic projects provided by sponsor. Experience conducting literature reviews, organizing/describing data, estimating models, writing executive report on findings, presenting findings to sponsor. The project for this course serves as meeting the Plan B master's project requirement.

PUBH 6813. Managing Electronic Health Information. (2 cr.; Student Option No Audit; Every Spring) Managing health information is a central function of health care organizations. Information is used for managing population health, profiling providers, and measuring quality. This course describes relational data theory, normalization, and Structured Query Language (SQL) will be used to create and query databases. Students will be introduced to the basic programming skills necessary to manage data in research projects. Programming aspects of the course will use SQL procedure in the SAS language. prereq: Admission to a University of Minnesota Masters program or Permission of instructor.

PUBH 6814. Data and Information for Population Health Management. (2 cr.; Student Option No Audit; Every Spring) Information is used for managing population health surveillance, profiling providers, measuring quality, measuring resource use, and managing population health. This course describes the organizational context of health information and how to use health data to manage population health. Sources and types of health information, organizational processes affecting information quality, consistency, completeness, and accuracy, methods for organizing information, use of information for decision making, and how data can be used to provide usable information, will be discussed. prereq: Completion or concurrent enrollment in PUBH 6813, Managing Electronic Health Information. 2cr contains the skills necessary for completing the assigned paper/project in this course, PUBH 6814, OR instructor permission.

PUBH 6815. Community-based Participatory Research. (2 cr.; Student Option No Audit; Every Fall) This introductory course is intended for junior faculty, post-docs, graduate students and community practitioners interested in adding CBPR to their repertoire of effective approaches to understanding and addressing social and health disparities. Topics will explore the purpose and applications of CBPR; partnership formation and maintenance; issues of power, trust, race, class, and social justice; conflict resolution; ethical issues; CBPR's relationship to cultural knowledge systems, and funding CBPR projects. This is NOT a methodology course. CBPR is an approach to conducting research that is amenable to a variety of research designs and methodologies and will NOT cover topics such as survey design, quantitative methods, qualitative methods, focus groups, community needs assessment procedures, etc.

PUBH 6832. Economics of the Health Care System. (3 cr.; Student Option; Every Fall) Development of traditional issues in health economics. Production of health, demand for health capital and health care, insurance theory and markets, managed care, pricing, physician's services, production and costs in health care institutions, role of government, cost effectiveness analysis, reform. prereq: [Grad or professional school] student, knowledge of [microeconomic analytical tools, analytical statistics] or instr consent.

PUBH 6833. Principles of Health Policy. (2 cr.; Student Option; Every Spring) Social, political, and economic context within which U.S. health-care system developed. Influence of these contextual elements on public policies guiding/regulating organization/delivery of health services. prereq: [Pub hllh [MPH or certificate] or pub affairs MPA or healthcare admin MHA or [health serv research, policy/admin [MS or PhD]]] student or instr consent.

PUBH 6845. Using Demographic Data for Policy Analysis. (3 cr.; A-F only; Every Spring) How to pose researchable policy questions, locate existing data, turn data into a usable format, understand data documentation, analyze data, communicate findings according to standards of the professional policy community. Quantitative issues. prereq: [Grad level research methods course, basic statistics course] or instr consent.

PUBH 6852. Program Evaluation in Health and Mental Health Settings. (2 cr.; A-F only; Every Spring) Understanding an evaluation study. Program evaluation. Applications to health and mental health settings. emphasizes public health.

PUBH 6855. Medical Sociology. (3 cr.; Student Option; Every Spring) Introduction to common theoretical/empirical approaches used by sociologists to study health/illness. How content reflects social inequalities in health/illness. Social processes that shape experience of health/illness. prereq: [Grad or professional school] student, previous experience with statistical software or instr consent.

PUBH 6861. Health Insurance. (2 cr.; A-F or Audit; Every Spring) Financing personal health care: theory of insurance, health insurance markets, cost sharing, HMOs, PPOs, public and catastrophic health insurance, and the uninsured. Emphasis on public policy. prereq: Microecon theory course or instr consent.


PUBH 6863. Understanding Health Care Quality. (2 cr.; A-F only; Every Fall) Introduction to assessing/assuring quality of care. Emphasizes both process and outcomes approaches, paralleling interest in appropriateness/effectiveness of care. Issues around creating needed behavioral changes.

PUBH 6864. Conducting Health Outcomes Research. (3 cr.; Student Option; Every Spring) Major concepts/principles in conducting health outcomes research that evaluates medical care. Developing study designs matched to research questions. Frequently used study designs. Evaluating health outcomes.
Analytical approaches. prereq: Introductory course in epidemiology or health services research methods or instr consent

**PUBH 6875. Practice of Health Services Research.** (2 cr.; Student Option; Every Fall)
How practice of health services research is conducted in various organizations. Presentations by guest lecturers from health services research organizations. How the specific organization conducts research and how it sets an agenda, and how it carries out research. prereq: Public health MPH or grad student or instr consent

**PUBH 6876. Public Health Systems Analysis and Design.** (2 cr.; Student Option No Audit; Every Fall)
Basic knowledge/skills to design, develop, implement public health information systems. Systems development lifecycle, including problem definition, feasibility analysis, logical modeling, system architecture/implemention. Develop communication, analysis, management skills needed to develop information systems that meet user needs. prereq: Grad or professional student or instr consent

**PUBH 6877. Public Health Systems Analysis and Design - Practicum.** (2 cr.; Student Option No Audit; Every Fall)
Hands-on group project to practice skills of design, development, and implementation of public health information systems. Project teams employ site visits, interviews, surveys, and other data collection methods to gather system requirement specifications. Experience full system development lifecycle, including problem definition, feasibility analysis, logical modeling, and system architecture implementation. prereq: Grad or professional student or instr consent, [completion of or concurrent registration is required (or allowed) in 6876]

**PUBH 6878. Public Health Systems Analysis and Development Practicum.** (2 cr.; S-N only; Every Fall)
Individual student or student teams will conduct a full systems analysis for a public health information system for a client.

**PUBH 6879. Public Health Systems Analysis and Development Practicum.** (2 cr.; S-N only; Every Spring)
Individual students or student teams will conduct a full systems analysis for a public health information system for a client.

**PUBH 6880. Introduction to Public Health Informatics.** (2 cr.; A-F or Audit; Every Spring)
Information is key to effective public health administration. Surveillance systems provide information on infectious disease tracking, disease clusters, food-borne outbreaks, and injuries. Environmental monitoring systems provide information on health risks such as toxic chemicals or airborne pollutants. Registries contain information on vital statistics such as birth, death, and immunization. e-Public Health integrates information from electronic health records to use in improving population health. Introduction to Public

Health Informatics describes these public health information systems and key issues in managing this information effectively, such as data standards, common functions, decision support, meaningful use, health information exchange, privacy and security. prereq: School of Public Health student or graduate student

**PUBH 6881. Advanced Public Health Informatics Applications.** (2 cr. [max 4 cr.]; A-F or Audit; Every Fall)
Public Health Informatics includes a wide variety of applications that are used to assess, assure, and advocate for population health such as immunization registries, vital statistics systems, birth and death registries, food and environmental health surveillance systems, and infectious disease surveillance. Health information exchange (HIE), such as reports from labs or clinics to public health departments, is a key informatics tool used to support surveillance systems. Advanced Public Health Informatics Applications teaches the key concepts and the skills related to HIE and the concepts and skills necessary to implement it in surveillance systems.

**PUBH 6890. Topics: Public Health Informatics.** (1-4 cr. [max 80 cr.]; Student Option; Periodic Fall, Spring & Summer)
New courses or topics of interest in Public Health Informatics.

**PUBH 6900. Topics: Public Health Nutrition.** (0.5-4 cr. [max 80 cr.]; Student Option; Periodic Fall, Spring & Summer)
New courses or topics of interest in public health nutrition.

**PUBH 6901. Foundations of Public Health Nutrition Leadership.** (2 cr.; Student Option; Every Fall)
Principles of public health nutrition. Roles/function of public health nutritionists. Programs/delivery mechanisms for promoting nutritional status of populations. Students explore their beliefs/competencies in relation to principles/philosophy of public health nutrition. This course has a strong focus on policy, systems and environmental changes to improves access to health foods for individuals and communities.

**PUBH 6904. Nutrition and Aging.** (2 cr.; Student Option; Every Summer)
Current literature on nutrition needs/factors affecting nutritional status of adults and the elderly. Relevant community resources. prereq: Grad student or professional school student or instr consent

**PUBH 6905. Nutrition for Public Health Promotion and Disease Prevention.** (2 cr.; Student Option; Every Fall)
Nutrition topics of contemporary interest. Concepts/facts about science of human nutrition discussed in relation to personal/community nutrition problems/concerns. Applied introductory course with labs. prereq: Grad student or instr consent

**PUBH 6906. Global Nutrition.** (2 cr.; Student Option; Every Spring)
Nature/scope of chief nutritional issues and problems in the world. Emphasizes developing countries. Nutrient deficiencies, nutrition-related aspects of infectious/chronic disease. prereq: Grad student

**PUBH 6907. Maternal, Infant, Child and Adolescent Nutrition.** (3 cr.; Student Option; Every Fall)
This course provides an overview of nutrition issues affecting pregnant and postpartum women, females of reproductive age, infants, children and adolescents. The course integrates public health practice and policy recommendations with evidence-based clinical practice guidelines to provide a comprehensive view of maternal and child health (MCH) nutrition issues seen by practitioners in community settings. The course addresses nutrition education, community/population nutrition intervention strategies, and programs and policies to promote healthy eating and physical activity and to reduce obesity and chronic disease risk among MCH populations. The course also provides an opportunity for students to develop social marketing and media communication skills and messages appropriate for maternal and child health (MCH) populations as well as to evaluate child nutrition assistance programs and policies.

**PUBH 6914. Community Nutrition Intervention.** (3 cr.; Student Option; Every Spring)
Tools for developing community nutrition interventions. Using behavioral therapy, conducting needs assessments, writing program objectives, developing intervention strategies, evaluating program implementation and effectiveness, planning a budget, writing grant proposals.

**PUBH 6915. Nutrition Assessment.** (2 cr.; Student Option; Every Fall)
Common nutritional assessment using dietary, biochemical, and anthropometric approaches. Applications of methods, interpretation of results. Hands-on experience, training in common anthropometric methods. prereq: Public health nutrition major or instr consent

**PUBH 6920. Foundations of Interprofessional Professional Communication and Collaboration.** (1 cr.; S-N only; Every Fall)
Explore nature of/need for interprofessional communication, qualities of successful teams/interprofessional interactions, professional identity, ethics, integrity, values, communication/decision making in interprofessional environment.

**PUBH 6933. Nutrition and Chronic Diseases.** (2 cr.; Student Option; Every Spring)
Issues in nutrition and public health. How nutrition research is translated into dietary recommendations for public health. Relation of nutrition to obesity, cardiovascular disease, diabetes, and cancer.

**PUBH 6945. From Kid to Community: Personal, Environmental, and Policy Interventions Targeting Youth Obesity.** (1 cr.; S-N only; Every Summer)
Overview of child and adolescent obesity from public health perspective.

**PUBH 6950. From Kid to Community: Personal, Social and Environmental
Influences on Youth Obesity. (2 cr.; Student Option; Every Fall) Overview of public health strategies for the prevention of pediatric obesity. Includes overview of epidemiology of child and adolescent obesity with a focus on social-ecological risk factors. Discusses implications for developing interventions and programs. prereq: completed one of the following: a) basic intro to nutrition course, b) PUBH 6094, or c) 1 year work experience in the field of obesity and/or public health or instructor consent.

PUBH 6955. Using Policy to Address Child and Adolescent Obesity Prevention. (1 cr.; Student Option; Every Spring) Overview of federal, state, local policy approaches. National initiatives for prevention of child and adolescent obesity. Specific policies will be discussed at local, state, federal levels. Extensive discussion on evidence of impact of policies on child and adolescent weight.

PUBH 6995. Community Nutrition Practicum. (0.5-4 cr.; A-F only; Every Summer) Didactic/experiential learning opportunities in community nutrition program delivery/management. Students complete at least 36 hours each week for eight weeks guided by on-site preceptor and course instructor. prereq: Public health nutrition MPH degree student, instr consent

PUBH 6996. Clinical Nutrition Practicum. (9 cr.; A-F only; Every Summer) Didactic/experiential learning in clinical nutrition. Application of nutrition care process/model to medical conditions. Students complete at least 36 hours each week for nine weeks guided by on-site preceptor and course instructor. prereq: Public health nutrition MPH degree student, instr consent

PUBH 7091. Independent Study: Community Health Promotion. (1.4-1 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Independent study supervised by community health promotion faculty member. prereq: CHP major, instr consent

PUBH 7094. Integrative Learning Experience: Community Health Promotion. (1-6 cr.; S-N only; Every Fall, Spring & Summer) MPH students complete an integrative learning experience (ILE) in community health promotion program delivery. Students must complete at least 36 hours each week for nine weeks guided by on-site preceptor and course instructor. prereq: CHP program, instr consent

PUBH 7096. Applied Practice Experience: Community Health Promotion. (1-5 cr.; S-N only; Every Fall, Spring & Summer) MPH students are required to complete a supervised Applied Practice Experience (APEX). Students must address five competencies and must submit two products that demonstrate attainment of the competencies. prereq: CHP program, instr consent

PUBH 7193. Directed Study: Environmental Health. (1-4 cr.; max 20 cr.; Student Option No Audit; Every Fall, Spring & Summer) Directed study in a topic agreed upon by student and faculty member. prereq: instr consent

PUBH 7194. Integrative Learning Experience: Environmental Health. (1-5 cr.; max 25 cr.; S-N only; Every Fall, Spring & Summer) MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student's educational and professional goals. prereq: Environmental health program, instr consent

PUBH 7195. MS in Environmental Health Sciences Plan B Project. (1-5 cr.; S-N only; Every Fall, Spring & Summer) Students must complete a written plan B project where they are required to synthesize and integrate knowledge acquired in coursework and other learning experiences and apply theory and principles in a context that reflects an aspect of professional practice. The culminating experience must be used as a means by which faculty judge whether the student has mastered the body of knowledge and can demonstrate proficiency in the required competencies through written and oral presentation. All master's degree candidates are required to pass a final comprehensive oral examination to be taken after submission of the Plan B project(s).

PUBH 7196. Applied Practice Experience: Public Health Practice. (0.5-4 cr.; max 80 cr.; Student Option No Audit; Every Fall, Spring & Summer) MPH students are required to complete a supervised Applied Practice Experience (APEX). Students must address five competencies and must submit two products that demonstrate attainment of the competencies. prereq: Environmental health student, instr consent

PUBH 7200. Topics: Public Health Practice. (0.5-4 cr.; max 80 cr.; Student Option No Audit; Every Fall, Spring & Summer) New course offerings or topics of interest in public health practice.

PUBH 7210. Topics: Global Food Systems. (0.5 cr.; max 3 cr.; S-N only; Every Summer) Food systems related to specific food products, including inputs, processes, and outputs from production sites to consumers. Context for food safety policy. Concept of food system biosecurity as prerequisites for a safe, abundant, affordable, and diverse food supply. Case studies of food-borne disease outbreaks illustrate critical controls in food production.

PUBH 7211. Food System Biosecurity: Preparedness and Response. (1 cr.; Student Option; Periodic Fall) Public health preparedness and response related to food system biosecurity. Systems approach to biosecurity. Models for systematic evaluation of vulnerabilities (HACCP, ORM) and problem solving (Haddon's Matrix). Risk communication, preparedness planning, text exercises, contingency planning. prereq: Grad student or professional school student or instr consent

PUBH 7212. Food System Biosecurity: Threats. (1 cr.; Student Option; Periodic Fall) Public health threats to food system biosecurity. Principles of biosecurity, vulnerabilities of the food system from pre-harvest through post-processing, potential threats by class of agent, strategies to minimize threats and protect public's health. prereq: Grad student or professional school student or instr consent

PUBH 7213. Applications of Microbiology to Food Systems Monitoring. (1 cr.; Student Option; Periodic Fall) Microbiological testing to determine prevalence of pathogens in specific foods. Identification of causes of foodborne disease outbreaks. Monitoring critical control points. Traditional/rapid lab methods are used to detect indicator organisms, pathogens, and other contaminants of public health concern. prereq: Grad student or professional school student or instr consent

PUBH 7214. Principles of Risk Communication. (1 cr.; Student Option No Audit; Every Summer) Key concepts of risk communication theory and their practical application to collection/sharing of information in support of individual and community decision-making about public health issues. Application of risk communication principles to routine, ongoing public health issues and those that arise out of emergency/crisis.

PUBH 7215. Food Safety: Risk Assessment and Risk Management. (1 cr.; Student Option No Audit; Summer Even Year) Risk assessment methods/strategies for managing risk for specific foods and across the food system. Students work in groups to identify a specific risk management question to be addressed by risk assessment and develop a specific risk management strategy.

PUBH 7216. Food Safety Risk Management. (1 cr.; Student Option No Audit; Summer Even Year) Strategies for managing risk of food-borne diseases for specific foods and across food system.

PUBH 7217. Advances in Molecular Epidemiological Analysis. (1 cr.; Student Option No Audit; Summer Even Year) Overview of molecular laboratory techniques used to detect, identify, and characterize infectious disease agents. Application of molecular subtyping techniques to surveillance and outbreak investigations. Implications for public health practice.

PUBH 7218. Culturally Based Community Health Immersion. (0.5 cr.; S-N only; Every Summer) Students view public health practice in action and reflect on ways that urban environments impact health services for members of...
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

PUBH 7220. Personal Protective Equipment and Respiratory Protection. (1 cr.; Student Option No Audit; Every Summer)

PUBH 7221. Planning for Urgent Threats. (1 cr.; Student Option No Audit; Every Summer)
Role of public health in disaster preparedness, response, and recovery. How public health agencies plan for managing the crisis. Providing surge capacity to maintain public health and health care functions. Assisting a community's recovery from a disaster.

PUBH 7222. Best Practices in Emergency Response. (1 cr.; S-N only; Periodic Summer)
Best practices in PH preparedness & response are evolving & continually tested with new experiences & expertise. This course for PH professionals and professionals responsible for preparedness planning, response & recovery is designed to provide participants with practical applications & tools to apply learning from real incidents.

PUBH 7223. Concepts of Disaster Behavioral Health. (1 cr.; S-N only; Every Summer)
Impact of disaster on the behavioral health of victims, survivors, and communities. Real scenarios for predictable phases of disaster recovery and concepts of behavioral health services after disaster. Steps for disaster behavioral health response planning/preparation. Presentations, discussion, individual/small group exercises.

PUBH 7224. Business Continuity Planning for Disasters and Emergencies. (1 cr.; Student Option No Audit; Every Summer)
Field-based learning experience. Student help develop business plan for natural or man-made disasters or emergencies, assess current business needs and existing continuity plans, and work in teams to develop, implement, and maintain programs to prevent, mitigate, prepare for, respond to, and recover from disasters/emergencies.

PUBH 7225. Communication and Information Technology Tools for Public Health Emergency Response. (1 cr.; Student Option No Audit; Summer Odd Year)
Uses Incident Command System as framework. Application of information/communication technology to emergency response. Communication exercise design, IT project management, backup communication methods. prerequisite [FEMA IS-100a, FEMA IS-546a] with certificate of completion

PUBH 7226. Media Relations Practicum. (1 cr.; Student Option No Audit; Every Summer)

PUBH 7227. Incident Management Systems: The Public Health Role. (1 cr.; S-N only; Periodic Summer)
Managing personnel/resources in an emergency incident. Formalized/common management practices applicable in virtually any setting.

PUBH 7230. Topics in Infectious Disease. (0.5-4 cr.; max 80 cr.; Student Option No Audit; Every Summer)

PUBH 7231. Surveillance of Foodborne Diseases in Humans. (1 cr.; Student Option No Audit; Every Spring & Summer)

PUBH 7232. Surveillance of Foodborne Diseases in Animals and Plants. (1 cr.; Student Option No Audit; Every Spring & Summer)

PUBH 7233. Food System Defense: Vulnerabilities in the Food System. (1.5 cr.; Student Option No Audit; Periodic Summer)
Holistic view of food system. Tools to assess vulnerability of specific food systems/facilities, economic, risk analysis, methods for risk prioritization, risk assessment, risk management and risk communication) to estimate and manage the food safety risks.

PUBH 7234. Global Food Systems Leadership. (1 cr.; S-N only; Periodic Summer)
Critical competencies for leadership in industry, government, and academia necessary for ensuring an abundant, affordable, and safe global food supply.

PUBH 7235. Surveillance of Zoonotic Pathogens in Animals. (1 cr.; Student Option No Audit; Periodic Summer)
Case-study approach/field trips. Surveillance issues related to zoonotic pathogens in animals.

PUBH 7236. Farm to Table Program: Minnesota. (2 cr.; Student Option No Audit; Every Summer)
Explore the food system from farm to table in Minnesota while considering aspects of food sustainability, environmental health, public health, animal welfare and health, food safety, and food security. Activities & highlights will highlight the farm, processing, retail, government and academic sectors of the food production chain.

PUBH 7237. Using Risk Analysis Tools: Estimating Food Safety on the Farm to Table Continuum. (1 cr.; Student Option No Audit; Periodic Summer)
This applications-based course will provide the necessary risk- and science-based tools to evaluate and mitigate the microbial and chemical risks in a food production chain?from the farm until consumption. Participants will be divided in small interdisciplinarly groups to mimic a real risk analysis team and develop real-case outbreak scenarios. The attendants will follow the risk analysis process as an integral part of a science-based decision-making (risk prioritization, risk assessment, risk management and risk communication) to estimate and manage the food safety risks. The attendants will apply different qualitative (hazard analysis, decision matrices) and quantitative (risk prioritization, modeling, and web-based software) tools by using a computer. The participants will present the main outcomes from the analyses and will evaluate possible mitigation options to reduce the risk in a cost-effective way.

PUBH 7240. Topics: Health Care Issues in Underserved Populations. (0.5-4 cr.; max 20 cr.; Student Option No Audit; Every Summer)
Overview of disparities compared with other U.S. population groups. Health/clinical issues affecting underserved populations. Cultural/historical aspects. Health care systems response.

PUBH 7241. Culturally Responsive Communication. (1 cr.; Student Option No Audit; Periodic Summer)

PUBH 7242. War and Public Health. (1 cr.; Student Option No Audit; Every Summer)
Public health problems associated with armed conflict; interdisciplinary perspective with emphasis on analyzing the complexities. Consequences of mass displacement, effects on community and family, women's roles and experiences, trauma and healing. Health intervention strategies. Seminar discussion format.

PUBH 7244. Community-based Participatory Research. (1 cr.; Student Option; Periodic Summer)
This introductory course is intended for graduate students and community practitioners interested in adding CBPR to their repertoire of effective approaches to understanding and addressing social and health disparities. Topics such as the purpose and applications of CBPR; partnership formation and maintenance; issues of power, trust, race, class, and social justice; ethical issues; CBPR's relationship to cultural
Types of MPH projects. Tools to facilitate completion. Literature review techniques, type of research, Institutional Review Board/Institutional Animal Care/Use Committee approval, analytic tools, writing/presenting/defending projects. prerequisite: Public health practice MPH student or [other MPH student, instr consent] PUBH 7257. Qualitative Data Analysis. (1 cr.; Student Option No Audit; Every Summer) Analyze/work with qualitative data from variety of data collection methods/multiple analysis approaches. Discussion of analyzing photograph/video data will provide insights on how best to analyze these types of data.

PUBH 7258. Data Driven and Time-Sensitive Decision Making. (1 cr.; Student Option; Periodic Summer) This course aims to provide knowledge and equip students with techniques to transform data into information that decision makers can use in order to make time critical decisions. It has been well documented that decision making during a crisis is difficult as information is limited and established procedures may not be followed, thus increasing the amount of stress on individuals required to make those decisions. To improve crisis decision-making data collection, analysis, and synthesis an abundant and wide-variety of data are required in order to make an informed decision. This course will have didactic and application components where students will be able to apply the skills knowledge learned.


PUBH 7261. Ecosystem Health. (1 cr.; Student Option No Audit; Periodic Summer) Impact of global environmental change on human health/welfare. How major changes in the environment such as wild land degradation, increasing contaminant loads, and climate change are altering human, wildlife, and domestic animal fitness/survival. Depletion of wild resources of nutritional, social, or economic importance. Loss of biodiversity. Alterations in disease prevalence, including emerging infectious diseases. Strategies to mitigate/prevent changes and their impacts on human well-being.

PUBH 7262. Globalization and Health. (1 cr.; Student Option No Audit; Periodic Summer) Global health concerns cross the borders of developed and developing nations. Effect of globalization on social and scientific consequences in public health. Interplay between global stressors such as population, war, economics, urbanization, and environment; effects on the health of women/children, spread of infectious/chronic diseases, nutrition and environmental health.

PUBH 7263. Global One Health Leadership Workshop and Practicum. (2 cr.; Student Option No Audit; Every Summer) Leadership skills for addressing challenges/opportunities at convergence of public health, animal health, environmental/ecosystem health, economic development. Enhance critical leadership competencies in context of complex, multifacatorial problems.

PUBH 7291. Independent Study: Epidemiology. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Independent study supervised by epidemiology faculty member. prerequisite: Public health practice MPH major, instr consent

PUBH 7292. Readings in Epidemiology. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Independent study supervised by epidemiology faculty member. prerequisite: [EPI major or grad student], instr consent

PUBH 7293. Independent Study: Public Health Practice. (1-6 cr.; S-N only; Every Fall, Spring & Summer) Independent study supervised by public health practice faculty member. prerequisite: [other MPH student, instr consent]

PUBH 7294. Integrative Learning Experience: Public Health Practice. (1-6 cr.; S-N only; Every Fall, Spring & Summer) MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student’s educational and professional goals, prerequisite: Public health practice MPH program, instr consent

PUBH 7295. Application of EpilInfo Software in Epidemiology Investigation and Data Management. (1 cr.; Student Option No Audit; Every Summer) Introduction to use of EpilInfo software for epidemiological investigations. Data management/analysis. Exercises in outbreak investigations and presentation of analysis and results. prerequisite: Grad-level epidemiology course

PUBH 7296. Applied Practice Experience: Epidemiology. (1-6 cr.; S-N only; Every Fall, Spring & Summer) MPH students are required to complete a supervised Applied Practice Experience (APEX). Students must address five competencies and must submit two products that demonstrate attainment of the competencies. prerequisite: public health practice student, instr consent

PUBH 7301. Independent Study: Public Health Practice. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Independent study supervised by public health practice faculty member. prerequisite: [EPI major or grad student], instr consent

PUBH 7302. Readings in Public Health Practice. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Current readings in public health practice. prerequisite: Epidemiology major, instr consent

PUBH 7304. Integrative Learning Experience: Public Health Practice. (1-6 cr.; S-N only; Every Fall, Spring & Summer) MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student’s educational and professional goals. prerequisite: MPH student, instr consent

PUBH 7306. Applied Practice Experience: Public Health Practice. (1-6 cr.; S-N only; Every Fall, Spring & Summer) MPH students are required to complete a supervised Applied Practice Experience (APEX). Students must address five competencies and must submit two products that demonstrate attainment of the

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PUBH 7485. Methods for Causal Inference. (3 cr. ; Student Option; Every Fall)

Although most of statistical inference focuses on associational relationships among variables, in many biomedical and health sciences contexts the focus is on establishing the causal effect of an intervention or treatment. Drawing causal conclusions can be challenging, particularly in the context of observational data, as treatment assignment may be confounded. The first part of this course focuses on methods to establish the causal effect of a point exposure, i.e., situations in which treatment is given at a single point in time. Methods to estimate causal treatment effects will include outcome regression, propensity score methods (i.e., inverse weighting, matching), and doubly robust approaches. The second half of the course focuses on estimating the effect of a series of treatment decisions during the course of a chronic disease such as cancer, substance abuse, mental health disorders, etc. Methods to estimate these time-varying treatments include marginal structural models estimated by inverse probability weighting, structural nested models estimated by G-estimation, and the (parametric) G-computation algorithm. We will then turn our attention to estimating the optimal treatment sequence for a given subject, i.e., how to determine ?the right treatment, for the right patient, at the right time,? using dynamic marginal structural models and methods derived from reinforcement learning (e.g., Q-learning, A-learning) and classification problems (outcome weighted learning, G-learning). PUBH 8485 is appropriate for Ph.D students in Biostatistics and Statistics. The homework and projects will focus more on the theoretical aspects of the methods to prepare students for methodological research in this area. PUBH 7485 is appropriate for Masters students in Biostatistics and PhD students in other fields who wish to learn causal methods to apply them to topics in the health sciences. This course uses the statistical software of R, a freely available statistical software package, to implement many of the methods we discuss. However, most of the methods discussed in this course can be implemented in any statistical software (e.g., SAS, Stata, SPSS, etc.) and students will be free to use any software for homework assignments.

PUBH 7494. Integrative Learning Experience: Biostatistics. (1-3 cr. ; S-N only; Every Fall, Spring & Summer)

MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student?s educational and professional goals. Prereq: Biostatistics program, instr consent

PUBH 7496. Applied Practice Experience: Biostatistics. (1 cr. ; max 6 cr.; S-N only; Every Fall, Spring & Summer)

MPH students are required to complete a supervised Applied Practice Experience (APEX). Students must address five competencies and must submit two products that demonstrate attainment of the competencies. Prereq: biostatistics MPH student

PUBH 7534. Marketing for Health Care Professionals. (1 cr. ; max 2 cr.; A-F only; Every Summer)

Application of principles of marketing to managing professional practice.

PUBH 7535. Managerial Accounting for Health Services. (3 cr.; A-F or Audit; Every Spring)

Differential, absorption, activity-based costing. Budgeting, variance analysis. Financial accounting, including transaction data/accrual accounting. Developing financial statements. Ration analysis. Prereq: [AHC student or instr consent], experience with spreadsheets such as Excel or Lotus recommended

PUBH 7536. Health Finance I. (; 3 cr.; Student Option No Audit; Every Summer)

Principles of corporate/not-for-profit finance. Net present value, financial analysis, capital budgeting, financing options/decisions. capital structure, capital asset pricing model, financial planning, working capital management.

PUBH 7537. Health Finance II. (; 3 cr.; A-F only; Every Fall)


PUBH 7541. Statistics for Health Management Decision Making. (3 cr.; Student Option No Audit; Every Spring)


PUBH 7542. Quality Improvement and Patient Safety. (2 cr.; A-F only; Every Fall)

Almost 20 years ago in the United States the Institute of Medicine published To Err is Human, transparently noting that between 44,000 and 98,000 people in that country die every year as a result of medical errors; further research has shown that patients in all countries are subject to unintended harm as a result of their interaction with our healthcare systems. Not only are these errors devastating to those who have them, they harm providers and cost billions of dollars a year. Additionally, as the healthcare landscape shifts rapidly from one build upon volume to a value-based system, health systems and countries face an ever more urgent need to improve quality and safety for the populations they serve. This course will review the role of the health system leader in addressing the challenge of improving quality, safety, and value. Modules will specifically address: an overview of quality improvement and patient safety, data and common improvement models, patient safety techniques, the administrator's role in the creation of the culture of safety, future trends in quality, safety, and value. Course Goals: a. Understand the patient, system, and population impacts of the current quality and safety challenges faced by healthcare b. Describe common models used for improvement work c. Understand the role that providers and health system leaders play in quality improvement and patient safety efforts d. Utilize common tools of quality and safety e. Balance system and personal responsibilities in quality improvement and patient safety f. Be familiar with common terminology and techniques such as PDSA. Lean, RCA, and Six Sigma Course is reserved for students enrolled in Executive Masters in Healthcare Administration Program ? School of Public Health.

PUBH 7547. Health Care Human Resource Management. (2 cr.; A-F only; Every Fall)


PUBH 7551. Principles of Management in Health Services Organizations. (2 cr.; A-F only; Every Spring)

Understanding of/improvement in competencies of managers in organizations, particularly as applied to health services/public health organizations.

PUBH 7553. Health Care Management Ethics. (1 cr. ; max 2 cr.; A-F only; Every Fall)

Ethical issues faced by health care managers as leaders of organization, members of profession, coordinators of clinical processes. Perspectives of managerial, organizational, professional, clinical ethics.

PUBH 7554. Health Care Strategy and Marketing. (3 cr.; A-F only; Every Summer)


PUBH 7555. Topics in Health Economics. (2 cr.; A-F only; Every Summer)

General principles of health economics applied to issues in health. Implications for health policy.

PUBH 7556. Health and Health Systems. (2 cr.; A-F only; Every Spring)


PUBH 7560. Operations Research and Health Policy. (2 cr.; A-F only; Every Fall)

Using systems perspective to develop models to analyze/improve health care operations. Identifying data needs/sources to model structures, processes, outcomes of care.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester Availability</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>PUBH 7562</td>
<td>Information Technology in Health Care.</td>
<td>2 cr.</td>
<td>A-F only; Every Summer</td>
<td>Managing information as a strategic resource within health care organizations. Designing information technology systems to capture, combine, transform information to measure processes/outcomes of care, support collaborative clinical decision making, support management decisions.</td>
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<tr>
<td>PUBH 7565</td>
<td>Health Care Delivery, Design &amp; Innovation.</td>
<td>2 cr.</td>
<td>A-F only; Every Spring</td>
<td>Designing_CREATING new care delivery services/ experiences. Exploiting opportunities for innovation. Overcoming obstacles. Capturing value.</td>
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<tr>
<td>PUBH 7566</td>
<td>The Henry Capstone: Core Concepts in Managing Health Care Organizations.</td>
<td>2 cr.</td>
<td>S-N only; Every Fall</td>
<td>Seminar course supporting students as they complete capstone project.</td>
</tr>
<tr>
<td>PUBH 7568</td>
<td>Interdisciplinary Teamwork in Health Care.</td>
<td>2 cr.</td>
<td>A-F only; Every Summer</td>
<td>Develops skills to function in inter-professional teams by using knowledge of various health care professions, principles of teamwork, knowledge of teams as they function in health care. Team formation, leading teams, decision making in teams, managing conflict in teams.</td>
</tr>
<tr>
<td>PUBH 7569</td>
<td>Health Care Policy.</td>
<td>1 cr.</td>
<td>A-F only; Every Summer</td>
<td>Public policy environment surrounding health care/public health systems. Political context of health policy. Approaches to policy formation/analysis. Tools/strategies for influencing health policy outcomes.</td>
</tr>
<tr>
<td>PUBH 7570</td>
<td>Healthcare Administration.</td>
<td>1-4 cr.</td>
<td>A-F only; Every Fall &amp; Spring</td>
<td>Selected readings in healthcare administration. Discussion based on readings. prerequisite: dept consent</td>
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<tr>
<td>PUBH 7571</td>
<td>Organizational Integration in Health Care Delivery.</td>
<td>2 cr.</td>
<td>A-F only; Every Fall</td>
<td>Introduction to integrated healthcare and integrated health systems. Design, governance, operations, strategy, and the models for effectively integrating and aligning physicians and other medical professionals in interprofessional teams.</td>
</tr>
<tr>
<td>PUBH 7572</td>
<td>Health Care Strategies in Competitive Markets.</td>
<td>2 cr.</td>
<td>A-F only; Every Spring</td>
<td>Application/understanding of competitive strategy. Prominent theories/models for health care markets.</td>
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<tr>
<td>PUBH 7573</td>
<td>Managing the Embedded Medical Practice.</td>
<td>2 cr.</td>
<td>A-F only; Every Fall</td>
<td>Build competencies in areas of design, strategy, operations, finance for embedded medical practice.</td>
</tr>
<tr>
<td>PUBH 7576</td>
<td>Legal Considerations in Health Services Organizations.</td>
<td>2 cr.</td>
<td>A-F only; Every Summer</td>
<td>Laws affecting administration of hospitals/other healthcare organizations. Administrative law, corporate/business law, labor law, civil liability, tax-related issues. Legal issues relevant to administration, decision making, planning.</td>
</tr>
<tr>
<td>PUBH 7580</td>
<td>Organizational Management in Long Term Care.</td>
<td>1 cr.</td>
<td>A-F only; Every Fall</td>
<td>Overview of organizational management and human resource management in long-term care setting from senior manager's perspective. Combines three days of on-campus seminars with independent study.</td>
</tr>
<tr>
<td>PUBH 7581</td>
<td>Supports and Services for Long Term Care.</td>
<td>1.5 cr.</td>
<td>A-F only; Every Spring</td>
<td>Organization, operations, functions, services, and programs of nursing facilities.</td>
</tr>
<tr>
<td>PUBH 7582</td>
<td>Practicum in Long-Term Care Administration.</td>
<td>4 cr.</td>
<td>S-N or Audit; Every Fall, Spring &amp; Summer</td>
<td>Students apply knowledge to practice of long-term care administration, under guidance of an instructor. prerequisite: [7580, 7581, 7583] or [7587, 7588]</td>
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<tr>
<td>PUBH 7583</td>
<td>Managerial Accounting in Long-Term Care Administration.</td>
<td>4 cr.</td>
<td>A-F or Audit; Every Spring</td>
<td>Advanced managerial accounting. Financial statement analysis, strategic planning, costing, control. Planning for capital needs in long-term care administration. Specific applications made to Minnesota State Medicaid reimbursement, Rule 50 cost reporting, nursing home industry standards, and budgeting process. Five days of on-campus seminars are combined with independent study. prerequisite: Introductory accounting</td>
</tr>
<tr>
<td>PUBH 7584</td>
<td>Health Care and Medical Needs.</td>
<td>1 cr.</td>
<td>A-F only; Every Fall</td>
<td>Differentiation between aging process and disease process. Common conditions/diseases associated with aging.</td>
</tr>
<tr>
<td>PUBH 7585</td>
<td>Community Health Care Leadership Development I.</td>
<td>5-10 cr.</td>
<td>A-F or Audit; Periodic Summer</td>
<td>Nine-month program including on-campus (two weeks) plus off-campus study including seminars and monthly dialogues with mentors. Community development of health. Cultural meaning of community. Analyzing economic/political foundations of health. prerequisite: Member of a community health care group</td>
</tr>
<tr>
<td>PUBH 7586</td>
<td>Community Healthcare Leadership Development II.</td>
<td>5-10 cr.</td>
<td>A-F or Audit; Periodic Summer</td>
<td>Nine-month program including on-campus (two weeks) plus off-campus study including seminars and monthly dialogues with mentors.</td>
</tr>
</tbody>
</table>

Innovative community health development. Leading implementation of change. Networking with national/international health communities. prerequisite: Member of a community healthcare group

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester Availability</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBH 7587</td>
<td>Regulatory Management in Long-Term Care.</td>
<td>1 cr.</td>
<td>A-F or Audit; Every Summer</td>
<td>Funding mechanisms, regulatory compliance mechanisms, and legal provisions currently in force for long-term care industry.</td>
</tr>
<tr>
<td>PUBH 7588</td>
<td>Information Uses in Long-Term Care.</td>
<td>2 cr.</td>
<td>A-F or Audit; Every Fall</td>
<td>Accumulation/analysis of data to inform management decision-making in long-term care. One day on-campus seminar, independent study. prerequisite: Some knowledge of computers</td>
</tr>
<tr>
<td>PUBH 7589</td>
<td>Human Resource Management in Long Term Care.</td>
<td>0.5 cr.</td>
<td>A-F only; Every Fall</td>
<td>Covers workplace culture, accountability and fairness, and just and learning culture concepts.</td>
</tr>
<tr>
<td>PUBH 7590</td>
<td>Gerontology for Healthcare Managers.</td>
<td>1 cr.</td>
<td>A-F only; Every Spring</td>
<td>Covers physical, biological, social, and psychological aspects of the aging process.</td>
</tr>
<tr>
<td>PUBH 7591</td>
<td>Independent Study: Health Care Administration.</td>
<td>1-4 cr.</td>
<td>A-F or Audit; Periodic Spring &amp; Summer</td>
<td>Independent study supervised by a health care administration faculty member. prerequisite: instr consent</td>
</tr>
<tr>
<td>PUBH 7592</td>
<td>Healthcare Law.</td>
<td>0.5 cr.</td>
<td>A-F only; Every Summer</td>
<td>Covers legal and regulatory issues related to the operation of long-term care service delivery organizations.</td>
</tr>
<tr>
<td>PUBH 7596</td>
<td>Clerkship in Health Care Administration.</td>
<td>2 cr.</td>
<td>A-F or Audit; Periodic Spring &amp; Summer</td>
<td>Survey/solution of management problems within a local health services organization. Preparation of formal management report. prerequisite: 6544, health care admin student</td>
</tr>
<tr>
<td>PUBH 7598</td>
<td>Community Health Care Leadership Development II.</td>
<td>5-10 cr.</td>
<td>A-F or Audit; Periodic Summer</td>
<td>Nine-month program including on-campus (two weeks) plus off-campus study including seminars and monthly dialogues with mentors. Community development of health. Cultural meaning of community. Analyzing economic/political foundations of health. prerequisite: Member of a community health care group</td>
</tr>
<tr>
<td>PUBH 7599</td>
<td>Applied Practice Experience: Maternal and Child Health.</td>
<td>1-5 cr.</td>
<td>S-N only; Every Fall &amp; Summer</td>
<td>MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student's educational and professional goals. prerequisite: Maternal/child health program, instr consent</td>
</tr>
</tbody>
</table>

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
PUBH 7710. Setting Priorities and Framing Public Health Issues. (2 cr. [max 6 cr.]; A-F only; Every Spring)
The course is designed to develop the skills required to define researchable policy questions, critically analyze policy issues and problems, articulate relevant policy options and bring research and data to help frame decision-making. Additionally, this course will familiarize students with the governmental public health system in the United States. In the field of public health policy, there are always multiple sides to every issue and complex political and socio-economic dynamics that create a certain level of uncertainty about what to do. This complexity makes predicting outcomes and making recommendations for policy solutions difficult. Yet decisions still need to be made and are often made given the best information available at that particular time. Providing recommendations based on an analysis of available evidence is an important part of any decision-making process. Through the use of varied writing and presentation exercises students will learn to identify issues, develop problem statements, define an audience and analyze an issue based on a set of key criteria.

PUBH 7730. Public Health Laws, Rules, and Regulations. (1 cr. [max 3 cr.]; A-F only; Every Spring)
This course will address basic concepts of public health law and the legal bases for the existence and administration of public health programs. Balancing the legal aspects of current public health issues, controversies, individual rights, and the regulatory role of government in health service systems will be considered.

PUBH 7740. Leadership and Leading Change. (2 cr. [max 6 cr.]; A-F only; Every Fall)
Leadership and Leading Change, is designed for E-PHAP students who aspire to be effective leaders and effective change agents in multi-sectoral contexts. The health care sector organizations discussed will include a variety of public health settings, care delivery organizations and others including government, private and public organizations across multiple sectors. Students explore the core concepts of leadership theory and the principles of change in organizational, community, political, social, and global settings. They use a self-assessment instrument to understand their own strengths and areas for improvement as a leader and the results of that assessment to develop a personal leadership development plan. The readings are books and articles from the general leadership literature, from the change management literature, and from public health teaching cases. In this hybrid course, the face-to-face portion includes small group discussions, guest speakers, exercises and class discussions that focus on applying concepts from the readings to a variety of settings. Students participate in small discussion groups; each small group will have an opportunity to lead a class discussion on assigned reading materials and their application to leadership in health care settings today. The on-line portion of the course focuses on principles of change and change strategies for public health leaders. Students post reflection notes and engage in discussion with colleagues on course content to critique, comment on relationships between concepts, and to provide personal reflections on the material as the course progresses through the on-line weeks. The in-person portion of the course ends with an assigned paper, the personal leadership development plan. Finally, students choose one of two options for their final course paper: (1) a critique of a change project and leadership from the field, or (2) a personal project plan that demonstrates application of change and leadership strategies.

PUBH 7784. Master’s Project Seminar: PHAP and HSRP&SA. ( ; 1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
Students participate in exercises to improve written/verbal communication, enhance skills related to giving constructive feedback. Ways that public health administration/policy is practiced. How to integrate knowledge into individually designed master’s project, prereq: Public health administration/policy major or health services research/policy/administration major

PUBH 7791. Independent Study: Public Health Administration and Policy. ( ; 1-6 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer)
Independent study supervised by a public health administration and policy faculty member. prereq: Public health administration/policy major, instr consent

PUBH 7794. Integrative Learning Experience: Public Health Administration and Policy. ( ; 2-3 cr.; S-N or Audit; Every Fall, Spring & Summer)
MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student’s educational and professional goals, prereq: Public health administration/policy program, instr consent

PUBH 7796. Applied Practice Experience: Public Health Administration and Policy. ( ; 2 cr.; S-N only; Every Fall, Spring & Summer)
MPH students are required to complete a supervised Applied Practice Experience (APEX). Students must address five competencies and must submit two products that demonstrate attainment of the competencies. prereq: public health administration and policy student, instr consent

PUBH 7894. MS in Health Services Research, Policy, and Administration Plan B Project. (1-5 cr. [max 10 cr.]; S-N only; Every Spring)
Plan B project. prereq: [Health Services Research, Policy/Administration] MS student

PUBH 7991. Independent Study: Public Health Nutrition. ( ; 1-4 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Independent study supervised by a Public Health Nutrition faculty member. prereq: [PubH Nutr MPH student or Nutr grad student], instr consent

PUBH 7994. Integrative Learning Experience: Public Health Nutrition. ( ; 1-6 cr.; S-N only: Every Fall, Spring & Summer)
MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students in consultation with faculty select foundational and concentration-specific competencies appropriate to the student’s educational and professional goals, prereq: PubH Nutr program, instr consent

PUBH 7996. Field Experience: Public Health Nutrition. ( ; 1-6 cr.; S-N only: Every Fall, Spring & Summer)
Supervised public health nutrition field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems, prereq: Public health nutrition major, dept consent

PUBH 8100. Topics: Applied Analyses of Occupational Health Data. ( ; 1-4 cr. [max 80 cr.]; Student Option; Every Fall, Spring & Summer)
New course offerings or topics of interest in environmental health, prereq: Doctoral student in occupational health studies. Prior coursework in epidemiology, statistics

PUBH 8120. Occupational Health and Safety Research Seminar. ( ; 1 cr. [max 12 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Facilitates student research training in occupational injury prevention. Roundtable discussions, interdisciplinary involvement, prereq: [6120, [6330 or 6341], 6450, environmental health major, [OIPRTP specialty or equiv]] or instr consent

PUBH 8140. Validity Concepts in Epidemiologic Research. ( ; 2 cr.; S-N only; Every Fall)
Conceptual basis for validity in observational epidemiologic research. Recognizing, evaluating, preventing, and correcting for confounding results of specification error, measurement-error bias, and selection/follow-up bias.

PUBH 8141. Doctoral Seminar in Observational Inference. ( ; 2 cr. [max 20 cr.]; S-N or Audit; Every Fall & Spring)

PUBH 8142. Epidemiologic Uncertainty Analysis. ( ; 2 cr.; S-N only; Every Spring)
Scientific interpretation of statistical analysis as dependent on both data and assumptions. Techniques that enable an investigator to incorporate uncertainty about assumptions into a quantitative analysis, prereq: 8140
**PUBH 8160. Advanced Toxicology.** (2 cr.; A-F only; Every Fall)
Cellular/molecular mechanisms by which xenobiotics cause toxicity. Investigative approaches to current research problems in toxicology/carcinogenesis. Apoptosis, cell cycle regulation, genetic toxicology, molecular mechanisms of chemical carcinogenesis, genetic basis for susceptibility to environmental toxicants. prereq: 6160, one course in biochem, one course in molecular biol, instr consent

**PUBH 8161. Current Literature in Toxicology.** (1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Modern methods in toxicology, critical thinking skills. Topics vary each semester. Students read and discuss toxicological literature.

**PUBH 8162. Chemical Carcinogenesis and Chemoprevention.** (3 cr.; A-F or Audit; Periodic Fall)
Fundamental background in chemical carcinogenesis, carcinogen activation/detoxification, carcinogen-DNA adduct formation, cellular oncogenesis, cancer chemoprevention, nutrition/cancer. Topics integrated/interspersed. prereq: [BioC 3081, BioC 3021, BioC 4351 or equiv.], [Chem 2302 or equiv]

**PUBH 8163. Toxicology.** (5 cr.; A-F only; Every Fall)
Biological/physiological principles that govern toxicological methods. prereq: Enrolled in toxicology concentration of environmental health PhD program

**PUBH 8165. Current Topics in Toxicology.** (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Seminars presented by students/faculty in toxicology grad program. prereq: [Environmental health PhD, toxicology concentration] student or instr consent

**PUBH 8166. Experiences in Toxicology Research.** (3 cr.; A-F only; Every Spring)
Students complete research projects in labs of toxicology program graduate faculty members. prereq: Environmental health PhD student in toxicology concentration

**PUBH 8170. Advanced Industrial Hygiene Applications.** (2 cr.; A-F or Audit; Periodic Fall)
Recognition, evaluation, and control of occupational health/safety hazards. Application of concepts to specific industrial hygiene problems related to gases/vapors, aerosols, and physical agents. prereq: 5170, eh grad major

**PUBH 8194. Directed Research: Environmental Health.** (1-6 cr.; Student Option; Every Fall, Spring & Summer)
Research, with direction from faculty member, in environmental/occupational stresses on human health. prereq: instr consent

**PUBH 8300. Topics: Epidemiology.** (1-4 cr. [max 80 cr.]; Student Option; Periodic Fall, Spring & Summer)
New course offerings or topics of interest in epidemiology.

**PUBH 8333. FTE: Master’s.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

**PUBH 8341. Advanced Epidemiologic Methods: Concepts.** (3 cr.; Student Option; Every Fall)
Conceptual foundations of fundamental issues in epidemiologic methodology. How/why a given method, design, or approach might help explain population health. Strengths, limits, and potential alternatives for a given approach.

**PUBH 8342. Advanced Epidemiologic Methods: Applications.** (3 cr.; Student Option; Every Spring)
Applied methodology course designed for students in the Epi PhD program. Examples and readings are aimed at clinical/biological and social/behavioral track students.

**PUBH 8343. Synthesis and Application of Methods in Epidemiologic Research.** (4 cr.; Student Option; Every Fall)
Focusses on the extension, synthesis, and integration of research methods taught in the advanced epidemiology methods sequence (PUBH 8341 and PUBH 8342) and the application of these methods. Discussion of novel methods such as causal inferences related to the g-formula and penalized regression. Fosters a deeper understanding of current epidemiologic methods and how they are actually implemented in research.

**PUBH 8392. Readings in Clinical Research.** (1-4 cr.; Student Option; Every Fall, Spring & Summer)
Current readings in clinical research. prereq: Clinical research major, instr consent

**PUBH 8393. Directed Study: Clinical Research.** (1-4 cr.; max 20 cr.; Student Option; Every Fall, Spring & Summer)
Directed research or field practice in clinical research. prereq: Clinical research major, instr consent

**PUBH 8394. Plan B Project: Clinical Research.** (10 cr.; S-N only; Every Fall, Spring & Summer)
Directed research toward completion of culminating experience project in clinical research.

**PUBH 8400. Topics: Biostatistics.** (0.5-4 cr. [max 20 cr.]; Student Option; Periodic Fall, Spring & Summer)
Topics of interest.

**PUBH 8401. Linear Models.** (4 cr.; Student Option; Every Fall)
Theory/application of statistical techniques for regression analysis. Computing for linear models. Modeling, computation, data analysis. prereq: [7405, concurrent registration is required (or allowed) in STAT 8101 or instr consent], calculus, familiar with matrix/linear algebra

**PUBH 8403. Research Skills in Biostatistics.** (1 cr.; S-N only; Every Fall)
Introduces research skills necessary for writing/defending dissertation, career in research.

**PUBH 8432. Advanced Bayesian Decision Theory and Applications.** (3 cr.; No Grade Associated; Every Fall)
Overview of inferential methods needed for biostatistical research. Topics without overt reliance on measure-theoretic concepts. Classic likelihood inference, asymptotic distribution theory, robust inferential methods (M-estimation). prereq: Stat 8101-8102 or equivalent, students should be comfortable with multivariate normal distribution/have some introduction to convergence concepts

**PUBH 8422. Advanced Nonparametric Models for Biostatistics.** (3 cr.; Student Option; Every Fall)
Classical nonparametric inference, exact tests, and confidence intervals. Robust estimates. The jackknife, Bootstrap and cross-validation. Nonparametric smoothing and classification trees. Models/applications. Formal development sufficient for understanding statistical structures/properties. Substantial computing, prereq: [7406, STAT 5102, public health or grad student] or instr consent

**PUBH 8435. Linear Variable Measurement Models and Path Analysis.** (3 cr.; Student Option; Every Fall)
Introduction to use of statistical techniques known collectively as latent variable models. Exploratory/confirmatory factor analysis, path analysis, structural equation modeling, latent trait models, latent class models. SAS/AMOS software are used. prereq: Biostatistics PhD student or instr consent

**PUBH 8442. Bayesian Decision Theory and Data Analysis.** (3 cr.; Student Option; Every Spring)
Theory/application of Bayesian methods. Bayesian methods compared with traditional, frequentist methods. prereq: [7460 or experience with FORTRAN or with [C, S+]], Stat 5101, Stat 5102, Stat 8311, grad student in [biostatistics or statistics] major or instr consent

**PUBH 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**PUBH 8445. Statistics for Human Genetics and Molecular Biology.** (3 cr.; Student Option; Every Spring)
Introduction to statistical problems arising in molecular biology. Problems in physical
mapping (radiation hybrid mapping, DDP), genetic mapping (pedigree analysis, lod scores, TDT), biopolymer sequence analysis (alignment, motif recognition), and micro array analysis. prereq: [[Stat 8101, Stat 8102] or equiv]. PhD student or instr consent: some background with molecular biology desirable

**PUBH 8446. Advanced Statistical Genetics and Genomics.** (3 cr.; Student Option; Every Spring)
Genetic mapping of complex traits in humans, modern population genetics with an emphasis on inference based observed molecular genetics data, association studies; statistical methods for low/high level analysis of genomic/proteomic data. Multiple comparison and gene network modeling. prereq: [7445, statistical theory at level of Stat 5101-2; college-level molecular genetics course is recommended] or instr consent

**PUBH 8452. Advanced Longitudinal Data Analysis.** (3 cr.; Student Option; Every Spring)
Methods of inference for outcome variables measured repeatedly in time or space. Linear/nonlinear models with either normal or non-normal error structures. Random effects. Transitional/marginal models with biomedical applications. prereq: [Stat 5102, Stat 8311, experience with [SAS or S-]], advanced [biostats or stat] student or instr consent

**PUBH 8462. Advanced Survival Analysis.** (3 cr.; Student Option; Periodic Fall & Spring)

**PUBH 8472. Spatial Biostatistics.** (3 cr.; Student Option; Periodic Fall & Spring)
Spatial data, spatial statistical models, and spatial inference on unknown parameters or unobserved spatial data. Nature of spatial data. Special analysis tools that help to analyze such data. Theory/applications. prereq: [[Stat 5101, Stat 5102] or [Stat 8101, Stat 8102]], some experience with S-plus; Stat 8311 recommended

**PUBH 8475. Statistical Learning and Data Mining.** (3 cr.; Student Option; Periodic Spring)
Statistical techniques for extracting useful information from data. Linear discriminant analysis, tree-structured classifiers, feed-forward neural networks, support vector machines, other nonparametric methods, classifier ensembles (such as bagging/boosting), unsupervised learning. prereq: [[[6450, 6451, 6452] or Stat 5303 or equiv], [biostatistics or statistics PhD student]] or instr consent

**PUBH 8482. Sequential and Adaptive Methods for Clinical Trials.** (3 cr.; Student Option; Every Fall & Spring)
Statistical methods for design/analysis of sequential experiments. Wald theorems, stopping times, martingales, Brownian motion, dynamic programming. Compares Bayesian/frequentist approaches. Applications to interim monitoring of clinical trials, medical surveillance. prereq: Stat 8101-8102 or equivalent, [students should be comfortable with the multivariate normal distribution or instr consent]

**PUBH 8485. Methods for Causal Inference.** (3 cr.; Student Option; Every Fall)
Although most of statistical inference focuses on associational relationships among variables, in many biomedical and health sciences contexts the focus is on establishing the causal effect of an intervention or treatment. Drawing causal conclusions can be challenging, particularly in the context of observational data, as treatment assignment may be confounded. The first part of this course focuses on methods to establish the causal effect of a point exposure, i.e., situations in which treatment is given at a single point in time. Methods to estimate causal treatment effects will include outcome regression, propensity score methods (i.e., inverse weighting, matching), and doubly robust approaches. The second half of the course focuses on estimating the effect of a series of treatment decisions during the course of a chronic disease such as cancer, substance abuse, mental health disorders, etc. Methods to estimate these time-varying treatments include marginal structural models estimated by inverse probability weighting, structural nested models estimated by G-estimation, and the (parametric) G-computation algorithm. We will then turn our attention to estimating the optimal treatment sequence for a given subject, i.e., how to determine “the right treatment, for the right patient, at the right time,” using dynamic marginal structural models and methods derived from reinforcement learning (e.g., Q-learning, A-learning) and classification problems (outcome weighted learning, C-learning).
PUBH 8485 is appropriate for PhD students in Biostatistics and Statistics. The homework and projects will focus more on the theoretical aspects of the methods to prepare students for methodological research in this area. PUBH 7485 is appropriate for Masters students in Biostatistics and PhD students in other fields who wish to learn causal methods to apply them to topics in the health sciences. This course uses the statistical software of R, a freely available statistical software package, to implement many of the methods we discuss. However, most of the methods discussed in this course can be implemented in any statistical software (e.g., SAS, Stata, SPSS, etc.) and students will be free to use any software for homework assignments.

**PUBH 8492. Theories of Hierarchical and Other Richly Parameterized Linear Models.** (3 cr.; A-P only; Spring Odd Year)

**PUBH 8494. Directed Research: Biostatistics.** (1-4 cr.; S-N only; Every Fall, Spring & Summer)
Research, with direction from a faculty member, in biostatistics. prereq: instr consent

**PUBH 8666. Doctoral Pre-Thesis Credits.** (1-6 cr.; max 12 cr.) No Grade Associated; Every Fall, Spring & Summer
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**PUBH 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**PUBH 8800. Topics in Health Services Research and Policy.** (1-4 cr.; max 20 cr.; Student Option; Periodic Fall, Spring & Summer)
Topics and credit vary by instructor.

**PUBH 8801. Health Services Policy Analysis: Theory.** (3 cr.; Student Option; Every Fall)
Integrated overview of U.S. health services policy. Related theoretical/empirical literature. Analysis of alternative policy-making models, political/philosophical underpinnings of those models. prereq: [Grad or professional school] student or instr consent

**PUBH 8802. Health Services Policy Analysis: Applications.** (2 cr.; A-F or Audit; Every Spring)
Emphasizes relationships between health services research/policy. Uses case studies to examine how research influences policy/vice versa.

**PUBH 8803. Long-Term Care: Principles, Programs, and Policies.** (2 cr.; Student Option; Periodic Spring)
Long-term care policy for functionally impaired persons, particularly the elderly. Team taught from healthcare and social services perspective; grounded in research literature on evidence of program effects. Innovative programs addressing current fragmentation of services. prereq: Grad-level health-care policy course or instr consent

**PUBH 8804. Advanced Quantitative Methods Seminar.** (3 cr. [max 6 cr.]; Student Option; Spring Even Year)
Understand/competently use advanced quantitative methods in applied social science, policy, demographic research. Methods considered largely within or related to framework of regression analysis. Effort will be made to reflect interests of class. prereq: This is an advanced, doctoral-level course.
Students are expected to have completed a full year of doctoral-level introductory statistical and/or econometric classes in their respective field prior to enrolling in this course (e.g., PUBH 7401-2, ApEc8211-2, SOC 8801-8811). Exceptions may be granted with instr consent.

**PUBH 8805. Sociological Theory in Health Services Research.** (; 3 cr.; Student Option; Every Fall) Overview of sociological theories in medical sociology, occupations/professions. Emphasizes teaching students how to apply theories to health/social phenomena of their own interest/choice.

**PUBH 8806. Sociology of Health Occupations and Organizations.** (; 3 cr.; Student Option; Every Fall & Spring) Sociological theories of occupations/organizations as applied to health care. Functional, conflict, evolutionary theories applied to health care reorganization such as managed care, technology on organization of work/occupations. Emphasizes application of theories to develop hypotheses, prereq: Harpconcurrent registration is required (or allowed) in a grad major or instr consent

**PUBH 8810. Research Studies in Health Care.** (; 3 cr.; [max 6 cr.]; Student Option; Every Fall) Introduction to philosophy of science, conceptual modeling, experimental design, survey/sample design, issues relevant to health services research, prereq: [Grad or professional school] student or instr consent

**PUBH 8811. Research Methods in Health Care.** (; 3 cr.; Student Option; Every Fall & Spring) Research methods commonly used in analysis of health services research and health policy problems, prereq: [8810, [grad or professional school] student] or instr consent

**PUBH 8813. Measurement of Health-Related Social Factors.** (; 3 cr.; A-F or Audit; Every Fall & Spring) How social factors such as innovativeness, compliance, religiosity, and stress are measured and tested for reliability and validity. Relationships between theory, concepts, variables, data, prereq: Intro stat course, understanding of simple correlations or instr consent

**PUBH 8820. Health Economics I.** (; 3 cr.; A-F or Audit; Every Spring) Application of microeconomic theory to healthcare decisions of consumers and producers under different assumptions about market structure and behavior, prereq: One course each in intermediate microeconomics, calculus, intro to linear algebra

**PUBH 8821. Health Economics II.** (; 3 cr.; A-F or Audit; Every Fall & Spring) Examines application of microeconomic theory to health services research through selected reading from published and unpublished health economics literature, prereq: 8820 or instr consent

**PUBH 8830. Writing for Research.** (; 2 cr.; Student Option No Audit; Every Fall) Two-course sequence. Writing research grants/papers. Writing skills appropriate to research proposals and scholarly papers. How to review, synthesize, and critique research proposals and published articles, prereq: HSRPA PhD student or instr consent

**PUBH 8831. Writing for Research.** (; 2 cr.; Student Option No Audit; Every Spring) Second of two course sequence. Writing research proposals and scholarly papers. How to review, synthesize, and critique papers and research proposals, prereq: 8830

**PUBH 8836. Integration of Public Health Research Methods in Health Services Research and Policy.** (; 2 cr.; Student Option: Periodic Fall) Integration of concepts/designs of public health research methods, how they can be integrated into health services research and policy analysis. Experiential learning opportunities in clinical settings that illustrate need for integration, prereq: Professional school or grad student or instr consent

**PUBH 8888. Thesis Credit: Doctoral.** (; 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required: For Environmental Health Students ONLY: Contact Director of Graduate Studies and the Graduate Student Coordinator.

**PUBH 8893. Directed Study: Health Services Research, Policy, and Administration.** (; 1-3 cr.; Student Option; Every Fall, Spring & Summer) tbd prereq: HSRPA grad student, instr consent

**PUBH 8894. Directed Research: Health Services Research, Policy, and Administration.** (; 1-8 cr.; Student Option; Every Fall, Spring & Summer) tbd prereq: HSRPA grad student, instr consent

### Radiology (RAD)

**RAD 7101. Externship in Radiology.** (; 4 cr.; H-N only; Every Fall, Spring & Summer) The student gains an appreciation for the radiologic examination, its capabilities, limitations, and hazards, and will be offered a review of fundamental physical and basic science aspects of the subject. The student learns how to work with technical and other auxiliary personnel. Emphasis is on how to approach radiologic diagnosis and work with the clinician in a radiologic consultation service. There is observation and participation in daily interpretation of films, fluoroscopy, and special procedures.

**RAD 7110. Radiology Research.** (; 2-8 cr.; [max 16 cr.]; H-N only; Every Fall, Spring & Summer) After consultation with staff, the student performs well-defined, radiologic-related research projects adjusted to the student's level of experience and interest.

**RAD 7140. Special Problems: Roentgenology.** (; 1-15 cr.; H-N or Audit; Every Fall, Spring & Summer) N/A prereq: enrolled med

**RAD 7172. Radiation Biology.** (; 2 cr.; H-N or Audit; Every Fall, Spring & Summer) N/A prereq: enrolled med

**RAD 7240. Special Problems: Nuclear Medicine.** (; 1-15 cr.; H-N or Audit; Every Fall, Spring & Summer) N/A prereq: enrolled med

**RAD 7400. Interventional Radiology.** (4 cr.; H-N only; Every Fall, Spring & Summer) Dedicated elective for prospective students to become familiar with interventional radiology and understand the clinical scope and research possibilities available in Interventional Radiology.

**RAD 7511. Roentgen Technique.** (; 1 cr.; H-N or Audit; Every Fall) N/A prereq: enrolled med

**RAD 7530. Nuclear Medicine.** (; 4 cr.; H-N only; Every Fall, Spring & Summer) Provides the student with a better understanding of the various uses of radioactive materials in the practice of medicine.

**RAD 7540. Special Problems: Radiological Physics.** (; 1-15 cr.; H-N or Audit; Periodic Fall) N/A prereq: enrolled med

**RAD 7910. Radiology Medical Residency.** (; 6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Radiology medical residency.

**RAD 7930. Radiology Medical Fellowship.** (; 6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Radiology medical fellowship.

**RAD 8200. Nuclear Medicine.** (; 1-15 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: 1st-yr resident

**RAD 8210. Fundamentals of Nuclear Medicine.** (; 1 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled med

**RAD 8250. Research: Nuclear Medicine.** (; 1-15 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled med

**RAD 8450. Research: Radiation Biology.** (; 1-15 cr.; Student Option; Every Fall, Spring & Summer) N/A prereq: enrolled med
Recreation Administration (REC)

REC 1501. Orientation to Leisure and Recreation. (3 cr.; A-F only; Every Fall & Spring)
Opportunities to explore field of recreation/role it plays in society/human development. Visit recreation facilities representing public, quasi-public, for-profit agencies. Overview of recreation field/foundation for continuing on to more advanced recreation courses.

REC 1600. Topics in Recreation Administration. (1-4 cr. [max 9 cr.]; Student Option No Audit; Periodic Fall & Spring)
Topics related to the understanding of the Recreation Industry which may include historical perspectives and philosophical foundations as well as contemporary issues and challenges.

REC 2151. Outdoor and Camp Leadership. (3 cr.; A-F only; Every Spring)
Practical/theoretical study of leading/educating diverse groups in outdoor settings. Outdoor leadership skills, styles/methods, how these translate to general leadership methods in other settings/careers. How leadership styles impacts learning processes.

REC 3281. Research and Evaluation in Recreation Administration. (4 cr.; A-F only; Every Fall)
Social research/evaluation methodology. Survey of present status of recreation/park research, evaluation. prereq: Rec major or instr consent

REC 3321. Outdoor Recreation 3-Season Skills. (3 cr.; A-F only; Every Fall)
Introduction to essential outdoor technical skills as they relate to outdoor leadership and programming. Focus on teaching students to lead/instruct in outdoor classroom. prereq: Student will not receive credit if they have previously taken REC 4900/5900 - Special Topics with this topic title

REC 3322. Outdoor Recreation Winter Skills. (3 cr.; A-F only; Every Spring)
Introduction to essential winter technical skills as they relate to outdoor leadership/programming. Focus on teaching students to lead/instruct in outdoor classroom. prereq: Student will not receive credit if they have previously taken REC 4900/5900 - Special Topics with this topic title

REC 3541W. Recreation Programming. (WI; 3 cr.; A-F only; Every Fall)
Methods, skills, materials needed for planning, developing, implementing, evaluating professional recreation programs for diverse populations in various settings. prereq: REC major or instr consent

REC 3551. Recreation Administration and Finance. (4 cr.; A-F only; Every Spring)
Principles/practices of financing/managing leisure service agencies in public/private sector. prereq: rec major

REC 3601W. Leisure and Human Development. (WI; 3 cr.; A-F only; Every Spring)
Explore issues associated with roles of leisure throughout life span. Principles/procedures for designing programs, services, facilities relative to individual values, attitudes, identity, culture, age, gender, prereq: REC major or instr consent

REC 3796. Senior Internship in Recreation Administration. (3-9 cr.; S-N only; Every Fall, Spring & Summer)
On-the-job supervised practical experience under specialist in a field directly related to student's academic program. prereq: Rec major, completion of most core courses, sr, instr consent

REC 3993. Directed Study in Recreation Administration. (1-9 cr.; A-F only; Every Fall, Spring & Summer)
Work with faculty or grad students on research or scholarly or creative activities. Students usually assist with faculty scholarship or carry out projects under faculty supervision. Topic leads to new learning or discovery or contributes to student’s academic program. prereq: Rec major, instr consent

REC 4161. Recreation Land Policy. (3 cr.; A-F only; Every Spring)
Historical development of recreational land policy in United States. Related contemporary issues in policy, management, interpretation, research.

REC 4191. Adventure Recreation, Tourism, and Eco-Tourism. (3 cr.; A-F only; Every Spring)
Development of adventure recreation programs, including emphasis on tourism industry.

REC 4271. Community Leisure Services for Persons with Disabilities. (3 cr.; A-F only; Every Fall)
Exploration/application of concepts/techniques of normalization. Least restrictive environment strategies to leisure service delivery in inclusive community settings for range of individuals with disabilities. prereq: REC major or instr consent

REC 4301. Wilderness and Adventure Education. (4 cr. [max 12 cr.]; A-F only; Every Spring)
Rationale for, methods in applying wilderness/adventure education programs in education, recreation, corporate, human service settings. Emphasizes adventure/wilderness program management.

REC 4311. Programming Outdoor & Env Ed. (3 cr.; A-F only; Every Spring)
Methods, materials, settings for developing/conducting environmental/outdoor education programs. prereq: REC major or ORE minor or instr consent

REC 4900. Special Topics: Contemporary Issues in Leisure Services. (1-12 cr.; Student Option; Every Fall, Spring & Summer)
Contemporary issues emphasizing administrative and supervisory functions for recreation and allied professionals; individual offerings, to be determined by faculty, focus on special issues and professional groups.

Rehabilitation Science (RSC)

RSC 5058. Anatomy for Rehabilitation Science. (1-6 cr.; A-F or Audit; Every Summer)
Study of gross human anatomy through modular lecture/laboratory experiences that include cadaver dissection of extremities, head, neck, back, abdomen, thoracic, pelvic regions with correlation to clinical conditions, prereq: Student enrolled in Rehabilitation Science Program, instr consent, dept consent

RSC 5060. Lower Extremity Anatomy Intensive. (2 cr.; A-F only; Every Summer)
Intensive and focused study of lower extremity gross human anatomy for graduate students. The content is presented through lecture and laboratory experiences that include cadaver dissection of lower extremities with correlation to clinical conditions.

RSC 5065. Upper Extremity Anatomy Intensive. (2 cr.; A-F only; Every Summer)
Intensive and focused study of upper extremity gross human anatomy for graduate students. The content is presented through lecture and laboratory experiences that include cadaver dissection of upper extremities with correlation to clinical conditions.

RSC 5101. Mathematical Tools for Research Applications in Health, Rehab, and Human Movement Sciences. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer)
Quantitative research approaches in health, rehabilitation, human movement sciences. Application examples/practice problems focus of the course. Basic algebra/geometry, solving equations for unknowns, logarithmic transforms, derivatives/integrals, matrix methods, use of macros in research applications. prereq: Basic algebra, trigonometry, and geometry. Pre-calculus or calculus is helpful but not required.

RSC 5106. Introduction to Rehabilitation Science. (1 cr.; A-F or Audit; Periodic Fall)
This is one of a series of seminar courses that prepares students to think critically in reading and discussing the literature in rehabilitation science and to speak and write persuasively on scientific topics. This semester, the seminar will focus on the past, present, and future of rehabilitation science. This course will include lecture presentations from rehabilitation science faculty for the first 50 minutes of the weekly class time, as well as discussion/interaction sessions planned jointly by assigned students and faculty for the second 50 minute session each week.

RSC 5135. Advanced Biomechanics I: Kinematics. (3 cr.; A-F or Audit; Fall Odd Year)
How to describe/measure movement. Basic/advanced biomechanics, pathokinesiology, and rehabilitation literature. Lecture, lab, seminar discussion. Meets with RSC 8135. prereq: instr consent
RSC 5200. Introduction to Neuromodulation. (1-3 cr.; A-F or Audit; Fall Even Year)
This course will provide training in the theory, biophysics and evidence-based application of non-invasive magnetic and electric brain stimulation in humans. Course content will be delivered in three modules: (1) safety and administration of non-invasive brain stimulation, (2) neuromodulation methods, and (3) advanced assessment and modeling techniques. All registered students must take module #1. Testing methods will include various methods to assess intracortical, transcallosal and interhemispheric excitability. Neuromodulation methods presented will include non-invasive and invasive forms of brain stimulation. Hands-on instruction and laboratory applications will be provided for cortical excitability testing using transcranial magnetic stimulation (TMS) as well as for other non-invasive forms of brain stimulation. Those enrolled will both administer and receive non-invasive brain stimulation and will be asked to sign a consent form. Specific safety exclusion criteria for receiving non-invasive brain stimulation exist and enrollees who have questions should contact the Division of Rehabilitation Science.

RSC 5206. Academic Ethos. (1 cr.; A-F or Audit; Periodic Spring)
Explicit/implicit culture unique to academia. Early understanding within/beyond rehabilitation science. Role of higher education in society, academic freedom, tenure, corporatization of education, accreditation, globalization of education, regulatory monitoring of research, faculty scholarship/ governance.

RSC 5231. Clinical Biomechanics. (2-5 cr.; A-F Only; Every Fall)
Biomechanics. Internal/external forces/structures responsible for normal/abnormal human movement. Joint and tissue mechanics, muscle function, task analysis, and gait mechanics. Lecture and lab practice. prereq: concurrent registration is required (or allowed) in PT 6231, general physics, [intro or short] calculus, anatomy; intensive anatomy course in human cadaver dissection recommended.

RSC 5235. Advanced Biomechanics II: Kinetics. (3 cr.; A-F or Audit; Spring Even Year)
Forces that create human motion and are produced within body as a result. Measuring human motion. Clinical movement assessment, Exercise, sport, and activities of daily living. Two-dimensional rigid body dynamics models, forward/inverse dynamics solutions, hypotheses to describe whole body/joint kinetics. Lectures, lab, discussion, prereq: 5135 or equiv or instr consent

RSC 5231. Scientific Foundations: Exercise Theory. (3 cr.; A-F Only; Every Fall)
In-depth presentation of fundamental concepts in exercise physiology/exercise biochemistry related primarily to skeletal muscle, secondarily to cardiovascular system/connective tissue. Exercise/performance-enhancing ergogenic aids. prereq: Rehabilitation Science grad student

RSC 5294. Independent Study in Rehabilitation Science. (1-3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer)
Independent exploration into topics related to rehabilitation science. prereq: Rehabilitation science student or program approval

RSC 5306. Scientific and Professional Presentation. (1 cr.; A-F or Audit; Periodic Spring)
This course will focus on the process and practice of oral presentation of scientific inquiry and discoveries. These skills are essential for scientists in all disciplines, yet often guidelines for optimal scientific presentation are not taught or practiced in an educational setting. Specific areas to be covered in this course include presentation intent, audience analysis, timing, content, keys to effective communication, vocal behavior, and important things to avoid. Context will include conference-style platform or podium presentations, poster presentations, and seminar presentation. The course will involve opportunities to prepare and practice presentation skills and receive constructive feedback in a safe, supportive environment. It is appropriate for students from all disciplines and levels of PhD study.

RSC 5310. Physiology for Physical Rehabilitation. (1-5 cr.; A-F or Audit; Every Spring)
This course is designed to convey foundational information regarding human basic physiology and more advanced integrative physiology to provide the student a broad range of knowledge on how the human body works at rest, exercise, and as we age. Basic cell physiology, which serves the human body? infrastructure for function in different cell types for various organ systems, will be discussed with the major emphasis of this course being on the human body as a system. Along these lines, most of the content will relate to integrative physiology, as our systems are often redundant in regulating homeostasis. The objective of this course is to prepare the student for the study of pathophysiologic changes within the human body.

RSC 5814. Age, Exercise, and Rehabilitation. (2 cr.; Student Option; Every Fall & Summer)
Overview of normal physiological responses to exercise in the elderly. Comparison of exercise-induced responses of physiological systems throughout aging process. Focuses on importance of exercise from rehabilitation perspective. Offered Fall semesters of even-numbered years. prereq: Rehabilitation science student or program permission

RSC 5815. Scientific Foundations: Exercise Theory. (3 cr.; A-F Only; Every Fall)
This course will introduce students to collecting and processing biomedial time series data. Students will gain experience using data acquisition hardware common in many laboratories, as well as related software for acquisition of the data and digital signal processing. Data sources will include electroencephalography (EEG), electromyography (EMG), wearable sensors, and data from other systems based on the background and interests of students in the class. The overall goal of this course is to provide students with the necessary, fundamental skills to run a successful experiment, troubleshoot errors, and produce high quality data sets. prereq: prefer students to have completed general physics, introductory of short calculus

RSC 5901. Scholarly Inquiry in Health Sciences. (4 cr.; A-F or Audit; Every Spring)
How research evidence is developed, disseminated, utilized in health sciences. Qualitative/quantitative scholarly project proposal. Critique studies/peer proposals. Explore conduct of research. prereq: Three credits of undergraduate statistics. instr consent, dept consent.

RSC 8106. Critical Analysis of Scientific Literature. (2 cr.; A-F or Audit; Periodic Fall)
This course will focus on the process of critical review, appraisal, and synthesis of scientific literature. Overview of organizing and writing literature reviews for a traditional dissertation, systematic reviews, and meta-analysis. Writing skills necessary for scientific manuscripts will be included. The course will involve substantive review of the literature and writing in your anticipated area of dissertation work.

RSC 8130. Current Literature Seminar. (1-3 cr. [max 9 cr.]; A-F or Audit; Every Fall, Spring & Summer)
Critical review of literature to evaluate efficacy of selected physical therapy interventions. prereq: Grad student in PT or rehabilitation science major or instr consent

RSC 8135. Human Kinematics. (3 cr.; A-F or Audit; Fall Odd Year)
How to describe/measure movement. Basic/ applied biomechanics, pathokinesiology, and rehabilitation literature. Lecture, lab, seminar discussion. Meets in conjunction with RSC 5135. prereq: [Rehabilitation science student or program permission], instr consent

RSC 8170. Special Topics in Rehabilitation Science. (1-3 cr.; A-F or Audit; Fall Odd Year)
Topics vary by semester. Papers required.

RSC 8185. Problems in Rehabilitation Science. (1-3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Research practicum on selected topic. Use of systematic literature search. Critical analysis of scientific literature. Specific measurement systems. Data collection/reduction methods of on-going or new research projects. Preparing/defending research reports.

RSC 8188. Teaching Practicum. (1-5 cr.; A-F or Audit; Every Fall, Spring & Summer)
Supervised experience in teaching/evaluation. Effective use of instructional materials in lecture/lab courses. Students create learning objectives for teaching unit(s), conduct a review of current literature on topic, prepare/deliver presentations, compose test questions. Offered by individual arrangement with faculty, prereq: [Rehabilitation science student or program permission], instr consent
RSC 8192. Research Design in Rehabilitation Science. (4 cr.; A-F or Audit; Every Fall) The goals of this course are to develop abilities to critically evaluate peer-reviewed literature. It will also enable students to identify and apply appropriate statistical procedures, and interpret the meaning of statistical analyses. Finally, it will give students an opportunity to present the aims, methods, intended analyses, and preliminary results of their own research. Additionally, students will meet individually for 2 hours every month with the lecturer to work on the method section of a paper related to their Ph.D. project. This paper will be critically reviewed and graded as end-evaluation for this class. prereq: instr consent

RSC 8206. Grant Writing. (2 cr.; A-F or Audit; Periodic Fall) Process of applying for individual National Institutes of Health (NIH) pre-doctoral research training fellowship. Overview of NIH Program Announcement PA-11-111/NIH SF424 individual fellowship application guide required for application will be included. Substantive writing of components of NIH fellowship.

RSC 8235. Human Kinetics. (3 cr.; A-F or Audit; Spring Even Year) Forces that create human motion or are produced within body as a result of motion. Measuring kinetics of motion. Clinical movement assessment. Measuring/analyzing exercise, sport, and activities for transfer of forces within body. Two-dimensional rigid body dynamics. Forward/inverse dynamics. Hypotheses for whole body/joint kinetics. Lectures, lab experiments, discussion. Meets with RSC 5235. prereq: [5135 or equiv] or instr consent

RSC 8282. Problems in Human Movement. (4 cr.; A-F or Audit; Every Spring) Fundamental principles of neurophysiology, neurology, motor control, and motor learning as a basis for therapeutic intervention in motor dysfunction. prereq: [Rehabilitation science student or program permission], instr consent

RSC 8306. Peer Review and Publication. (2 cr.; A-F or Audit; Periodic Spring) This course will focus on the process of publication in the scientific literature, with emphasis on publication of original research. Overview of organizing and writing for publication, and the peer review process for scientific manuscripts will be included. The course will involve substantive writing practice in your anticipated area of scientific inquiry.

RSC 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

RSC 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

RSC 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

RSC 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

RSC 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credit: doctoral. prereq: Max 18 cr per semester or summer, 24 cr required; RSC doctoral student who has successfully passed the prelim written exam, dept consent

REL 1001. Introduction to the Religions of the World. (GP; 3 cr.; Student Option; Every Fall & Spring) Introduction to major religions of world/academic study of religion. Hinduism, Buddhism, Judaism, Christianity, Islam, some pre-Christian religions of Antiquity.

REL 1002. Introduction to the Study of Religions. (AH; 3 cr.; Student Option; Every Fall) Religions are complex systems that help their adherents to make sense of the world, justify certain ideas and practices, and form relationships and identities. Taking the multifaceted nature of religions into account, scholars have brought diverse questions and methodologies to the study of these systems in order to shed light on various aspects of the human condition. What is the point of religious rituals, for example? How do religions resist or facilitate the exercise of power on physical and psychological levels? How do they shape our perceptions of social markers such as race and gender? This course introduces students to the variety of approaches that scholars of religion use to arrive at a deeper understanding of the function of religions in human life.

REL 1011. Religions and American Identity in the United States from World War II to the Present. (CIV; 3 cr.; Student Option; Every Fall) Political/cultural watersheds of last 60 years. Debates within/between religious traditions/communities. How gender, race, class, sexuality have shaped relationships between religion/politics. Tensions between secularism/religiosity, liberalism/fundamentalism.

REL 1034. Introduction to Jewish History and Cultures. (HIS; 3 cr.; Student Option; Every Fall) Jewish history, society, culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, artifacts of daily life. Emphasizes political, social, cultural contexts that shaped development of Jewish ideas, practices, and institutions.

REL 1082. Jesus in History. (HIS; 3 cr.; Student Option; Every Spring) Who was Jesus? While there has been some basic consistency in the depictions of Jesus throughout history, there has also been a lot of variety. We will explore a whole host of portraits of Jesus at different points in history to demonstrate not only the varying ways that Jesus has been thought of but also to understand the relationship between these portraits and the historical and cultural contexts in which they were created. We will look at the gospels of the New Testament and some from outside the New Testament. We will look at ancient and medieval art, and we will look at modern film. Although we might not get to the bottom of who Jesus was, we might understand more fully how communities throughout history have thought about him. Intended as a course of interest to undergraduates in all colleges of the TC campus. Students of any, all, or no religious background are welcome.

REL 1201. Bible/Context & Interpretation. (LITR; 3 cr.; Student Option; Every Fall) Introduction to the modern academic study of the Old Testament/Hebrew Bible in the historical context of literature from ancient Mesopotamia. Read Babylonian Epic of Creation, Epic of Gilgamesh, Hammurabi, Genesis, Exodus, Psalms. Stories of creation, law, epic conflict, and conquest. prereq: Knowledge of Hebrew not required

REL 1544. History of Christianity I: Martyrs, Monks, Crusaders. (3 cr.; Student Option; Fall Odd; Spring Even Year) This course surveys the history of Christianity from its status as a persecuted minority religion of the Roman Empire to its dominant role in medieval Europe and Byzantium. We study Christian traditions in Asia and Africa as well as Europe with special attention to the relationship between Christianity and culture in the ancient and medieval world.

REL 1911. Islam in America: A History of the Present. (3 cr.; Student Option; Every Fall) From the “Age of Discovery” and the African slave trade, to Malcolm X and the War on Terror, Islam has long been an integral part of the American landscape. In this seminar students will examine the history of Islam and social formation of Muslim communities in the United States. We will explore the ways in which racial, national, cultural, and sectarian differences within and between Muslim communities have shaped and shifted what it means to be Muslim in the United States. And, we will ask what tracing the history of Islam can tell us about the role of religion in the United States more broadly.

RELS 3034. Introduction to Jewish History and Cultures. (HIS; 3 cr.; Student Option; Every Fall)
Jewish history, society, culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, artifacts of daily life. Emphasizes political, social, cultural contexts that shaped development of Jewish ideas, practices, and institutions.

RELS 3070. Topics in Religious Studies. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Topics specified in Class Schedule and Course Guide.

RELS 3071. Greek and Hellenistic Religions. (HIS; 3 cr.; Student Option; Fall Even Year)

RELS 3072. The Birth of Christianity. (AH; 3 cr.; Student Option; Periodic Fall & Spring)

RELS 3076. The Apostle Paul: Life, Letters, and Legacy. (3 cr.; Student Option; Fall Odd, Spring Even Year)
How/what we can know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.

RELS 3079. Muslims and Jews: Conflict and Co-existence in the Middle East and North Africa since 1700. (GP,HIS; 3 cr.; Student Option; Fall Odd Year)
Diversity of social/cultural interactions between Muslims and Jews and between Islam and Judaism since 1700. What enabled the two religious communities to peacefully coexist? What were causes of conflict? Why is history of Muslim-Jewish relations such a contested issue?

RELS 3092. Jesus in History. (HIS; 3 cr.; Student Option; Every Spring)
Who was Jesus? How can we recover what he said and did? Why was he killed and who did it? Was there agreement about the life and words of Jesus in the earliest stages of Christianity, or were there major disagreements even then? How were the early writers about Jesus influenced by their social, political, and religious contexts? And why was it reported in the news recently that Jesus was married? In course we examine the earliest attempts to describe Jesus and his significance in the gospel literature of the first and second centuries and beyond. We ask how historians may claim to "know" the "facts" of Jesus's life and meaning in light of these various portraits. We seek to understand how the different literary presentations of Jesus reflect their authors' social, religious, and political situations. We aim to understand in more detail the diversity of perspectives about Jesus from the earliest stage of the development of Christianity. Intended as a course of interest to all undergraduates on the Twin Cities campus. Students of any, all, or no religious background are welcome.

RELS 3113. History of Modern Israel/Palestine: Society, Culture, and Politics. (GP; 3 cr.; Student Option; Fall Odd Year)

RELS 3121. Gender and Body in Early Christianity. (AH; 3 cr. [max 30 cr.]; Student Option; Fall Odd Year)
Ancient Christians, like any other social group in the ancient world, represented themselves through images, stories, and discourses using the cultural tools available to them in their own contexts. We will explore the literature of early Christians with special attention to how representations of the body and gender served to communicate the nature of what it meant to be Christian for these authors. The study of ancient texts and social groups provides an opportunity to understand better some of the origins of modern Western culture, but it goes beyond issues of origins. The study of ancient material also offers a space to acquire the skills of critical analysis of body and gender dynamics closer to modern experience. The result of such a process is often quite eye-opening with respect to the roles that the body and gender play in shaping our sensibilities around self-identity, social interaction, and societal structures.

RELS 3182. Egypt and Western Asia: Art and Archaeology of Ancient Egypt and Western Asia. (AH,GP; 3 cr.; Student Option; Every Fall & Spring)
This course will provide students with foundational knowledge in the art, architecture and archaeology of Egypt, East Africa, Asia Minor, Mesopotamia, Iran and Central Asia from the Neolithic through Late Antiquity (ca. 7,000 B.C.E. - 650 C.E.). Students will gain an understanding of the relationship between the visual material and the social, intellectual, political and religious contexts in which it developed and functioned. In this regard, students will also gain an understanding of the evolution of, and exchanges and differences among, the visual cultures of these time periods and regions. It will also expose them to the preconditions for contemporary geopolitics of the region.

RELS 3201. Bible: Context & Interpretation. (LITR; 3 cr.; Student Option; Every Fall)

RELS 3202. Bible: Prophecy in Ancient Israel. (3 cr.; Student Option; Every Spring)
Survey of Israelite prophets. Emphasizes Amos, Hosea, Isaiah, Jeremiah, Ezekiel, Second Isaiah. Prophetic contributions to Israelite religion. Personality of prophets. Politics, prophetic reaction. Textual analysis, Biblical scholarship. Prophecy viewed cross-culturally. prereq: [Rel 1001] or [CNES 1201 or JWST 1201 or RELS 1201 or CNES 3201 or JWST 3201 or RELS 3201]

RELS 3204. The Dead Sea Scrolls. (3 cr.; Student Option; Periodic Fall & Spring)
Introduction to Dead Sea Scrolls and Qumran. Contents of Dead Sea Scrolls, significance for development of Bible. Background of Judaism and Christianity. Archaeological site of Qumran.

RELS 3205. Women, Gender, and the Hebrew Bible. (AH; 3 cr.; Student Option; Spring Odd Year)
How men, women, gender, sexuality is portrayed in Hebrew Bible. Social/religious roles/status of women in ancient Israel. Read biblical texts from academic point of view.

RELS 3254. Archaeology of Ritual and Religion. (3 cr.; Student Option; Fall Even Year)
The course discusses evidence for the origins of religion and its diverse roles in human societies over millennia. It focuses on how artifacts and architecture are essential to religious experience. It asks: What constitutes religion for different cultures? Why is religion at the heart of politics, social life, and cultural imagination?

RELS 3321. American Indian Philosophies. (AH,DS; 3 cr.; Student Option; Every Fall, Spring & Summer)
World views of indigenous people of Americas. Topics include native medicines/healing practices, ceremonies/ritual, governance, ecology, humor, tribal histories, status of contemporary native people.

RELS 3322. Art of Central and South America Before Columbus. (AH; 3 cr.; Student Option; Periodic Fall)
Art/architecture of native peoples of Americas from twelfth century B.C. until arrival of Europeans in sixteenth century. Ways that people living in diverse areas of South America/Mesoamerica used art/architecture. Tools to investigate Pre-Columbian art at more advanced levels.

RELS 3371. Buddhism. (GP; 3 cr.; Student Option; Summer Even Year)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

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Maccabees (all of which provide historical
information about the Maccabean revolt and rise of the Hasmonaeans), and the writings of Josephus (a Jewish writer who witnessed the Roman takeover of Palestine in the first century C.E.). This course will stay within the confines of the ancient evidence and not examine later interpretations when analyzing each historical period; it will begin with Ptolemaic control of the region and conclude with the Bar Kokhba revolt, its aftermath, and the resilience of Jewish populations in northern Palestine. Topics that will be examined in depth are messianism and apocalypticism, the Jerusalem Temple, Jewish ancestral traditions (which include "biblical" literature), and theoretical models used by scholars to analyze power relationships in antiquity.

RELS 3520. History of the Holocaust. (3 cr.; Student Option; Periodic Fall & Spring)

RELS 3535. Death and the Afterlife in the Ancient World. (AH; 3 cr.; Student Option; Fall Odd Year)
Beliefs, attitudes, and behaviors related to death and afterlife found in cultures of ancient Mediterranean and Near East. Literature, funerary art/epitaphs. Archaeological evidence for burial practices and care of dead.

RELS 3541. Age of St. Augustine of Hippo. (3 cr.; Student Option; Periodic Fall & Spring)
Cultural diversity (A.D. 363 to circa 500 A.D.). Replacement of Roman Empire in Western Europe by barbarian kingdoms, consolidation of Constantinople. Literature, art, thought resulting from Christianity and Augustine of Hippo. Meets with CNES 3108.

RELS 3543. Pagans, Christians, Barbarians: The World of Late Antiquity. (3 cr.; A-F or Audit; Fall Odd Year)
Between classical and medieval, pagan and Christian, Roman and barbarian, the late antique world was a dynamic age. This course focuses on the Mediterranean region from the 2nd to the mid-7th century exploring such topics as the conversion of Constantine, the fall of Rome, barbarian invasions, the spread of Christianity, and the rise of Islam.

RELS 3544. History of Christianity I: Martyrs, Monks, Crusaders. (3 cr.; Student Option; Fall Odd Year)
This course surveys the history of Christianity from its status as a persecuted minority religion of the Roman Empire to its dominant role in medieval Europe and Byzantium. We study Christian traditions in Asia and Africa as well as Europe with special attention to the relationship between Christianity and culture in the ancient and medieval world.

RELS 3545. History of Christianity II: From the Middle Ages to the Enlightenment. (3 cr.; Student Option; Spring Odd Year)
The course examines the history of Christianity from the 13th century to the end of the 18th century. It begins with the Latin church at the height of its power before moving on to a consideration of the disastrous 14th century, the revolts of the 15th and the Reformations of the 16th centuries. The course closes by considering new challenges facing the church in an age of Enlightenment and Revolution.

RELS 3611. Eastern Orthodoxy: History and Culture. (3 cr.; Student Option; Periodic Fall & Spring)

RELS 3612. Baroque Rome: Art and Politics in the Papal Capital. (HIS; 3 cr.; Student Option; Fall Even Year)
Center of baroque culture--Rome--as city of spectacle and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

RELS 3621W. The Christian Right and Left in America: Protestant Liberals, Evangelicals, and Fundamentalists. (WI; 3 cr.; Student Option; Spring Even Year)
Religious, historical, social, and scientific thought/practice across three main U.S. Protestant groups since 1820. Historical processes that brought about diverse understandings of Christianity, theologies, and worship. Theological left/right views of views of society, history, and science, that influence public debates.

RELS 3622. 'Sinners, Saints, and Savages': Religion in Early America. (3 cr.; Student Option; Spring Odd Year)

RELS 3623. Religion and the American Culture Wars. (HIS; 3 cr.; Student Option; Every Fall)

RELS 3624. Atheists & Others: Religious Outsiders in the United States. (DSJ; 3 cr.; Student Option; Periodic Spring)
What does it mean to be an atheist in the United States today? Atheists comprise a small percentage of the American population, but one with an increasingly visible presence in popular culture, political discourse, and everyday life. How do atheists organize into groups oriented toward identity-formation, social connection, and political action? prereq: SOC 1001 recommended
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RELS 3625. Magic and Medicine. (3 cr.; Student Option; Spring Odd Year) 
Course examines how the line between magic and medicine has changed over time. From accusations of witchcraft to proclamations of scientific breakthrough, we will examine the relationship between the supernatural and the natural from the early modern period to today. Specific topics include the practice of exorcism, the concept of the four humors, the persecution of witches, the development of voodoo, the effectiveness of placebos, and the professionalization of medicine. Throughout, we will ask how gender, class, and race have affected the construction of "magic" and "medicine."

RELS 3626W. Witches, Seers, and Saints: Women, Gender, and Religion in the U.S. (WI; 3 cr.; Student Option; Periodic Fall & Spring) 
This course examines the development and ramifications of gender ideologies within several religious groups in North America from the colonial period to the present and explores women's strategies that have contributed to and resisted these ideologies.

RELS 3627. The End of the World in Literature and History. (HIS; 3 cr.; Student Option; Periodic Fall & Spring) 
For at least two and a half millennia, prophets, politicians, and poets have crafted terrifying accounts about the end of the world. This comparatist seminar examines the ways different cultures have imagined a final apocalyptic with particular attention to the political and social consequences of their visions. Students will read texts that focus on pandemic, extraterrestrial attack, nuclear holocaust, prophecy, cybernetic revolt, divine judgment, resource depletion, meteoric impact, or one of the many other ways in which humans write of their demise. They will use literary analysis to explore the many historical and contemporary wastelands they will encounter. They will write short papers and give in-class presentations on different kinds of apocalyptic texts.

RELS 3671. Hinduism. (3 cr.; Student Option; Periodic Fall & Spring) 
Development of Hinduism focusing on sectarian trends, modern religious practices, myths/rituals, pilgrimage patterns/religious festivals. Interrelationship between Indian social structure/Hinduism.

RELS 3706W. Art of Islam. (AH, WI, GP; 4 cr.; Student Option; Every Fall) 
Architecture, painting, and other arts from Islam's origins to the 20th century. Cultural and political settings as well as themes that unify the diverse artistic styles of Islamic art will be considered.

RELS 3707W. Anthropology of the Middle East. (GP, WI, SOCS; 3 cr.; Student Option; Fall Even Year) 
Anthropological field methods of analyzing/interpreting Middle Eastern cultures/societies.

RELS 3708. The Cultures of the Silk Road. (3 cr.; Student Option; Every Fall & Spring) 
Past/present state of cultures that flourished in Central Asia (present-day CA republics, Iran, Afghanistan) after Alexander the Great. Decline with opening of sea routes.

RELS 3709. Ancient Iran. (3 cr.; Student Option; Periodic Fall & Spring) 
Development of ancient Iranian culture under Achaemenians and Sassanians. Impact of Zoroastrian religion on Iranians, on Hellenism, and on domains such as Bactria. Iran's contribution to cultures of Silk Road.

RELS 3711. The Islamic World. (GP, SOCS; 3 cr.; Student Option; Every Fall) 

RELS 3712. Islam: Religion and Culture. (; 3 cr.; Student Option; Every Fall) 
Religion of Islam. Faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies. Asia, Europe, Americas.

RELS 3713. Modern Iran: Nationalism, Religion, and the Struggle to Create Modern Iran. (; 3 cr.; Student Option; Spring Odd Year) 
Iranian history from the fall of the Sassanids (7th C. CE) to the present. Shi'ite Islam in a world context. Iranian dynasties. Iran's entrance into modern world politics.

RELS 3714. Islam and the West. (; 3 cr.; Student Option; Periodic Fall & Spring) 
Cultural/intellectual trends that have defined differences between Islam and the West. Development of historical, philosophical, and intellectual mindset of both spheres. Factors in tension, anxiety, and hatred between Muslim world and Europe and the United States.

RELS 3715. History of the Crusades. (GP, HIS; 3 cr.; Student Option; Every Fall, Spring & Summer) 

RELS 3716. Gender and the Family in the Islamic World. (; 3 cr.; A-F only; Periodic Spring) 
Experiences of Muslim women/families from a historical/comparative perspective. Gender/family power relations in colonial representations, sexual politics, family, education/health, paid work, human rights, and Islamic feminism. prereq: At least soph

RELS 3717. Christians, Muslims, and Jews in the Middle Ages. (GP, HIS; 3 cr.; Student Option; Fall Even, Spring Odd Year) 
Muslim/Christian expansion, jihad/crusade, anti-Jewish violence/persecution. Trade, intellectual exchange, religious dialogue.

RELS 3718W. Christ in Islamic Thought. (WI; 3 cr.; Student Option; Periodic Spring) 
Course examines the history of the figure of Christ in Islamic thought, from the beginnings of Islam in the Qur'an and the Hadith to the recent 2013 book by Reza Aslan, Zealot. The course is based on close reading of primary sources from regions extending from Spain to Iran, and in various languages (in translation): Arabic, Greek, French, Farsi, and Italian. Course demonstrates how much the interpretation of the figure of Christ in Islamic thought belonged to specific historical contexts.

RELS 3721. North Africa since 1500: Islam, Colonialism, and Independence. (3 cr.; Student Option; Spring Odd Year) 
History of Maghrib (Morocco, Algeria, Tunisia, Libya, disputed territories of Western Sahara) from time of Ottoman expansion/Shari'ite dynasties (Sa'dian/'Alawid) in 16th/17th Centuries to end of 20th century. Focus on encounter of Islamic cultures/societies of Maghrib with Africa/Europe.

RELS 3722. The Ottoman Empire. (GP, HIS; 3 cr.; Student Option; Every Fall & Spring) 
Survey of Islam's most successful empire, from its founding circa 1300 to its demise in 1923. Lands, institutions, peoples, historical legacy.

RELS 3970. Supplemental Discussion in Religious Studies. (; 1 cr. [max 3 cr.]; Student Option; Periodic Fall & Spring) 
Extra discussion section attached to a religious studies course/event.

RELS 3993. Directed Studies. (; 1-4 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) 
Student works with faculty on a subject decided upon by both.

RELS 4049. Religion and Culture. (; 3 cr.; Student Option; Periodic Fall) 
Religious beliefs and world views cross-culturally. Religious dimensions of human life through theories of origins, functions, and forms (e.g. myth, ritual, symbolism) of religion in society. prereq: ANTH 1003 or ANTH 1005 or instr consent

RELS 4309. Religion in American Public Life: Culture, Politics, and Communities. (CIV; 3 cr.; A-F or Audit; Periodic Fall & Spring) 
How diversity/vitality of American religion shape public life. How religious groups engage in political action, foster understandings of democracy/styles of civic participation. Volunteering/service activities. Race, poverty, the family, sexuality, prereq: Soc majors/minors must register A-F

RELS 4952. Capstone. (; 1-4 cr.; A-F or Audit; Every Fall & Spring) 
Independent research/writing under supervision of faculty sponsor. In-depth research paper/comparable project to be completed in conjunction with RELS course. prereq: Limited to RELS majors and second semester junior and seniors. Please see director of Undergraduate Studies for permission.

RELS 5001. Theory and Method in the Study of Religion: Critical Approaches to the Study of Religion. (; 3 cr.; Student Option; Every Spring)
Theoretical/methodological issues in academic study of religion. Theories of origin, character, and function of religion as a human phenomenon. Psychological, sociological, anthropological, and phenomenological perspectives. prereq: Sr or grad student or instr consent


RELS 5070. Topics in Religious Studies. (; 3 cr. [max 18 cr.]; Student Option; Periodic Fall, Spring & Summer) Topics specified in Class Schedule and Course Guide.


RELS 5204. The Dead Sea Scrolls. (; 3 cr.; Student Option; Periodic Fall & Spring) Introduction to Dead Sea Scrolls and Qumran. Contents of Dead Sea Scrolls, significance for development of Bible. Background of Judaism and Christianity. Archaeological site of Qumran. The course will focus on the material in translation and academic scholarship on the literature and archaeological site. Open to graduate students across the college; knowledge of classical Hebrew will not be required. The course is open to upper level undergraduate students with permission of the instructor.

RELS 5254. Archaeology of Ritual and Religion. (3 cr.; Student Option; Fall Even Year) The course discusses evidence for the origins of religion and its diverse roles in human societies over millennia. It focuses on how artifacts and architecture are essential to religious experience. It asks: What constitutes religion for different cultures? Why is religion at the heart of politics, social life, and cultural imagination?

RELS 5504. Development of Israelite Religion II. (; 3 cr.; Student Option; Periodic Fall) Ancient Judaism from the Persian restoration (520 B.C.E.) to Roman times (2nd century B.C.E.). Religious, cultural, and historical developments are examined to understand Jewish life, work, and worship under a succession of foreign empires: Persian, Greek, Roman.

RELS 5513W. Scripture and Interpretation in Israelite Religion and Judaism. (WI; 3 cr.; A-F or Audit; Spring Odd Year) Idea of divine revelation. Impact on religion/literature. How history of Bible's creation, transmission, interpretation helps us think critically about role of idea of revelation in history of religious traditions, prereq: At least one upper level course (3xxx or higher) in academic biblical or religious studies


RELS 5621W. The Christian Right and Left in America: Protestant Liberals, Evangelicals, and Fundamentalists. (WI; 3 cr.; Student Option; Spring Even Year) Religious, historical, social, and scientific thought/practice across three main U.S. Protestant groups since 1820. Historical processes that brought about diverse understandings of Christianity, theologies, and worship. Theological left/right views of views of society, history, and science that influence public debates.

RELS 5671. Hinduism. (3 cr.; Student Option; Periodic Fall & Spring) Development of Hinduism focusing on sectarian trends, modern religious practices, myths/rituals, pilgrimage patterns/religious festivals. Interrelationship between Indian social structure/Hinduism.

RELS 5707W. Anthropology of the Middle East. (GP, WI, SOCS; 3 cr.; Student Option; Fall Even Year) Anthropological field methods of analyzing/interpreting Middle Eastern cultures/societies.

RELS 5721. North Africa since 1500: Islam, Colonialism, and Independence. (3 cr.; Student Option; Spring Odd Year) History of Maghrib (Morocco, Algeria, Tunisia, Libya, disputed territories of Western Sahara) from time of Ottoman expansion/Shafii dynasties (Sa’dian/Alawid) in 16th/17th Centuries to end of 20th century. Focus on encounter of Islamic cultures/societies of Maghrib with Africa/Europe.

RELS 5777. The Diversity of Traditions: Indian Art 1200 to Present. (3 cr.; Student Option; Every Fall, Spring & Summer) Issues presented by sculpture, architecture and painting in India, from prehistoric Indus Valley civilization to present day.

RELS 5781. Age of Empire: The Mughals, Safavids, and Ottomans. (3 cr.; Student Option; Periodic Fall) Artistic developments under the three most powerful Islamic empires of the 16th through 19th centuries: Ottomans of Turkey; Safavids of Iran; Mughals of India. Roles of religion and state will be considered to understand their artistic production.

RELS 5993. Directed Studies. (; 1-4 cr. [max 24 cr.]; Student Option; Every Fall & Spring) TBD prereq: instr consent

RELS 8070. Readings in Religious Texts. (; 3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Close reading of selected literary or epigraphical texts of importance for the history of ancient Mediterranean religions, along with critical discussion of trends in recent scholarship. The texts may be read in the original languages (such as Greek, Latin, Hebrew, etc.) but may also be accessed in translation where appropriate.

RELS 8190. Comparative Seminar in Religions in Antiquity. (; 3 cr. [max 6 cr.]; A-F or Audit; Spring Odd Year) Topics vary, see Class Schedule. Major cultural movement as it developed over several centuries. Draws on evidence in literature, archival records, inscriptions, documentary papyri, and archaeological remains. Artistic media such as wall painting, architectural ornament, funerary sculpture, or manuscript illumination. prereq: Grad student in relevant field

Retail Merchandising (RM)

RM 1201. Fashion, Ethics, and Consumption. (CIV; 3 cr.; Student Option; Every Fall & Spring) Apparel business. Overview of steps in the process of creating, merchandising, selling, and consuming apparel. Various ethical positions reflected in manufacturer, retailer, and consumer decision making are considered.

RM 2196. Work Experience in Retail Merchandising. (; 1-4 cr. [max 8 cr.]; S-N only; Every Fall, Spring & Summer) Supervised work experience in business, industry, or government, related to student's area of study. Integrative paper or project. prereq: Plan submitted/approved by [advisor, internship supervisor], written approval of supervisor, instr consent

RM 2215. Introduction to Retail Merchandising. (; 3 cr.; A-F or Audit; Every Spring) Overview of retailing management. Aspects of retailing management in global, multi-channel retail environment. Strategies/tactics to make decisions to operate retail business. Retail management principles covered.

RM 2234. Retailing in a Digital Age. (TS; 3 cr.; A-F only; Every Spring) Students will explore and evaluate the impact of emergence of retail technology on the retail industry and consumers as well as on the society at large. Changes in the retail business and consumer behaviors will be examined in relation to emerging technologies. Both
benefits and concerns related to digital retailing will be discussed.

**RM 3124. Consumers of Design.** (3 cr.; A-F only; Every Fall & Spring)
Contemporary approaches to consumer behavior. prereq: retail merchandising major or minor

**RM 3196. Field Study: National or International.** (1-4 cr.; max 10 cr.; A-F or Audit; Every Fall, Spring & Summer)
Faculty-directed field study in national or international setting. prereq: instr consent

**RM 3201. Career and Internship Preparation for Retail Merchandising.** (1 cr.; A-F only; Every Fall & Spring)
Research career opportunities related to retail industry, set career objectives based on an assessment of individual skills/interests, and identify job search skills to implement a transition from college to employment. prereq: Retail merchandising major

**RM 3242. Retail Buying.** (3 cr.; A-F or Audit; Every Fall)
Principles/mathematics of merchandise inventory control, merchandising selection. prereq: [2215 or DHA 2215], [MATH 1031 or MATH 1051 or MATH 1142 or MATH 1151 or MATH 1155 or MATH 1271], [jr or sr], retail merchandising [major or minor] or instr consent

**RM 3243. Visual Merchandising.** (3 cr.; A-F or Audit; Every Spring)
Retail store environment. Physical/psychological effects that initiate/motivate consumer behavior. Merchandise display: creativity, department layout, fixtureing, lighting, cross merchandising, visual resources, signing, maintenance. prereq: 2215, [DHA major or minor or instr consent]

**RM 4117W. Retail Environments and Human Behavior.** (WI; 3 cr.; A-F only; Every Spring)
Theory/research related to designed environments across retail channels. prereq: 2215 or DHA 2215, [jr or sr or grad student], [design major or minor or instr consent]

**RM 4123. Living in a Consumer Society.** (3 cr.; A-F only; Fall Odd Year)
Consumerism within U.S. society. Commodification of health care, education, and production of news. Commercialization of public space/culture. What drives consumer society. How meaning is manufactured. What drives consumer decision making. prereq: 2215, [jr or sr or grad student], [DHA major or minor or instr consent]

**RM 4196. Internship in Retail Merchandising.** (1-2 cr.; S-N or Audit; Every Fall, Spring & Summer)
Supervised work experience related activity in business, industry, or government to student's area of study. Integrative paper or project may be required. prereq: Completion of at least one-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, instr consent

**RM 4212W. Dress, Society, and Culture.** (WI; 3 cr.; A-F or Audit; Every Spring)
Contemporary dress from diverse cultures within/outside USA analyzed using social science concepts. Dress as nonverbal communication system. prereq: [jr or sr or grad student], [design major or minor or instr consent]

**RM 4216. Retail Promotions.** (3 cr. [max 4 cr.]; A-F or Audit; Every Fall)
Role of integrated marketing communications in retail businesses. Promotion techniques/media characteristics. Application of theories behind consumer decision making. prereq: 2215,3124, [jr or sr or grad student], [DHA major or minor or instr consent]

**RM 4217. International Retail Markets.** (GP; 3 cr.; A-F or Audit; Every Spring)
Operating a retail business in foreign countries. How international markets differ from U.S. market. Effects of sociocultural systems within foreign countries. Theories of international trade. Interface between countries and firms. Strategic alternatives. prereq: 2215 or DHA 2215, [jr or sr or grad student], [DHA major or minor or instr consent]

**RM 4247. Advanced Buying and Sourcing.** (3 cr.; A-F or Audit; Every Spring)
Technology application for buying/sourcing. Six-month dollar merchandise planning, assortment planning, market purchase and sales promotions planning, inventory management, costing, markdowns, timing, and sourcing. prereq: RM 2215, RM 3242, [DHA major or minor or instr consent]

**RM 4248. Creative Leadership in Retailing.** (3 cr.; A-F only; Every Fall)
Theory/research on creative leadership. Opportunities to apply knowledge to contemporary issues facing practicing retail leaders.

**RUSS (RUSS)**

**RUSS 1101. Beginning Russian I.** (5 cr.; Student Option; Every Fall)
Listening, speaking, reading, writing.

**RUSS 1102. Beginning Russian II.** (5 cr.; Student Option; Every Spring)
Listening, speaking, reading, writing. prereq: 1101 or equiv

**RUSS 3001. Intermediate Russian I.** (5 cr.; Student Option; Every Fall)
Conversation, composition, grammar review, translation, readings in literature. prereq: 1102 or instr consent

**RUSS 3002. Intermediate Russian II.** (5 cr.; Student Option; Every Spring)
Expansion of experience in speaking, reading, and understanding Russian. Reading contemporary texts. prereq: 3001 or instr consent

**RUSS 3101. Advanced Russian I.** (4 cr.; Student Option; Every Fall)
Advanced grammar, conversation, composition, reading. prereq: 3002 or 4104 or instr consent

**RUSS 3102. Advanced Russian II.** (4 cr.; Student Option; Every Spring)
Advanced grammar, conversation, composition, reading. prereq: 3101 or 4111 or instr consent

**RUSS 3105. Russian Poetry and Prose.** (3 cr.; Student Option; Periodic Fall)
Appreciation of literary values through stylistic analysis and literary interpretation; analysis of humanistic elements. Readings in Russian. prereq: Russ 3102 or concurrent enrollment in Russ 3102 or permission

**RUSS 3311V. Honors Major Project in Russian.** (WI; 3-4 cr.; A-F only; Every Fall & Spring)
Directed research/writing in student's chosen field. prereq: Advanced Russian major

**RUSS 3311W. Russian Major Project.** (WI; 3 cr.; A-F or Audit; Every Fall & Spring)
Directed research and writing in student's chosen field. prereq: Advanced Russian major

**RUSS 3404. Tolstoy in Translation.** (GP,LITR; 3 cr.; Student Option; Spring Odd Year)
Novels, stories, and philosophical writings of Leo Tolstoy.

**RUSS 3411. Dostoevsky in Translation.** (GP,LITR; 3 cr.; Student Option; Spring Even Year)
Novels, stories, and miscellaneous writings of Fyodor Dostoevsky.

**RUSS 3421. Literature: Middle Ages to Dostoevsky in Translation.** (LITR; 3 cr.; Student Option; Every Fall)
Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.

**RUSS 3422. Literature: Tolstoy to the Present in Translation.** (LITR; 3 cr.; Student Option; Every Spring)
Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

**RUSS 3512. Russian Art and Culture.** (AH,GP; 3 cr.; Student Option; Fall Odd Year)
Major trends in Russian visual arts in context of social, political, and ideological questions.

**RUSS 3900. Topics in Russian Language, Literature, and Culture.** (1 cr. [max 16 cr.]; Student Option; Periodic Fall & Spring)
Variable topics in Russian language, literature, and culture. Consult department for details. prereq: 1102 for language topics

**RUSS 3993. Directed Studies.** (1-4 cr. max 16 cr.); Student Option; Every Fall & Spring)
Guided individual study. Prereq instr consent, dept consent, college consent.

**RUSS 4101. Beginning Russian for Graduate Research I.** (4 cr.; Student Option; Every Fall) Listening, speaking, reading, writing.

**RUSS 4102. Beginning Russian for Graduate Research II.** (4 cr.; Student Option; Every Spring) Listening, speaking, reading, writing. Prereq: 4101

**RUSS 4103. Intermediate Russian for Graduate Research I.** (5 cr.; Student Option; Every Fall) Conversation, composition, grammar review, translation, readings in literature. Prereq: 4102

**RUSS 4104. Intermediate Russian II.** (5 cr.; Student Option; Every Spring) Speaking, reading, and understanding Russian. Reading contemporary texts. Prereq: 4103

**RUSS 4111. Advanced Russian for Graduate Research I.** (4 cr.; Student Option; Every Fall) Advanced grammar, conversation, composition, reading. Prereq: 3002 or 4104 or instr consent

**RUSS 4112. Advanced Russian for Graduate Research II.** (4 cr.; Student Option; Every Spring) Advanced grammar, conversation, composition, reading. Prereq: 3101 or 4111 or instr consent

**RUSS 5404. Tolstoy in Translation.** (GP.LITR; 3 cr.; Student Option; Spring Even Year) Novels, stories, and philosophical writings of Leo Tolstoy.

**RUSS 5411. Dostoevsky in Translation.** (GP.LITR; 3 cr.; Student Option; Spring Even Year) Novels, stories, and other writings of Fyodor Dostoevsky.

**RUSS 5421. Literature: Middle Ages to Dostoevsky in Translation.** (LITR; 3 cr.; Student Option; Every Fall) Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.

**RUSS 5422. Literature: Tolstoy to the Present in Translation.** (LITR; 3 cr.; Student Option; Every Spring) Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

**RUSS 5900. Topics in Russian Language, Literature, and Culture.** (1-4 cr. [max 3 cr.]; Student Option; Periodic Fall) Variable topics in Russian language, literature, and culture. Prereq: 1102 for language topics

**RUSS 5993. Directed Studies.** (1-4 cr. [max 16 cr.]; Student Option; Every Fall & Spring) Guided individual study. Prereq instr consent, dept consent, college consent.

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**SCAND**

**SCAN 3011W. Readings in Scandinavian Languages.** (WI; 4 cr.; Student Option; Every Fall) Reading/composition in Danish, Norwegian, and Swedish for advanced proficiency. Introduction to differences between the three languages. Prereq: [Dan or Nor or Swe]1004 or 4004 or instr consent

**SCAN 3501W. Scandinavian Culture Past and Present.** (GP.WI; 3 cr.; Student Option; Fall Even, Spring Odd Year) Cultural, social, and political developments; principal views and core values; major cultural figures; Scandinavian mentality. Readings in translation for nonmajors. Invited lectures on central topics within selected areas of study.

**SCAN 3502. Scandinavian Myths.** (GP.LITR; 3 cr.; Student Option; Fall Odd, Spring Even Year) Literary and cultural investigation of the popular beliefs, myths, and religion of the medieval Scandinavians; the interaction of paganism and Christianity; the reflection of myths in Old Scandinavian literature and art. All readings in English.

**SCAN 3503. Scandinavian Folklore.** (GP.HIS; 3 cr.; Student Option; Fall Odd, Spring Even Year) Literary and folkloristic investigation of Scandinavian folktales and legends. Readings in translation for nonmajors.

**SCAN 3504. Emigration, Immigration, Integration: The Nordic Experience.** (GP.LITR; 3 cr.; Student Option; Every Fall & Spring) Issues of origin/language, immigration/settlement, traditions/values, culture/politics, and transgressions of boundaries from the old to the new studied through photos, diaries, letters, stories, and novels by Moberg, Rolvaag, Ager, and other pioneers. All readings in translation.

**SCAN 3505. Scandinavian Fiction From 1890 to Present.** (LITR; 3 cr.; Student Option; Fall Odd, Spring Even Year) Modernity’s search for new forms to represent changing historical situations. Ibсен, Strindberg, Hamsun, Selma Lagerlof, Hjalmar Bergman, Paar Lagerkvist, Karen Blixen, Moa Martenson, Tarjei Vesaas, Edith Sodergran, Ingrid Bergman, Lars Gustafsson. All readings in translation.

**SCAN 3601. Great Literary Works of Scandinavia.** (LITR; 3 cr.; Student Option; Fall Odd Year) Major literary works from the Middle Ages to the present. Readings in translation.

**SCAN 3602. The Literary Fairy Tale in Scandinavia.** (LITR; 3 cr.; Student Option; Fall Even, Spr & Summer Odd Yr) Literary fairy tales from Scandinavia, especially Hans Christian Andersen. Readings in translation for non-majors.

**SCAN 3605. The Scandinavian Short Story.** (LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year) Short stories by important 19th/20th-century authors from five Scandinavian countries. Genre theory/practical criticism. Readings in English for non-majors.

**SCAN 3613. Children’s Literature in Scandinavia.** (LITR; 3 cr.; Student Option; Fall Even Year) Analysis and discussion of representative works in Scandinavian children's literature from picture books to young adult books using a variety of critical methods of interpretation. Taught in English.

**SCAN 3614. Blood on Snow: Scandinavian Thrillers in Fiction and Film.** (GP.LITR; 3 cr.; Student Option; Periodic Fall & Spring) Scandinavian crime novels/films against background of peaceful welfare states. Readings in translation for non-majors. Scandinavian majors/minors read excerpts in specific languages.

**SCAN 3634. Scandinavian Women Writers.** (GP.LITR; 3 cr.; Student Option; Spring Odd Year) Investigation of issues important to women as articulated by Scandinavian women writers. Historical overview of women’s writing in Scandinavia and in-depth investigation of texts by contemporary women writers. All readings in translation.

**SCAN 3670. Topics in Scandinavian Studies.** (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in Class Schedule. Readings in English for nonmajors. May meet with 5670.

**SCAN 3993. Directed Studies.** (1-4 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading and study. Prereq instr consent, dept consent, college consent.

**SCAN 4011. Readings in Scandinavian Languages.** (2 cr.; Student Option; Every Fall) Meets with 3011W. See 3011W for description. Prereq: Grad student

**SCAN 5502. The Icelandic Saga.** (3 cr.; Student Option; ) Study of the sagas written in 13th-century Iceland. Discussion includes cultural and historical information about medieval Iceland and analysis of a selection of saga texts using contemporary critical approaches. All readings in translation.

**SCAN 5605. The Scandinavian Short Story.** (LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year) Short stories by 19th-20th century authors from five Scandinavian countries. Genre theory/ practical criticism. Readings in English for non-majors.

**SCAN 5613. Contemporary Scandinavian Literature.** (3 cr.; Student Option; )
An investigation of issues which emerged as extremely important after 1945 in Scandinavia, as articulated by writers and analyzed by researchers in social sciences. All readings in translation.

**SCAN 5614. Blood on Snow: Scandinavian Thrillers in Fiction and Film.** (3 cr.; Student Option; Periodic Fall & Spring)

Scandinavian crime novels/films against background of peaceful welfare states. Readings in translation for non-majors. Scandinavian majors/minors read excerpts in specific languages.

**SCAN 5634. Scandinavian Women Writers.** (GP, LITR; 3 cr.; Student Option; Fall Even, Spring Odd Year)

Issues important to women as articulated by Scandinavian women writers. Historical overview of women's writing in Scandinavia. In-depth investigation of texts by contemporary women writers. All readings in translation.

**SCAN 5670. Topics in Scandinavian Studies.** (; 3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring)

Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in Class Schedule. Readings in English for nonmajors. May meet with 3670.

**SCAN 5701. Old Norse Language and Literature.** (; 3 cr.; Student Option; Every Fall)

Acquisition of a reading knowledge of Old Norse; linguistic, philological and literary study of Old Norse language and literature.

**SCAN 5703. Old Norse Poetry.** (3 cr.; Student Option; Periodic Fall)

Reading and analysis of either eddic poetry from the Poetic Edda or skaldic poetry. Texts read in Old Norse.

**SCAN 5710. Topics in Old Norse Literature.** (; 3 cr.; max 9 cr.; Student Option; Every Spring)

Topic may focus on Old Norse prose or poetry. Primary texts read in Old Norse. Critical literature about texts, medieval Icelandic culture in English. Topics specified in Class Schedule. Prereq: 5701 or equiv

**SCAN 5993. Directed Studies.** (1-4 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer)

Guided individual reading and study. Prereq: instr consent; dept consent, college consent.

**SCAN 8500. Seminar in Medieval Scandinavian Languages and Literature.** (; 3 cr.; max 9 cr.; Student Option; Periodic Spring)

Sample topics: [Volsunga Saga], studies in Snorri Sturluson's [Edda], dialogue analysis in the Icelandic saga.

**SCAN 8994. Directed Research.** (; 1-3 cr.; max 12 cr.; Student Option; Every Fall & Spring)

Tbd prereq: instr consent; may be taken as tutorial with instr consent, dept consent

**SFS 2010. Religion and Culture of Bhutan.** (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 2050. Language, Culture, and Society of Costa Rica.** (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 2060. Introduction to Swahili Language and East African Tribal Communities.** (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 2070. Language, Culture, and Society of Panama.** (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 2080. Language and Culture of Cambodia.** (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 2090. Language, Culture and Society of Peru.** (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3000. Tourism and Island Systems: Assessment of Sustainable Practices.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3020. Environmental Policy and Socioeconomic Values.** (4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3030. Economic and Ethical Issues in Sustainable Development.** (4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3040. Political and Socioeconomic Dimensions of Environment.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3050. Land Use, Natural Resources and Conservation.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3060. Mountain Ecology.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3070. Field Practicum in Public Health and Environment.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3111. Ecology and Conservation of Southeast Asian Elephants.** (4 cr.; Student Option; Every Fall, Spring & Summer)

This course will focus on the ecology and conservation of the Asian elephant (Elephas maximus). Due to a drastic decrease in wild elephant populations, the reality of a world without these charismatic megafauna is becoming a likely possibility. In Asia this is primarily due to a booming human population and increased demand for space. Elephants are of great scientific interest due to their complex behaviors associated with intelligence and social interactions, forming deep family bonds and displaying empathy by recognizing and responding to another elephant’s pain or problem and showing signs of grief after the loss of a family member. Saving the elephants requires improved scientific understanding of the species and the increasingly complex environment that they inhabit.

**SFS 3500. Wildlife Management and Conservation.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3510. Marine Protected Areas: Management Techniques and Policies.** (4 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3520. Sustaining Tropical Ecosystems: Biodiversity, Conservation, and Development.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3530. Tropical Marine Ecosystems: Monitoring and Management.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3540. Rainforest Management Studies in Australia and New Zealand.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3550. Techniques for Rainforest Research in Australia.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3560. Applied Marine Research Techniques.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3570. Techniques for Wildlife Field Research.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3580. Himalayan Forests, Watersheds, and Rural Livelihoods.** (6 cr.; max 12 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3690. Rainforest Ecology.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3700. Principles of Forest Management.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3710. Techniques in Wildlife Management.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course

**SFS 3720. Wildlife Ecology.** (4 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer)

Study abroad course
Study abroad course.

SFS 3730. Tropical Marine Ecology. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3740. Principles of Resource Management. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3770. Tropical Ecology and Sustainable Development. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3790. Tropical Coastal Ecology. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3800. Conservation Science and Practice. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3810. Ecosystems and Livelihoods. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3820. Environmental Ethics and Development. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 3831. Tropical Ecology of the Amazon. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) The term biodiversity refers to the variety of life on Earth at all its levels, from genes to ecosystems. Ecology is the scientific study of interactions of organisms with one another and with the physical and chemical environment around them. In this course Tropical Ecology of the Amazon we will be looking at the biodiversity of the region and the processes that originate and sustain it at multiple scales: regional, landscape, ecosystem, habitat, communities, and species. The overarching goal of this course is for students to be able to identify and characterize the diversity of non-human life in the Amazon region, and to understand the patterns and processes that support this diversity. Students will learn the fundamental principles of ecology through studying a diverse mosaic of ecosystems, habitats, and species along elevation gradients, succession gradients, and geomorphic features.

SFS 3840. Political Ecology of Developing Landscapes: Peru. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 4910W. Directed Research. (WI; 4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SFS 4930. Applied Research Techniques and Strategies Toward Sustainability in Costa Rica. (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

### Scientific Computation (SCIC)

**SCIC 8001. Parallel High-Performance Computing.** (3 cr.; Student Option; Every Fall) Interdisciplinary overview of computer science aspects of scientific computation, both hardware and techniques. Parallel computing, architectures, programming, and algorithms; restructuring compilers and data structures. prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8011. Scientific Visualization.** (3 cr.; Student Option; Every Spring) Basic issues in scientific visualization, visualization software, graphics, representation of scientific data, modeling, hardware for visualization, user interface techniques, output, commonly used algorithms and techniques for visualization, animation, information visualization, higher dimensional data, case studies, and examples of successful visualizations. prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8021. Advanced Numerical Methods.** (3 cr.; Student Option; Every Spring) Interdisciplinary overview of advanced numerical methods of scientific computation, emphasizing computational aspects. Approximation methods for partial differential equations, numerical linear algebra, sparse matrix techniques, iterative methods, solution of eigenvalue problems, and case studies. prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8031. Modeling, Optimization, and Statistics.** (3 cr.; Student Option; Periodic Fall) Interdisciplinary overview of mathematical modeling, optimization, and statistics techniques for scientific computation. Nonlinear equations and nonlinear optimization, statistics, control theory, modeling, and simulation. prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8041. Computational Aspects of Finite Element Methods.** (3 cr.; Student Option; Periodic Fall) Fundamental concepts and techniques of finite element analysis. Variational equations and Galerkin's method; weak formulations for problems with nonsymmetric differential operators; Petrov-Galerkin methods; examples from solid and fluid mechanics; properties of standard finite element families, implementation. prereq: Undergrad degree in field using sci comp or IT grad student or instr consent

**SCIC 8095. Problems in Scientific Computation.** (1-3 cr.; Max 9 cr.; Student Option; Periodic Fall) Selected topics in interdisciplinary aspects of scientific computing. prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8190. Supercomputer Research Seminar.** (1 cr. [max 3 cr.]; Student Option; Periodic Fall & Spring) Series of seminars by distinguished lecturers. prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8253. Computational Nanomechanics.** (3 cr.; Student Option; Every Spring) Fundamentals of mechanical properties in nanometer scale. Role of discrete structure and underlying atomic, molecular, and interfacial forces are illustrated with modern examples. Overview of computational atomistic methods. Lectures, hands-on computing using publicly available or personally developed scientific software packages. prereq: CSE graduate student

**SCIC 8333. FTE: Master's.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

**SCIC 8444. FTE: Doctoral.** (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

**SCIC 8551. Multiscale Methods for Bridging Length and Time Scales.** (3 cr.; A-F or Audit; Periodic Spring) Classical/merging techniques for bridging length/time scales. Nonlinear thermoelasticity, viscous fluids, and micromagnetics from macro/atomic viewpoints. Statistical mechanics, kinetic theory of gases, weak convergence methods, quasicontinuum, effective Hamiltonians, MD, new methods for bridging time scales. prereq: Basic knowledge of [continuum mechanics, atomic forces], familiarity with partial differential equations, grad student in [engineering or mathematics or physics or scientific computation]

**SCIC 8594. Scientific Computation Directed Research.** (1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) tbd prereq: Undergrad degree in field using sci comp or instr consent

**SCIC 8666. Doctoral Pre-Thesis Credits.** (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**SCIC 8777. Thesis Credits: Master’s.** (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**SCIC 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

**Security Technologies (ST)**

**ST 8109. Cybersecurity Foundations - Technology, Risk & Communication.** (2 cr.; A-F only; Every Fall)
Explore cyber security risks through evaluation of consumer driven technology concepts and their applicability to enterprise. Core technology concepts that face both consumers and businesses. How technology works, how to understand and communicate risks to business management, deliver actionable risk mitigation approaches. Security standards and benchmarks that guide industry. This course is also open to non-ST graduate students and non-degree graduate students who may register with permission/consent from the ST program. (DGS, DGSA or teaching faculty.)

ST 8110. Security Science and Technology Foundations. (3 cr.; A-F only; Every Summer) Essential areas of emerging science and pivotal technology disciplines for homeland security. Nanotechnology, sensor networks (biosensing, critical infrastructure protection), and food and biosafety, cyber and control systems security, and secure energy technologies. Current state-of-the-art status for each technology, together with barriers and opportunities for commercialization. prereq: Admitted student in security technologies program

ST 8111. Methods, Theory, and Applications. (2.5 cr.; A-F only; Every Fall) Methods, theory, techniques and models for understanding risk and implementing security strategies. Processes, methods, and application of risk assessment and management. Approaches for building scenarios, assessing the effectiveness of alternative management strategies, and designing risk management and mitigation plans. Case studies/simulations. How to use emergency management tools, techniques, and resources.

ST 8112. Technology for Homeland Security. (2 cr.; A-F only; Every Fall) Technologies involved in homeland security issues from several perspectives, including science, engineering, business, policy, and society. Advanced tools for the analysis and forecasting of technology and developing strategies aligned with overall stakeholder and organizational goals. Micro- and nanotechnologies and biochemical/chemical, radiological agents. Readings/discussion. Select a technology topic and analyze its current status and possible future trajectories for application or relevance to key issues of importance to security, both threats and opportunities. Present this in the last class session.

ST 8113. Information and Cyber Security. (2 cr.; A-F only; Every Spring) Existing and emerging IT, cyber, communication networks, and coordination activities during emergencies. Technological and policy issues for the need to share information through the use of interoperable technologies and to rapidly collect and synthesize data in real time in order to achieve critical national security. In addition to MSST grad students this course is also open to non-ST graduate students and non-degree graduate students who may register with permission/consent from the ST program (DGS, DGSA or teaching faculty).

ST 8200. Special Topics in Security Technologies. (0.5 cr.; A-F only; Every Fall & Spring) Leaders in the field related to security technologies. Special speakers.


ST 8221. Communications of Risk and Security. (1 cr.; A-F only; Every Fall) Analyze public speaking. How to be an effective listener, how to prepare for effective public speaking, how to be an effective writer, communicate by email, write for emphasis, tone, and business writing. prereq: MSST grad student

ST 8330. Critical Infrastructure Protections. (3 cr.; A-F only; Every Summer) Systems risk analysis, engineering, economics, and public policy. Investigate infrastructure security/support design and management of complex civil infrastructure systems. Systems' vulnerability assessment, asset and risk management, investigation of infrastructure interdependencies and couplings, along with judicious analyses of policies. Contribution of science and technology to strategically enhance security/quality of life. prereq: MSST grad student

ST 8331. Dynamic Systems Modeling and Simulation Tools. (2 cr.; A-F only; Every Fall) Techniques for modeling complex systems and predicting and evaluating consequences, risks and the potential utility of interventions and countermeasures in the context of intentional disruption or use of the system as an attack vehicle. Importance of inter/intra system modeling. Variety of modeling approaches. How systems can be characterized focusing on the parameters that are important for consequence assessment, risk assessment, capability benchmarking, and decision support. Develop a systems and simulation-based approach to risk assessment, preparedness, intervention assessment, and problem solving.

ST 8440. Security Practicum. (0.5-2 cr.; A-F only; Every Summer) Seminars and focused workshops on selected areas of security science and technology. prereq: Admitted to MSST grad program

ST 8441. Internship (optional). (0.5 cr.; A-F only; Every Fall & Spring) Summer internship opportunities at the university centers, companies, state, and federal agencies.

ST 8513. Cyber Threat Intelligence. (2 cr.; A-F only; Every Spring) The educational objective of this course is to provide students the foundational theory and applied skill in cyber threat intelligence analysis. This includes all phases of the intelligence life cycle: requirements development, collection, analysis methods, and reports and briefings for organizational leaders to influence risk-based cyber security decisions. The class counts as an elective for the MSST major and is also open to other graduate students after consultation with the director of graduate studies and a background check.

ST 8620. Capstone. (0.5-2 cr.; A-F only; Every Spring & Summer) The Capstone project is an independent, original, and applied investigation on a relevant subject, problem, or issue in the area of security technologies and homeland security. prereq: MSST grad program student

ST 8660. Independent Study. (1-4 cr.; A-F only; Every Fall, Spring & Summer) Focused study in security science, technology, business, policy or law, with a deliverable project report/presentation.

ST 8661. Securing Cyberspace (Fundamentals). (3 cr.; A-F only; Every Fall) The course is a two-course sequence which provides a comprehensive technical and logical foundation for defending an organization against cyber security threats. ST 8661 will be offered every fall and ST 8662 every spring.

ST 8662. Securing Cyberspace - Advanced. (3 cr.; A-F only; Every Spring) Political, psychological, sociological, and economic foundations and dynamics of both terrorism and homeland security. Contemporary debates over terrorism, counterterrorism, and homeland security. Students develop their own (informed) perspectives.
The course is a two-course sequence which provides a comprehensive technical & logical foundation for defending an organization against cyber security threats. The class is open to other grad students & upper undergrads after an interview with the director of graduate studies.

Senegal (SNGL)

SNGL 1001. Beginning French I. (4-5 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 1002. Beginning French II. (4-5 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 1003. Intermediate French I. (4-5 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 1004. Intermediate French II. (4-5 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 1011. Beginning Wolof. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3002. Entrepreneurship & Marketplace. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3015. Advanced French I. (3-4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3016. Advanced French II. (3-4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3017. Intermediate Wolof. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3018. Advanced Wolof. (4 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3201. Advanced Language Through Current Events. (2 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

SNGL 3202. Reading and Writing through Current Events. (4 cr.; Student Option; Every Fall, Spring & Summer) This course is a continuation of SNGL 3201, Advanced Language through Current Events. Students examine contemporary issues in Senegal through the lens of Senegalese newspapers, journals, films, radio, and TV broadcasts.

Social Work (SW)

SW 20. Community Engagement. (3 cr.; No Grade Associated; Every Fall, Spring & Summer)


SW 1501. Introduction to Peacemaking Studies. (GP; 3 cr.; A-F only; Every Fall & Spring) Interdisciplinary field that considers questions such as how human conflicts can be resolved in ways that promote justice/peace. Definitions, conditions, and causes of violence, nonviolence, war, and peace between nations, groups, or individuals.

SW 2501W. Introduction to Social Justice. (WI,DSJ; 4 cr.; A-F only; Every Fall & Spring) Meanings of social justice. Ways in which social justice advocates work for social change. Criminal justice, globalization, and social welfare. Students do service learning in a social justice organization.


SW 3702. Introduction to Adult Intimate Partner Violence: Intervention and Prevention. (3 cr.; Student Option; Every Fall & Spring) Theories, research, intervention, and prevention strategies regarding violence against women and the abuse of vulnerable adults in the United States. Issues of gender, race, culture, age, physical ability, SES, and sexual orientation. Includes service learning.

SW 3703. Gender Violence in Global Perspective. (3 cr.; Student Option; Every Fall & Spring) Theories/research on violence in intimate domestic relationships examined through multiple lenses. Overview of interventions in Minnesota, United States, and other societies.

SW 4501. Senior Seminar in Social Justice. (4 cr.; A-F only; Every Spring) Capstone course. Students complete a social justice portfolio, do service learning in a social justice organization. prereq: 2501, 3501

SW 4693. Directed Studies. (1-10 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study related to social issues, social work methods, or social work history. prereq: instr consent

SW 4694. Directed Research. (1-10 cr.; Student Option; Every Fall, Spring & Summer) Guided research related to social issues, social work methods, or social work history. prereq: instr consent

SW 5051. Human Behavior and the Social Environment. (2-3 cr.; A-F or Audit; Every Fall & Spring) Social, psychological, biological, and cultural factors of individual and group development as applied to social work practice. Behavior and life-cycle development focusing on diversity and each stage of life. Discuss development in terms of the individual, and in terms of overlapping social systems such as the multigenerational family, culture, community, and society. prereq: Grad student or 8 cr social sciences or inst consent

SW 5101. Historical Origins and Contemporary Policies and Programs in Social Welfare. (3-4 cr.; A-F or Audit; Every Fall & Spring) Contemporary policies and programs in social welfare are examined in light of their historical origins and evolution. A framework is then developed for analysis of concepts and principles in contemporary social policy for social welfare programs and services. The development of the profession of social work is also examined. prereq: Grad or 8 sem cr of social sciences

SW 5562. Global Social Work and Social Development. (3 cr.; Student Option; Periodic Fall & Spring) Theories or strategies of social work and social development in industrial/developing countries. Applying international perspective and comparative framework to analyze basic human needs, social problems, and social work and social development strategies in different countries.

SW 5810. Seminar: Special Topics. (1-4 cr. [max 10 cr.]; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

SW 5903. Substance Abuse and Social Work. (2 cr.; Student Option; Every Fall & Spring) Students gain skills in eliminating the detrimental impact of substance use disorders at multiple levels (families, groups, organizations, and communities) through an ability to identify, assess, intervene, and evaluate those struggling with substance abuse and dependency throughout the life span. prereq: Grad student or dept consent

SW 5904. Facilitation and Conflict Management: Humanistic Approach. (2 cr.; Student Option; Periodic Fall & Spring)
Humanistic approach to facilitating meetings in small human service organizations and units within large bureaucratic structures. Managing conflict among individuals, groups, and communities in multiple settings.

SW 5905. Permanency in Child Welfare. (2 cr.; A-F or Audit; Every Spring) Depth/breadth in knowledge/skill acquisition in achieving permanency for children receiving services within public, tribal, and private child welfare systems. Out-of-home/permanency placements, specific permanency interventions, and child/family responses to different permanency options. prereq: Grad student or dept consent

SW 5906. Advanced Ethical Decision Making. (1 cr.; Student Option; Every Spring) Identify ethical issues, resolve ethical dilemmas, make ethical decisions when confronted with conflicting duties/choices that occur within the context of professional social work at all levels of practice.

SW 5907. School Social Work. (1 cr.; Student Option; Periodic Fall, Spring & Summer) Apply social work knowledge/skills in school settings through prevention, assessment, intervention, and evaluation from an ecological multilevel approach focused on students, families, and the school community.

SW 5908. Technology and Communication in Social Work. (1 cr.; Student Option; Periodic Fall & Spring) This course explores the influence of technology in social work practice/society. Appropriate community or direct interventions using new technologies. Introduction to effective communication and public relations.

SW 5909. Social Work With Involuntary Clients. (2 cr.; Student Option; Periodic Fall & Spring) Includes theory, ethics, effectiveness, and intervention methods for work with client systems that experience involuntary contact with a social worker. Interventions at micro, mezzo, and macro levels are included. Practice in varied settings such as child welfare, mental health, corrections, and public schools as well as practice related to organizational responses to change.

SW 5912. Grief and Loss in Social Work Practice. (1 cr.; Student Option; Every Fall & Spring) Review current concepts of grief/loss. Historical/modern views, symptoms of grief, implications of diverse losses, including expected, sudden, or traumatic losses, ambiguous grief.


SW 5991. Independent Study in Social Work. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Independent study in areas of special interest to students and faculty. This course is open to graduate students in the School of Social Work with an approved independent study proposal. MSW students may apply a maximum of 4 credits of SW 5991 to their program of study.

SW 8010. Seminar: Field Practicum I. (1-8 cr.; S-N or Audit; Every Fall, Spring & Summer) Integrates classroom learning with direct experience of a social work field internship. Professional support/learning groups focus on student and facilitator-identified issues. Students discuss professional/personal biases, ethical dilemmas, and supervisory issues. Cross-cultural understanding, implications of cross-cultural practice. prereq: 8201

SW 8020. Field Practicum II. (1-6 cr.; S-N or Audit; Every Fall, Spring & Summer) Integrates classroom learning with a direct concentration with the direct experience of an internship. Students expand competency in cross-cultural practice. prereq: 8010

SW 8030. Advanced Standing Social Work Practicum. (1-8 cr.; S-N or Audit; Every Fall, Spring & Summer) Integrates classroom learning with direct experience of a social work field internship. Professional support/learning groups discuss issues raised in field placement. Groups focus on professional/personal biases, ethical dilemmas, supervisory issues, cross-cultural sharing, and implications of students’ privilege/power in relation to client systems. prereq: Adv standing

SW 8041. Specialized Field Placement. (1-4 cr.; S-N only; Every Fall, Spring & Summer) Field placement added to required foundation/concentration field placements (or to concentration placement for advanced standing students). prereq: [8020 or 8030], inst consent

SW 8151. Social Work Methods: Practice With Individuals and Systems. (2 cr.; A-F or Audit; Every Fall) Develops foundational knowledge and skills for social workers to work with individuals and systems. prereq: MSW student or inst consent

SW 8152. Social Work Practice Methods: Families and Groups. (2 cr.; A-F or Audit; Every Fall) Develops foundational knowledge and skills in relationship building, engagement, interviewing, and assessment with families and groups using the ecological-systems theoretical framework and resiliency-based approach. prereq: MSW student or inst consent

SW 8153. Social Work Practice Methods: Macro Practice and Organizations. (2 cr.; A-F only; Every Fall) Models of community intervention, community practice and macro-level interventions as integral to professional social work. Building upon theoretical approaches to human service organizations and their distinct attributes, the course addresses key practice knowledge, skills, and values that promote, develop, and maintain human service organizations that effectively meet community and client needs.

SW 8251. Social Work Practice in Health, Disabilities, and Aging. (3 cr.; A-F or Audit; Every Fall) Social work practice in health/disabilities/aging. History in social work, practice contexts/settings, service delivery systems. Practice/population overlaps, distinctions, co-operations. prereq: [5051, 5101, 8151, 8152, 8153, 8154] or MSW Adv Standing or inst consent

SW 8261. Advanced Social Work Practice in Health Care. (3 cr.; A-F only; Every Fall, Spring & Summer) Advanced social work practice in health care. Theoretical models/evidence-based interventions. Psychosocial assessment, treatment interventions, interdisciplinary teamwork, ethics, leadership. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or inst consent

SW 8262. Empowerment Practice With Persons With Disabilities. (3 cr.; A-F or Audit; Every Fall) Models of disability, types of disability, common social work practices. Knowledge/skills for use across lifespans/cultures/various settings. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or inst consent

SW 8263. Advanced Direct Practice and Community-Based Interventions in Gerontology. (3 cr.; A-F or Audit; Every Fall) Direct/community-based social work intervention with older adults in individual, family, group, residential, community settings. Geriatric assessment/therapy modalities. Evidence-based interventions/approaches. prereq: [SW 8251 or concurrent registration is required (or allowed) in 8251, [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or inst consent

SW 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

SW 8351. Assessment and Engagement with Families and Children. (3 cr.; A-F or Audit; Every Fall & Spring) Utilizing evidence-informed, culturally respectful assessments/engagement models with families/children. Factors internal/external to families. Work with families/children around broad scope of stressors. Resiliency. prereq: [5051, 5101, 8151, 8152, 8153, 8154] or MSW Adv Standing or inst consent

SW 8352. Intervention Methods with Families. (3 cr.; A-F or Audit; Every Fall & Spring) Work with families/children in family-centered, community, preventive practice. Engagement, assessment, intervention, evaluation. prereq: [8351 or concurrent registration is required (or allowed) in 8351], [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or inst consent
SW 8361. Identification and Assessment of Family Violence. (3 cr.; A-F or Audit; Periodic Fall)
Identification/assessment of family violence. Contextual knowledge of behaviors of perpetrators, victims, survivors. Gender, race, culture, age, ability, SES, sexual orientation. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8363. Social Work in Child Welfare. (3 cr.; A-F or Audit; Every Spring)
Public, private, tribal child welfare related to assessment of strengths/risks. Develop appropriate plans that secure child safety/well-being. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

SW 8451. Assessment and Engagement in Clinical Social Work Practice. (3 cr.; A-F or Audit; Every Fall & Summer) Mental health diagnostic codes/classifications. Interviewing skills, assessment writing skills/techniques. Biopsychosocial perspective/engagement strategies. prereq: [5051, 5101, 8151, 8152, 8153, 8154] or MSW Adv Standing or instr consent

SW 8452. Core Concepts in Clinical Social Work Practice. (3 cr.; A-F or Audit; Every Fall & Spring) Interpersonal process skills. Developing/maintaining effective therapeutic alliances/positive intervention outcomes with diverse populations. prereq: [8451 or concurrent registration is required (or allowed) in 8451], [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8461. Advanced Clinical Social Work Practice with Adults. (3 cr.; A-F or Audit; Every Fall) Research-informed clinical interventions for adults with mental health distress. Application of cognitive behavioral/psychodynamic psychotherapies through brief/long-term models across diverse populations. prereq: [8451 or concurrent registration is required (or allowed) in 8451], [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8462. Advanced Clinical Practice With Children and Adolescents. (3 cr.; A-F or Audit; Every Fall) Social work interventions using normative developmental supports/mental health case planning. Develop advanced clinical social work practice knowledge/skills for working with children/adolescents with mental health risks. Provide knowledge for community social workers serving children exposed to stress. prereq: [8351 or concurrent registration is required (or allowed) in 8351] or [8451 or concurrent registration is required (or allowed) in 8451], [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8463. Social Work Practice With Severe and Persistent Mental Illness and Severe Emotional Disturbance. (3 cr.; A-F or Audit; Every Spring) Integrated social work approach to assessing/working with individuals with SPMI, SED. Trends in theories supported approaches. Recovery/wellness approaches. Macro systems that impact lives of individuals/families. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8505. Advanced Community Organization and Advocacy. (3 cr.; A-F only; Every Fall & Spring) Methods for stimulating/supporting joint action for constructive change to fulfill community needs. Principles of working with local organizations. Social action to accomplish specific changes. prereq: [Foundation curriculum, advanced standing] or instr consent

SW 8507. Community Practice Seminar. (1 cr.; Student Option; Every Spring) Links content from human services management and from community organization and advocacy. Integrating framework that draws upon knowledge/skills used in agency/organizational management and in community organization/change. prereq: [Foundation curriculum, advanced standing] or instr consent

SW 8515. Advanced Community Practice: Assessment, Organizing, and Advocacy. (3 cr.; A-F or Audit; Every Fall) Community practice, including community organizing, policy advocacy, social service/change leadership. prereq: [5051, 5101, 8151, 8152, 8153, 8154] or MSW Adv Standing or instr consent

SW 8552. Advanced Community Practice: Leadership, Planning, and Program Development. (3 cr.; A-F or Audit; Every Fall) Advanced community practice knowledge/skills. Strategic planning, program design, organizational leadership/management, work groups. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8551. Advanced Community Practice: Assessment, Organizing, and Advocacy. (3 cr.; A-F or Audit; Every Fall) Community practice, including community organizing, policy advocacy, social service/change leadership. prereq: [5051, 5101, 8151, 8152, 8153, 8154] or MSW Adv Standing or instr consent

SW 8553. Advanced Community Practice: Leadership, Planning, and Program Development. (3 cr.; A-F or Audit; Every Fall) Advanced community practice knowledge/skills. Strategic planning, program design, organizational leadership/management, work groups. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8562. Human Services Finances. (2 cr.; A-F or Audit; Every Fall) Financial management and from community organization and advocacy. Integrating framework that draws upon knowledge/skills used in agency/organizational management and in community organization/change. prereq: [Foundation curriculum, advanced standing] or instr consent

SW 8506. Program Evaluation. (2 cr.; A-F only; Every Fall) Conceptual, methodological, political, psychological, and administrative factors related to conduct and consequences of social work program evaluation. Social programs as cause and effect; models, types, and strategies of evaluation; appraisal of selected research literature. prereq: 8601 or equiv or instr consent

SW 8605. Program Evaluation. (2 cr.; A-F only; Every Fall) Conceptual, methodological, political, psychological, and administrative factors related to conduct and consequences of social work program evaluation. Social programs as cause and effect; models, types, and strategies of evaluation; appraisal of selected research literature. prereq: 8601 or equiv or instr consent

SW 8603. Program Evaluation. (2 cr.; A-F only; Every Fall) Conceptual, methodological, political, psychological, and administrative factors related to conduct and consequences of social work program evaluation. Social programs as cause and effect; models, types, and strategies of evaluation; appraisal of selected research literature. prereq: 8601 or equiv or instr consent

SW 8606. Program Evaluation. (2 cr.; A-F only; Every Fall) Conceptual, methodological, political, psychological, and administrative factors related to conduct and consequences of social work program evaluation. Social programs as cause and effect; models, types, and strategies of evaluation; appraisal of selected research literature. prereq: 8601 or equiv or instr consent

SW 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

SW 8693. Directed Study. (1-6 cr.; Student Option; Every Fall, Spring & Summer) Independent study under tutorial guidance. prereq: instr consent

SW 8694. Directed Research. (1-6 cr.; Student Option; Every Fall, Spring & Summer) Individual or small group research inquiry translating introductory course content into research design and study. Projects may be conducted in conjunction with field learning experiences or other coursework. prereq: instr consent

SW 8801. Social Work Ethics and Legal Issues. (3 cr.; Student Option; Periodic Fall & Spring) Develops knowledge base and skills required to identify and understand legal and ethical issues, resolve ethical dilemmas, and make ethical decisions within social work. Values base, ethical standards, ethical decision-making models, and laws and legal procedures related to social work. Legal aspects of child welfare practice. prereq: Credit will not be granted if credit has been received for: 5811; foundation courses or adv standing or instr consent

SW 8804. Child Welfare Policy. (3 cr.; A-F or Audit; Every Spring) Develops advanced policy knowledge/skills for social workers practicing in or collaborating...
with public or private child welfare services. 
prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8805. Aging and Disability Policy. (3 cr.; A-F or Audit; Every Spring)
Social policy related to disability/aging. Major policy areas of income support, health, education, caregiving, employment, housing, retirement. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8806. Health and Mental Health Policy. (3 cr.; A-F or Audit; Every Spring)
Critically engage in health/mental health policy debate, analysis, development, implementation. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8807. International and Comparative Social Welfare Policy. (3 cr.; A-F or Audit; Every Spring)
Cross-national comparisons of social welfare policies, major international conventions, treaties. Social welfare, social development theories/policies. In-depth analyses of selected countries’ policies, international agreements, social development strategies. prereq: [5051, 5101, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8821. Social Work and Difference, Diversity and Privilege. (2 cr.; A-F only; Every Fall & Summer)
Essential knowledge/awareness/skills to support culturally competent social work practice. prereq: [5051, 5801, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8841. Social Work Research Methods. (2 cr.; A-F or Audit; Every Fall & Spring)
Develops foundational research methods knowledge/skills fundamental to evidence-based social work practice. prereq: MSW student or instr consent

SW 8842. Advanced Social Work Evaluation. (1-3 cr. [max 6 cr.; A-F or Audit; Every Fall, Spring & Summer])
Students design/ carry out evaluation of program or own direct practice. Purposes/types of evaluations. Instrument design, data analysis, ethical issues. Organizational, political, social, cultural factors affecting evaluation in diverse human contexts. prereq: [current registration is required (or allowed) in 8020 or 8030], [5051, 5801, 8151, 8152, 8153, 8841] or MSW Adv Standing or instr consent

SW 8843. Social Work Program Evaluation. (1-2 cr. [max 3 cr.; A-F only; Every Fall & Spring])
Students design, implement, and present an evaluation of a program either in their field practicum or of particular interest to them. Class topics include the purpose and types of evaluations; instrument design; data collection techniques and management; data analysis; ethical issues; and organizational, political, social and cultural factors influencing evaluation in diverse human contexts.

SW 8851. Social Welfare History and Historical Research Methods. (3 cr.; A-F only; Periodic Spring)
Methods of historical research in, and survey of, history/evolution of social welfare/work, using primary/secondary source materials. prereq: Completed research courses for soc work PhD student or [equiv research methods courses, grad student]

SW 8855. Social Policy Formulation and Analysis. (3 cr.; A-F only; Periodic Fall)
Application of theoretical perspectives, conceptual frameworks, and research methodologies to analysis of social issues and analysis formulation of social welfare policy. prereq: Soc wk PhD student or instr consent

SW 8861. Theory and Model Development in Social Work. (3 cr.; A-F only; Periodic Fall)
Intervention research methods, contemporary social work practice models. Direct intervention in systems, from individual to community. Theoretical, value, empirical foundations of practice models for intervention research. prereq: Soc wk PhD student or instr consent

SW 8863. Social Work Teaching Methods and Educational Issues. (3 cr.; A-F only; Periodic Fall)
Teaching methods, strategies, and issues related to Teaching, scholarship, and service roles in social work education. Issues, including curriculum development. Teaching experience in a social work class. prereq: Soc wk PhD student or 2nd-yr MSW student or instr consent

SW 8871. Social Work Research Seminar I. (3 cr.; A-F only; Every Fall)
Concepts/methods of social research. Issues in social science, social work research, and knowledge development. Development of research questions. Sampling, measurement, data collection in qualitative/quantitative research. prereq: Soc wk PhD student or instr consent

SW 8872. Social Work Research Seminar II. (3 cr.; A-F only; Every Spring)
Methods/design of quasi-experiments, surveys, descriptive research. Grounded theory. Analysis of qualitative/quantitative data. prereq: 8871 or instr consent

SW 8875. Research Practicum. (2 cr. [max 6 cr.; S-N or Audit; Every Fall & Spring])
Experience in conduct of research, following completion of 8871 and 8872. Students work under faculty direction. prereq: Soc wk PhD student or instr consent

SW 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.; No Grade Associated; Every Fall, Spring & Summer])
No description prereq: Max 18 cr per semester or summer; 24 cr required

SW 8901. Assessment and Treatment of Trauma. (2 cr.; Student Option; Every Spring)
Sociopolitical context of trauma. Impact on diverse populations of individuals, families, communities. Evidence-based approaches for addressing trauma on multiple system levels. Applications to case conceptualization, treatment planning. prereq: Advanced Standing or students who have completed entire foundation curriculum including SW 8010 or instr consent

SW 8902. Social Work Supervision, Consultation, and Leadership. (2 cr.; Student Option; Periodic Fall & Spring)
Sociopolitical context of trauma/its impact on diverse populations of individuals, families, communities. Evidence-based approaches for addressing trauma on multiple system levels through applications to case conceptualization/treatment planning. prereq: Advanced Standing or students who have completed the entire foundation curriculum including SW 8010 or instr consent

Social, Adm, and Clinical Phar (SACP)

SACP 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Master’s student, [adviser, DGS] consent

SACP 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student, [adviser, DGS] consent

SACP 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.; No Grade Associated; Every Fall, Spring & Summer])
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

SACP 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.; No Grade Associated; Every Fall, Spring & Summer])
tbd prereq: Plan A

SACP 8888. Thesis Credits: Doctoral. (1-24 cr. [max 100 cr.; No Grade Associated; Every Fall, Spring & Summer])
tbd

Social/ Administrative Pharmacy (SAPH)

SAPH 5100. Pro-Seminar. (1 cr.; A-F or Audit; Every Fall)
History, foundational frameworks, and key research domains for social and administrative pharmacy through examining landmark literature. Students think critically, reflect on important works, and create a cognitive map of the discipline and their own focus for study.

SAPH 5610. Pharmacoepidemiology. (3 cr.; A-F only; Fall Odd Year)
Application of epidemiologic principles to study/use. Beneficial/adverse outcomes of drugs in human populations.

SAPH 8054. Advanced Studies in Pharmaceutical Care Practice. (3 cr.; A-F or Audit; Every Fall & Spring)
SAPH 8100. Seminar. (1 cr. [max 8 cr.]; A-F only; Every Fall & Spring)
Contemporary issues and research problems in sociobehavioral pharmacy, pharmacoeconomics and policy, and clinical research. prereq: Grad SAPH major or instr consent

SAPH 8173. Principles and Methods of Implementing Research. (3 cr.; Student Option; Every Fall)
Integrates scientific, statistical, and practical aspects of research. Interrelationships among design, sample selection, subject access, human subjects requirements, instrument selection and evaluation, data management, analyses plans, grant writing, and research career issues. Field experiences. prereq: Two grad stat courses

SAPH 8200. Research Problems. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Individually designed research experience directed at contemporary problems related to drug use process. prereq: Grad SAPH major or instr consent

SAPH 8235. Pharmaceutical Economics and Policy. (3 cr.; A-F or Audit; Every Fall)
Economic analysis of pharmaceutical sector of health care systems. Problems of pricing production and distribution of pharmaceuticals. Domestic or international policy issues relevant to price and access of pharmaceuticals. prereq: Grad SAPH major or instr consent

SAPH 8255. Pharmaceutical Marketing. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Historical development of distributive systems, marketing strategies, institutions, policies, and practices as they relate to pharmaceutical industry. Contemporary issues/theory related to pharmaceutical marketing. Pharmaceutical proportion, especially directed to consumer advertising. prereq: Grad SAPh major or instr consent

SAPH 8270. Clinical Conferences. (2 cr.; Student Option; Every Fall)
N/A prereq: Grad SAPH major or instr consent

SAPH 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

SAPH 8420. Social and Behavioral Aspects of Pharmacy Practice. (3 cr.; A-F or Audit; Every Spring)
Historical development of the profession, its growth and development, emphasizing forces of education, professionalization, attitude modification, and changes occurring as a product of legal and organizational forces in society. prereq: Grad SAPH major or instr consent

SAPH 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

SAPH 8500. Pharmacy and Its Environment. (3 cr.; A-F or Audit; Every Spring)
Cultural foundations of pharmacy. Development of present state of pharmacy practice. Role of pharmacist as health practitioner in relation to other health practitioners. Identification of factors (health policy, regulation, economics, research and development, promotion) that affect individual responses to drug therapy. prereq: Grad SAPH major or instr consent

SAPH 8610. Pharmacoepidemiology. (3 cr.; Student Option; Periodic Fall)
Pharmacoepidemiology is the study of the uses and effects of drugs in patient populations. The science of pharmacoeconomics borrows from pharmacology and epidemiology. This course will introduce students to the field of pharmacoeconomics including study methodology, relevant statistics, data sources, measurement of treatments and outcomes, sources of bias and control of confounding, techniques to reduce bias and confounding, survival analysis and regression techniques, interpretation of results, and drug safety surveillance and risk management.

SAPH 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Doctoral pre-thesis credits. prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

SAPH 8700. Hospital Pharmacy Administration. (3 cr.; A-F or Audit; Periodic Fall & Spring)
History, classification, organization, and functions of hospital departments in relation to the pharmacy service. prereq: Grad SAPH major or instr consent

SAPH 8702. Hospital Pharmacy Survey. (1 cr. [max 3 cr.]; Student Option; Periodic Fall)
Readings for self-directed students to explore contemporary issues in hospital pharmacy practices. prereq: Grad SAPH major or instr consent

SAPH 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

SAPH 8810. Social Psychology of Health Care. (3 cr.; Student Option; Periodic Spring)
Behavioral and social aspects of recovery responses to drugs and other therapies, patients' compliance with prescribed therapies, relationships between healthcare professional and patient. prereq: Grad SAPH major or instr consent

SAPH 8840. Social Measurement. (3 cr.; A-F or Audit; Periodic Fall & Spring)
How social factors such as innovativeness, compliance, religiosity, and stress are measured and tested for reliability and validity. Relationships between theory, concepts, variables, data. prereq: Intro stat course, understanding of simple correlations or instr consent

SAPH 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

SOC 1101V. Honors: Introduction to Sociology. (DSJ,WI,SOCS; 4 cr.; A-F only; Every Fall & Spring)
This course is designed to introduce you to the study of society and what sociologists call the "sociological imagination": a way of viewing the events, relationships and social phenomena that shape our individual lives and much of our collective experience. Through the course we will examine some of the central concepts and problems that have preoccupied both classical and contemporary sociologists and gain a sense of how the sociological imagination can illuminate the social forces that have a concrete impact on our everyday lives. Throughout the course you will be asked to consider the ways in which society affects your life, and how you, in turn, affect society. prereq: Soc Majors/ Minors must register A-F

SOC 101. Law, Crime, & Punishment. (3 cr.; A-F; Every Fall & Spring)
Introductory course designed to provide students with a general understanding of the main theoretical perspectives and empirical findings that dominate socio-legal studies and contemporary criminology. We examine the connections and relationships between law, crime, and punishment using an interdisciplinary social science approach.

SOC 3003. Social Problems. (3 cr.; A-F or Audit; Periodic Fall & Spring)
In this course, we will engage in a sociological examination of major social problems facing the contemporary US and abroad. We explore the origins and causes of different social problems.
problems, seek to understand how they impact individuals, groups, and the society as a whole, and evaluate solutions. We ask how an issue becomes defined as a "social problem," discuss the social construction of reality and deviance, and consider the primary frameworks under which societies have organized their responses to different social problems. prereq: 1001 recommended; soc majors/minors must register A-F.

SOC 3090. Topics in Sociology. (3 cr. [max 6 cr.]; Student Option; Periodic Spring) Topics specified in Class Schedule. prereq: 1001 recommended; soc majors must register A-F; cr will not be granted if cr has been received for the same topics title

SOC 3093. Directed Study. (1-4 cr.; Student Option; Every Fall, Spring & Summer) Guided individual reading or study at sophomore level. Prereq 1001, instr consent, dept consent, college consent; soc majors/minors must register A-F.

SOC 3094. Directed Research. (1-4 cr.; Student Option; Every Fall & Spring) Guided research experience at sophomore level. Prereq: 1001, instr consent; soc majors/minors must register A-F.

SOC 3101. Sociological Perspectives on the Criminal Justice System. (CIV; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) This course introduces students to a sociological account of the U.S. criminal justice system. We will critically examine the components, dynamics, and effects of policing, criminal courts, community supervision, jails, and prisons. Throughout the course, we focus on sociological understandings of these processes, with particular attention to ethnic, racial, class, and gender inequalities as well as long-term problems associated with the high rate of criminal justice supervision in the U.S. prereq: [SOC 1001] recommended. Sociology majors/minors must register A-F.

SOC 3101H. Honors: Sociological Perspectives on the Criminal Justice System. (CIV; 3 cr.; A-F only; Every Fall, Spring & Summer) This course introduces students to a sociological account of the U.S. criminal justice system. We will critically examine the components, dynamics, and effects of policing, criminal courts, community supervision, jails, and prisons. Throughout the course, we focus on sociological understandings of these processes, with particular attention to ethnic, racial, class, and gender inequalities as well as long-term problems associated with the high rate of criminal justice supervision in the U.S. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our class session. Examples of additional requirements may include: ? Honor students will be expected to interview a current Sociology graduate student working on a LCD topic. Following this, each student will individually be expected to do an in-class power-point presentation explaining how the interviewees? research relates with themes presented in the course. Students will also be expected to meet as a group and individually with the professor four times during the course semester. ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). ? Write two brief (1-page) reflection papers on current news, or a two-page critique of a class reading? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2 page maximum reflective paper. prereq: [SOC 1001] recommended. Sociology majors/minors must register A-F, honors.

SOC 3102. Criminal Behavior and Social Control. (3 cr.; Student Option; Every Fall & Spring) This course will address the social and legal origins of crime and crime control with a focus on general theories of deviance/crime and present an overview of forms of social control. We will critically examine criminological, sociological and legal theories that explain the causes of crime and other misdeeds. prereq: Soc majors/minors must register A-F.

SOC 3201. Inequality: Introduction to Stratification. (3 cr.; Student Option; Periodic Fall) Why does inequality exist? How does it work? These are the essential questions examined in this class. Topics range from welfare and poverty to the role of race and gender in getting ahead. We will pay particular attention to social inequalities ? why some people live longer and happier lives while others are burdened by worry, poverty, and ill health. prereq: soc majors/minors must register A-F.

SOC 3211W. American Race Relations. (DSJ; WI; 3 cr.; A-F or Audit; Every Fall & Spring) This course is designed to provide students with an understanding of the contours of race in the post-civil rights era United States. This course will focus on race relations in today's society with a historical overview of the experiences of various racial and ethnic groups in order to help explain their present-day social status. The class will also class consider the future of race relations in the U.S. and evaluate remedies to racial inequality.

SOC 3211W. American Race Relations. (DSJ; WI; 3 cr.; A-F or Audit; Every Fall & Spring) This course is designed to provide students with an understanding of the contours of race in the post-civil rights era United States. This course will focus on race relations in today's society with a historical overview of the experiences of various racial and ethnic groups in order to help explain their present-day social status. The class will also class consider the future of race relations in the U.S. and evaluate remedies to racial inequality.

SOC 3215. Supercapitalism: Labor, Consumption & the Environment in the New Global Economy. (3 cr.; A-F only; Every Spring) Far-reaching transformations of the global economy over the last seventy years in the realms of labor, consumption and the environment. The movement away from regulated national economies to a more fully integrated global economy; changing patterns and organization of production, employment, consumption, and waste disposal; rise of supercapitalism: a new culture of market rule over society and nature.

SOC 3221. Sociology of Gender. (3 cr.; A-F or Audit; Periodic Fall & Spring) Gender is something so fundamental to our lives, to our identities, and how we interact with others that we often take it for granted. However, understandings of gender vary across time and place, and even within cultures, making it clear that our understandings of gender are not universal or timeless. In this class, we will examine how gender intersects with race and sexuality, as well as how it impacts areas of our lives such as childcare, family structure, the media, intimate relationships, and the workplace prereq: 1001 recommended; soc majors/minors must register A-F.

SOC 3246. Diseases, Disasters, & Other Killers. (ENV,HIS; 3 cr.; A-F or Audit; Every Fall) This course studies the social pattern of mortality, beginning with demographic transition theory. Students will study specific causes of death or theories of etiology, including theories about suicide, fundamental causes, and different institutional life conditions in mortality. Students learn tools for studying mortality, including cause of death classifications and life tables. Soc majors/minors must register A-F.

SOC 3251W. Sociological Perspectives on Race, Class, and Gender. (DSJ, WI, SOCS; 3 cr.; A-F or Audit; Every Fall, Spring & Summer) Race, class, and gender as aspects of social identity and as features of social organization. Experiences of women of color in the United States. Family life, work, violence, sexuality/reproduction. Possibilities for social change. prereq: Soc majors/minors must register A-F.

SOC 3301W. Politics and Society. (WI; 3 cr.; A-F or Audit; Periodic Spring) Political sociology is concerned with the social bases of power and the social consequences of the organization of power, especially how power operates in relationship to various forms of inequality and different institutional life forms. We will explore political socialization, electoral politics and voting, social movements, the media and framing, and politics of inequality, poverty, and welfare. prereq: 1001 recommended; soc majors/minors must register A-F.

SOC 3309. Atheists & Others: Religious Outsiders in the United States. (DSJ; 3 cr.; A-F only; Periodic Spring) What does it mean to be an atheist in the United States today? Atheists comprise a small percentage of the American population, but one with an increasingly visible presence in popular culture, political discourse, & everyday life. How do atheists organize into groups oriented toward identity formation, social connection, and political action? prereq: 1001 recommended.

SOC 3311W. Hard Times & Bad Behavior: Homelessness & Marginality in the United States. (WI; 3 cr.; Student Option; Periodic Spring) As we read about hobos and sailors, opium users and saloon girls, and contemporary experiences on the streets, we trace themes about marginality in the US, such as rootlessness produced by labor market, the love-hate relationship between elites and marginal populations in popular culture.
and the complex mixture of freedom and deprivation of people on the edge. prereq: 1001 recommended; soc majors/minors must register A-F

SOC 3322W. Social Movements, Protests, and Change. (CIV, WI; 3 cr.; Student Option; Spring Odd Year)
Origins, dynamics, and consequences of social movements. Challenges facing movement organizations. Relationship between movements and political institutions. Role of movements in bringing about social change. Theoretical issues, case studies. prereq: 1001 or instr consent; soc majors/minors must register A-F

SOC 3411W. Organizations and Society. (Wi; 3 cr.; A-F or Audit; Periodic Fall & Spring)
This course introduces undergraduates to contemporary theories and debates about formal organizations in an international context, including such forms as large corporations, small businesses, public bureaucracies, nonprofits, voluntary associations, social movement organizations, terrorist networks and counterterror organizations. prereq: 1001 recommended; soc majors/minors must register A-F

SOC 3412. Social Networking: Theories and Methods. (TS; 3 cr.; A-F only; Periodic Spring)
Network analysis spans a diverse range of phenomena from ego-centric ties, to small work-team sociograms, to organizational relations, to trade and military alliances among nation states. This course introduces undergraduate students to theories and methods for studying social networks, the ties connecting people, groups, and organizations. Topics include friendship, communication, small group, health, sexual and romantic, corporate, social movement, public policy, innovation diffusion, criminal and terrorist, and Internet networks. prereq: 1001 recommended, Sociology majors/minors must register A-F

SOC 3417W. Global Institutions of Power: World Bank, International Monetary Fund, and World Trade Organization. (GP, WI; 3 cr.; A-F only; Every Fall)

SOC 3421W. Sociology of Work: Good Jobs, Bad Jobs, No Jobs?. (Wi; 3 cr.; A-F or Audit; Periodic Spring)
Work is central to individuals, economy, and society. This course introduces students to sociological perspectives and analyses of work. We will look at what makes a good job good, a bad job bad, and impacts of joblessness on society. prereq: 1001 recommended, Soc majors/minors must register A-F

SOC 3446. Comparing Healthcare Systems. (GP; 3 cr.; A-F or Audit; Periodic Fall & Spring)
Examination of national health systems from an international comparative perspective, emphasizing social, organizational, political, economic, and ethical dimensions of healthcare policies and programs to deliver services and their impacts on the health of population groups. The comparative approach will enable students to acquire a better understanding of the problems and potential for reforming and improving US healthcare delivery. Pre-req: Soc majors/minors must register A-F

SOC 3451W. Cities & Social Change. (Wi; 3 cr.; A-F or Audit; Spring Odd Year)
The core themes of this class will provide an essential toolkit for approaching broad questions about social justice, culture, work, housing and service provision on multiple levels and across the globe. This course will have units on economic development, inequality, the interaction between design and human action, inclusive and exclusive cultural formations, crime and cultures of fear, social control and surveillance, prereq: 1001 recommended, Soc majors/minors must register A-F
some parts of the world (often from the least developed regions to the highly developed Western nations) create such strong and highly charged debates? How are cross border social and economic relations of individuals and households maintained and perpetuated? What are particular governments doing to either encourage or hinder these movements? How are current migrations different from earlier eras? Is this gendered, and if so, how and why? The objective of this course is to explore the above questions through academic and policy published literature. prereq: Soph, jr, or sr

**SOC 3507. Immigration to the United States: Beyond Walls.** (3 cr.; A-F or Audit; Periodic Fall & Spring)

Immigration is one of the most politically and emotionally charged issues in the United States today. It is also poorly understood. Assumptions, myths, and misinformation about US immigration are routinely and increasingly manifested in acrimonious political debates, news stories and sound bites, and our daily conversations and interactions with one another in the very communities in which we live and work. At the same time, US immigration and immigrants have been, are, and will continue to be an essential and vibrant part of our lived and shared experiences as individuals and communities, Minnesotans and Americans, and global citizens.

**SOC 3511. World Population Problems.** (GP; 3 cr.; A-F or Audit; Periodic Fall & Summer)

This class is an introduction to the contemporary issues that accompany such dramatic population change, including fertility change, disease experiences, migration as opportunity and challenge and human-environment conflict. Further, we will examine the roles of global organizations, national governments, and culture in shaping and reshaping populations. prereq: [SOC 1001] recommended, Sociology majors/minors must register A-F

**SOC 3511H. Honors: World Population Problems.** (GP; 3 cr.; A-F only; Periodic Fall & Spring)

This class is an introduction to the contemporary issues that accompany such dramatic population change, including fertility change, disease experiences, migration as opportunity and challenge and human-environment conflict. Further, we will examine the roles of global organizations, national governments, and culture in shaping and reshaping populations. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Examples of additional requirements may include: - Sign up and prepare 3-4 discussion questions in advance of at least one class session. - Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). - Write two brief (1-page) reflection papers on current news or a two-page critique of a class reading - Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. - Interview a current sociology/Global Studies graduate student and present briefly in class or write a reflective piece, not more than 2 pages in length, to be submitted to the professor.

**SOC 3613V. Honors: Stuffed and Starved: The Politics of Eating.** (GP,WI,SOCS; 3 cr.; A-F only; Periodic Fall & Spring)

This course takes a cross-cultural, historical, and transnational perspective to the study of the global food system. Themes explored include: different cultural and social meanings attached to food; social class and consumption; the global food economy; global food chains; work in the food sector; the alternative food movement; food justice; environmental consequences of food production. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Examples of additional requirements may include: - Sign up and prepare 3-4 discussion questions in advance of at least one class session. - Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). - Write two brief (1-page) reflection papers on current news or a two-page critique of a class reading - Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. - Interview a current sociology/Global Studies graduate student and present briefly in class or write a reflective piece, not more than 2 pages in length, to be submitted to the professor.

**SOC 3613W. Stuffed and Starved: The Politics of Eating.** (GP,WI,SOCS; 3 cr.; A-F or Audit; Periodic Fall & Spring)

This course takes a cross-cultural, historical, and transnational perspective to the study of the global food system. Themes explored include: different cultural and social meanings attached to food; social class and consumption; the global food economy; global food chains; work in the food sector; the alternative food movement; food justice; environmental consequences of food production. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Examples of additional requirements may include: - Sign up and prepare 3-4 discussion questions in advance of at least one class session. - Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). - Write two brief (1-page) reflection papers on current news, or a two-page critique of a class reading - Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. - Interview a current sociology/Global Studies graduate student and present briefly in class or write a reflective piece, not more than 2 pages in length, to be submitted to the professor.
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
an expression of cultural values, a reflection of social and political structure, and an instrument of social control and social change. Emphasizing a comparative perspective, we begin by discussing theories about law and legal institutions. We then turn our attention to the legal process and legal actors, focusing on the impact of law, courts, and lawyers on the rights of individuals. Although this course focuses on the US legal system, we will explore issues of the relationship between US law and global law and concepts of justice. prereq: [SOC 1001] and [SOC 1101 or 3101 or 3102] recommended, Sociology majors/minors must register A-F

SOC 4102. Criminology. (3 cr.; A-F or Audit; Periodic Fall & Spring)  This class seeks to develop an understanding of patterns of crime and punishment in the United States (including American particularities in international comparison), their social, political, economic, cultural, and institutional conditions, and how these patterns relate to broader sociological themes. We will examine a cross-section of most outstanding recent and some (by now) classical criminological and sociological books and a few articles that have attracted much attention among scholars and/or the broader public. prereq: [SOC 3101 or SOC 3102 or instr consent]; Sociology majors/minors must register A-F

SOC 4102H. Honors: Criminology. (; 3 cr.; A-F only; Periodic Fall & Spring)  This class seeks to develop an understanding of patterns of crime and punishment in the United States (including American particularities in international comparison), their social, political, economic, cultural, and institutional conditions, and how these patterns relate to broader sociological themes. We will examine a cross-section of most outstanding recent and some (by now) classical criminological and sociological books and a few articles that have attracted much attention among scholars and/or the broader public. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Examples of additional requirements may include: ? Honors students will be expected to interview a current Sociology graduate student working on an LCD topic. Following this, each student will individually be expected to do an in-class power point presentation explaining how the interviewee's research relates to themes presented in the course. Students will also be expected to meet as a group and individually with the professor four times during the course semester. ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). ? Write two brief (1-page) reflection papers on current news or a two-page critique of a class reading? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. prereq: [SOC 3101 or SOC 3102 or instr consent]; Sociology majors/minors must register A-F

SOC 4104. Crime and Human Rights. (3 cr.; A-F or Audit; Periodic Fall & Spring)  This course addresses serious violations of humanitarian and human rights law, efforts to criminalize those violations (laws and institutions), and consequences of these efforts. Special attention will be paid to the impact interventions have on representations and memories of atrocities on responses and the future of cycles of violence. Case studies on Holocaust, Balkan wars, Darfur, My Lai massacre, etc. Criminal justice, truth commissions, vetting, compensation programs. prereq: SOC 1001, at least one 3xxx SOC or GLOS course recommended, Sociology and Global Studies majors/minors must register A-F

SOC 4104H. Honors: Crime and Human Rights. (; 3 cr.; A-F only; Periodic Fall & Spring)  This course addresses serious violations of humanitarian and human rights law, efforts to criminalize those violations (laws and institutions), and consequences of these efforts. Special attention will be paid to the impact interventions have on representations and memories of atrocities on responses and the future of cycles of violence. Case studies on Holocaust, Balkan wars, Darfur, My Lai massacre, etc. Criminal justice, truth commissions, vetting, compensation programs. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Examples of additional requirements may include: ? Honors students will be expected to interview a current Sociology graduate student working on an LCD topic. Following this, each student will individually be expected to do an in-class power point presentation explaining how the interviewees' research relates to themes presented in the course. Students will also be expected to meet as a group and individually with the professor four times during the course semester. ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). ? Write two brief (1-page) reflection papers on current news or a two-page critique of a class reading? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. prereq: SOC 1001, at least one 3xxx SOC or GLOS course recommended, Sociology and Global Studies majors/minors must register A-F

SOC 4105. Sociology of Punishment and Corrections. (; 3 cr.; A-F or Audit; Periodic Spring)  Correctional strategies such as prison, probation, and parole. Theories/structures of diversion, probation, parole, and other community corrections programs. U.S. penal policies/practices compared with those in other countries. prereq: 3101 or 3102 or 3111 or instr consent; soc majors/minors must register A-F

SOC 4106. Crime on TV. (3 cr.; Student Option; Every Fall)  This course uses television shows to explore sociological perspectives on crime and punishment. We will critically examine how (and to what extent) four television series represent or distort prevailing knowledge about crime and punishment. prereq: recommended [1001 or 1001V, 1101 or 3101 or 3102]; Soph or above or instr consent; soc majors/minors must register A-F

SOC 4108. Current Issues in Crime Control. (; 3 cr.; Student Option; Periodic Spring & Summer)  Selected current criminal justice policies from perspective of courts, legislature, community, and interest groups. Impact of criminal justice policy changes on society and on social control agencies. prereq: Soc majors/minors must register A-F

SOC 4109. Domestic Criminal Violence. (; 3 cr.; Student Option; Periodic Fall & Spring)  Survey of research on family violence within criminological framework. Definition of domestic violence. Empirical/theoretical approaches. Response of social control agencies. prereq: 3101 or 3102 or 3111 or instr consent; soc majors/minors must register A-F

SOC 4111. Deviant Behavior. (; 3 cr.; A-F or Audit; Periodic Fall)  Definition/nature of deviant behavior. Social processes associated with deviant careers and social reintegration. Relationship of deviant behavior to social control. prereq: 3101 or 3102 or 3111 or instr consent; soc majors/minors must register A-F

SOC 4125. Policing America. (3 cr.; A-F or Audit; Periodic Fall & Spring)  Forms, dynamics, philosophical underpinnings of policing/surveillance agencies (formal/informal). Legal limitations, police culture, community relations, aims of policing, state power. prereq: [3101 or 3102 recommended or instr consent], soc majors/minors must register A-F

SOC 4135. Sociology of White-Collar Crime. (3 cr.; A-F or Audit; Periodic Spring)  This course deals with diverse types of white-collar crime (high status, occupational, organizational crimes), their causation, the damage they cause, and their control. We will read some of the outstanding literature on these issues and explore well-known cases in depth. There will be lectures and discussion in the classroom. We will explore what white-collar crime teaches us about the nature and explanation of crime and about the nature of criminal justice and other government social control. prereq: [SOC 3101 or SOC 3102 or instr consent]; soc majors/minors must register A-F
SOC 4135H. Honors: Sociology of White-Collar Crime. (3 cr.; A-F only; Periodic Spring)
This course deals with diverse types of white-collar crime (high status, occupational, organizational crimes), their causation, the damage they cause, and their control. We will read some of the outstanding literature on these issues and explore well-known cases in depth. There will be lectures and discussion in the classroom. We will explore what white-collar crime teaches us about the nature and explanation of crime and about the nature of criminal justice and other government social control. Special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Examples of additional requirements may include: ? Honors students will be expected to interview a current Sociology graduate student working on a LCD topic. Following this, each student will individually be expected to do an in-class power point presentation explaining how the interviewee's research relates with themes presented in the course. Students will also be expected to meet as a group and individually with the professor four times during the course semester. ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, group assignments). ? Write two brief (1-page) reflection papers on current news, or a two-page critique of a class reading or assignment. ? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2 page maximum reflective paper. prereq: Honors, [SOC 3101 or SOC 3102 or instr consent]

SOC 4141. Juvenile Delinquency. (3 cr.; A-F or Audit; Periodic Fall & Spring)
This course offers an overview of social theory and research on youth crime and delinquency. We start by critically examining the social facts surrounding the measurement, extent, and distribution of delinquency. Next, we study the principal sociological explanations of delinquent behavior. These theories provide conceptual tools for analyzing delinquency and punishment among groups such as gang members. We then trace youth experiences in the juvenile justice system, from policing, to juvenile court, to probation, and institutionalization. Throughout, we analyze the success or failure of key programs implemented in attempts to prevent or reduce delinquency. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Examples of additional requirements may include: ? Honors students will be expected to interview a current Sociology graduate student working on a LCD topic. Following this, each student will individually be expected to do an in-class power point presentation explaining how the interviewee's research relates with themes presented in the course. Students will also be expected to meet as a group and individually with the professor four times during the course semester. ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). ? Write two brief (1-page) reflection papers on current news, or a two-page critique of a class reading or assignment. ? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2 page maximum reflective paper. prereq: Honors, [SOC 3101 or 3102 or instr consent], Sociology majors/minors must register A-F

SOC 4142. Adolescents and the Legal System. (3 cr.; A-F or Audit; Periodic Fall)
This is a course covers the legal and social statuses of juveniles in our society. A recurrent theme is the power relationships among minors, their families, social institutions, and the legal system. Issues dealing with delinquent behavior are discussed in terms of different behaviors with which a juvenile justice system has to deal, such as the matter of certification to adult courts, the procedures in different jurisdictions for such matters, and death penalty issues which arose with juveniles and the consequences of several recent Supreme Court cases. prereq: soc majors/ minors must register A-F

SOC 4149. Killing. (3 cr.; Student Option; Every Spring)
Sociological, legal, psychological aspects of diverse types of killing. Normal killings contrasted with pathological types. Mentally disturbed killings, sexual killings, killings within families, gang killings, terrorist killings. prereq: jr or sr or grad student or instr consent; soc majors/minors must register A-F

SOC 4161. Criminal Law in American Society. (3 cr.; Student Option; Every Fall)
Purposes of criminal law and of principles of criminal liability, justification, and excuse. Applications to law of criminal homicide, sexual assault, drugs, and crimes against property, public order, and morals. prereq: 3101 or 5102 or 3111 or instr consent; soc majors/minors must register A-F

SOC 4305. Environment & Society: An Enduring Conflict. (ENV; 3 cr.; A-F or Audit; Every Fall)
Examines how natural/built environments influence human behavior/social organization. Focuses on microenvironments/their influence on individuals. Impact of macroenvironments on societal organization. Environmental movements. prereq: 1001 or environmental course recommended, [soc majors/minors must register A-F]

SOC 4309. Religion in American Public Life: Culture, Politics, & Communities. (CIV; 3 cr.; A-F or Audit; Periodic Fall & Spring)
How diversity/vitality of American religion shape public life. How religious groups engage in political action, foster understandings of democracy/styles of civic participation. Volunteering/service activities. Race, poverty, the family, sexuality. prereq: Soc majors/minors must register A-F

SOC 4309H. Honors: Religion in American Public Life - Culture, Politics, & Communities. (CIV; 3 cr.; A-F only; Periodic Fall & Spring)
How diversity/vitality of American religion shape public life. How religious groups engage in political action, foster understandings of democracy/styles of civic participation. Volunteering/service activities. Race, poverty, family, sexuality. Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Examples of additional requirements may include: ? Sign up and prepare 3-4 discussion questions
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SOC 4311. Power, Justice & the Environment. (DSJ; 3 cr.; A-F only; every Spring)
Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations. Prereq: SOC 1001 recommended.

SOC 4315. Never Again! Memory & Politics after Genocide. (GP; 3 cr.; A-F or Audit; Spring Odd Year)
Course focuses on the social repercussions and political consequences of large-scale political violence, such as genocide, war crimes, and crimes against humanity. Students learn how communities and states balance the demands for justice and memory with the need for peace and reconciliation and addresses cases from around the globe and different historical settings. Prereq: SOC 1001 or 1011V recommended. A-F required for Majors/Minors.

SOC 4321. Globalize This! Understanding Globalization through Sociology. (GP; 3 cr.; A-F or Audit; every Fall)

SOC 4411. Terrorist Networks & Counterterrorism Organizations. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Terror involves using violent actions to achieve political, religious, or social goals. This course examines theories and evidence about the origins, development, and consequences of terrorist networks. It analyzes efforts to prevent, investigate, and punish terrorists by counterterrorism organizations, including law enforcement, security, and military forces. Graduate and honors students are expected to demonstrate greater depth of discussion, depth and, to a degree, length of writing assignments, presentations, and leadership of the students. Prereq: Sociology majors/minors must register A-F.

SOC 4411H. Honors: Terrorist Networks & Counterterrorism Organizations. (3 cr.; A-F only; Periodic Fall & Spring)
Terror involves using violent actions to achieve political, religious, or social goals. This course examines theories and evidence about the origins, development, and consequences of terrorist networks. It analyzes efforts to prevent, investigate, and punish terrorists by counterterrorism organizations, including law enforcement, security, and military forces. Graduate and honors students are expected to demonstrate greater depth of discussion, depth and, to a degree, length of writing assignments, presentations, and leadership of the students. Honors students registering for SOC 4411H: Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Preregistration and preparation: 3-4 discussion questions in advance of at least one class session. Preregistration and preparation with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). Preregistration and preparation with professor and TA on other two-page critique of a class reading? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2-page maximum reflective paper. Prereg: Honors.

SOC 4461. Sociology of Ethnic and Racial Conflict. (DSJ; 3 cr.; Student Option; Fall Odd Years)

SOC 4511. Sociology of Youth: Transition to Adulthood. (3 cr.; Student Option; Periodic Fall)

SOC 4521. Love, Sex, & Marriage. (3 cr.; Student Option; Periodic Fall)

SOC 4521H. Honors: Love, Sex, & Marriage. (3 cr.; A-F only; Periodic Fall)

SOC 4551. Sociology of Sexualities. (DSJ,SOCS; 3 cr.; A-F or Audit; Periodic Spring)
In this course we will examine sociological theories and sociological research on the topic of sexuality. We will explore the concept of sexuality as it intersects with race, gender, age, and class. This course is designed to give you a basic understanding of sociological implications of sexuality in the United States. This course is intended to help you develop your analytical and critical thinking skills. You will be asked to move beyond your own experience and perspectives to sociologically analyze and evaluate over-simplified explanations of past and contemporary issues

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as they appear in our course readings. prereq: Sociology majors/minors must register A-F

SOC 4551H. Honors: Sociology of Sexualities. (DSJ,SOCs; 3 cr. ; A-F only; Periodic Spring)
In this course we will examine social theories and sociological research on the topic of sexuality. We will explore the concept of sexuality as it intersects with race, gender, age, and class. This course is designed to give you a basic understanding of sociological implications of sexuality in the United States. This course is intended to help you develop your analytical and critical thinking skills. You will be asked to move beyond your own experience and perspectives to sociologically analyze and evaluate over-simplified explanations of past and contemporary issues as they appear in our course readings.
Additional special assignments will be discussed with honors participants who seek to earn honors credit toward the end of our first class session. Students will also be expected to meet as a group and individually with the professor four times during the course semester. Examples of additional requirements may include: ? Sign up and prepare 3-4 discussion questions in advance of at least one class session. ? Work with professor and TA on other small leadership tasks (class discussion, paper exchange, tour). ? Write two brief (1-page) reflection papers on current news, or a two-page critique of a class reading ? Attend a presentation, workshop, or seminar on a related topic for this class and write a 2 page maximum reflective paper. ? Interview a current Sociology graduate student and present briefly in class or write a reflective piece, not more than 2 pages in length, to be submitted to the Professor. prereq: Honors

SOC 4703. Contemporary American Culture. (CIV; 3 cr. ; Student Option; Spring Even Year) Key changes in cultural life in the United States and internationals that have been developed to understand them. Topics may include work, family, social movements, media and popular culture, and politics. prereq: 1001 or instr consent; soc majors/minors must register A-F

SOC 4821. Measuring the Social World: Concepts and Analysis. (3 cr. ; A-F only; Periodic Spring) In this course, you will develop practical social science data analysis skills for use in the non-profit or corporate workplace or in a graduate program of research. You will assess the measurement of important social concepts, like race, health, or education, in large social surveys, and the strengths and weaknesses of those different measurement techniques. You will conduct data analysis on large datasets (see, e.g., www.ipums.org) using a statistical software program, such as STATA. You will develop a substantive, empirical final project (poster and paper) based on your analysis. prereq: SOC 3801 or equiv, and SOC 3811 or equivalent

This course is designed to: a) provide students with an opportunity to reflect on what they have learned as a sociology major; b) use that knowledge to write a sociological analyses - often based on community service learning; and c) think about how the knowledge, skills, and insights of the sociological enterprise can be used and applied outside of the University. Through this course sociology majors will emphasize the relationship between a sociological perspective and critical thinking, effective communication, and meaningful civic engagement. This class is the final step in the sociology undergraduate major. prereq: 1001, 3701, 3801, 3811, 12 cr upper div sociology, dept consent

SOC 4977V. Senior Honors Proseminar I. (WI; 3 cr. ; A-F or Audit; Every Fall) Exploring contemporary research for senior thesis. Guidance in defining a problem and reviewing prior theoretical works. Presentation/discussion with faculty researchers. prereq: 3701, 3801, 3811, 9 additional upper div sociology cr, sr soc honors major, dept consent

SOC 4978V. Senior Honors Proseminar II. (WI; 3 cr. ; A-F or Audit; Every Spring) Developing the methodology of senior project, researching it, and writing the thesis. Students work individually or in small groups in consultation with seminar director and other faculty. Group discussion of individual projects. prereq: [4977V or instr consent], 3701, 3801, 3811, at least 9 additional upper div sociol cr, sr soc honors major, dept consent

SOC 4994W. Capstone Experience: Directed Research (1 cr.). (WI; 1 cr. ; A-F only; Every Fall & Spring) Guided individual research for the sociology major's Capstone requirement, conducted in conjunction with enrollment in an upper division sociology course. This is designed to: a) provide students with an opportunity to reflect on what they have learned as a sociology major; b) use that knowledge to write a sociological analyses; and c) think about how the knowledge, skills, and insights of the sociological enterprise can be used and applied outside of the University. Through this one:one capstone experience, using the structure and foundation of the 6th Sociology elective, majors will emphasize the relationship between a sociological perspective and the emphasis of the course. The final paper created for 4994W is in addition to the other 6th Sociology elective course requirements. prereq: 1001/1011V, 3701, 3801, 3811, and at least 12 cr upper div sociology electives; dept & instructor consent. Students are only authorized to register for Soc 4994W in conjunction with a 6th Sociology Elective.

SOC 5090. Topics in Sociology. (; 1-3 cr. [max 9 cr.]; Student Option; Periodic Spring) Topics specified in Class Schedule. prereq: Undergrad soc majors/minors must register A-F

SOC 5104. Crime and Human Rights. (3 cr. ; A-F or Audit; Periodic Fall & Spring) This course addresses serious violations of humanitarian and human rights law, efforts to criminalize those violations (laws and institutions), and consequences of these efforts. Special attention will be paid to the impact interventions have on representations and memories of atrocities on responses and the future of cycles of violence. Case studies on Holocaust, Balkan wars, Darfur, My Lai massacre, etc. Criminal justice, truth commissions, vetting, compensation programs. prereq: at least one 3xxx SOC or GLOS course recommended

SOC 5170. Sociology of International Law: Human Rights, Trafficking, and Business Regulation. (GP; 3 cr. ; A-F or Audit; Periodic Fall & Spring) Cultural values and practices in a globalized world. Role of international law. Immigration, terrorism, Americanization, and structure of international legal system.

SOC 5246. Disease, Disasters, and Other Killers. (ENV,HIS; 3 cr. ; A-F or Audit; Every Fall) This course studies the social pattern of mortality, beginning with demographic transition theory. Students will study specific causes of death or theories of etiology, including theories about suicide, fundamental cause theory, and the role of early life conditions in mortality. Students learn tools for studying mortality, including cause of death classifications and life tables. Grad student or instructor consent.

SOC 5315. Never Again! Memory & Politics after Genocide. (GP; 3 cr. ; A-F or Audit; Spring Odd Year) Course focuses on the social repercussions and political consequences of large-scale political violence, such as genocide, war crimes, and crimes against humanity. Students learn how communities and states balance the demands for justice and memory with the need for peace and reconciliation and addresses cases from around the globe and different historical settings. prereq: SOC 1001 or 1011V recommended, A-F required for Majors/Minors.

SOC 5411. Terrorist Networks & Counterterror Organizations. (3 cr. ; A-F or Audit; Periodic Fall & Spring) Theories/endorsements about origins, development, and consequences of terrorist networks. Efforts to prevent, investigate, and punish terrorists by use of law enforcement, security, and military forces. Terror involves using violent actions to achieve political, religious, or social goals. This course examines theories and evidence about the origins, development, and consequences of terrorist networks. It analyzes efforts to prevent, investigate, and punish terrorists by counterterror organizations, including law enforcement, security, and military forces. Graduate and honors students are expected to demonstrate greater depth of discussion, depth and to a degree length of writing assignments, presentations, and leadership of the students. Prereq: Sociology Major/Minor must register A-F

SOC 5455. Sociology of Education. (; 3 cr. ; Student Option; Every Fall) Structures and processes within educational institutions. Links between educational
organizations and their social contexts, particularly as these relate to educational change. prereq: 1001 or equiv or instr consent; soc majors/minors must register A-F
SOC 5511. World Population Problems. (3 cr.; Student Option; Every Fall) Population growth, natural resources, fertility/mortality in less developed nations, population dynamics/forecasts, policies to reduce fertility. prereq: Soc majors/minors must register A-F; credit will not be granted if credit has been received for PA 5301

SOC 5811. Social Statistics for Graduate Students. (MATH; 4 cr.; Student Option; Every Fall) This course will introduce statistical measures and procedures that are used to describe and analyze quantitative data in sociological research. The topics include (1) frequency and percentage distributions, (2) central tendency and dispersion, (3) probability theory and statistical inference, (4) models of bivariate analysis, and (5) basics of multivariate analysis. Learning these topics will be given in class, and lab exercises are designed to help students learn statistical skills and software needed to analyze quantitative data provided in the class. Soc 5811 is intended for new graduate students, undergraduate honors students, and students pursuing the Sociology BS degree. prereq: Credit will not be granted if credit has been received for Soc 3811 (Soc 5811 offered Fall terms only). Undergraduates with a strong math background are encouraged to register for 5811 in lieu of 3811. Soc majors must register A-F. 5811 is a good social statistics foundation course for MA students from other programs.

SOC 8001. Sociology as a Profession. (; 1 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring) This 1 credit class fosters adaptation to the Graduate Program in Sociology and preparation for a sociological career. In the Fall, we explore professional careers in this field. We discuss the wide range of opportunities in sociology and help students further explore the next steps to becoming a scholar, educator, and member of various professional, intellectual, and social communities. We share practical information about being a student in sociology and about sociological careers, discuss presentations in department workshop seminars, and provide a safe place to discuss issues of student concerns. Students are encouraged to bring to the class their thoughts and reactions to experiences during their first semester in the PhD program. The Spring 8001 class is oriented to particular milestones in the Sociology Graduate Program and important student activities (for example, preparing reading lists for the preliminary exam and then writing the preliminary exam, preparing a dissertation prospectus, writing grant proposals, preparing an article for publication, etc.). Pre-req: Soc PhD students

SOC 8011. Teaching Sociology: Theory & Practice. (3 cr.; Student Option; Every Spring) Social/political context of teaching. Ethical issues, multiculturalism, academic freedom. Teaching skills (e.g., lecturing, leading discussions). Active learning. Evaluating effectiveness of teaching. Opportunity to develop syllabus or teaching plan. prereq: Soc grad student or instr consent

SOC 8090. Topics in Sociology. (; 1.5-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Topics specified in Class Schedule. prereq: instr consent

SOC 8091. Independent Study. (; 1-5 cr. [max 20 cr.]; Student Option; ) Independent study of an established 8xxx course.

SOC 8093. Directed Study. (; 1-4 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Directed study in sociology. prereq: Grad soc major or instr consent

SOC 8094. Directed Research. (; 1-4 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) May be used to fulfill sociology graduate requirement for advanced methodological training.

SOC 8101. Sociology of Law. (; 3 cr.; Student Option; Periodic Fall & Spring) Sociological analysis of law and society. In-depth review of research on why people obey the law, of social forces involved in creation of law (both civil and criminal), procedures of enforcement, and impact of law on social change.

SOC 8111. Criminology. (; 3 cr.; Student Option; Periodic Fall & Spring) Overview of theoretical developments and empirical research. Underlying assumptions, empirical generalizations, and current controversies in criminological research.

SOC 8148. Law, Society, and the Mental Health System. (; 3 cr.; A-F or Audit; Periodic Fall & Spring) Intensive survey of psychopathology. Reference to criminal behavior, criminal justice system. prereq: [Grad student, 4148] or instr consent

SOC 8171. Cross-Disciplinary Perspectives in Human Rights. (3 cr.; Student Option; Periodic Spring) This seminar will approach human rights issues from a variety of "disciplinary" perspectives, including history, the arts, law, the social sciences, and praxis. Empirical work in the social sciences will receive somewhat greater emphasis. One key focus will be the unique advantages (and disadvantages) of the different perspectives and fruitful ways to combine them to strengthen action that improves human rights situations in countries around the world, including the United States. prereq: Grad student or instr consent

SOC 8190. Topics in Law, Crime, and Deviance. (; 3 cr. [max 9 cr.]; A-F or Audit; Every Fall) Advanced topics in law, crime, and deviance. Social underpinnings of legal/illegal behavior and of legal systems.

SOC 8211. The Sociology of Race & Racialization. (3 cr.; Student Option; Periodic Fall & Spring) Major theoretical debates. Classic and contemporary theoretical approaches to studying U.S. race relations; contemporary and historical experiences of specific racial and ethnic groups.

SOC 8221. Sociology of Gender. (; 3 cr.; Student Option; Periodic Fall) Organization, culture, and dynamics of gender relations and gendered social structures. Sample topics: gender, race, and class inequalities in the workplace; women's movement; social welfare and politics of gender inequality; theoretical and methodological debates in gender studies; sexuality; science; sociology of emotions.

SOC 8290. Topics in Race, Class, Gender and other forms of Durable Inequality. (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall) Comparative perspectives on racial inequality; race, class, and gender; quantitative research on gender stratification; stratification in post-communist societies; institutional change and stratification systems; industrialization and stratification. Topics specified in Class Schedule.

SOC 8311. Political Sociology. (; 3 cr.; Student Option; Every Fall) Social dimensions of political behavior and social origins of different forms of the state. How various theoretical traditions—Marxist, Weberian, functionalist—address key issues in political sociology, including citizenship, revolution, state formation, origins of democracy, welfare state, and fascism.

SOC 8333. FTE: Master’s. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

SOC 8390. Topics in Political Sociology. (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topics with common focus on social underpinnings of political behavior/change. Topics specified in Class Schedule. Sample topics: democracy and development, international legal and political systems, power and protest in advanced capitalist states, xenophobia and international migration, and civil society and democracy.


SOC 8444. FTE: Doctoral. (; 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

**SOC 8490. Advanced Topics in Social Organization.** (; 3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Content varies with instructor. Sample topics: gender and organizations, interorganizational relations, comparative study of organizations, nonprofit organizations, consumer behavior, industry and technology, social networks, conflict, coercion, and social exchange. Topics specified in [Class Schedule]. prereq: instr consent

**SOC 8501. Sociology of the Family.** (; 3 cr.; Student Option; Every Fall)
Theoretical and empirical works from contemporary family sociology. Content varies with instructor. Sample topics: definitions of the family, family roles, family interactions, marriage and divorce, childbearing, parenthood, and cultural variations in families.

**SOC 8540. Topics in Family Sociology.** (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring)
Families and mental health; families, work, and the labor market; historical/comparative research on the family. Topics specified in [Class Schedule].

**SOC 8551. Life Course Inequality & Health.** (; 3 cr.; Student Option; Periodic Fall)
Seminar examines the changing life course in its social and historical context, including theoretical principles, methodologies, and policy implications. Focus on key societal institutions that offer unequal opportunities and constraints, depending on social class, race/ethnicity, and gender. Unequal access to age-graded social roles and resources shape the course of development, and in doing so, they have profound impacts on health. We will consider how inequality in the family, education, work, the military, and in the health care & criminal justice systems influence health behaviors and outcomes at different ages and life stages. prereq: grad student or instr consent

**SOC 8590. Topics in Life Course Sociology.** (; 3 cr. [max 12 cr.]; Student Option; Periodic Fall)
Sociology of aging, sociology of youth, and mental health and adjustment in early life course. Topics specified in [Class Schedule].

**SOC 8666. Doctoral Pre-Thesis Credits.** (; 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

**SOC 8701. Sociological Theory.** (; 4 cr.; A-F or Audit; Every Fall)
Traditions of social theory basic to sociological knowledge, their reflection and expansion in contemporary theory, their applications in selected areas of empirical research. Sample topics: social inequality, social organization and politics, family organization and social reproduction, social order and change, sociology of knowledge and religion.

**SOC 8721. Social Psychology: Micro-Sociological Approaches to Inequalities and Identities.** (; 3 cr.; Student Option; Periodic Fall & Spring)
Social psychology is basic to an understanding of contemporary social life. This subfield of sociology focuses on social phenomena at the micro-level. Small group dynamics, social interactions, and individual experiences are importantly structured by the macro-structural context, e.g., by socioeconomic status, race, gender, sexuality, and other dimensions of social inequality. At the same time, these and other micro-sociological processes reflect individual-level identities, perceptions, motivations and cognitions. This seminar examines a wide range of social psychological phenomena linked to inequality (e.g., the effects of class, minority status, and gender on disparities in identity, self-concept, and health; the development of status hierarchies in small group interaction; intergroup relations, prejudice, and discrimination). We begin with a consideration of ?personal structure,? emphasizing the cultural and structural variability of self-conceptions and identities, cognitive processes, and motivation, as well as the biosocial bases of action. These may be considered individual-level ?building blocks? of social psychological theories (along with emotions, attitudes, values, and ideologies). We then address prominent theoretical perspectives in social psychology that illuminate the linkages between micro-social contexts of inequality and identity, including symbolic interactionism, exchange theory, structural social psychology (?social structure and personality?) and the social psychology of the life course. Social psychological theory and research are foundational to many specialty fields in sociology, including the sociology of the family, education, health, deviance, work, social mobility, social movements, emotions, and the sociology of childhood, youth, and aging. Social psychology is also central to prominent theoretical debates in sociology surrounding the relationship between social structure and agency; individual-level identities, perceptions, motivations, goals, and strategies are both structured by the social context and affect the capacity of individuals to act agentially and to achieve their goals.

**SOC 8731. Sociology of Knowledge.** (; 3 cr.; Student Option; Periodic Fall)
Knowledge and related terms (ideology, stereotype, prejudice, belief, truth). Variation of knowledge across social groups/categories (e.g., gender, race, class, generation, nationality); institutions (e.g., politics, law, science); and societies across time and space. Power, rituals, institution, networks, and knowledge. Genealogy of theories.

**SOC 8735. Sociology of Culture.** (; 3 cr.; Student Option; Periodic Spring)

**SOC 8777. Thesis Credits: Master's.** (; 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

**SOC 8790. Advanced Topics in Sociological Theory.** (; 3 cr. [max 12 cr.]; Student Option; Periodic Spring)
Sample topics: theories of conflict, theories of purposive action, Marxist theory, and structure-agency debate.

**SOC 8801. Sociological Research Methods.** (; 4 cr.; A-F or Audit; Periodic Fall & Spring)
Multiple objectives of social research and how they inform research design. Conceptualization and measurement of complex concepts. Broad issues in research design and quantitative and qualitative approaches to data collection and management. prereq: Grad soc major or instr consent

**SOC 8811. Advanced Social Statistics.** (; 4 cr.; A-F or Audit; Every Fall & Spring)
Statistical methods for analyzing social data. Sample topics: advanced multiple regression, logistic regression, limited dependent variable analysis, analysis of variance and covariance, log-linear models, structural equations, and event history analysis. Applications to datasets using computers. prereq: recommend 5811 or equiv; graduate student or instr consent

**SOC 8851. Advanced Qualitative Research Methods: In-Depth Interviewing.** (3 cr.; A-F only; Spring Odd Year)
Interviewers have opened up other worlds to the sociological imagination and taught us much about the way people think, feel, and make sense of the world as well as of their own identities. We will conduct interviews; transcribe, code, and analyze interview data; and write up interview-based research. We will also consider a range of epistemological, practical, and ethical issues related to interviewing as a research method, reading materials drawn from a broad range of substantive sociological subfields as well as from geography. This course is best suited to graduate students who have an interview-based project in mind and want to acquire the skills for carrying out their research and students who are considering using interviews in their dissertation research and want to try their hand at interviewing before making a decision. Because this is a hands-on, fieldwork-based course, no auditors are permitted.

**SOC 8852. Advanced Qualitative Research Methods: Ethnographic Practicum.** (3 cr.; A-F or Audit; Fall Odd Year)
Ethnographic practice involves two core activities: engaging people in their own space and time, and separating yourself enough from the fieldwork site to write about observations and experiences with some
Software Engineering (SENG)

SENG 5115. Graphical User Interface Design, Evaluation, and Implementation. (3 cr.; max 3 cr.; A-F or Audit; Every Fall & Spring) Design and evaluation of interactive application interfaces, user- and task-centered approaches to design, guidelines for graphical design, interface evaluation techniques, current interface trends, including web interfaces and information visualization. Group projects that include designing, prototyping, and implementing an application interface. prereq: Grad SEng major

SENG 5116. Graphical User Interface Toolkits. (2-3 cr.; A-F or Audit; Periodic Fall) Toolkit-centered introduction to GUI implementation technology. Students learn to use a GUI toolkit to implement a graphical application. Introduction to advanced techniques, including constraint-based data management, 3D visualization tools, and toolkit structure and design. prereq: Grad SEng major

SENG 5130. Introduction to Internet of Things: Systems-Level Design and Experimentation. (3 cr.; A-F or Audit; Every Spring) Project-based examples from modern “Internet of Things” (IoT) systems. Hands-on experiments with core wireless hardware, sensors, and software elements. Students will gain the practical system-level skills and understandings able to be applied to any IoT system, and walk away with an IoT project created themselves. There will be discussions and team-centric activities focused on market trends, ground-breaking tech and products, security, communication protocols, and exciting emerging technologies related to IoT including machine learning, artificial intelligence, and augmented reality.

SENG 5131. Distributed Application Design and Development. (3 cr.; A-F or Audit; Every Spring) Java programming, concurrent programming, workflow, distributed database, security, collaborative computing, object-oriented architecture/design, network publishing, messaging architecture, distributed object computing, and intranet. prereq: Grad SEng major

SENG 5132. Web Application Development. (3 cr.; A-F or Audit; Every Spring) This course is an in-depth discussion of the challenges and complexities involved in designing and implementing modern web applications. Students will gain experience designing and implementing a project during in the course of the semester.

SENG 5199. Topics in Software Engineering. (2-3 cr.; max 6 cr.; A-F or Audit; Every Spring) Topics specified in Class Schedule. prereq: SEng grad student

SENG 5271. Cybersecurity. (3 cr.; A-F or Audit; Every Spring) This course introduces the major topics of cybersecurity. Class time will focus on demonstrations, exercises, mini-projects, and discussions. Topics include authentication, access control, file system forensics, symmetric and asymmetric cryptography, network monitoring and controls, dynamic web site attacks, and network cryptography.


SENG 5551. Introduction to Intelligent Robotic Systems. (3 cr.; A-F or Audit; Periodic Fall) Transformations, kinematics and inverse kinematics, dynamics, and control. Sensing (robot vision, force control, tactile sensing), applications of sensor-based robot control, robot programming, mobile robotics, and micro-robotics. prereq: Grad SEng major

SENG 5707. The Principles of Database Systems. (3 cr.; A-F or Audit; Every Fall) Fundamental concepts; representing instances; prototypic model shapes; model evolution; interviewing user skills, reverse engineering; mapping to DBMS schema; database querying. prereq: Grad SEng major

SENG 5708. Data Analytics. (2-3 cr.; A-F or Audit; Every Spring) Applications/motivation. Extended relational, object-relational, and object-oriented data models. Object identifier, types/constructors. Versions, schema evolution. Query language (e.g., recursion, path expressions). Object indices, buffer management, and other implementation issues. Triggers, rules, complex objects, and case studies. prereq: Grad SEng major

SENG 5709. Big Data Engineering and Analytics. (3 cr.; A-F or Audit; Every Spring) This course aims to teach students how to evaluate and engineer solutions that traditional data systems cannot handle, as well as various real-world use cases related to big data problems. This course will integrate theory and hands-on learning of various big data systems like NoSQL, streaming architectures, along with popular industry tools for scalable analytics.

The focus of the course is largely around big data engineering, with some coverage of data science and analytics.

SENG 5801. Software Engineering I: Overview, Requirements, and Modeling. (3 cr.; A-F or Audit; Every Fall) Software engineering as a discipline. Preview of topics to be covered in subsequent courses in master of science in software engineering program; in-depth study of requirements engineering; modeling techniques applicable to requirements and specification, including UML and formal modeling. prereq: Grad SEng major

SENG 5802. Software Engineering II: Software Design. (3 cr.; A-F or Audit; Every Spring) Software design quality, processes that produce quality design, graphical and textual representations, including UML, common problems and patterns that solve them.
refactoring. Students develop fluency in object-oriented design, and ability to read, critique, and advocate design ideas. Students work in teams to complete a multiphase project. prereq: Grad SEng major


SENG 5831. Software Development for Real-Time Systems. (2-3 cr.; A-F or Audit; Periodic Fall) Analysis, design, verification, and validation of real-time systems. Periodic, aperiodic, and sporadic processes, scheduling theory. Pragmatic issues. prereq: Grad SEng major

SENG 5841. Model-based Development. (3 cr.; A-F or Audit; Every Spring) Formal specification of software artifacts. Applicability of formal specifications. Methods such as Z, SCR, and Statecharts. Formal analysis. Theorem proving. Reachability analysis. Model checking. Tools such as PVS, Statemate, SPIN, and SMV. prereq: Grad SEng major

SENG 5851. Software Project Management. (3 cr.; A-F or Audit; Every Fall & Spring) Concepts used to manage software projects. Project management cycle: initiation, planning/control, status reporting, review, post-project analysis. Leadership and motivation strategies. Lecture, discussion, individual/team presentations/projects. prereq: Grad SEng major

SENG 5852. Quality Assurance and Process Improvement. (3 cr.; A-F or Audit; Every Fall & Spring) Theory and application of capability maturity model: process assessment, modeling, and improvement techniques. Life cycle issues related to development and maintenance; quality, safety, and security assurance; project management; and automated support environments. Group projects and case studies. prereq: Grad SEng major

SENG 5861. Introduction to Software Architecture. (3 cr.; A-F or Audit; Periodic Fall) Software/systems architecture. Representation/design, how they fit into software engineering process. Description of architectures, including representation and quality attributes. prereq: 2nd year, MSSE grad student

SENG 5899. Software Engineering Seminar. (1 cr.; max 2 cr.; Student Option; Every Fall) Software engineering trends. Talks by invited speakers, selected readings. prereq: Grad SEng major, instr consent

SENG 5900. Directed Study. (1-3 cr.; Student Option; Every Fall & Spring) Directed study/research in software engineering. Topics/scope decided in collaboration with instructor.

SENG 6333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

SENG 8494. Capstone Project (Plan B Project). (3 cr.; S-N or Audit; Every Spring) Students work in teams on software project using tools, techniques, and skills acquired during previous coursework. Each team works with a client to establish requirements, agree upon design, and achieve a successful acceptance test of resulting software system. prereq: SEng major

SENG 8891. Independent Project. (2-6 cr. max 12 cr.; Student Option; Every Fall & Spring) Independent project arranged with faculty.

**Soil, Water, and Climate (SOIL)**

SOIL 2125. Basic Soil Science. (ENV.PHYS.; 4 cr.; A-F or Audit; Every Fall & Spring) Basic physical, chemical, and biological properties of soil. Soil genesis classification, principles of soil fertility. Use of soil survey information to make a land-use plan. WWW used for lab preparation information. prereq: [CHEM 1015, CHEM 1017] or CHEM 1021 or equiv

SOIL 2601. The Social Life of Soil. (ENV; 3 cr.; Student Option; Every Fall) Soil microorganisms can either promote plant health or wage chemical warfare. And alliances can turn on a dime. Learn about this fascinating dog-eat-dog world and how we can support a rich soil ecosystem that benefits plants and humans.


SOIL 3521. Soil Judging. (1 cr.; max 3 cr.; A-F or Audit; Every Fall) A field-based course which requires students to apply fundamental knowledge obtained from Basic Soil Science and Field Study of Soils to the description of soils in the field. This course includes an inter-collegiate Soil Judging contest that takes during the course of the class. prereq: An introductory soils course and field studies course.

SOIL 4093. Directed Study. (1-7 cr. max 20 cr.; Student Option; Every Fall, Spring & Summer) Research, readings, and instruction. prereq: instr consent

SOIL 4094. Directed Research. (1-7 cr.; Student Option; Every Fall, Spring & Summer) Research under the direction of department faculty. prereq: instr consent

SOIL 4111. Introduction to Precision Agriculture. (3 cr.; A-F or Audit; Every Spring) Soil, landscape, and crop spatial variability. GIS, DEM, GPS technologies. Variable rate machinery, PA software, remote sensing. Geostatistics, sampling, experimental designs. Precision integrated crop management. Data acquisition, processing, and management. Socio-economical and e-marketing aspects. prereq: Basic sciences, statistics, soil, agronomy

SOIL 4511. Field Study of Soils. (2 cr.; A-F or Audit; Every Summer) Learn to write soil profile descriptions in the field. Class requires hands-on experience to determine soil texture, color, and horizon designations in the field. prereq: 2125

SOIL 5125. Soil Science for Teachers and Professionals. (4 cr.; Student Option; Every Fall & Spring) Basic physical, chemical, and biological properties of soil. Soil genesis classification, principles of soil fertility. Use of soil survey information to make a land-use plan. WWW used for lab preparation information.

SOIL 5232. Vadose Zone Hydrology. (3 cr.; Student Option; Every Fall) Basic soil physical properties/processes governing transport of mass/energy in soils. Emphasizes water/solute transport through unsaturated root/vadose zones, their impact on subsurface hydrology and on water quality. Lectures, hands-on laboratory exercises, discussion of real world problems, problem solving. prereq: [Math 1271 or equiv], [Phys 1042 or equiv]

SOIL 5555. Wetland Soils. (3 cr.; A-F or Audit; Every Fall) Morphology, chemistry, hydrology, formation of mineral/organic soils in wet environments. Soil morphological indicators of wet conditions, field techniques of identifying hydric soils for wetland delineations. Peatlands. Wetland benefits, preservation, regulation, mitigation. Field trips, lab, field hydric soil delineation project. prereq: SOIL 1125 or 2125 or equiv or instr consent; concurrent registration is required (or allowed) in SOIL 4511 recommended

SOIL 5611. Soil Biology and Fertility. (4 cr.; Student Option; Every Fall) Properties of microorganisms that impact soil fertility, structure, and quality. Nutrient requirements of microbes and plants, and mineral transformations in biogeochemical cycling. Symbiotic plant/microbe associations and their role in sustainable agricultural production. Biodegradation of pollutants and bioremediation approaches. prereq: Biol 1009 or equiv, Chem 1021 or equiv; Soil 2125 recommended

SOIL 8005. Supervised Classroom or Extension Teaching Experience. (2 cr.; S-N or Audit; Every Fall & Spring) Teaching experience in one of five departments: Biosystems and Agricultural Engineering; Agronomy and Plant Genetics; Horticultural Science; Soil, Water, and Climate; or Plant Pathology. Participation in discussions about effective teaching to strengthen skills...
Spanish (SPAN)

SPAN 144. Intermediate Medical Spanish. (0 cr.; S-N or Audit; Every Fall) Vocabulary of Spanish medical terms, skills in report writing, proper format for medical communications. Developing conversational fluency for medical-related topics. prereq: [1st yr college-level Spanish or equiv], dept consent

SPAN 221. Reading Spanish. (0 cr.; S-N or Audit; Spring Even Year) Intensive reading of a variety of texts to provide a basic reading knowledge of Spanish. At the end of the semester students may take the equivalent of the Spanish Graduate Reading Examination.

SPAN 344. Advanced Medical Spanish. (0 cr.; S-N or Audit; Every Spring) 0 cr. course designed to further develop and strengthen the language skills and cultural awareness students have been exposed to and acquired in Intern Med Span 0144, a course designed to help care professionals communicate with patients who speak Spanish. prereq: Span 0144, 2 yrs. Spanish College Level or equiv, dept consent.

SPAN 1001. Beginning Spanish. (5 cr.; Student Option; Every Fall & Summer) Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings. prereq: Less than 2 yrs of high school Spanish, dept consent, no college-level Spanish

SPAN 1002. Beginning Spanish. (5 cr.; Student Option; Every Fall, Spring & Summer) Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings. prereq: 1001 completed at UMNTC, dept consent

SPAN 1003. Intermediate Spanish. (5 cr.; Student Option; Every Fall, Spring & Summer) Speaking/comprehension. Developing reading/writing skills based on materials from Spain/Spanish America. Grammar review. Compositions, oral presentations. prereq: [1002 or 1022] or EPT placement

SPAN 1004. Intermediate Spanish. (5 cr.; Student Option; Every Fall, Spring & Summer) Speaking/comprehension. Developing reading/writing skills based on materials from Spain/Spanish America. Grammar review. Compositions, oral presentations. prereq: 1003 or EPT placement

SPAN 1014. Business Spanish. (5 cr.; Student Option; Every Fall, Spring & Summer) Vocabulary, report writing skills. Proper format for business communications. Conversational fluency on trade-related topics. prereq: 1003

SPAN 1022. Alternate Second-Semester Spanish. (5 cr.; Student Option; Every Fall & Spring) For students who have studied Spanish in high school or at community college, or who are transfer students. Begins with accelerated review of 1001 followed by material covered in 1002. prereq: Placement above 1001

SPAN 1044. Intermediate Medical Spanish. (5 cr.; Student Option; Every Fall & Spring) Language needed by health-care workers who interact with Spanish-speaking patients. Basic medical vocabulary, questions/answers in common medical situations. Vocabulary/phrases to conduct patient interviews and physical exams. Readings on Latin American view of health and health care. prereq: 1003 or equiv

SPAN 1911. U.S. Latino/Latina American Theaters and Cultural Studies. (3 cr.; Student Option; Every Fall) A wide variety of Latino groups have used the stage to explore identity issues in a public forum and have developed nontraditional approaches which have altered the nature, quality, and substance of recent theater in the United States. These theaters have attempted to break the mainstream theater's hegemony by addressing the audience's desire to see their problems enacted in understandable and creative terms. Through an interdisciplinary approach which will include lectures and visual material, the course will introduce established and works-in-progress of United States Latin(o) playwrights, and the historical, political, and cultural development framework which made it possible. Delivered in English, the course will be of special interest for those in search of a better understanding of the construction of English-Spanish cultural and theatrical discourses within and outside of the United States.
SPAN 3011W. Spanish Grammar and Composition Workshop. (WI; 4 cr.; Student Option; Every Fall & Spring) Real-world writing, speaking, reading. Writing summaries of lectures by native speakers. Two papers. Reader's journals. Oral presentation. Grammar review. Audio exercises, paired/small-group work. Discussions. Peer editing. Process writing. prerequisite: [1004 or 1014 or 1044], LPE pass

SPAN 3015V. Honors: Spanish Composition and Communication. (WI; 4 cr.; A-F or Audit; Every Fall & Spring) Comprehension of written/spoken text. Speaking/reading/writing. prerequisite: SPAN LPE pass, Honors student

SPAN 3015W. Spanish Composition and Communication. (WI; 4 cr.; Student Option; Every Fall & Spring) Comprehending written/spoken texts. Speaking, reading, writing beyond intermediate level. prerequisite: SPAN LPE pass

SPAN 3019W. Composition and Communication for Spanish Speakers of the U.S. (WI; 4 cr.; Student Option; Every Fall) Students in this course will further develop the main linguistic skills taught in the foundational course 1001-1004 sequence, modified appropriately for students born and/or raised in the US and who speak/speak Spanish in the home. These students may or may not have received formal education in Spanish. Instruction will target the linguistic forms and rhetorical organization necessary for the genres of narration, exposition, and comparison-contrast while exploring cultural texts. Through guided activities, students will identify their linguistic and communicative strengths and weaknesses and also steps that they can take to advance in their language development prerequisite: Instructor consent (recommended SPAN 1004 Pass or SPAN LPE Pass)

SPAN 3022. Advanced Business Spanish. (4 cr.; Student Option; Every Spring) Major issues of culture in relation to business in context of Spanish-speaking world. Important historical-social factors that contribute to understanding of economy/business relationships with industrialized nations. prerequisite: 3015

SPAN 3044. Advanced Medical Spanish. (4 cr.; Student Option; Every Spring & Summer) How to communicate more effectively in linguistic-cultural terms with Spanish speaking patients. Advanced/ specific medical vocabulary, communication strategies, and related cultural aspects. Conducting patient interviews/videoconference. Using vocabulary/conversation to conduct physical exams. Latin American views on health/health care. prerequisite: [1004 or 1014 or 1044 or equiv], Spanish LPE or instr consent

SPAN 3046V. Introduction to the Study of Hispanic Literatures. (LITR, WI; 3 cr.; Student Option; Every Fall, Spring & Summer) Structures, meaning, and social/historical function of diverse literary texts. prerequisite: 3015, Spanish [major or minor] and/or Span-Port major

SPAN 3048W. Introduction to the Study of Hispanic Literatures. (LITR, WI; 3 cr.; Student Option; Every Fall, Spring & Summer) Structures, meaning, and social/historical function of diverse literary texts. prerequisite: 3015, Spanish [major or minor] and/or Span-Port major

SPAN 3104V. Honors: Introduction to the Study of Hispanic Cultures. (WI; 3 cr.; A-F only; Periodic Fall & Spring) prerequisite: 3105V or TLDO 3104 or VENZ 3104 or VENZ 3105 or VENZ 3231 or VENZ 3512 or instr consent

SPAN 3105V. Honors: Introduction to the Study of Hispanic Cultures. (WI; 3 cr.; A-F only; Periodic Fall & Spring) prerequisite: 3105V or TLDO 3104 or VENZ 3104 or VENZ 3105 or VENZ 3231 or VENZ 3512 or instr consent

SPAN 3106. Advanced Oral Proficiency Workshop. (3 cr.; A-F only; Periodic Fall & Spring) Late modern and contemporary discourses in literature, popular culture, mass media, and film. prerequisite: 3105, 3104W or TLDO 3104 or VENZ 3104 or instr consent

SPAN 3200H. Honors Seminar in Spanish and Portuguese Studies. (3 cr.; A-F only; Every Fall) Topics related to cultural studies, literature, linguistics in Iberian/Latin American milieus. Taught in Spanish. May be cross-listed with another department. prerequisite: Honors student, 3105, 3104W or TLDO 3104 or TLDO 3105 or VENZ 3104 or VENZ 3512 or instr consent

SPAN 3301. Advanced Oral Proficiency Workshop. (3 cr.; A-F only; Periodic Fall & Spring) Topics related to cultural studies, literature, linguistics in Iberian/Latin American milieus. Taught in Spanish. May be cross-listed with another department. prerequisite: Honors student, 3105, 3104W or TLDO 3104 or TLDO 3105 or VENZ 3104 or VENZ 3512 or instr consent

SPAN 3401. Latino Immigration and Community Engagement. (CIV; 3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Students analyze US power structures associated with emigration from Latin America and issues confronting societies with a rapid demographic change such as has been the case with Latino immigration in the U.S. Students have many opportunities to engage in dialogue with Latino immigrants. Topics include: the relationship between the global economic system and emigration from Latin America, human rights along the U.S./Mexican border, and US federal immigration policies. 33 hours of volunteer work outside of class required in the Latino immigrant community. Prerequisite: ARGN 3015W or ECDR 3015W or SPAN 3105 or SPAN 3015W or SPAN 3015V or TLDO 3231 or VENZ 3105

SPAN 3403. Latino Immigration on US/Mexican Border. (3 cr.; Student Option; Periodic Summer) This course takes place off campus, through an organization called "Border Links" that is located in Tucson and works with migrants. Students will experience firsthand many issues that directly affect the migrant journey and meet with many immigrants to hear their personal stories. In addition to learning the history of the situation on the border, students will take a tour of the border wall, visit neighboring communities that work with immigrants, do a legal immigration simulation, walk the migrant trails in the Sonoran Desert and leave water there with Humane Borders, go to a Operation Streamline Deportation Court hearing, visit migrants seeking political asylum in Florence Detention Center, talk with a leader in Southside Workers Center,
meet with an author focusing on Border Patrol, and more. Themes explored in this course include the connection between the roots of emigration and the global economy of violence in Central America; human rights on the border; and issues immigrants face in the US such as immigrants living in the US with or without legal documents, detention and deportation and the work they are doing to make a more just immigration system. Students will gather information during their stay and create a presentation to be shown to people in Minnesota upon returning from the border.

SPAN 3404. Medical Spanish and Community Health Service. (; 3 cr.; Student Option; Every Fall & Spring) Creating materials for effective communication with and education of Spanish-speaking patients. Students engage in service learning with community health care partners that serve the Chicano/Latino population. prereq: 3015 with grade of at least B- or [1044, high pass on at least three sections of LPE]

SPAN 3502. Modern Spain. (; 3 cr.; Student Option; Every Spring) Spanish culture, from beginning of 19th century to present. Cultural change and its conflicts as represented in Spanish art, literature, film, and diverse political developments. prereq: 3015, [3105W or TLDO 3105 or VENZ 3512 or instr consent]

SPAN 3503. Pre-modern Spanish Culture and Thought. (HIS; 3 cr.; Student Option; Periodic Fall & Spring) Notions of nation, empire, and race precipitated by presence of Muslims, Jews, and Christians in Iberia in 12th and 13th centuries. Toledo as center of translation, technology, innovation, design, and philosophical inquiry for all of Europe. How Iberian literary works differed from those produced in the rest of Western Europe. Readings from Saint Isidore, Ibn Hazm, Avernoes (Ibn Rushd), and Maimonides. prereq: SPAN 3104W or SPAN 3104V or TLDO 3104W or ARGN 3104W or SPAN 3105W or TLDO 3105W or SPAN 3105V or VENZ 3512 or instr consent

SPAN 3510. Issues in Hispanic Cultures. (; 3 cr. [max 9 cr.]; A-F or Audit; Every Fall, Spring & Summer) Analysis of practices that have shaped cultural identity of Spanish or Portuguese-speaking areas. Topics vary. prereq: 3015, [3105W or TLDO 3105 or VENZ 3512 or instr consent]

SPAN 3512. Don Quijote and the Novel. (LITR; 3 cr.; Student Option; Spring Even Year) How Cervantes’ text enters in dialogue with prevalent novelistic and social discourses of Spain’s Renaissance and Baroque periods (sixteenth/seventeenth century). How novel has managed to interest succeeding generations of readers. Taught in English.

SPAN 3653. Contemporary Latino and Latin American Drama Written in English. (; 3 cr.; Student Option; Every Spring) Contextual, theoretical, and thematic contributions and formal dimensions of U.S. Latino theatre. Issues of gender, identity, class, and cultural politics. Taught in English. prereq: SPAN 1001 or equiv

SPAN 3699. Study of Advanced Spanish Language Abroad. (; 1-5 cr.; Student Option; Every Fall & Spring) Study of advanced Spanish language in a Spanish-speaking country. prereq: Two yrs college-level Spanish, dept consent

SPAN 3701. Structure of Spanish: Phonology and Phonetics. (; 3 cr.; Student Option; Periodic Fall & Spring) Analysis of phonetics/phonology of modern Spanish. Regional/social variants of the language in Spain and Spanish America. Emphasizes improving Spanish pronunciation. prereq: 3015, [3107W or TLDO 3107 or VENZ 3107 or instr consent]

SPAN 3702. Structure of Spanish: Morphology and Syntax. (; 3 cr.; Student Option; Periodic Fall & Spring) Using linguistic concepts such as morpheme, flexional affix, noun phrase, subject, subordination, and coordination to identify different morphological/syntactic components of Spanish. prereq: 3015, [3107W or TLDO 3107 or VENZ 3107 or instr consent]

SPAN 3703. Origins and History of Spanish and Portuguese. (; 3 cr.; Student Option; Every Fall & Spring) Development of Spanish from its Latin roots. Phonetic, morphological, syntactic, and sociolinguistic aspects of language variations over time. prereq: 3015, [3107W or TLDO 3107 or VENZ 3107 or instr consent]

SPAN 3704. Sociolinguistics of the Spanish-Speaking World. (; 3 cr.; Student Option; Every Spring) Spanish dialects. Spanish in contact with other languages. Bilingualism, language attitudes. Pragmatic analysis of Spanish. Impact of recent cultural, political, and socioeconomic transformations on language. prereq: 3015, [3107W or TLDO 3107 or VENZ 3107 or instr consent]

SPAN 3706. Spanish Applied Linguistics. (; 3 cr.; Student Option; Every Spring) Introduction to second language acquisition processes as they relate to fundamental analysis of linguistic concepts of Spanish. Features that present difficulties for English speakers. Sociolinguistic aspects of language learning. Application to Spanish language teaching. prereq: 3015, [3107W or TLDO 3107 or VENZ 3107 or instr consent]

SPAN 3707. Linguistic Accuracy Through Translation. (; 3 cr.; A-F only; Every Spring) Analysis of style/audience/lexicon of various texts in Spanish (popular press, business, academic) examined as framework for training to communicate with accuracy in different contexts. Students apply lexical/grammatical choices in translating texts. prereq: 3015, [3104W or 3105W or 3107W or TLDO 3104 or TLDO 3105 or TLDO 3107 or VENZ 3104 or VENZ 3107 or VENZ 3512 or instr consent]

SPAN 3730. Topics in Hispanic Linguistics. (; 3 cr. [max 9 cr.]; A-F only; Periodic Fall & Spring) Topics specified in Class Schedule. prereq: 3015, [3107W or TLDO 3107 or VENZ 3107 or instr consent]

SPAN 3800. Film Studies in Spanish. (; 3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Summer) Films from Spain or Spanish-speaking world in their historical, (geo)political, and socioeconomic contexts. Films analyzed under interdisciplinary frameworks, noting aspects related to cinematography/historic. prereq: 3015, [3104W or 3105W or TLDO 3104 or TLDO 3105 or VENZ 3104 or VENZ 3512 or instr consent]

SPAN 3910. Topics in Spanish Peninsular Literature. (; 3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Spring) Focus on central theme related to important groups of writers, literary movements, trends, critical approaches, methods. Topics specified in Class Schedule. prereq: 3015, [3104W or TLDO 3104 or VENZ 3104 or instr consent]

SPAN 3920. Topics in Spanish-American Literature. (; 3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Spring) Focus on central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in Class Schedule. prereq: SPAN 3104W or SPAN 3105V or VENZ 3104 or ARGN 3104W or SPAN 3105W or SPAN 3105V or VENZ 3512 or instructor consent

SPAN 3970. Directed Studies. (1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading/study in Hispanic linguistics, cultural studies, or peninsular, Latin American, or U.S. Latino theater or literatures. Preir instr consent, dept consent, college consent.

SPAN 3972W. Graduation Seminar. (WI; 3 cr.; A-F only; Every Fall & Spring) Completion of a research paper on cultural, literary, or artistic issue in Spanish or Portuguese speaking worlds or on a topic related to Hispanic linguistics. In-depth research/consultation with instructor. SPAN 3972W needs to be taken during the semester in which student completes major course work. prereq: Spanish Studies Majors: C- or better in SPAN 3015, 3104, 3105, 3107 and 3 SPAN electives with a critical analysis prereq. Spanish/Portuguese Studies Majors: C- or better in SPAN 3015, PORT 3003, SPAN 3104, 3107, 1 PORT 35xx class, 2 upper level SPAN or PORT electives.
SPAN 4001. Beginning Spanish for Graduate Student Research. (3 cr.; Student Option; Every Fall & Summer) Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings.

SPAN 4002. Beginning Spanish for Graduate Student Research. (3 cr.; Student Option; Every Spring; Summer) Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings. Meets concurrently with 1002.


SPAN 4014. Business Spanish for Graduate Student Research. (3 cr.; Student Option; Every Spring) Vocabulary, report writing skills. Proper format for business communications. Conversational fluency on trade-related topics. Meets with SPAN 1014.

SPAN 4022. Alternate Second-Semester Spanish for Graduate Student Research. (3 cr.; Student Option; Every Fall, Spring & Summer) For students who have studied Spanish in high school or at community college, or who are transfer students. Begins with accelerated review of 1001/4001 followed by material covered in 1002/4002. Meets concurrently with 1022.

SPAN 5110. Discursive Formations at the Threshold of 20th-Century Spain. (3 cr.; Student Option; Periodic Fall & Spring) Theory and representative examples of the realist/naturalist novel (Galdas, Pardo Bazan) in the context of its antecedents ("costumbremismo"), opposites (the idealist/sentimental novel), and turn-of-the-century innovations of modernism and the "generation of 1898." prereq: Grad student or instr consent

SPAN 5150. Contemporary Spanish Literature. (3 cr.; Student Option; Periodic Fall & Spring) Major literary works/movements in Spain from 1915 to 2000. Neomodernism, surrealism, social realism, literatures of dictatorship/exile. Postmodernism. Poetry, novel, drama, essays, film, video/TV. Problems of literary history. prereq: Grad student or instr consent

SPAN 5160. Medieval Iberian Literatures and Cultures. (3 cr.; Student Option; Periodic Fall & Spring) The major literary genres developed in Spain from the Reconquest to 1502, with reference to the crucial transformations of the Middle Ages, including primitive lyric, epic, clerical narrative, storytelling, debates, collections, chronicles, "exempla," and the Celestina (1499-1502).

SPAN 5170. The Literature of the Spanish Empire and Its Decline. (3 cr.; Student Option; Periodic Fall & Spring) Major Renaissance/Baroque works of Spanish Golden Age (16th-17th-century poetry, nonfiction prose, novel, drama) examined against historical background of internal economic decline, national crisis, ideological apparatus developed by modern state. prereq: Grad student or instr consent

SPAN 5180. Don Quixote. (3 cr.; Student Option; Periodic Spring) Analysis of Cervantes' [Don Quixote] in its sociohistorical context; focus on the novel's reception from the romantic period to postmodern times. prereq: Grad student or instr consent

SPAN 5190. The Crisis of the Old Regime: Spanish Literature of the Enlightenment and Romanticism. (3 cr.; Student Option; Periodic Fall & Spring) Major literary works/intellectual movements/conflicts represented in written culture, of 18th/early 19th centuries (1680-1845), examined as expressions of long crisis of Spain's Old Regime and rise of bourgeois liberalism. prereq: Grad student or instr consent

SPAN 5316. Spanish Picarsque Narratives. (3 cr.; Student Option; Periodic Fall) Literary autobiography, residual elements of Erasmian humanism, post-Tridentine repression/censorship. Picaro's critique of imperial Spain's system of values/authority. Cultural critics' challenge to rediscover popular texts of early modern period. prereq: Grad student or instr consent

SPAN 5531. Hispanic Literature of the United States. (3 cr.; Student Option; Periodic Fall) Interdisciplinary approach providing a framework for deconstructing issues of national identity, marginalization, and gender. U.S. Hispanic theatre/literature and its ethnic diversity, regional variations, cultural links, and scope of its genres. prereq: Grad student or instr consent

SPAN 5550. Caribbean Literature: An Integral Approach. (3 cr.; Student Option; Periodic Fall & Spring) Literature of Spanish-speaking Caribbean. Emphasizes historical legacy of slavery, African culture, independence struggles. prereq: Grad student or instr consent


SPAN 5560. Global Colonial Studies in the Hispanic World. (3 cr.; Student Option; Periodic Fall) Discourse production in Spanish America between 1492 and 1700. Conquest/colonial writing/counter writing. Historical origin, evolution, impact of cultural, political, socioeconomic factors. prereq: Grad student or instr consent

SPAN 5570. Latin American Cultural Integration in the Neocolonial Order. (3 cr.; Student Option; Periodic Fall & Spring) Modernismo, historical vanguard, impact of populist politics in patterns of culture/literature. 1900-50. prereq: Grad student or instr consent

SPAN 5571. History of Ibero-Romance. (3 cr.; Student Option; Periodic Spring) Origins and developments of Ibero-Romance languages; evolution of Spanish, Portuguese, and Catalan. prereq: Grad student or instr consent


SPAN 5576. The Structure of Modern Spanish: Phonology. (3 cr.; Student Option; Periodic Fall) Formulating and evaluating a phonological description of Spanish. Approaches to problems in Spanish phonology within metrical, autosegmental, and lexical phonological theories. prereq: Grad student or instr consent

SPAN 5580. Latin American Cultural Discourses. (3 cr.; Student Option; Every Fall & Spring) Linguistic types/processes that appear across languages. Grammatical relations, word order, transitivity, subordination, information structure, grammaticalization. How these are present in syntax of Spanish. prereq: Grad student or instr consent

SPAN 5711. The Structure of Modern Spanish: Semantics. (3 cr.; Student Option; Periodic Fall) Applying semantic theory to Spanish: conceptual organization and the structuring of experience; meaning and cultural values; semantic fields; categorization and prototypes; cognitive model theory; metaphor, metonymy, and mental imagery as source and change of meaning. prereq: Grad student or instr consent

SPAN 5715. The Structure of Modern Spanish: Pragmatics. (3 cr.; Student Option; Periodic Fall) Concepts in current literature in Spanish pragmatics. Deixis, presupposition, conversational implicature, speech act theory, conversational structure. prereq: Grad student or instr consent

SPAN 5717. Spanish Sociolinguistics. (3 cr.; Student Option; Periodic Spring) Sociolinguistic variation, cross-dialectal diversity in different varieties of Spanish
in Latin America and Spain. Impact of recent cultural, political, and socioeconomic transformations on language. prereq: Grad student or instr consent

SPAN 5718. Spanish Language Contact. (3 cr.; Student Option; Periodic Fall & Spring) Analysis of different types/results of Spanish language contact globally, taking into account varying social conditions under which contact occurs. prereq: Grad student or instr consent

SPAN 5721. Spanish Laboratory Phonology. (3 cr.; A-F or Audit; Periodic Fall & Spring) Core literature on Spanish laboratory phonology. Phonology from a laboratory perspective. Students evaluate laboratory research methodologies, perform basic acoustic analyses, and design laboratory phonology studies. prereq: Grad student or instr consent

SPAN 5910. Topics in Spanish Peninsular Studies. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Crucial moment or characters, works, or events marking beginning of new phase in literary/cultural landscape. prereq: Grad student or instr consent

SPAN 5920. Topics in Spanish-American Studies. (3 cr. [max 9 cr.]; Student Option; Periodic Fall, Spring & Summer) Spanish-American literature analyzed according to important groups, movements, trends, methods, and genres. Specific approaches depend on topic and instructor. Topics specified in Class Schedule. prereq: Grad student or instr consent

SPAN 5930. Topics in Ibero-Romance Linguistics. (3 cr. [max 9 cr.]; Student Option; Periodic Spring & Summer) Problems in Hispanic linguistics; a variety of approaches and methods.

SPAN 5970. Directed Readings. (1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Students must submit reading plans for particular topics, figures, periods, or issues. Readings in Spanish and/or Spanish-American subjects. Prereq Grad student or instr consent.

SPAN 5985. Sociolinguistic Perspectives on Spanish in the United States. (3 cr.; Student Option; Periodic Spring) Sociolinguistic analysis of issues such as language maintenance/shift in U.S. Latino communities, code switching, attitudes of Spanish speakers toward varieties of Spanish and English, language change in bilingual communities, and language policy issues. prereq: Grad student or instr consent

SPAN 5990. Directed Research. (1-4 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Directed research. Prereq Grad student or instr consent.

SPAN 5991. The Acquisition of Spanish as a First and Second Language. (3 cr.; Student Option; Periodic Spring) Analysis of issues such as the acquisition of Spanish and English by bilingual children; Spanish in immersion settings; developmental sequences in Spanish; classroom language learners’ attitudes, beliefs, and motivation; development of pragmatic competence. prereq: Grad student or instr consent

SPAN 8100. Research in Sociohistorical Approaches to Spanish Literature. (3 cr. [max 9 cr.]; Student Option; Periodic Fall) Sociohistorical functions of Spanish literary works and major theories concerning literary production of texts. Testing modern theories in terms of representative fictional discourses from specific historical periods. prereq: 5xxx courses in Span literature and culture

SPAN 8200. Spanish Literary Texts: Theories of Formal Structures. (3 cr. [max 9 cr.]; Student Option; Periodic Fall) Advanced research in methods of literary analysis of discourse. Emphasizes theoretical and practical frameworks within which representative texts are analyzed and interpreted from differing perspectives. prereq: 5xxx courses in Span literature and culture

SPAN 8212. Spanish Theater of the 16th Century: Drama up to Lope. (3 cr.; Student Option; Periodic Fall) Medieval origins of drama to [La Celestina] (1499-1502); pastoral dialogues, crossover plays of Spanish and Portuguese dramatists, popular theater up to emerging public and private theaters under Italian influence. Rojas, Encina, Vicente, Naharro, Cervantes, and new tragedians. prereq: 5xxx courses in Span literature and culture

SPAN 8223. The Poetry of the Spanish Golden Age. (3 cr.; Student Option; Periodic Fall) New Spanish poetic forms, from Garcielas de Le[?]n, mystics, and San Juan to Baroque trends by G[?]ngora, Lope, and Quevedo. Classic traditions and modern adaptations. Ideological foundations of lyric genres--eclogue, lira, mystics, satire, conceptismo/culteranism, and sonnet. prereq: 5xxx courses in Span literature and culture

SPAN 8300. The Construction of Spanish Literary History. (3 cr. [max 9 cr.]; Student Option; Periodic Fall) Origins and development of Hispanic literary canon; sociocultural theories of Spanish literary histories as academic and historiographic disciplines. Critiques of modern literary theories through analysis of literary works by major writers. prereq: Two 5xxx courses in Span literature and culture

SPAN 8312. Two Spanish Masterpieces: [Libro de Buen Amor] and [La Celestina]. (3 cr.; Student Option; Periodic Fall) Cultural reappraisal of the late Middle Ages by reference to two Spanish masterpieces: the Archpriest’s [Book of True Love] and Rojas’ [La Celestina] (1499-1502). Emphasizes historical function of varied genres, motifs, and sources adapted by the authors. prereq: 5106, 5107 or 5xxx course in Portuguese

SPAN 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) Major literary works and genres of Caribbean literature studied against the background of sociohistorical vicissitudes of the process (No description) prereq: Master’s student, adviser and DGS consent

SPAN 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

SPAN 8666. Doctoral Pre-Thesis Credits. (1-18 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

SPAN 8710. Seminar in Hispanic Linguistics. (3 cr. [max 9 cr.]; Student Option; Fall Even Year) Critical examination of readings/research on specific topic. prereq: 5711. (Ling 5302 or instr consent)

SPAN 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

SPAN 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

SPAN 8900. Spanish Seminar. (3 cr. [max 9 cr.]; Student Option; Every Fall, Spring & Summer) Projects relying heavily on advanced research in Spanish problems. Investigation of assigned fields, analysis of problems, appraisal of principles. Limited to small group of students. For list of sample seminars, consult department and director of graduate studies. prereq: Span 5xxx series required for MA or instr consent

SPAN 8940. Advanced Research in Spanish-American Literary Historiography. (3 cr. [max 9 cr.]; Student Option;) Sources and procedures that have given rise to institutionalizations of Spanish-American literary history. Evaluation and review of epistemological principles and assumptions in theory of literary criticism and histories of literature.

SPAN 8960. Workshop: Research in Hispanic Cultural Issues. (3 cr. [max 9 cr.]; Student Option;) Individualized support and advice in framing, theorizing, problematizing, and interpreting areas of cultural research. Taught in Spanish, Portuguese, and English. prereq: Reading knowledge of Spanish and Portuguese

SPAN 8990. Advanced Comparative Research of Caribbean Genres. (3 cr. [max 9 cr.]; Student Option; Periodic Fall) Major literary works and genres of Caribbean literature studied against the background of sociohistorical vicissitudes of the process
leading to the formation and consolidation of the national states. prereq: S525 or instr consent

Spanish and Portuguese (SPPT)

SPPT 3256. Latin American Cultural Discourse. (3 cr.; Student Option; Periodic Spring)
Cultural assumptions in current modes of interpreting Latin American reality. Representative texts are analyzed. prereq: SPAN 3015

SPPT 3600. Topics in Spanish and Portuguese Studies (Taught in English). (3 cr.; Student Option; Periodic Fall & Spring)
Latin American, Iberian, or Lusophone topics related to culture, society, art, or linguistics. Taught in English.

SPPT 5930. Selected Topics in Hispanic and Lusophone Cultural Discourse. (1-3 cr. [max 9 cr.]; A-F or Audit; Periodic Fall & Spring)
Cultural discourses in Spanish- and Portuguese-speaking areas. Historical intersections/divergences. Taught in Spanish or Portuguese, and in English when cross-listed. Topics specified in Class Schedule. prereq: Reading knowledge of Spanish and Portuguese

SPPT 5995. Directed Teaching. (1 cr.; S-N only; Every Fall)
Taken in conjunction with SPPT 5999. Language acquisition theory as applied to foreign language instruction at college level. How current theory translates into practice through hands-on practical application particular to communicative language instruction practiced in Department of Spanish/Portuguese Studies. prereq: Grad student with concurrent enrollment in 5999

SPPT 5999. The Teaching of College-Level Spanish: Theory and Practice. (3 cr.; Student Option; Every Fall)
Theoretical grounding in the general principles of second language acquisition and guidance with their practical applications to the teaching of first- and second-year Spanish at the college-level. prereq: Grad or instr consent

SPPT 8400. Topics in Modern Hispanic and Lusophone Culture. (3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring)
Advanced research in methods of analysis of cultural products, including but not limited to literature. Emphasizes historical, ideological, and theoretical frameworks within which representative texts/events may be interpreted. prereq: Three Sxxx SPAN or PORT courses

SPPT 8920. Introduction to Hispanic and Lusophone Literatures, Cultures, and Languages. (2 cr. [max 9 cr.]; S-N only; Every Spring)
This two-credit seminar will familiarize beginning doctoral students in the areas of Hispanic/Lusophone literary and cultural studies and Hispanic linguistics. Course must be taken during spring semester of the first year. Topics to be covered include: expected milestones and progress prior to reaching ABD status; methods for writing conference abstracts and presentations; the basics of academic writing in cultural studies and linguistics; how to transform a seminar paper into a publishable piece of scholarship; best practices for determining appropriate conference and publication venues; how to start formulating a dissertation project in the early stages of the graduate career; tactics for requesting funding and completing scholarship/grant applications; collegiality and professionalism in the discipline prereq: Graduate Student

SPPT 8930. Dissertation & Professionalization Workshop. (1 cr. [max 6 cr.]; S-N only; Every Spring)

Speech-Language-Hearing Sci (SLHS)

SLHS 1301V. The Physics and Biology of Spoken Language Honors. (PHYS,WI; 4 cr.; A-F or Audit; Every Fall & Spring)
Physics/biology of spoken language, from talker’s production of sounds/words, to transmission of sound, to listener's perception of what was said. Computer analysis/synthesis of speech.

SLHS 1301W. The Physics and Biology of Spoken Language. (PHYS,WI; 4 cr.; Student Option; Every Fall & Spring)
Physics and biology of spoken language, from the talker’s production of sounds and words, to the transmission of sound, to the listener’s perception of what was said. Computer analysis and synthesis of speech.

SLHS 1302. Rate Your World: Quantifying Judgments of Human Behavior. (MATH; 3 cr.; Student Option; Every Fall & Spring)
Methods for acquiring, summarizing, and analyzing judgments of human behavior. Measurement theory as it relates to ratings scales and physiological measures of behavior. Methods for summarizing and visualizing large sets of data, such as those used in research in the social sciences. Statistical analyses of data on human behavior. This course focuses strongly on using computational methods for analyzing and visualizing behavioral data using free open-course statistical software. Weekly laboratory sessions.

SLHS 1401. Communication Differences and Disorders. (SOC; 3 cr.; Student Option; Every Fall & Spring)
Introduction to normal and disordered cognition and communication in regards to hearing, speech, and language in pediatric and adult populations. Specific focus on functional communication, assessment, and intervention as it relates to socially, culturally, and linguistically diverse populations.

SLHS 1402. The Talking Brain. (SOC; 3 cr.; Student Option; Every Fall & Spring)
How the brain produces/understands speech/language, including various aspects of the nervous system involved in producing/understanding speech/language. Differences in brain structure/function among individuals with and without brain injury, based on scientific versus historical, mass media and literature portrayals.

SLHS 1911. Diversity in Social Communication. (3 cr.; A-F only; Every Fall)
Social communication is the process of interacting with others to send a message. It includes speech, language, and nonverbal communication such as eye contact and gestures. Social communication develops from infancy and changes over the lifespan. There are differences in social communication across cultures, generations, genders, and communication disorders. This course will provide students with an understanding of what social communication is and how it develops, how it relates to speech and language, how it differs from person to person, and how speech-language pathologists and other professionals evaluate and treat social communication impairments. The course will focus on neurodiversity related to autism as well as on cultural self-awareness and building cultural competence.

SLHS 3302. Anatomy and Physiology of the Speech and Hearing Mechanisms. (3 cr.; Student Option; Every Fall)
Survey of anatomy and physiology of the auditory and speech production systems, including the nervous, respiratory, laryngeal, velopharyngeal and orofacial subsystems. Emphasis on normal processes and functions.

SLHS 3303. Language Acquisition and Science. (3 cr.; Student Option; Every Spring)
Survey of typical language development, major theoretical perspectives about development, and analyses of children’s language.

SLHS 3304. Phonetics. (3 cr.; Student Option; Every Spring)
Phonetic transcription of speech produced by children and adults who speak a variety of the world’s languages. Extensive practice with transcription. Phonetic theory, including theories of phonetic variation across the lifespan and across the world’s languages. A strong emphasis on developing fluency in phonetic transcription, and on appreciating the limits of this skill. Introduction to socially meaningful phonetic variation.

SLHS 3305W. Speech Science. (WI; 3 cr.; Student Option; Every Fall)
Survey of theories, methods, and research in speech science. Emphasis is on the acoustics of speech production and speech perception. Writing assignments focus on communicating theory and clinical aspects of speech communication to professional and to the lay public.

SLHS 3306. Hearing Science. (3 cr.; Student Option; Every Spring)
Theories, methods, and research in psychological and physiological acoustics.
Emphasizes relation between physiological measures and perception. Cochlear mechanics, auditory nerve firing patterns, scaling, and object perception. prereq: [3302, 3305W] or instr consent

SLHS 3401. Communication Differences and Disorders. (SOCSS; 3 cr.; Student Option; Every Fall & Spring) Introduction to normal and disordered cognition and communication in regards to hearing, speech, and language in pediatric and adult populations. Specific focus on functional communication, assessment, and intervention as it relates to socially, culturally, and linguistically diverse populations.

SLHS 3402V. Capstone Project in Speech-Language-Hearing Sciences Honors. (WI; 3 cr. [max 6 cr.; A-F only; Every Spring) Seminar for completion of undergraduate major project. Emphasis on development of writing skills and service learning.

SLHS 3402W. Capstone Project in Speech-Language-Hearing Sciences. (WI; 3 cr.; S-N or Audit; Every Spring) Seminar for completion of undergraduate major project. Emphasis on development of writing skills and service learning.

SLHS 3555H. Honors Thesis. (; 1-2 cr.; A-F or Audit; Every Fall & Spring) Research/writing under direction of faculty member. Details of work are determined in consultation with faculty thesis adviser selected based on availability/topic. prereq: See dir of undergrad studies for [thesis adviser, forms]

SLHS 3994. Directed Research. (; 1-12 cr. [max 24 cr.]; Student Option; Every Fall, Spring & Summer) tbd prereq: Undergrad doing research

SLHS 4301. Introduction to the Neuroscience of Human Communication. (; 3 cr.; Student Option; Periodic Fall) Basic neuroanatomy and neurophysiology, especially as they relate to normal speech, language, and hearing processes.

SLHS 4402. Assessment and Treatment in Speech-Language Pathology. (3 cr.; A-F or Audit; Every Fall) Introduction to clinical methods and issues in communication disorders. Professional and legal mandates, collection and analysis of clinical data, principles and models of intervention with adults and children, and clinical reporting. prereq: [1401 OR 3401, 3302, 3303, 3304, 4301] (either before registration for 4402 or concurrent registration is required [or allowed] in 4402), or grad student, or instr consent

SLHS 4801. Hearing Measurement and Disorders. (; 3 cr.; Student Option; Every Fall) Introduction to theory, administration, and interpretation of behavioral and physiological hearing tests for all age groups. Immittance, pure tone, speech, otoacoustic emissions, evoked potential measures. Hearing-screening protocols. prereq: [3302, 3305W] or instr consent

SLHS 4802. Rehabilitative Audiology. (; 3 cr.; Student Option; Every Spring) Survey of sensory aids and methods used in audiologic intervention across the life span after diagnosis of hearing loss. Impact of hearing loss, developmental level, communication modalities, client and family choice, disability and handicap, and linguistically and culturally diverse populations.

SLHS 5401. Counseling and Professional Issues. (; 3 cr.; Student Option; Every Fall) Basic counseling principles and current professional issues related to practice in a dynamic multicultural environment. Application of counseling theory to clinical practice. Analysis of regulation, practice, and future direction of communication disorders. prereq: [current registration is required (or allowed) in 8720 or concurrent registration is required (or allowed) in 8820], grad student recommended

SLHS 5502. Voice and Cleft Palate. (3 cr.; Student Option; Every Spring) Disordered voice and resonance. Presentation and discussion of the nature of etiologies, assessment and management of organic/functional voice disorders and cleft palate to meet clinical competencies for speech-language pathology. prereq: [3305, 4301] or [CDIS 3305, CDIS 4301] or instr consent

SLHS 5503. Fluency and Motor Speech Disorders. (3 cr.; Student Option; Every Fall) Nature-management of stuttering and other motor speech disorders in adults/children. prereq: graduate SLHS student or department permission, [3305, 4301] or instr consent


SLHS 5602. Speech Sound Disorders: Assessment and Treatment across Languages. (3 cr.; Student Option; Every Fall) Nature, assessment, and treatment of speech sound disorders in children. Assessment and treatment of phonological awareness and pre-literacy skills. This course covers cross-linguistic issues in speech sound disorders, including characteristics of speech sound disorders in a variety of languages, and the differential diagnosis of speech sound disorder from the effects of normal second-language acquisition. Emphasis on functional speech sound disorders, with some coverage given to disorders of a clear organic origin, like cerebral palsy, hearing impairment, and cleft palate. prereq: [3303, 3304, 4601] or instr consent

SLHS 5603. Assessment and Intervention of Language Disorders in Children. (; 3 cr.; Student Option; Periodic Fall & Spring) Assessment and intervention techniques approaches for treating language impairment in children with disabilities, such as specific language impairment, developmental delays, and autism spectrum disorder. prereq: 3303 or CDIS 3303 or equiv or grad student or instr consent

SLHS 5605. Language and Cognitive Disorders in Adults. (; 3 cr.; Student Option; Periodic Fall & Spring) Acquired cognitive and communicative disorders in the adult population specifically including: stroke/aphasia, right hemisphere dysfunction, traumatic brain injury, and dementia. Consideration of neurological substrates, disorder symptomatology, assessment, clinical intervention, and functional impact across the lifespan and amongst diverse populations. prereq: [3302, 4301] or [CDIS 3302, CDIS 4301] or instr consent

SLHS 5606. Introduction to Augmentative and Alternative Communication. (; 3 cr.; Student Option; Every Fall & Spring) Description of the range of augmentative and alternative communication applications for persons with developmental and acquired disabilities. Topics include assessment, intervention strategies, progress monitoring, generalization, and maintenance; collateral behavior resulting from AAC applications.

SLHS 5608. Clinical Issues in Bilingualism and Cultural Diversity. (; 3 cr.; A-F only; Every Spring) Topics in cultural diversity, bilingualism, and second language learning needed for clinical competency in speech-language pathology. Basic/applied issues across a broad range of culturally/linguistically diverse populations. prereq: 3303 or equiv or instr consent

SLHS 5609. Child Language Disorders in Diverse Populations. (3 cr. [max 6 cr.]; Student Option; Every Spring) This course covers topics across three broad areas of child language: cultural and linguistic diversity, early intervention, and social communication. The first section will address multicultural issues and bilingualism. The second section will focus on assessment and treatment of language disorders from birth through preschool. Finally, we will address the assessment and treatment of social communication and pragmatic language deficits across disorders and developmental levels, including early prelinguistic communication. The course will include both theoretically and clinically motivated content.

SLHS 5801. Advanced Audiologic Assessment. (; 3 cr.; Student Option; Every Fall) Basic audiometric battery, including pure tone thresholds, measures of speech understanding, masking and immittance in adults. Topics include video otoscopy, ototoxicity, functional hearing loss, and identification of middle-ear fluid. Students enrolled in this course concurrently enroll in SLHS 5810. prereq: 4801 or CDIS 4801 or instr consent

SLHS 5802. Hearing Aids I. (; 3 cr.; Student Option; Every Fall) Survey of modern hearing aids including history of development, electroacoustic functions, clinic and laboratory measurement techniques, sound field acoustics, techniques for selection. prereq: [3305, 4801] or [CDIS 3305, CDIS 4801]. SLHS grad) or instr consent
SLHS 5803. Pediatric Audiology. (3 cr.; Student Option; Every Fall) Behavioral, physiological approaches to assessment and identification, development of the auditory mechanism, etiologies of hearing losses in infants, children, principles of case management with children and families. prereq: [4801 or CDIS 4801], SLHS grad or instr consent

SLHS 5804. Cochlear Implants. (3 cr.; A-F or Audit; Periodic Spring) Implantable auditory prostheses. History of device development, including cochlear implants and auditory brainstem implants. Signal processing. Techniques for selection, fitting, and rehabilitation. Behavioral/physiological changes across life span. prereq: [4802, 5801, 5802] or [CDIS 4802, CDIS 5801, CDIS 5802], SLHS grad or instr consent


SLHS 5806. Auditory Processing Disorders. (3 cr.; A-F or Audit; Fall Even Year) Normal and disordered auditory processing abilities. Anatomy and physiology of central auditory pathway, assessments to evaluate auditory processing skills, techniques to address auditory processing weaknesses. Current and historical theories and controversies surrounding auditory processing assessment. prereq: [4802 or CDIS 4802], SLHS grad or instr consent


SLHS 5808. Pathophysiology of Hearing Disorders. (3 cr.; A-F or Audit; Summer Odd Year) Disorders of auditory system, including anatomical, physiological, perceptual, and audiological manifestations of pathologies affecting hearing. Focus will be on understanding current data on physiology, pharmacology, and novel treatment alternatives. prereq: [8801, 8802] or [CDIS 8801, CDIS 8802], SLHS grad or instr consent

SLHS 5810. Laboratory Module in Audiology. (1-2 cr. max 10 cr.; A-F only; Every Fall & Spring) Intensive study of clinical methods in audiology. Supplements didactic courses in audiology curriculum. Laboratory study, individually or in small groups. Students enroll in this course concurrently with SLHS 5801, 5802, 8801, 8802. prereq: [4801 or CDIS 4801], SLHS grad or instr consent

SLHS 5820. Clinical Research and Practice: Grand Rounds. (1-6 cr.; S-N or Audit; Every Fall & Spring) Group discussions of current professional issues in audiology. Case presentations, guest presentations on current technology, clinical/research ethics. Group meets for an hour weekly with faculty coordinator who leads discussion. Integrates academic/clinical education. prereq: [4801 or CDIS 4801 or equiv], SLHS grad or instr consent

SLHS 5830. Clinical Foundations in Audiology. (1-8 cr. max 24 cr.; S-N or Audit; Every Fall, Spring & Summer) Clinical foundations in audiology for first year AuD graduate students. prereq: Grad SLHS major

SLHS 5900. Topic in Speech-Language-Hearing Sciences. (1-3 cr. max 6 cr.; Student Option; Periodic Fall & Spring) Topics listed in Speech-Language-Hearing Sciences office. prereq: SLHS grad student or instr consent

SLHS 5993. Directed Study. (1-12 cr. max 18 cr.; Student Option; Every Fall, Spring & Summer) Directed readings and preparation of reports on selected topics. prereq: SLHS grad or instr consent

SLHS 8133. FTE: Masters. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

SLHS 8410. Seminar: Research. (3 cr.; Student Option; Periodic Fall & Spring) Advanced study exploring application of experimental and quasi-experimental research designs used in single-subject and group research.

SLHS 8420. Seminar: Teaching. (3 cr.; max 9 cr.; Student Option; Periodic Fall & Spring) Advanced study to prepare doctoral students for careers in undergraduate and graduate teaching. prereq: Grad com dis major

SLHS 8430. Proseminar in Speech-Language-Hearing Sciences. (1-6 cr. max 60 cr.; S-N only; Every Fall & Spring) Presentations/discussions led by faculty and PhD students in the department, based on research or issues in the discipline.

SLHS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

SLHS 8501. Interdisciplinary Management in Cleft Palate and Craniofacial Disorders. (3 cr.; Student Option; Every Fall) Communication problems associated with cleft palate and craniofacial disorders within interdisciplinary context; structural bases for speech problems, and physical and behavioral approaches to speech treatment; interdisciplinary medical and dental concerns and management. prereq: 3305 or CDIS 3305 or instr consent

SLHS 8530. Seminar: Speech. (3 cr. max 12 cr.; Student Option; Periodic Fall & Spring) Advanced study and analysis of research in speech science and speech pathology.

SLHS 8602. Traumatic Brain Injury. (3 cr.; Student Option; Periodic Fall) Survey of communicative and cognitive disorders in adults who have traumatic brain injuries. Demographics, neuropathologic substrates, assessment and diagnosis, clinical applications. prereq: [3302, 4301] or [CDIS 3302, CDIS 4301] or instr consent

SLHS 8630. Seminar: Language. (3 cr.; max 12 cr.; Student Option; Periodic Fall & Spring) Research in language acquisition, language science, and language disorders.

SLHS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. max 12 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

SLHS 8720. Clinical Education in Speech-Language Pathology. (1-8 cr. max 24 cr.; S-N or Audit; Every Fall, Spring & Summer) Clinical experience. Prereq Grad CDIs major, adviser, DGS consent.

SLHS 8777. Thesis Credits: Master's. (1-18 cr. max 50 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

SLHS 8801. Electrophysiologic Assessment of Auditory Function. (3 cr.; Student Option; Every Spring) Basic terminology and theoretical aspects of the auditory evoked potentials, electrocochleography, acoustic reflectance, and otocoustic emissions. Topics include case studies with clinical application of short-latency responses such as the auditory brainstem response and otocoustic emissions in adults. Students enrolled in this course concurrently enroll in SLHS 5810, prereq: 5801 or CDIS 5801 or instr consent

SLHS 8802. Hearing Aids II. (3 cr.; Student Option; Every Spring) Instrumentation and methods for fitting and evaluating personal hearing aids; ear impression techniques and materials; repair and modification of hearing aids. prereq: 5802 or CDIS 5802 or instr consent

SLHS 8803. Signals and Systems in Audiology. (3 cr.; Student Option; Every Fall) This mostly laboratory class includes familiarization and application of test equipment
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

**SLHS 8805. Hearing Science Foundations of Audiology.** (3 cr.; Student Option; Periodic Fall)
Physical/psychological acoustics. Emphasizes hearing loss. Acoustics of the middle and external ear, cochlear mechanics, neural codes for perception, frequency selectivity, loudness, temporal resolution, clear speech, attention, prediction of speech understanding ability using stimulus measures, and binaural hearing. prereq: Knowledge of acoustics, basic anatomy/physiology of ear, intro coursework in hearing/speech science.

**SLHS 8806. Audiology Capstone.** (1-6 cr.; S-N or Audit; Periodic Fall)
Students research a case history of patient with an auditory disorder, write paper that summarizes the literature on the disorder, and recommend assessment tools and treatment plans. prereq: 8802, 8807

**SLHS 8807. Balance Assessment.** (3 cr.; Student Option; Spring Odd Year)
Anatomy/physiology of vestibular mechanism. Assessment techniques to evaluate balance function. Treatment options available for persons with balance disorders. prereq: 5801, 8801

**SLHS 8820. Clinical Education in Audiology.** (1-8 cr. [max 24 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Clinical experience. prereq: Grad CDIS major

**SLHS 8830. Seminar: Hearing.** (3 cr. [max 12 cr.]; Student Option; Periodic Fall, Spring & Summer)
Advanced study/analysis of research in hearing science and audiology.

**SLHS 8840. Audiology Externship.** (1-8 cr. [max 24 cr.]; S-N or Audit; Periodic Fall & Spring)
Students intern at external clinical setting under supervision of certified audiologist. Entry-level knowledge and skills required for professional practice as clinical audiologist. External internship settings may include hospitals, schools, private otolaryngology practices, hearing aid dispensing practices, industrial settings, or community clinics. prereq: [8802, 8807] or [CDIS 8802, CDIS 8807]

**SLHS 8888. Thesis Credit: Doctoral.** (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required.

**SLHS 8994. Directed Research.** (1-12 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer)
Directed research prereq: instr consent

**SMGT 1701. Introduction to Sport Management.** (2 cr.; A-F or Audit; Every Fall & Spring)
Scope/motive of the study of sport from social, psychological, historical, economic, and scientific perspective. Issues in sport.

**SMGT 2751. Sport and Wellness in China.** (3 cr.; A-F Only; Every Summer)
Course covers international and governing body selection of host market, economic impact of hosting a sport event, media, communications, working with athletes, marketing, event operations, host politics and culture. Students will also participate in wellness and rec as presented by our Chinese partners.

**SMGT 3111. Sports Facility and Event Management.** (3 cr.; A-F only; Every Fall, Spring & Summer)
This course is designed to provide the student with knowledge pertaining to the various aspects of managing a sport facility and the events which take place within these facilities. Some of the topics discussed include operations, scheduling, marketing, ticketing, finance, sponsorship, risk, security, and event management. Students will have the opportunity to present their viewpoints as it relates to the management of sport facilities and event management. In addition, students will have the opportunity to apply knowledge gained through lecture and in class exercises by viewing a sports event and critiquing various facility management functions during the event, and by developing a sports event management plan. prereq: SMGT major or SMGT minor or CEHD IDP or instructor consent and 45 credits completed or in progress.

**SMGT 3143. Organization and Management of Sport.** (3 cr.; A-F only; Every Fall, Spring & Summer)
This course is designed to provide the student with knowledge pertaining to the various aspects of organization, management, and administration within the sport industry. Students will have the opportunity to hear, learn, and share viewpoints as they relate to sport management through lectures, discussions on current events, and case study analysis, prereq: SMGT major or SMGT minor or CEHD IDP or instructor consent, and 45 credits completed or in progress.

**SMGT 3421. Business of Sport.** (3 cr.; A-F or Audit; Every Fall & Spring)
This course is designed to provide students with an introduction to the business activity of the sports industry. Topics include sports and its business ecosystem, basic economic principles, revenue management, ticketing, sponsorships and other revenue sources, and expenditure management. prereq: SMGT or KIN or REC major or SMGT minor or CEHD IDP or instructor consent and 45 credits completed or in progress.

**SMGT 3501. Sport in a Diverse Society.** (DSJ, SOCS; 3 cr.; A-F only; Every Fall & Spring)
This course provides an overview of sport marketing management in sport organizations. The most basic objectives of the course provide you with a broad introduction to sport marketing concepts, the role of sport marketing in society, and the various factors that influence marketing decision making. Like other introductory survey courses, you will be exposed to and expected to learn the "language? of the industry (i.e., terms, concepts, and frameworks) used by practicing marketing professionals. However, it is also expected that by the end of the course you will have a solid understanding of the major decision areas under marketing, the basic interrelationships of those decision areas, and an appreciation of how to apply key frameworks and tools in analysis of customers, competition, and marketing strengths and weaknesses. With this combination, the course should help you develop insight about creative selection of target markets and blending decisions related to product, price, promotion,
place, and PR (i.e., the marketing mix) to meet the needs of a target market. It is important that sport management students understand the vital role of marketing within the sport industry. Marketing may take several forms in sport businesses. Students must be able to differentiate between use of marketing to sell sport products and/or services (marketing of sport) from the use of sport and sport personality marketing to sell general or sport-related products or services (marketing through sport). These objectives can only be achieved through a joint effort. I will work to stimulate your interest and learning in these areas, but you will be expected to display initiative and a program of self-study. In that sense, a complementary objective of the course is to provide you with an environment that will encourage and reward your own intellectual effort, while simultaneously maintaining rigorous standards that identify those who are motivated to pursue excellence in their own educational preparation for a sport business career. prereq: SMGT Major or SMGT Minor, or instructor consent AND 45 credits completed or in progress.

SMGT 3632. Sport Sales and Fund-raising. (3 cr.; A-F only; Every Fall, Spring & Summer) Foundation of revenue production in sport management. Necessary skills related to revenue production and sales processes as they apply to the business of sport. prereq: Sport Management major or instr consent

SMGT 3741. Sustainability through Sport. (2 cr.; A-F only; Every Summer) Sport attracts literally millions of followers around the world, in the United States alone the NRDC, makes note of the following, ?13% of Americans follow science, but 63% follow sports?. Sport has a unique and unparalleled influence globally over not just people but industries. Over the past few years the sport industry has embraced increasingly visible and influential positions supporting sustainability and environmental protection and this course will focus on the sport industry and its conquest to be a leader in the field of ?green?. Specifically focusing on the initiatives of Major League Baseball (MLB), which has in conjunction with its professional counterparts have made statements on the record that encourage all clubs and venues to address ecological issues including climate change, energy efficiency, water conservation, waste reductions, and selection of more environmentally friendly supplies.

SMGT 3861. Sport and Recreation Law. (3 cr.; A-F only; Every Fall & Spring) This course is designed to acquaint the students to the US legal system, structure, process and terminology. The course provides an introduction of the legal aspects of contract law, tort law, statutory law, negligence, and constitutional law. A student upon completion of the course will understand basic legal aspects of sport and physical activity and will be able to provide managerial analysis and decision making based upon a legal aspects of sport knowledge, therefore providing a competitive advantage of the organization of which are involved. The course instruction relies heavily on court case studies and the legal implications in a sport setting. prereq: SMGT major or REC major or SMGT minor or Health and Wellness Promotion minor and 60 credits completed or in progress.

SMGT 3861W. Senior Seminar in Sport Management. (WT; 3 cr.; A-F or Audit; Every Fall & Spring) Presentations/discussions on sport-related topics of interest.

SMGT 3993. Directed Study in Sport Management. (1-3 cr.; A-F only; Every Fall, Spring & Summer) Students work with faculty and grad students on research, scholarly, or creative activities. Students assist with faculty scholarship or carry out projects under faculty supervision. prereq: Undergrad, instr consent

SMGT 3996. Practicum: The Sport Experience. (2-8 cr.; S-N only; Every Fall, Spring & Summer) Practical experience in one or more sport settings. prereq: 3881, SMGT major, instr consent

Statistics (STAT)

STAT 1001. Introduction to the Ideas of Statistics. (MATH; 4 cr.; Student Option; Every Fall, Spring & Summer) Graphical/graphic presentations of data. Judging the usefulness/reliability of results/ inferences from surveys and other studies to interesting populations. Coping with randomness/variance in an uncertain world. prereq: Mathematics requirement for admission to University

STAT 1911. Big Data for the Social Good. (3 cr.; A-F only; Periodic Fall) How are companies, non-profits, and governmental agencies using Big Data, modern statistics, and machine learning techniques to improve our lives? In this course we will explore how cities are using statistics and Big Data for a variety of outreach programs, including helping people avoid foreclosure/ keep their homes, improving traffic flow of all kinds -- from walking and running paths to roads and public transit routes -- and more! We will explore how charities and non-profits are using Big Data to improve charitable giving and access to resources for those who need it, how school districts and public charter schools are using Big Data to improve K-12 education, and finally we will explore how companies like Facebook and Google are using statistics and online Big Data to change modern cities and developing countries. Big Data touches our everyday lives, and this course will explore the good our data can be used for.


STAT 3021. Introduction to Probability and Statistics. (3 cr.; Student Option; Every Fall, Spring & Summer) This is an introductory course in statistics whose primary objectives are to teach students the theory of elementary probability theory and an introduction to the elements of statistical inference, including testing, estimation, and confidence statements. prereq: Math 1272

STAT 3022. Data Analysis. (4 cr.; Student Option; Every Fall & Spring) Practical survey of applied statistical inference/computing covering widely used statistical tools. Multiple regression, variance analysis, experiment design, nonparametric methods, model checking/selection, variable transformation, categorical data analysis, logistic regression. prereq: 3011 or 3021 or SOC 3811

STAT 3032. Regression and Correlated Data. (4 cr.; Student Option; Every Fall & Spring) This is a second course in statistics with a focus on linear regression and correlated data. The intent of this course is to prepare statistics, economics and actuarial science students for statistical modeling needed in their discipline. The course covers the basic concepts of linear algebra and computing in R, simple linear regression, multiple linear regression, statistical inference, model diagnostics, transformations, model selection, model validation, and basics of time series and mixed models. Numerous datasets will be analyzed and interpreted using the open-source statistical software R. prereq: STAT 3011 or STAT 3021

STAT 3501. Internship in Statistical Practice. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Internship for statistics undergraduate students, in the university or in the community with supervision provided by statistics faculty and on-site mentors. prereq: Statistics Major

STAT 3701. Introduction to Statistical Computing. (4 cr.; A-F only; Every Fall & Spring) Elementary Monte Carlo, simulation studies, elementary optimization, programming in R, and graphics in R. Prerequisites: (MATH 1272 or 1372 or 1572H), CSCI 1113, and STAT 3032

STAT 4051. Applied Statistics I. (4 cr.; A-F or Audit; Every Fall & Spring) This is the first semester of the Applied Statistics sequence for majors seeking a BA or BS in statistics. The course introduces a wide variety of applied statistical methods, methodology for identifying types of problems and selecting appropriate methods for data analysis, to correctly interpret results, and to provide hands-on experience with real-life data analysis. The course covers basic concepts of single factor analysis of variance (ANOVA) with fixed and random effects, factorial designs, analysis of covariance (ANCOVA), repeated measures analysis with mixed effect models, principal component analysis (PCA) and multidimensional scaling, robust estimation and regression methods, and rank tests. Numerous
STAT 4052. Introduction to Statistical Learning. (4 cr.; A-F only; Every Fall & Spring)
This is the second semester of the core Applied Statistics sequence for majors seeking a BA or BS in statistics. Both Stat 4051 and Stat 4052 are required in the major. The course introduces a wide variety of applied statistical methods, methodology for identifying types of problems and selecting appropriate methods for data analysis, to correctly interpret results, and to provide hands-on experience with real-life data analysis. The course covers basic concepts of classification, both classical methods of linear classification rules as well as modern computer-intensive methods of classification trees, and the estimation of classification errors by splitting data into training and validation data sets; non-linear parametric regression; nonparametric regression including kernel estimates; categorical data analysis; logistic and Poisson regression; and adjustments for missing data. Numerous datasets will be analyzed and interpreted, using the open-source statistical software R and Rstudio.
prerequisites: Stat 4051 and Stat 4102 or 5102
STAT 4101. Theory of Statistics I. (4 cr.; Student Option; Every Fall)

STAT 4102. Theory of Statistics II. (4 cr.; Student Option; Every Spring)

STAT 4893W. Consultation and Communication for Statisticians. (WI; 3 cr.; A-F only; Every Fall & Spring)
This course focuses on how to interact and collaborate as a statistician on a multidisciplinary team. Students will learn about all aspects of statistical consulting by performing an actual consultation. This includes: understanding the needs of the researcher, designing a study to investigate the client's needs, and communicating study results through graphs, writing, and oral presentations in a manner that a non-statistician can understand. Students will also discuss how to design research ethically (respecting the rights of the subjects in the research), how to analyze data without manipulating results, and how to properly cite and credit other people's work. Students will also be exposed to professional statisticians as a means of better understanding careers in statistics. prereq: Senior Statistics Major

STAT 5021. Statistical Analysis. (4 cr.; Student Option; Every Fall & Spring)
Intensive introduction to statistical methods for graduate students needing statistics as a research technique. prereq: Credit will not be granted if credit has been received for: 3011; College algebra or instr consent; Stat course recommended

STAT 5031. Statistical Methods for Quality Improvement. (4 cr.; Student Option; Periodic Spring)
Random variability/sampling. Controlling statistical process. Shewhart/accumulate charting. Analyzing plant data, trend surface, and variance/design of experiments. prereq: [3021 or 4102 or 5021 or 5102 or 8102], Math 1272

STAT 5101. Theory of Statistics I. (4 cr.; Student Option; Every Fall)
Logical development of probability, basic issues in statistics. Probability spaces. Random variables, their distributions and expected values. Law of large numbers, central limit theorem, generating functions, multivariate normal distribution. prereq: [Math 2263 or Math 2374 or Math 2573H], [CSCI 2033 or Math 2373 or Math 2243]

STAT 5102. Theory of Statistics II. (4 cr.; Student Option; Every Spring)
Sampling, sufficiency, estimation, test of hypotheses, size/power. Categorical data. Contingency tables. Linear models. Decision theory. prereq: 5101 or Math 5651

STAT 5201. Sampling Methodology in Finite Populations. (3 cr.; Student Option; Every Spring)
Simple random, systematic, stratified, unequal probability sampling. Ratio, model based estimation. Single stage, multistage, adaptive cluster sampling. Spatial sampling. prereq: 3022 or 4102 or 5021 or 5102 or instr consent

STAT 5302. Applied Regression Analysis. (4 cr.; Student Option; Every Fall, Spring & Summer)
Simple, multiple, and polynomial regression. Estimation, testing, prediction. Use of graphics in regression. Stepwise and other numerical methods. Weighted least squares, nonlinear models, response surfaces. Experimental research/applications. prereq: 3022 or 4102 or 5021 or 5102 or instr consent

STAT 5303. Designing Experiments. (4 cr.; Student Option; Every Fall, Spring & Summer)
Analysis of variance. Multiple comparisons. Variance-stabilizing transformations. Contrasts. Construction/analysis of complete/incomplete block designs. Fractional factorial designs. Confounding split plots. Response surface design. prereq: 3022 or 4102 or 5021 or 5102 or instr consent

STAT 5401. Applied Multivariate Methods. (4 cr.; Student Option; Periodic Fall)

STAT 5421. Analysis of Categorical Data. (3 cr.; Student Option; Every Fall & Spring)

STAT 5511. Time Series Analysis. (3 cr.; Student Option; Every Fall & Spring)

STAT 5601. Nonparametric Methods. (3 cr.; Student Option; Every Fall & Spring)
Order statistics. Classical rank-based procedures (e.g., Wilcoxon, Kruskal-Wallis). Goodness of fit. Topics may include smoothing, bootstrap, and generalized linear models. prereq: 3022 or 4102 or 5021 or 5102 or instr consent

STAT 5701. Statistical Computing. (3 cr.; A-F or Audit; Every Fall)
Statistical programming, function writing, graphics using high-level statistical computing languages. Data management, parallel computing, version control, simulation studies, power calculations. Using optimization to fit statistical models. Monte Carlo methods, reproducible research. prereq: (Stat 5102 or Stat 8102) and (Stat 5302 or STAT 8051) or consent

STAT 5931. Topics in Statistics. (3 cr.; Student Option; Periodic Fall)
Topics vary according to student needs and availability staff.

STAT 5993. Tutorial. (1-6 cr.; max 12 cr.;
Student Option; Every Fall, Spring & Summer)
Directed study in areas not covered by regular offerings. prereq: instr consent

STAT 8051. Advanced Regression Techniques: linear, nonlinear and nonparametric methods. (3 cr.; A-F or Audit; Every Fall)
Linear/generalized linear models, modern regression methods including nonparametric regression, generalized additive models, splines/basis function methods, regularization, bootstrap/other resampling-based inference. prereq: Statistics grad or instr consent prereq: Statistics grad or instr consent

STAT 8052. Applied Statistical Methods 2: Design of Experiments and Mixed-Effects Modeling. (3 cr.; A-F or Audit; Every Spring)
STAT 8053. Applied Statistical Methods 3: Multivariate Analysis and Advanced Regression. (3 cr.; A-F or Audit; Every Fall)
Standard multivariate analysis. Multivariate linear model, classification, clustering, principal components, factor analysis, canonical correlation. Topics in advanced regression. prereq: PhD student in stat or DGS permission and 8052

STAT 8054. Statistical Methods 4: Advanced Statistical Computing. (3 cr.; A-F or Audit; Every Spring)
Optimization, numerical integration, Markov chain Monte Carlo, related topics. prereq: STAT 8053 or instr consent

STAT 8055. Applied Project. (2 cr.; S-N only; Every Fall)
Collaborative applied statistical practice with a member of University community, including consulting, problem solving, presentation/documentation of results. prereq: [8054, 8801] or instr consent

STAT 8056. Statistical Learning and Data Mining. (3 cr.; Student Option No Audit; Periodic Spring)
Statistical techniques for extracting useful information from data. Linear discriminant analysis, tree-structured classifiers, feed-forward neural networks, support vector machines, nonparametric methods, classifier ensembles (such as bagging/boosting), unsupervised learning, prereq: [(6450, 6451, 6452) or STAT 5303 or equiv], [biostatistics or statistics PhD student] or instr consent

STAT 8101. Theory of Statistics 1. (3 cr.; Student Option; Every Fall)

STAT 8102. Theory of Statistics 2. (3 cr.; Student Option; Every Spring)

STAT 8111. Mathematical Statistics I. (3 cr.; Student Option; Every Fall)
Probability theory, basic inequalities, characteristic functions, and exchangeability. Multivariate normal distribution. Exponential family. Decision theory, admissibility, and Bayes rules. prereq: [5102 or 8102 or instr consent], [Math 5615, Math 5616] or real analysis), matrix algebra

STAT 8112. Mathematical Statistics II. (3 cr.; Student Option; Every Spring)

STAT 8141. Probability Assessment. (3 cr.; Student Option; Periodic Spring)
Probability as a language of uncertainty for quantifying and communicating expert opinion and for use as Bayesian prior distributions. Methods for elicitation and construction of subjective probabilities. De Finetti coherence, predictable elicitation, fitting subjective-probability models, computer-aided elicitation, and use of experts. prereq: 5102

STAT 8171. Sequential Analysis. (3 cr.; Student Option; Periodic Fall)
Wald's sequential probability ratio test and modifications. Sequential decision theory. Martingales. Sequential estimation, design, and hypothesis testing. Recent developments. prereq: 8112

STAT 8201. Topics in Sampling. (3 cr.; S-N or Audit; Periodic Fall)
Sampling theory; stratified sampling, ratio estimators, cluster sampling, double sampling, superpopulation theory, Bayesian methods, multiple imputation, nonresponse. prereq: 8102 or instr consent

STAT 8311. Linear Models. (4 cr.; Student Option; Every Fall)
General linear model theory from a coordinate-free geometric approach. Distribution theory, ANOVA tables, testing, confidence statements, mixed models, covariance structures, variance components estimation. prereq: Linear algebra, 5102 or 8102 or instr consent

STAT 8312. Linear and Nonlinear Regression. (3 cr.; Student Option; Periodic Fall)
Nonlinear regression: asymptotic theory, Bates-Watts curvatures, super leverage, parameter plots, projected residuals, transform-both-sides methodology, Wald versus likelihood inference. Topics in linear and generalized linear models as they relate to nonlinearly issues, including diagnostics, semi-parametric models, and model assessment. prereq: 8311

STAT 8313. Topics in Experimental Design. (3 cr.; Student Option; Periodic Fall)
Optimal, Bayes, and nonlinear designs; algorithms for computing designs; sample size; recent developments. prereq: 8311

STAT 8321. Regression Graphics. (3 cr.; Student Option; Periodic Fall)

STAT 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

STAT 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, advisor and DGS consent

STAT 8501. Introduction to Stochastic Processes with Applications. (3 cr.; Student Option; Periodic Fall)
Markov chains in discrete and continuous time, renewal processes, Poisson process, Brownian motion, and other stochastic models encountered in applications. prereq: 5101 or 8101

STAT 8511. Time Series Analysis. (3 cr.; Student Option; Periodic Fall)
Characteristics of time series. Stationarity. Second-order descriptions. Time-domain representation, ARIMA/GARCH models. Frequency domain representation, univariate/multivariate analysis. Periodograms, non-parametric spectral estimation, state space models. prereq: 5102 or 8111 or instr consent

STAT 8666. Doct Pre-Thesis Cr. (1-6 cr.; [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

STAT 8701. Computational Statistical Methods. (3 cr.; Student Option; Every Spring)
Random variate generation, variance reduction techniques. Robust location estimation and regression, smoothing additive models, regression trees. Programming projects; basic programming ability and familiarity with standard high-level language (preferably FORTRAN or C) are essential. prereq: 8311, programming exper
STAT 8711. Statistical Computing. (3 cr.; Student Option; Periodic Fall) Basic numerical analysis for statisticians. Numerical methods for linear algebra, eigenvalue analysis, integration, and optimization and their statistical applications. prereq: 8701 or instr consent

STAT 8721. Programming Paradigms and Dynamic Graphics in Statistics. (3 cr.; Student Option; Periodic Fall) Alternative programming paradigms to traditional procedural programming, including object-oriented programming and functional programming. Applications to development of dynamic statistical graphs and representation and use of functional data, such as mean function in nonlinear regression log likelihoods and prior densities in Bayesian analysis. prereq: 8062, 8102

STAT 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

STAT 8801. Statistical Consulting. (3 cr.; S-N or Audit; Every Spring) Principles of effective consulting/problem-solving, meeting skills, reporting. Aspects of professional practice/behavior, ethics, continuing education. prereq: STAT 8051 and STAT Grad Student or Instructor Consent

STAT 8811. Statistical Consulting Practicum. (3 cr. [max 12 cr.]; S-N or Audit; Every Fall & Spring) Providing (under faculty supervision) statistical support to clients, primarily University researchers. Exercises in problem solving, ethics, listening/communication skills. prereq: Statistics grad student or instr consent

STAT 8821. Curricular Practical Training. (1 cr. [max 3 cr.]; S-N only; Every Fall, Spring & Summer) Industrial work assignment using advanced statistical techniques. Grade based on final report and presentation covering work assignment. prereq: Statistics grad student, dept consent

STAT 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

STAT 8900. Student Seminar. (1 cr. [max 2 cr.]; S-N or Audit; Every Fall & Spring) Preparation or presentation of seminar on statistical topics. prereq: Statistics graduate student

STAT 8913. Literature Seminar. (1 cr. [max 4 cr.]; S-N only; Every Fall & Spring) Students will read, present, discuss, and critique current literature/research. prereq: Statistics grad major or instr consent

STAT 8931. Advanced Topics in Statistics. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topics vary according to student needs/available staff.

STAT 8932. Advanced Topics in Statistics. (3 cr. [max 12 cr.]; Student Option; Periodic Fall & Spring) Topics vary according to student needs/available staff.

STAT 8933. Advanced Topics in Statistics. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Topics vary according to student needs and available staff.

STAT 8992. Directed Readings and Research. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Directed study in areas not covered by regular offerings. prereq: instr consent

**Stem Cell Biology (SCB)**

SCB 5051. Stem Cell Biology Practical Training Module. (1 cr.; A-F only; Every Fall) Intensive two-week course. Hands-on instruction in techniques of tissue culture. Conventional, fluorescence, and confocal microscopy. Flow cytometry for both analysis of cell populations and sorting of cells. prereq: Acceptance into stem cell biology master's program

SCB 5054. Stem Cell Institute Research Seminar and Journal Club. (2 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring) Students attend weekly Stem Cell Institute research seminars and journal clubs, write brief summaries, participate in journal club, and present original research paper. prereq: Acceptance into stem cell biology [master's prog or PhD minor prog] or instr consent

SCB 5900. Master's Plan B Research Paper and Presentation. (2 cr.; A-F only; Every Fall, Spring & Summer) Students write research paper based on primary literature on stem cell biology topic of interest, mentored by faculty member. prereq: Admission to stem cell biology master's plan B program

SCB 8181. Stem Cell Biology. (3 cr.; Student Option; Every Fall) Stem cell research and its applications. Critical analysis, written summaries/critiques, oral presentations. prereq: ([GCD 4034], [GCD 4161]) or equiv or instr consent

SCB 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) FTE: master's prerequisite: Master's student, adviser consent, DGS consent

SCB 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credits: master's

**Studies in Cinema Media Culture (SCMC)**

SCMC 1201W. Cinema. (AH, WI; 4 cr.; Student Option; Every Fall & Spring) Introduction to the critical study of the visual in modernity, presented through sustained analysis of the cinema and cinematic codes. Emphasizes on formal film analysis and major film movements and conventions in the international history of cinema. Students develop a vocabulary for formal visual analysis and explore major theories of the cinema. *Students will not receive credit for CSCL 1201W if they have already taken SCMC 1201W, ARTH 1921W, CSCL 1921W, CSCL 1201 or SCMC 1201

SCMC 1202W. Media: Word, Image, Sound. (AH, WI, TS; 4 cr.; Student Option; Every Fall & Spring) Introduction to the critical and theoretical study of media and technology from Aristotle to the modern world. The first half of the course emphasizes theoretical readings in dialogue with historical apparatuses (printing press, photography, radio, cinema, television) and various expressive objects (the bible, early film, ethnographic sound recordings). The second half turns to the modern culture industry since World War II, and introduces students to the critical study of mass culture, the concept of ideology, and of the relationship between corporate power and media conglomerates.

SCMC 3001W. History of Cinema and Media Culture. (WI; 4 cr.; Student Option; Every Fall) Genealogy of cinema in relation to other media, notably photography, radio, television/video, and the Internet. Representative films from decisive moments in global development of cinema. Rise/fall of Hollywood studio system, establishment of different national cinemas, cinematic challenges to cultural imperialism, emergence of post-cinematic technologies.

SCMC 3201. Fundamentals of Digital Filmmaking. (4 cr.; A-F only; Every Fall) Practice of digital filmmaking. Digital techniques, practical tools required to produce films. Optical/digital devices as artistic tools. Historical/theoretical issues of cinema, its relation to other art forms.

SCMC 3202. Intermediate Digital Filmmaking. (4 cr.; A-F only; Every Spring) Students complete a film of any length, 24 frames or feature-length. Emphasizes formal analysis of frames, shots, sequences, and relations of unit (frame or shot) to whole. prereq: 3201 or instr consent

SCMC 3210. Cinema and Ideology. (AH; 4 cr.; Student Option; Every Fall & Spring) The cinema as a social institution with emphasis on the complex relations it maintains with the ideological practices that define both the form and the content of its products. Specific films used to study how mass culture contributes to the process of shaping beliefs and identities of citizens.

SCMC 3220W. Screen Cultures. (AH, WI, TS; 3 cr.; Student Option; Every Spring) Study of the ways that technologies of film, television, and computing have shaped the twentieth and twenty-first centuries, especially our forms of cultural expression and identity. These topics are approached from both critical and historical perspectives in order to explore the complex relationship between media technologies and audiences.
SCMC 3910. Topics in Studies in Cinema and Media Culture. (3 cr.; Student Option; Periodic Fall & Spring)
Topics specified in Class Schedule.

SCMC 3993. Directed Study. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Guided individual reading or study.

SCMC 4993. Directed Study. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Guided individual reading or study.

SCMC 5001. Critical Debates in the Study of Cinema and Media Culture. (4 cr.; Student Option; Every Fall)
Basic concepts in historical/international debates over production/reception of media culture. Emphasizes cinema. Advanced orientation toward intellectual traditions that inform contemporary scholarship.

SCMC 5002. Advanced Film Analysis. (4 cr.; A-F only; Every Spring)
Application of textual analysis to the reading of a film. Students work collaboratively to discern and interpret all component aural/visual elements of what the film says and how it says it.

SCMC 5993. Directed Study. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Guided individual reading or study.

Studies of Science and Tech (SST)

SST 8000. Colloquium. (1.5 cr. [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Series of weekly lectures by nationally and internationally known scholars with diverse disciplinary and methodological backgrounds speaking on a variety of issues. prereq: Grad SST minor

SST 8100. Seminar: Models, Theories, and Reality. (3 cr.; Student Option; Every Fall & Spring)
Students participate in ongoing research on the role of models and theories in science, and prepare and present research papers. prereq: HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or instr consent

SST 8200. Seminar: Philosophy of the Physical Sciences. (3 cr. [max 6 cr.]; Student Option; Periodic Fall)
Students participate in ongoing research in history, philosophy, and social study of physical sciences and prepare and present research papers. prereq: instr consent

SST 8300. Seminar: The Biological and Biomedical Sciences. (3 cr.; Student Option; Every Fall & Spring)
Students participate in ongoing research in history, philosophy, and social study of biological and biomedical sciences, and prepare and present research papers. prereq: HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or instr consent

SST 8400. Seminar: Science, Technology, and Society. (3 cr.; Student Option; Periodic Fall & Spring)
Students participate in ongoing research on interactions involving science, technology, and society from perspectives of history, philosophy, and social study of science, and prepare and present research papers. prereq: HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or instr consent

SST 8420. Seminar: Social and Cultural Studies of Science. (3 cr. [max 6 cr.]; Student Option; Periodic Fall & Spring)
Recent work: theoretical and methodological differences among practitioners; selected responses from historians and philosophers of science.

Study Abroad in Argentina (ARGN)

ARGN 1000. Language and Culture in Buenos Aires Program. (1-18 cr. [max 54 cr.]; A-F only; Every Fall & Spring)

ARGN 1001. Beginning Spanish I. (5 cr.; A-F only; Every Fall & Spring)
Listening, speaking, reading, writing. Some cultural readings.

ARGN 1002. Beginning Spanish. (5 cr.; A-F only; Every Fall & Spring)
Listening, speaking, reading, writing. Some cultural readings.

ARGN 1003. Intermediate Spanish I. (5 cr.; A-F only; Every Fall & Spring)
Conversation, comprehension proficiency. Reading/writing through literary analysis and grammar review.

ARGN 1004. Intermediate Spanish IV. (5 cr.; A-F only; Every Fall & Spring)
Conversation, comprehension proficiency. Reading/writing through literary analysis and grammar review.

ARGN 1022. Alternate Second Semester Spanish. (5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

ARGN 3000. Language and Culture in Buenos Aires Program. (1-18 cr. [max 54 cr.]; A-F only; Every Fall & Spring)

ARGN 3001. Colloquial Spanish. (3 cr.; A-F only; Every Fall & Spring)
Spanish language in its spoken colloquial form. Variations based on age, social status, and regional background. Vocabulary, grammar, language characteristics.

ARGN 3003. Politics and Society in Latin America. (3 cr.; A-F only; Every Fall & Spring)
Comparative analysis of social/political structures of Argentina and Latin America in 20th century. Taught in English.

ARGN 3004. Latin American Economy: The Argentine Perspective. (3 cr.; A-F only; Every Fall & Spring)
Privatization, industrialization, and economic reforms in Latin America and Argentina. Inflation, structural change, poverty, changes in the external/rural sector. Taught in English.

ARGN 3005. Buenos Aires: City of the Arts. (3 cr.; A-F only; Every Fall & Spring)
Unique artistic side of Buenos Aires. Theory classes, art/literature workshops. Excursions to museums, theaters, tango clubs, and opera houses. European and Latin American influences that make the city unique. Taught in English.

ARGN 3006. Topics in Argentine History. (3 cr.; A-F only; Every Fall & Spring)
Study Argentina's history. Main topics include the legacy of Peron, the army in politics and government, the return of democracy, and current events. Taught in English.

ARGN 3008. Latin American Literature and Cinema. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)

ARGN 3009. Argentina: Stereotypes and Identity. (3 cr.; Student Option; Every Fall, Spring & Summer)
Intercultural perspectives on Argentina. How others perceive Argentines and how Argentines perceive themselves, through literature, humor, art, music, and history. prereq: 1004

ARGN 3011. Buenos Aires - City of the Arts: Spanish. (3 cr.; Student Option; Every Fall, Spring & Summer)
This course focuses on the art and architecture of Argentina. Learn about the different artistic movements in the country and visit museums, private art collections, and public monuments. The city becomes your classroom. At the same time, get a broader perspective of world art that serves as a background for a better understanding of the art and architectural scene in Argentina throughout the past 300 years.

ARGN 3015W. Spanish Composition and Communication. (WI; 4 cr.; Student Option; Every Fall, Spring & Summer)
Writing, speaking, reading, and understanding modern Spanish at level of majors/minors. Students generate compositions and read texts from Spain and Latin America. Grammar review, audio tape exercises, paired work, small group work, discussion, oral presentations, peer editing, process writing.

ARGN 3104W. Introduction to the Study of Hispanic Literatures. (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

ARGN 3640. Service Learning in Buenos Aires: ENG. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Students work with non-governmental and community service organizations devoted to helping children/adults in impoverished urban areas, immigrants from border countries, and groups at high risk (women, children, seniors).

ARGN 3641. Service Learning in Buenos Aires: SPANISH. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Students work with non-governmental organizations and community service organizations to help children/adults in impoverished urban, immigrants from border...
Study Abroad in Dublin (DBLN)

DBLN 3010W. The Playwright in Practice: Writing for the Stage in 21st Century Ireland. (WI; 3 cr.; Student Option; Every Fall & Spring)

Irish playwrights have contributed disproportionately to the output of English-language drama over the course of the 20th century, creating some of the most memorable dramatic literature of the last hundred years. With that in mind, this intensive practical playwriting course will interrogate the tradition of theatrical writing in the Irish capital of Dublin by engaging comprehensively with a variety of modes and disciplines specific to the act of writing for the Irish stage. Contemporary Dublin has undergone an unprecedented process of modernization rarely seen in the developed world, with the city becoming in just twenty years a multicultural, cosmopolitan space that is embracing provocative ways of seeing and creating work meant for theatrical performance. Questions about the relevance of the practice of writing in creating performance, how authorship of a play is determined, and the slipperiness of language are now at the heart of Irish theatre’s drive to redefine itself. Challenged by a wide range of disciplinary approaches to writing and rewriting, students will be exposed to a host of methodologies for creating dramatic literature for the stage specific to this unique moment in Irish theatrical history and, in the process, gain an appreciation for the important role writers still play in making theatrical performance.

Study Abroad in Florence (FLOR)

FLOR 1001. Beginning Italian. (; 3 cr.; Student Option; Every Fall & Spring)
Listening, speaking, reading, communicative competence.

FLOR 1002. Beginning Italian. (; 5 cr.; Student Option; Every Fall, Spring & Summer)
This second beginning level course of Italian helps you develop the ability to communicate effectively in everyday, practical situations and to read authentic materials in Italian. The course reviews and completes all basic grammar structures, reinforces the mastering of these elements in real life situations, and expands your vocabulary and knowledge of more complex grammar and syntax structures. As the language learning progresses, you will be expected to produce more Italian while actively engaging in communicative activities that have real world relevance both in and out of class, and practice all four linguistic abilities. You will be encouraged through a variety of in- and out-of-class activities to explore the city of Florence and engage in guided interactions with the local culture. You will also be exposed to a variety of registers and uses of the language. Site visits and authentic materials in a variety of media are used extensively in order to facilitate your communication and comprehension skills and with the culture and society of Italy at large.

FLOR 1004. Intermediate Italian. (; 5 cr.; Student Option; Every Fall, Spring & Summer)
This communication-based intermediate course of Italian helps you develop the ability to communicate effectively in everyday practical situations and to read authentic materials in Italian. The course reviews and completes all basic grammar structures, reinforces the mastering of these elements in real life situations, and expands your vocabulary and knowledge of more complex grammar and syntax structures. As the language learning progresses, you will be expected to produce more Italian while actively engaging in communicative activities that have real world relevance both in and out of class, and practice all four linguistic abilities. You will be encouraged through a variety of in- and out-of-class activities to explore the city of Florence and engage in guided interactions with the local culture. You will also be exposed to a variety of registers and uses of the language. Site visits and authentic materials in a variety of media are used extensively in order to facilitate your communication and comprehension skills and with the culture and society of Italy at large.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
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FLOR 1201. Beginning Drawing Studio. (3 cr.; A-F only; Every Fall & Spring) Three-dimensional work in figurative sculpture through means of clay and wax.

FLOR 1301. Figurative Sculpture. (3 cr.; A-F only; Every Fall & Spring) Life-drawing course on the Study Abroad in Florence program.

FLOR 1303. Life Drawing. (3 cr.; A-F only; Every Fall & Spring) Life-drawing course on the Study Abroad in Florence program.

FLOR 1401. Introduction to Photojournalism. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3001. Italian Renaissance Art. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3002. Women and Italian Politics. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3003. Graphic Design and Visual Communication. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3004. Photography: Exploring Society Through the Camera’s Lens. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3005. History and Sociology of Modern Consumerism. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3006. Cross Cultural Psychology. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3007. Made in Italy: Retail Merchandising in Florence. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3008. Entrepreneurship: Small Businesses in Florence. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3009. Internships in Florence: A Comparative Approach to the Italian Workforce. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3010W. Literary Representations of Florence: Space, Self & Other. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3011. Bookmaking: The Art of the Book in Florence. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3012. Florence and the Mediterranean: A Sea of Culture. (3 cr.; A-F only; Every Fall, Spring & Summer) During the Middle Ages and in the early Modern Age, three great civilizations clashed for the control of the Mediterranean basin: the Latin West, the Byzantine Empire, and the Muslim world. But the sea was not just a theatre of war, it was also a lively economic area, with trade routes crossing it from north to south, from east to west. Moreover, it was the place where different cultures met: This course will explore their reciprocal influence, with a special focus on art history and a mainly Italian and Florentine point of view. Topics will include: the impact of Islamic art on Western culture; the role of Byzantine art in the development of Florentine painting; the rediscovery of Greek classical culture and its importance in Renaissance civilization; the consequences of the fall of Constantinople and of the expansion of the Ottoman Empire. Students will explore Florentine churches, palaces, and museums in search of visual evidence of the links between the city and the diversity of Mediterranean culture.

FLOR 3040. The Impact of Globalization on European Markets. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3100. Advanced Italian Grammar and Conversation. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3101. Intermediate Drawing. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3102. Intermediate Watercolor. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3210. History of Italian Art. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3211. Contemporary Italian Literature. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3212. Medieval and Renaissance Italian Literature. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

FLOR 3213. History of Italian Art in Antiquity to the Baroque. (3 cr.; A-F only; Every Fall & Spring) Foundation in history of art though painting, sculpture, and architecture.

FLOR 3214. History of Italian Art, From Early Renaissance to Early 20th Century. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3215. Italian Cinema: Contemporary Italy on the Screen. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3220. Intermediate Oil Painting. (3 cr.; A-F only; Every Fall & Spring) Intermediate level oil painting for Study Abroad in Florence program.

FLOR 3230. Intermediate Life Drawing. (3 cr.; A-F only; Every Fall & Spring) Intermediate Level life drawing course for Study Abroad in Florence program.

FLOR 3232. Understanding Modern Italy: An Anthropology of Contemporary Italian Society. (3 cr.; A-F only; Every Fall, Spring & Summer) Italian culture/society through politics, economics, and cultural trends.

FLOR 3233. Political and Economic History of Europe in the 20th Century. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3234. Great Works of Italian Literature. (3 cr.; A-F only; Every Fall & Spring) Great works of Italian authors from 14th-20th Centuries. Students look at how Italian masterpieces have effected European culture as a whole.

FLOR 3235. Cross Cultural Psychology. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3300. Comparative History of Mediterranean Civilizations. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3301. Intermediate Figurative Sculpture. (3 cr.; A-F only; Every Fall & Summer) Study abroad course.

FLOR 3302. Intermediate Oil Painting. (3 cr.; A-F only; Every Fall & Spring) Intermediate level oil painting for Study Abroad in Florence program.

FLOR 3303. Intermediate Life Drawing. (3 cr.; A-F only; Every Fall & Summer) Intermediate Level life drawing course for Study Abroad in Florence program.

FLOR 3332. Understanding Modern Italy: An Anthropology of Contemporary Italian Society. (3 cr.; A-F only; Every Fall, Spring & Summer) Italian culture/society through politics, economics, and cultural trends.

FLOR 3333. Political and Economic History of Europe in the 20th Century. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3340. Italian Internships. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3342. Understanding Modern Italy (taught in Italian). (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3344. Italian-taught Great Works of Italian Literature. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3345. Analyzing and Exploring the Global City: Florence. (3 cr.; A-F only; Every Fall & Spring) Study abroad course.

FLOR 3346. Sociology of Crime: Mafia and the Media in Italy. (3 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.
Study abroad course

**Study Abroad in London (LNDN)**

**LNDN 3201. Integrated Course.** [; 1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad.

**LNDN 3202. Integrated Course.** [; 1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad.

**LNDN 3203. Integrated Course.** [; 1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad.

**LNDN 3204. Integrated Course.** [; 1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad.

**LNDN 3205. Integrated Course.** [; 1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad.

**LNDN 3210. Historical Backgrounds of English Literature.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course

**LNDN 3211. Terror and the Witch: Fictions of Witchcraft from Shakespeare to Harry Potter.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course

**LNDN 3212W. Travel Writing: Topics in Composition.** [WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3213. 20th and 21st Century Art.** [; 3 cr. ; A-F only; Every Fall, Spring & Summer] Art movements and major artists of Modern period, 1900-1970. Various visual media in relation to theories, historic events, scientific/technological changes, and literature. Emphasizes European art. Influences from other cultures.

**LNDN 3214. Modern Acting.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3215. British Theatre Now and Then.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3216. Practical Shakespeare Acting.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3217W. Writing the City: London.** (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3218. Contemporary British Film.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course

**LNDN 3219. London Across History, Literature and Film.** [; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad.

**LNDN 3220W. Contemporary World Architecture in London.** (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3221W. Writing a Play.** (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3222. Detective Fiction: Crime and the City.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3223. Special Studies in Economics: Globalization Studies.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3224. International Dimensions of Organizational Behavior.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3225. Issues in Global Economic Development.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3226. Religion in Modern Britain: A Comparative Perspective.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3227. Global Workforce Management.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3228. Managing Global Supply Chains.** [3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer] Study abroad course.

**LNDN 3229. Dateline London: Reporting and News Writing in a European Context.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3230. The Aesthetics of Power, Prestige and Social Change: A Survey of Renaissance through Modern Art Hist.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3231. Internet 2.0.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3232. Modern Art in London: From the Sublime to the Ridiculous.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3233. Queer Studies and LGBTQ Life in London and the Global World.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3234. Styles of Acting.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3235. Witchcraft and Magical Performance in London.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**LNDN 3236. The Law of Wrongful Convictions.** (3 cr.; Student Option; Every Fall, Spring & Summer) Wrongful convictions are a universal problem that in recent years has received a great deal of attention from the media, legislatures, and courts around the world. From the Netflix series "The Making of a Murderer" to the NPR podcast "Serial" there is a growing fascination with how people are wrongfully convicted and the processes and procedures used to right these wrongs. This course is taught by a law professor who has spent his career litigating wrongful conviction cases and directing the California Innocence Project. It is designed to provide students with an overview of the origins and case law related to wrongful convictions through the use of interactive exercises, lectures, readings, videos, and case studies.

**LNDN 3237. International Comparative Studies of Issues Impacting Education Systems.** (3 cr.; Student Option; Every Fall, Spring & Summer) The course provides students with an introduction to the school system in their study location and that of the other CAPA study locations. There will then be opportunities to compare it to the American system and to other learning communities in the world to better understand how they reflect and perpetuate the cultural values and identity of a country. Students will explore current educational issues from an intercultural perspective and develop their own informed views. At the end of the course, students are expected to have acquired a basic knowledge and understanding about the structure and content of contemporary school systems and a capacity to use this knowledge for cross-national comparisons. The insights gained will allow students to consider a key question: how can we all contribute to the school of the future? This course is designed as a CAPA Globally Networked Programme (GLN) connecting CAPA students in different study locations in order to examine issues from a transnational perspective. It will provide a unique opportunity to broaden critical understanding of the school system role in the identity building process at an individual, social, political, and national level. Through collaborative and comparative learning processes in both local environments and transnational communities, students will develop a deeper understanding of the school system role in shaping values, societies, and cultures.

**LNDN 3238. Literature and the Environment.** (3 cr.; Student Option; Every Fall, Spring & Summer) This course examines the ways in which writers in English have engaged with the natural environment. We will read a range of
authors, from the advent of industrialization in the late eighteenth century up to the present age of climate change, to consider how they have celebrated the "natural world," and looked critically at human effects on ecosystems. Throughout, we will be attentive both to the literary qualities of writings about the environment and to their historical and political contexts. We will be studying a range of genres, including poetry, fiction, nonfiction, websites and photographic texts. The course will be organized chronologically, with units on key ideas in the study of literature in relation to the environment: pastoral, wilderness, pollution, apocalypse, and ecosystems. Since the course will be set in London, we will also consider the design and representation of urban nature, including parks, gardens, zoos, riverbanks, and art exhibits. There will be some out-of-class visits and walks (with attention to accessibility, as needed).

**LNDN 3239. Theatre in the City.** (3 cr.; Student Option; Every Fall, Spring & Summer) Plays are written to be appreciated in performance, not only to be read: a play does not truly come to life until it appears on a stage. The course will introduce students to the current variety of theatre being produced in London. The course aims to provide multiple levels of theatre appreciation, and is therefore open to students who both have a background in theatre and those who have a general interest in expanding their knowledge.

**LNDN 3240. Arts Administration: The Creative Industries in a Digital World.** (3 cr.; Student Option; Every Fall, Spring & Summer) Arts and culture are rapidly growing sectors of the economy in the UK and worldwide. This course will focus on the ways in which the Creative industries are structured, and how arts administrators successfully share creativity with the public and leverage the commercial opportunities of creative production. Key topics to be covered include the arts as a business; managing financial imperatives and the artistic process; promoting and presenting cultural products. Case studies will be drawn from a variety of fields such as film, digital media, gaming, theatre, museums, and publishing, and students will have the opportunity to engage directly with practitioners successfully working in various fields of arts and culture and those managing the interface between creativity and business in London. It is an industry that is growing year on year, but it can be a difficult market to navigate and capture economical value, and is therefore open to students who both have a background in theatre and those who have a general interest in expanding their knowledge.

**LNDN 3241. Integrating Character through Voice and Movement.** (3 cr.; Student Option; Every Fall, Spring & Summer) In this performance-based theatre course, students will engage in acting techniques that utilize psycho-physical training, integrating their voice and body as they create characters from modern and contemporary texts. Students will begin by examining and building awareness of their own vocal and physical apparatus through solo and ensemble exercises. Students will learn the anatomy, physiology and physicality of the voice and build healthy and effective methods of vocal projection through a progression of exercises developed by Kristin Linklater and Patsy Rodenburg. Students will be concurrently introduced to various physical theatre training techniques such Michael Chekhov, Jacques Lecoq, and Vysyoly Meyerhold. For the final project, students will integrate these vocal and physical techniques through creating characters from selected scenes. Throughout the course, the actor-student’s journey will be focused on mind-body connection, self-awareness, relaxation, presence, emotional vulnerability, and clarity in verbal and non-verbal communication.

**LNDN 3242. Global Perspectives on Human Rights in Action.** (3 cr.; Student Option; Every Fall, Spring & Summer) The notion of human rights has become central to global politics today. It is not a single subject, but a broad field of potential investigation: this intensive seminar provides a multi-disciplinary introduction to the topic, critically examining the politics of human rights, their contentious nature and uneven global implementation. Throughout, the focus will be on practical issues and the contested politics of human rights in action through a range of topical case studies. Students will evaluate key debates about the politics and morality of human rights, analyze and explore the theoretical foundations of human rights concepts and topical issues relating to human rights from a variety of global, regional and local perspectives. The course critically examines the history and development of concepts of human rights and the philosophies underpinning them, as well as current frame-works of international human rights law and how this gives rise to the politics of patriomy. We will look at questions of cultural appropriation and the political debate on repatriation versus protection. This debate has recently been energized by the depredations of IS on what many would call the global heritage of Iraq and Syria. We will also be looking at material culture and what it says about individuals and society. Students will examine the choices, ethics and political and social meanings of both creating material culture and collecting it, and the ethics of preservation and restoration. While the creation of material culture has specific psychological, social and often political meanings; collecting, preserving and displaying one particular object involves a very complex decision-making process which is influenced by the cultural values of the decision maker. We will examine, for example, the impact of the classical period on British society in the past and present, its importance to class and education in Britain, and how this is reflected in museum collections. Students will also look at the complex decision making of conservators and restorers. These decisions have social and political impact, choosing to emphasize one period and use over another. The course will also look closely at decision makers and their role in the museum industry, the origins of museums from individuals to trade exhibitions and current museum professionals, as well as the impact museum audiences have on the work of museums. Students will also examine the impact of communities on museum development, on exhibition creation, how engaged museums are with their communities, sexuality, ethnicity and class; the relationship between human and civil rights; women’s, children’s and indigenous peoples’ rights; and the practical implementation and enforcement of human rights.
LNDN 3244. Shakespeare at Play: Performing the Bard using Folio and Physical Techniques. (3 cr.; Student Option; Every Fall, Spring & Summer) In this performance-based theatre course, students will engage in acting techniques that utilize mind/body awareness as well as analyzing acting clues from the First Folio (the first printed collection of plays published in 1623). Using vocal and physical exercises, students will perform hands-on practical activities to playfully engage with their acting partners and the text, immediately putting into practice these clues in a similar style as Shakespeare’s company working at the Globe Theater of the 16th century. In addition to textual analysis, students will engage in physical theatre techniques such as those used by Meyerhold, LeCoq and Boal to engage in story, character and to physicalize the given circumstances of the text. Topics covered in this class include: breathing and phrasing on the line, punctuation, capitalization, rhythm & meter, line endings, rhetoric, antithesis, and caesura. Students will work on one monologue and two scenes, both in verse and in prose, as well as attend performances and events at the Globe and the Royal Shakespeare Company in Stratford.

LNDN 3245. Comparative Health Systems. (3 cr.; Student Option; Every Fall, Spring & Summer) Health care systems are having to respond to a number of competing challenges. The pressures of globalization, aging populations, increasing patient demands and the rising costs of research and medical treatments are forcing us to look more critically at how healthcare is delivered to devise changes for the future. Changes made to health systems are often based on economic and political rationale and with many countries currently experiencing significant changes to the way in which health care systems have historically been funded and delivered. This course will introduce students to the healthcare system in the UK and the context within which it operates. It will start by looking at the introduction of the National Health System (NHS) in 1948 and take students through the key changes that have taken place right up to the present day. Drawing on a series of cases studies, students will be able to compare the UK model of healthcare with other healthcare systems such as in the USA, France, Sweden and/ or from low and middle-income countries. Students will explore a range of key concepts and themes in comparative healthcare from a multidisciplinary perspective. They will also develop critical appraisal skills to assess the quality of evidence used to support developments in healthcare policy and practice and help students to look critically at the role that governmental and non-governmental organizations play in healthcare. Throughout this course, special attention will be paid to comparisons between the UK, USA and low and middle-income countries to allow students to directly relate their learning to their own educational and healthcare setting and contrasting health systems worldwide. Emphasis will be placed on the multiple factors that determine health at the individual and population levels. By comparing patterns of health across different demographic groups, immigration status and so on, students will explore a range of different intersections to expand their understanding of impacts of health inequalities on different populations, and how different countries have sought to address these inequalities.

LNDN 3246. Global Perspectives on Nursing and History of Midwifery. (3 cr.; Student Option; Every Fall, Spring & Summer) This course is an exciting opportunity to experience nursing and midwifery history in the UK and further afield. The course will focus on major influences in the development of nursing and midwifery practice from the perspectives of medical, nursing and midwifery history. Case studies will be drawn from London, the UK and continental Europe, with comparative perspectives from the rest of the world where appropriate. Topics will include the impacts of social change, evolving attitudes to social care, and the role of the Enlightenment, French revolution and American Independence, as well as the transition from Agrarian to Industrial Society in shaping cultures and practices of nursing care. The course will also consider the contributions made by Florence Nightingale, Mary Seacole and Mrs. Bedford-Fenwick to nursing practice. It will also look at pioneers like Sir Frederick Truby King who set up the Plunket Society in New Zealand in 1907, from which sprung Plunket nurses, maternity and childcare still in practice today. The course will examine the ways in which medical breakthroughs, public health, epidemiology (social determinants of health), religion, philosophy, ethics, law, sociology and economics have played a part and influenced and affected clinical practice and in turn the influences on the professional role and practice of nurses and midwives. Students will be encouraged to reflect on the historical changes that have had a particular impact on patients, their families and the wider public. This will enable students to gain a deeper understanding of historical reasoning and insight into a variety of forms of historical evidence. In turn, this will enable students to consider the ways in which history has underpinned past healthcare provision, and the potential that exists for history to affect healthcare in the future and if and how far lessons can be incorporated into modern clinical practice. Speakers will include staff from Public Health and Epidemiology at a major London University and Medical school. The course will also enable students to access a broad range of distinctive museums and galleries to consider a wide range of healthcare history.

LNDN 3233. Shakespeare in London. (3 cr.; A-F only; Every Fall, Spring & Summer) Representative sampling of Shakespeare, including the four major tragedies. Some attention to English Renaissance period and Shakespeare’s time.

LNDN 3324. 20th Century British Fiction. (3 cr.; A-F only; Every Fall, Spring & Summer) Responses to colonialism, impact of World War I, changing conditions for women and for contemporary multicultural Britain. Literary movements/styles (realism, modernism), narrative techniques/perspectives (1st/3rd person, limited point-of-view, stream of consciousness). Use of symbolism, imagery, irony, etc. Role of author/reader. Problems of interpretation.

LNDN 3328. British Cinema. (3 cr.; A-F only; Every Fall, Spring & Summer) Major works of 20th century British drama. Focuses on postwar period. Students read/see plays.

LNDN 3333. Understanding Modern Britain. (3 cr.; A-F only; Every Fall, Spring & Summer) Introduction to social/cultural differences between Britain and the United States. British class/culture, monarchy/aristocracy, education system, media.

LNDN 3342. European Economic History. (3 cr.; A-F only; Every Fall, Spring & Summer) European economic history, 1000 AD to today. Industrial revolution, development of capitalism from feudalism. Reasons Europe took world technological lead during Middle Ages. Factors affecting economic growth, prosperity, and technological change.

LNDN 3343W. Post War Popular Culture. (WI; 3 cr.; Student Option; Every Fall, Spring & Summer) London as center for international popular culture, from WWII to present.

LNDN 3355. London Through Internships. (3-6 cr.; [max 12 cr.]; A-F only; Every Fall, Spring & Summer) British work and social structure. Cross-cultural issues surrounding integration into workforce. Internships from various fields of study.

LNDN 3375. Global Internship Program: London. (3-6 cr.; Student Option; Every Fall, Spring & Summer) The Global Internship Program (GIP) course is a unique and innovative opportunity for students to combine their internship placement (and living abroad) experience with a weekly in-class educational and mentoring experience (session), which aims to develop students’ personal and professional skills while earning academic credit. The GIP fits in with CAPA’s philosophy and practice of Globally Networked Learning (GNL), whereby students can learn about the social and cultural context of their internship placement and the host region and country, as well as other GIP themes, through comparative global analysis. At times, this analysis will be facilitated through a selection of CAPA Masterclasses given by leading professionals from a diverse range of fields. The GIP fits in with CAPA’s philosophy and practice of Globally Networked Learning (GNL), whereby students can learn about the social and cultural context of their internship placement and the host region and country, as well as other GIP themes, through comparative global analysis. At times, this analysis will be facilitated through a selection of CAPA Masterclasses given by leading professionals from a diverse range of fields. Thus, the weekly discussion-based sessions with their active learning approach, gives students the opportunity to discuss and analyze theories and models of work, critical thinking and organizational behavior and management in a cross-cultural context.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
LNDN 3412. British Broadcasting Today. (; 3 cr. ; A-F only; Every Fall, Spring & Summer) Introduction to international broadcasting. Social, cultural, and political conditions that have created selected world broadcasting systems. Focuses on broadcasting system of host country. Current system trends, governmental relationships, administration, domestic/foreign programming.

LNDN 3432. Western European Government and Politics. (; 3 cr. ; A-F only; Every Fall, Spring & Summer) Comparative framework. Assumes that Western European states maintain types of institutions/processes in common (e.g., legislatures, parties, elections) but that country-to-country institutions/processes are distinct. Reasons for differences, impact that such diversity has on course of politics as east/west divisions dissolve. Focuses on Great Britain.

LNDN 3500. CAPA Seminar in London. (3 cr. [max 6 cr.]; Student Option; Every Summer) Study abroad course

LNDN 3501. Telling the Story - London. (1 cr. [max 2 cr.]; Student Option; Every Summer) Study abroad course

LNDN 3523. Theatricality: Understanding the Possibilities in Theater. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) In-depth understanding of art of theater via survey of historical influences, changing styles/approaches to theater. Concept of theatricality.

LNDN 3524. Theatre Production Management. (; 3 cr. ; A-F only; Every Fall, Spring & Summer) Lecture/seminar from professional theatre practitioner on their job specialization. Structure of theatrical organizations. Development/marketing of theatrical productions. Wider factors that influence theatrical organizations/productions. Workshops. Visits to various venues to see how they operate.

LNDN 3530. Ethical Issues and the Media. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Principal ethical issues facing print/broadcast journalism. Practical dilemmas, moral framework. Real time arguments that arise in media coverage of matters of public controversy. Regulation, codes of practice. Case studies, visits, guest lectures.

LNDN 3531. Advertising and Marketing in Britain. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Forms of advertising and public relations techniques used by organizations to communicate with stakeholders. Consumer motivation/appeal. Media structures, effectiveness. Target audiences. Print/broadcast production, budgeting and promotion mix planning. Students design, cost, and implement an advertising campaign, and project the likely success rate.

LNDN 3532. Visualizing Britain: Film and Television Documentaries. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Canon of British film/television documentary from end of the 19th century to beginning of 21st Century. Drama-documentaries tackling/attracting major public controversies.

LNDN 3533. Women in Britain in the 21st Century. (; 3 cr. ; A-F only; Every Fall, Spring & Summer) Momentous changes in women's lives during 20th Century. Impact of two world wars, economic dislocation/recovery, revolutions in colonial states, super power rivalry, proxy wars, end of cold war, new international alliances/collectivities.

LNDN 3534. Criminal London: Aspects of Crime and Criminal Justice in Britain. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Late Middle Ages, Tudor/Stuart periods. Eighteenth, nineteenth, and twentieth centuries. Evolution of courts/criminal procedure. Debates, including death penalty and jury system. Visits to courts and places of interest.


LNDN 3613. Analyzing and Exploring the Global City: London—Modernity, Empire, and Globalization. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

LNDN 3614. Citizenship and Gender in Modern Europe. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

LNDN 3615. Urban Underworlds in Medieval and Early Modern London: A Literary Exploration. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

LNDN 3616. Global Mental Health Professions: A Comparison of U.S. and U.K.. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

LNDN 3650. Research Methods: Directed Research Project - London. (3 cr. ; Student Option; Every Fall, Spring & Summer) This course provides undergraduate students with the opportunity to undertake a research project in the context of their international education experience. Students opting for this course will be guided towards opportunities recommended by CAPA and determined by local resources and expertise. In most cases, CAPA will define potential projects generated by senior academic staff and faculty on site and suggest relevant sources: students will apply to do those projects. This would not preclude student proposals or projects suggested by home universities for individual or group study. Students will be introduced to core research concepts and will develop research skills through designing, executing, writing, and presenting their own research project within frameworks designed by CAPA. The topics that students will explore will be consistent with their majors and their own individual interests but will exploit the overseas experience. A variety of research methods employed in geographical, historical, political, sociological, cultural studies, and digital humanities will be introduced that may be applied to multidisciplinary topics, including qualitative and quantitative methods, as well as mixed methods research as appropriate to students' research themes. In collaboration with their instructor, students will develop appropriate research methodologies that will engage with a range of local sources, as well as online resources. These will include archival documents such as official records, maps, and personal accounts as well as basic ethnographic techniques such as questionnaires, interviews, and oral histories. Students will also be introduced to contemporary social investigation and the use of artistic/fictional representations of place and environment, and the use of photographs and other multimedia sources as tools for analysis.

LNDN 3733. International Finance. (3 cr. ; A-F only; Every Fall, Spring & Summer) Focuses on Europe. International marketing strategies of European companies. Special features of European Common Market, business environment.

LNDN 3734. International Marketing. (3 cr. ; A-F only; Every Fall, Spring & Summer) Focuses on Europe. International marketing strategies of European companies. Special features of European Common Market and business environment.

LNDN 3735. International Economics. (3 cr. ; A-F only; Every Fall, Spring & Summer) Comparative advantage, classical/neoclassical models, distribution consequences of trade, resource endowments, technological gaps, economies of scale, product differentiation, location, Tariffs, quotas, other forms of intervention. Preferential trading arrangements.

LNDN 3735. Creative Writing. (3 cr. ; A-F only; Every Fall, Spring & Summer) Creative writing course for the Study and Internships in London program.

LNDN 3755. Topics in London. (3 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Topics course for the Study and Internships in London program.

LNDN 3756. Topics in London. (3 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Topics course for the Study and Internships in London program.

LNDN 3757. British History in the 20th Century. (3 cr. ; A-F only; Every Fall, Spring & Summer) British history course for the Study and Internships in London program.
LNDN 3758. International Business Environment. (3 cr.; A-F only; Every Fall, Spring & Summer)
Study abroad course on Study and Internships in London program.

LNDN 3759. Islam, Politics, and Britain: A Case Study of London’s East End. (3 cr. [max 6 cr.]; A-F only; Every Fall & Spring)
Study abroad course.

LNDN 3975. Social Dynamics of London: Contemporary Issues Through Service-Learning. (3-6 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Study Abroad Course

Study Abroad in Montpellier (MONT)

MONT 1000. Intensive French Session
Lower Division. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1001. Beginning French. (5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Study Abroad Course

MONT 1002. Beginning French. (5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1003. Intermediate French. (5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1004. Intermediate French. (5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1301. Intermediate French Grammar. (3 cr.; Student Option; Every Fall, Spring & Summer)
This course will help students to improve their written and oral skills in French and train them to develop an approach to various writing assignments. This is designed to broaden the range of options available to them for expressing themselves in the language.

MONT 1302W. Intermediate Academic Writing in French. (3 cr.; Student Option; Every Fall, Spring & Summer)
This class is designed to introduce students to the techniques and tools required for both academic and personal writing. Over the course of the semester, students will learn how to write a variety of different types of texts including: the description, the compte rendu universitaire, the journalistic portrait, and other textual genres.

MONT 1309. Intermediate French Conversation. (3 cr.; Student Option; Every Fall, Spring & Summer)
This class is built as a series of discussion sessions. Throughout group discussions about news and precise topics (gastronomy, French music, immigration) students will acquire basic vocabulary and learn more about social and cultural facts and French contemporary civilization. We will study topics such as immigration in France, the French social system, cinema, leisure and provide the students with basic information in everyday life. Learning will be based on listening and speaking with material such as songs, TV shows, and movie extracts. A vocabulary sheet will provide basic vocabulary about the topic studied. Focus will be put on correct vocabulary and pronunciation.

MONT 1401. Integrated Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1402. Integrated Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1403. Integrated Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1404. Integrated Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1405. Integrated Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1501. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1502. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1503. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1504. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1505. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1506. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1507. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad.

MONT 1601. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1602. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1603. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1604. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 1605. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3000. Intensive French Session
Upper-Division. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course

MONT 3010. French Expression. (3-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3014. French Phonetics. (2-3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3015. Advanced French Grammar and Communication. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3016. Advanced French Composition and Communication. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3017. French Communication. (1-2 cr. [max 4 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3018. French Oral Communication. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3020. French Comprehension. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3021W. Love, Heresy and Betrayal in Medieval Literature. (WI; 3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3022. France and its Mediterranean Neighbors: A Relationship of Exchange. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3023. History of Theater. (3 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

MONT 3024W. Medieval French Literature: Arthurian Legends. (3 cr.; Student Option; Every Fall, Spring & Summer)
Who was King Arthur? How is it that a legendary figure from such a distant time still exists today in such a vibrant manner within

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu. 644
the collective mind? From the Middle Ages to the present day in such popular works as George R.R. Martin's Game of Thrones, the myths and folklore surrounding the king have been ceaselessly renewed. Beginning with the pseudo-historical origins of Arthur and his knights in the old French literary tradition as depicted by Chr?tien de Troyes and in iconic works of the matre de Bretegne, continuing through to Jean Cocteau's 20th-century theatrical adaptations and ending with Alexandre Astier's wildly popular television series, Kaamelott, this course will seek to shed light on the popularity and the mystery surrounding le roi Arthur. Over the course of the semester we will explore the legendary material in detail, consistently comparing and contrasting contemporary works with their medieval forerunners with the ultimate goal of understanding how these creations function within the socio-cultural framework.

MONT 3101. French Cinema. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3102. Southern French Civilization. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3103. French Culture and Heritage. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3104. French History of Art. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3105. Scientific French. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3106. French Literature and Oral Expression. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3107. French Literature. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3108. Southern French Literature. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3109. Business French. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3110. French for Science and Technology. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course

MONT 3119. Learning, Cognition, and Assessment. (3 cr. ; Student Option; Every Fall, Spring & Summer) This course is designed to provide students with the theoretical tools for learning (behaviorism, constructivism, and socio-constructivism) and to understand the link with specific teaching contexts. In addition, students will learn about various approaches to evaluating students and the notions behind competency acquisition. Finally, students will explore the relevant areas of the field of neurosciences with the goal of developing appropriate methodological tools for learning assessment.

MONT 3211. Introduction to Elementary School Teaching. (3 cr. ; Student Option; Every Fall & Summer) This course will provide students with the tools for becoming an effective teacher, by underlining and exploring certain areas of the field of pedagogy. Major topics include: ? Exploring the field of teaching foreign languages (with focus on English as a Foreign Language) ? Underlying principles related to how teachers learn to teach ? Pedagogical theories ? Personal values impacting the work of a teacher and ethical guidelines for the teaching profession ? Schools and the teacher?s world of work ? Teaching as a career development

MONT 3212. Teaching Practice. (3 cr. ; Student Option; Every Fall, Spring & Summer) Under the supervision of University of Montpellier education faculty, students participate in a substantive teaching practicum in the English classroom in the local Montpellier schools. Students are also supervised and mentored by the English teacher in the local school. Group reflection meetings and one-on-one feedback from the University of Montpellier faculty provide context and mentoring.

MONT 3213. Comparative Education and Pedagogy. (3 cr. ; Student Option; Every Fall & Summer) This course compares educational practices in the United States and in France. Major topics include: the beliefs, practices, and relationships that shaped human experience over time, methods and concepts employed in producing historical knowledge, how to do the interpretive work that makes meaning out of historical materials, and finally uses limitations of certain primary resources.

MONT 3301. French Grammar and Methodology. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3302. Civilization of the South. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3303. Internship. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3304. French Translation 1. (1.5 cr. ; max 3 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3305. Literature of the Fantastic. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3306. Seminar in French Politics and Culture. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3307. History from All Sides. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3308. French Art History. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3309. French Conversation. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3310. Advanced French Grammar and Translation. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3311W. La France Mosaïque: Perspectives on Contemporary France. (WI; 3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3312. Contemporary French Civilization. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3313. Masculine/Feminine: France through the Lens of Cinema. (3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3401. Integrated Course. (1-6 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3402. Integrated Course. (1-6 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3403. Integrated Course. (1-6 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3404. Integrated Course. (1-6 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3405. Integrated Course. (1-6 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3406. Integrated Course. (1-6 cr. ; max 12 cr.) ; Student Option; Every Fall, Spring & Summer) Study abroad course.
MONT 3408. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3409. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3410. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3411. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3412. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3413. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3414. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3415. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3416. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3417. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3418. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3419. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3501. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3502. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3503. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3504. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3505W. Writing in French: Tools and Techniques. (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) This class is designed to introduce students to the techniques and tools required for both academic and personal writing. Over the course of the semester, students will learn how to write a variety of different types of texts including: the description, the compte rendu universitaire, the journalistic portrait, and other textual genres. The course consists of an analytic component in which students will be asked to study a text corresponding to a specific style. Students are then asked to explore the writing techniques employed in each type: reformulation, synthesis, rhetorical figures, persuasive language, expressing an opinion via judgment or values, impersonal language, inverted questioning of the reader, etc. and subsequently write in those styles. Students will be expected to complete numerous writing assignments during the semester. These exercises will be collected and graded on a regular basis, with the possibility for students to revise and improve each project. Course objectives include: learning how to write different types of documents, with different content, using different styles, applying the knowledge acquired in the grammar/methodology course, mastering the stylistic tools and techniques for writing in French (e.g., the use of hyperbole, metaphor, personification, diction, symbolism) acquiring the ability to think in French and write directly in the target language without translating.

MONT 3506. Directed Research. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3507. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3508. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3509. Special Course for Americans. (0-10 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad.

MONT 3601. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3602. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3603. Institute Course. (0-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3604. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3605. Institute Course. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3650. Topics in French Culture. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3701. Sports and Culture in France. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3801. Comparative Business Environment: France, Europe and the US. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

MONT 3802. Global Business and Industry: France at the Crossroads. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) This course will examine similarities and differences among US, French and global business and industry environments and cultures. Topics will include the European Union (EU), as well as institutional, political, legal and socio-cultural factors at work in the contemporary business and industrial landscape. Students will learn and examine various contexts in business, education, workplace culture, and career pathways and options in France and abroad.

Study Abroad in Sydney (SDNY)

SDNY 1201. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 1202. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 1203. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 1204. Integrated Course. (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3002. Art Down Under: From the Dreamtime to the Present. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Works of art produced during the last century. Controversial contemporary Aboriginal art. Major 20th century art movements in relation to advances in technology, historical events, and sociological changes.

SDNY 3003. Australian Cinema: Representation and Identity. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Personal/collective identity via film narratives. Extent to which Australian films reflected/determined Australian identities. What it means to be Australian. Concepts of national identity, imagined community.

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

SDNY 3006. Learning Through Internships in Sydney. (3-6 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Internship course for Sydney program.

SDNY 3007. The Aboriginal Experience: An Anthropological View. (3 cr.; A-F only; Every Fall & Spring) Trends in contemporary Australian society. Emphasizes struggles of indigenous peoples.


SDNY 3009. Human Resource Management in the Australia/Pacific Rim Context. (3 cr. [max 6 cr.]; A-F only: Every Fall & Spring) How Australian and Pacific Rim companies are attempting to achieve competitive advantage in domestic/international markets through HRM. Structural changes HRM is undergoing in Singapore, Hong Kong, and Japan. Increased responsibility of line managers for HRM. Talent/performance/industrial relations management.

SDNY 3011. Australian Government and Politics in the Pacific Rim. (3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) History, concepts, and structures of politics/government in Australia. Debates, problems, and changes in relation to Pacific Rim. Discussing these issues critically.

SDNY 3012. Intercultural Communication: Theories, Practices, Factors. (3 cr. [max 6 cr.]; A-F only: Every Fall, Spring & Summer) Communication between people from different racial, ethnic, and cultural backgrounds within Australia, including Aboriginal, and immigrant populations. Theory/research in intercultural communication. Improving human interaction in study-abroad environment and international contexts.

SDNY 3013. Analyzing and Exploring the Global City: Sydney. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3014. Australian History: Aboriginal History to Colonization--Current Issues in Historical Perspective. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3015. International Marketing. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3016. Australian, Asian and Pacific Literatures. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3017W. Writing the City - Sydney. (WI; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3018. Advertising and Promotions. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3019. Advertising and Society. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3020. Indigenous Peoples and Modernity: Culture, Rights and Development in a Globalizing World. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3021. International Finance. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3022. International Economics. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3023. International Dimensions of Organizational Behavior. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3024. Global Workforce Management. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3025. Managing Global Supply Chains. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3026. People, Place and Culture: Environmental Debates in Australia, New Zealand and the Pacific. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3027. Investment Management. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3028. Gender, Culture and Society. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3029. Campaigning for Change: Advocacy, Activism and Policy in the Digital Age. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

SDNY 3030. Project Management Practicum. (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

The Project Management Practicum enables students to apply the principles and practices of project management learned in the Project Management course to a project conducted in an organization by working through the design, implementation, monitoring, completion and evaluation stages of project management for the project. This practicum will run in a primarily concurrent fashion with the Project Management course?the two combine for a total of 90 hours during the intensive program. The two courses (Project management course/Project Management Practicum) plus an internship form a track, however each course can be separately taken.

SDNY 3031. Skills and Challenges of Project Management. (3 cr.; Student Option; Every Fall, Spring & Summer) The project management course is designed as an introductory program specifically targeting students who intend to pursue careers in which the management of projects and/or programs is an area of responsibility. The course is designed to provide potential project managers with a systematic, structured framework and processes for the management of projects through the design, implementation, monitoring, completion and evaluation stages of project management.

SDNY 3032. Sports in Australian Society. (3 cr.; Student Option; Every Fall, Spring & Summer) Sports hold a central role in the development of the Australian character and identity, through the interaction with the expance of the new environment of the early settlers, evolving during the colonial era of the nineteenth century. Sports helped forge and provide a focus for Australian nationalism whether that be individual achievements or as a team, projecting Australians internationally on the global sporting stage. This course studies sports in Australian culture; the historical context through to its importance in today’s Australian society; sports as a reflection of the masculine monochrome culture; Australian identity of 19th Century and early 20th Century through to diversity of modern Australia multi-culturalism; and indigenous recognition and social structures will be studied. Themes covered in this course include volunteerism, gender, race, ethnicity, sexuality, amateurism and professionalism, globalization, integrity in sports (drugs in sports, influence of gambling on results, gene manipulation, and bio medical enhancements), trends and challenges of the future of sports, including doping in sports, rise of corporatization of sports, innovation and technology impact on sports, and the impact on Australian sports of the current Asian Century?

SDNY 3033. Sports Management. (3 cr.; Student Option; Every Fall, Spring & Summer) This course provides undergraduate students with the critical understanding of the theories, concepts, knowledge and skills for managers in commercialized and community-based sports in the Australian context. The course considers the ranges of challenges facing the 21st-Century sports manager including...
a complex sociocultural environment, competitive business markets, managing a range of key stakeholders, the future of sports management, and strategic planning to meet future sporting organizations objectives. The course also evaluates how public policy, sports governance, and legislative requirements impact the management of sporting organizations. Finally, the course examines the wider social utility of sport in Australia, such as its role in community and the forming of national identity, as an opportunity for social improvement and general community well-being.

**SDNY 3034. Sports Marketing.** (3 cr.; Student Option; Every Fall, Spring & Summer) This course examines in detail the various techniques and strategies of sports marketing. The issue of professionalism and the corporatization of sport will be addressed. The focus on the necessity of securing various revenue streams including sponsorships, investment opportunities, government grants and fundraising potential of individuals, teams, clubs and facilities in the broad arena of sport.

Students will examine the promotion of sports through various channels, including traditional media and the rise of digital marketing in its various forms. The ability to develop and implement marketing strategies and plans to present to individuals or organizations will be based around practical application using Australian case studies.

**SDNY 3035. The Australasian Nightmare: Horror Films and the Traumatic Imagination on the Pacific Rim.** (3 cr.; Student Option; Every Fall, Spring & Summer)

The classic American horror film is derived from a gothic heritage, an inheritor of a European context and its tropes: the disintegration of civilization through wars, disease, economic collapse, and associated social traumas. The horror that the current, post-9/11 generation has produced is notably different; it plays upon central themes that derive from an Australasian context, driven by the recent horror films of Australia, Japan, and Korea. These influential films have been made and distributed outside of an American context but then repackaged for the West in remakes and variations that awaken an American audience to themes of horror that are decidedly non-European in substance. This course will examine these films, comparing and contrasting European and Australasian tropes for horror as well as their reflection of and impact on society.

**SDNY 3036. Race and Ethnicity in Australia and the US.** (3 cr.; Student Option; Every Fall, Spring & Summer)

This course examines and compares race and ethnicity in Australia and the U.S. Similarities and differences historic and current conditions, causes, consequences, and policies in the two countries will be identified. By the end of the course, students will have greater understanding of the role of race and ethnicity in determining group and individual opportunities, restrictions, and life experiences. Students will become aware of the continuing importance of cultural and political factors in the salience of race/ethnicity in the two societies. Solutions for racial problems will also be emphasized.

**SDNY 3201. Integrated Course.** (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**SDNY 3202. Integrated Course.** (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**SDNY 3203. Integrated Course.** (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**SDNY 3204. Integrated Course.** (1-6 cr. [max 12 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**SDNY 3375. Global Internship Program: Sydney.** (3-6 cr.; Student Option; Every Fall, Spring & Summer)

The Global Internship Program (GIP) is a unique and innovative opportunity for students to combine their internship placement (and living abroad) experience with a weekly in-class educational and mentoring experience (session), which aims to develop students' personal and professional skills while earning academic credit. The GIP fits in with CAPA's philosophy and practice of Globally Networked Learning (GNL), whereby students can learn about the social and cultural context of their internship placement and the host region and country, as well as other GIP themes, through comparative global analysis. At times, this analysis will be facilitated through a selection of CAPA Masterclasses given by leading professionals from a diverse range of fields. Thus, the weekly discussion-based sessions with their active learning approach gives students the opportunity to discuss and analyze theories and models of work, critical thinking, and organizational behavior and management in a cross-cultural context. A variety of teaching and learning activities will be used; for example: lecture, workshop, discussion, informal and formal presentations, and mock (recorded) interviews. The assessment mechanisms are all designed to support learning, using the internship and living abroad experience as a vehicle. Above all, the on-site CAPA sessions give students the opportunity to listen to individual experiences, compare and contrast activities with others, and consider the experience in terms of their personal and professional development at the beginning we focus on self-reflection and at the end of this process we challenge each student to focus on self-projection. The 6-credit internship class has a specialized focus on the latter by engaging students in an internship/industry related research video project to develop each student's connection between their internship and time abroad with possible postgraduate study and career opportunities. It is, therefore, our intention that students will treat these on-site sessions with the same dedication and professionalism that we expect the students to display at their internships. Students will undertake an intensive orientation session to help them prepare for and integrate into their placements. Additional resources and readings to aid students' personal and professional development will be provided.

**SDNY 3500. CAPA Seminar in Sydney.** (3 cr.; [max 6 cr.]; Student Option; Every Summer) Study abroad course.

**SDNY 3501. Telling the Story - Sydney.** (1 cr. [max 2 cr.]; Student Option; Every Summer) Study abroad course.

**SDNY 3895. Directed Research Project for Study Abroad.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

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**Study Abroad in Tanzania (TANZ)**

**TANZ 1221. Beginning Swahili I.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 1222. Beginning Swahili II.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3001. Tanzania in Context.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3002. Environmental Challenges in Tanzania.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3003. Leadership Through Community Engagement.** (4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3004. Community Health in Tanzania.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3005. Public Health in Tanzania.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3006. Medicine in Tanzania.** (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3007. Human Rights and Social Change.** (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3008. Tanzanian History and Political Development.** (3 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course.

**TANZ 3225. Intermediate Swahili I.** (5 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.
VENZ 3032. Latin American Folklore in English. (; 3 cr. ; max 6 cr.) ; A-F only; Every Fall, Spring & Summer
Folklore of countries of Spain America. Relation between original elements and later influences. Development of folklore as historical process. Taught in English.

VENZ 3033. International Business in English. (; 3 cr. ; max 6 cr.) ; A-F only; Every Fall, Spring & Summer
Problems faced by firms engaging in international activities. Patterns in contemporary international business. History, culture, commerce, exchange, markets, corporate strategies. Taught in English.

VENZ 3034. International Economics in English. (; 3 cr. ; max 6 cr.) ; A-F only; Every Fall, Spring & Summer
Theory of international trade, commercial policy, balance of payments, international monetary issues. Comparative advantage, exchange rates, protectionism, open-economy, fiscal/monetary policies, common markets, free-trade areas.

VENZ 3035. International Finance in English. (; 3 cr. ; max 6 cr.) ; A-F only; Every Fall, Spring & Summer

VENZ 3036. Tropical Ecology in English. (; 4 cr. ; max 8 cr.) ; A-F only; Every Fall, Spring & Summer

VENZ 3037. Field Botany in the Andes in English. (; 3 cr. ; max 6 cr.) ; A-F only; Every Fall, Spring & Summer

VENZ 3038. Nutrition in Latin America in English. (; 3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer
Study abroad course

VENZ 3039. Nutrition in Latin America in Spanish. (; 3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer
Study abroad course

VENZ 3040. Cross-Cultural Communication in Spanish. (; 3 cr. ; A-F only; Every Fall, Spring & Summer
Geographical placement of Venezuela in its international context. Outstanding physical features. Relationship between territory of Venezuela and its significant socioeconomic features.

VENZ 3041. International Economics in Spanish. (; 3 cr. ; A-F only; Every Fall, Spring & Summer
Theories of international trade, commercial policy, balance of payments, and international monetary issues. Comparative advantage, exchange rates, protectionism, open-economy, fiscal/monetary policies, common markets, free-trade areas.

VENZ 3104W. The Art of Reading Literary Texts. (WI; 3 cr.; Student Option; Every Fall, Spring & Summer)
Major current theoretical approaches to literary texts. Contemporary categories of analysis/methodology. Literary sociology, psychological critique, semiology, comparative literature.

VENZ 3106. Latin American Art. (; 3 cr. ; A-F only; Every Fall, Spring & Summer
Panoramic view of Latin American art from prehistoric times to the present day. Emphasizes Venezuelan art production in its historical, political, and social context and relating it to other Latin American countries.

VENZ 3107W. Introduction to the Study of Hispanic Linguistics. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer
Concepts and operative terms of linguistics, nature/organization of language. Emphasizes phonological/grammatical analysis. Origin/nature of linguistic transformation. prereq: Two yrs college-level Spanish

VENZ 3108. The Spain of Cervantes' Don Quixote: History and Fiction. (; 3 cr. ; A-F only; Every Fall, Spring & Summer
Analysis of Don Quixote as crossroad of literary eras/genres, visions of the world, and attitudes towards life, and as synthesis of styles and an encounter of two centuries. prereq: Adv-lev written/spoken Span

VENZ 3200. Field Botany in the Andes in Spanish. (; 3 cr. ; A-F only; Every Fall, Spring & Summer

VENZ 3251. Spanish-American Literature: Aspects of Prose and Fiction. (; 3 cr. ; A-F only; Every Fall, Spring & Summer
Several writers whose work has become essential for contemporary Spanish American literature. Critical reading of various works. Background knowledge of authors, and of their work and historical context. prereq: Two yrs col-lev Span

VENZ 3260. Natural Resource Economics in English. (; 3 cr. ; max 6 cr.) ; Student Option; Every Fall, Spring & Summer
Study abroad course

VENZ 3261. Natural Resource Economics in Spanish. (; 3 cr.; Student Option; Every Fall, Spring & Summer
Cultural differences when dealing with people from different cultures. Issues related to cultural diversity and cross-cultural understanding. prereq: Two yrs college-level Spanish
Basic economic concepts most relevant to natural resources, factors affecting them. Property rights, conservation, regulations, government policy, and evaluation of resources.

VENZ 3262. Natural Resource Development. (3 cr.; A-F only; Every Fall, Spring & Summer) Organization/development of agriculture/mining in Latin America, from colonial era to present. Socio-political/economic ramifications of natural resources, their exploitation covering several countries.

VENZ 3263. Sustainable Tropical Agriculture in Spanish. (3 cr.; Student Option; Every Fall, Spring & Summer) Economics of tropical agriculture development. Potential for developing world trade and for improving standards of living in areas dependent on production of tropical agricultural products.

VENZ 3264. Sustainable Tropical Agriculture in English. (3 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) Study abroad course

VENZ 3401. History of Venezuela. (3 cr.; A-F only; Every Fall, Spring & Summer) Survey of Venezuela's historical processes, fundamental historical problems. Conquest, colonization, independence, 19th/20th centuries. prereq: Two yrs col-leve Span

VENZ 3402. Curriculum and Material Development. (3 cr.; A-F only; Every Fall, Spring & Summer) Applications of theories, principles, and current research related to second language acquisition, instructional techniques, and materials relevant to development of TESOL curriculum. Emphasizes teaching students whose English proficiency is limited.

VENZ 3403. Applied Linguistics. (3 cr.; A-F only; Every Fall, Spring & Summer) Applications of theories, principles, and current research related to second language acquisition. Instructional techniques/materials relevant to development of TESOL curriculum. Emphasizes teaching students whose English proficiency is limited.

VENZ 3404. Testing and Evaluation of TESL. (3 cr.; A-F only; Every Fall, Spring & Summer) Discussion, review, and critique of instruments of evaluation for English language acquisition. Selection/development of assessment instruments valid for (a) placing students at appropriate levels, (b) evaluating progress toward goals, and (c) grading promoting students.

VENZ 3405. Methods of Teaching English Proficiency. (3 cr.; A-F only; Every Fall, Spring & Summer) Identifying/applying major TESL methodologies to needs of students with various cultural/language backgrounds, ages, and learning styles. Emphasizes differentiating teaching English to native speakers and to speakers of other languages.


VENZ 3408. Caribbean Literature. (3 cr.; A-F only; Every Fall, Spring & Summer) Aspects of Caribbean culture related to development of literature of the region. Caribbean literature within context of Latin American literature. Analytical strategies for studying texts. prereq: Two yrs col-leve Span

VENZ 3409. Cultural Anthropology. (3 cr.; max 6 cr.; A-F only; Every Fall, Spring & Summer) Study abroad course.

VENZ 3410. Cultural Anthropology. (3 cr.; A-F only; Every Fall, Spring & Summer) Diversity/universality of culture from anthropological point of view. Concepts of culture. Representative cases that demonstrate human adaptation in its diverse variations. Diversity of values/lifestyles. Aspects of pre-Hispanic and contemporary Venezuelan Andean culture.

VENZ 3480. Latin American Politics and Civilization: Eng. (3 cr.; A-F only; Every Fall, Spring & Summer) Evolution of the Spanish language starting from vulgate Latin and viewing its major synchronic states. Languages that influenced the formation of Spanish. Popular vocabulary items, educated/semi-educated language features.


VENZ 3511. Film Criticism and Appreciation in Latin America. (3 cr.; A-F only; Every Fall, Spring & Summer) Latin American culture through eyes of outstanding Latin American filmmakers. Aesthetics/language of cinema. Emphasizes four most important Latin American film industries: Mexico, Cuba, Argentina and Venezuela. Overview of other productions. prereq: Two yrs col-leve Span

VENZ 3512W. Spanish-American Civilization: Modern Latin America. (WI; 3 cr.; A-F only; Every Fall, Spring & Summer) Summary of history of countries of Latin America. Pre-Hispanic indigenous cultures, principal features of colonial society. Analysis of socioeconomic situation of Latin American countries in 20th century. Emphasizes artistic developments. prereq: Two yrs college-level Spanish

VENZ 3513. Latin America and Cultural Discourse. (3 cr.; A-F only; Every Fall, Spring & Summer) Essential Latin American texts on culture with relation to important works on universal culture. How to distinguish between various historic-cultural currents. Contributions of major Latin American thinkers, diverse sources of principal-cultural systems of Latin America. prereq: Two yrs col-leve Span

VENZ 3520. Geography of Venezuela in Spanish. (3 cr.; A-F only; Every Fall, Spring & Summer) Venezuelan geography in its international context. Outstanding physical features. Socioeconomic patterns. prereq: Two yrs college-level Spanish

VENZ 3521. Education in Venezuela. (3 cr.; A-F only; Every Fall, Spring & Summer) Nature/problems of education in Venezuela. Historical precedents, evolution of the system. Philosophical, cultural, and pedagogical assumptions of national education in Venezuela. The system in its current form. prereq: Two yrs col-leve Span

VENZ 3530. Critical Writing. (3 cr.; A-F only; Every Fall, Spring & Summer) Critical Writing course offered in Merida, Venezuela.

VENZ 3540. Folklore in Latin America in Spanish. (3 cr.; A-F only; Every Fall, Spring & Summer) Principal manifestations of folklore of various countries of Spanish America. Emphasizes process of syncretism. Original elements related to later influences. Development of folklore as historical process. Music, oral tradition. prereq: Two yrs college-level Spanish

VENZ 3590. Children's Literature. (3 cr.; A-F only; Every Fall, Spring & Summer) Critical analysis of children's literature. Theoretical aspects from different points of view. Set of criteria for evaluating a variety of authors and their work. prereq: Two yrs col-leve Span

VENZ 3600. Spanish Linguistics. (3 cr.; A-F only; Every Fall, Spring & Summer) Present state of theory, research, and application of linguistics to Spanish speaking world. Variation and linguistic changes. Analysis of Spanish speech/writing modes.


VENZ 3650. Cross-Cultural Management. (3 cr.; A-F only; Every Fall, Spring & Summer) Strategies for overcoming cultural differences in business environment, from perspective of management. Issues of cultural diversity.
Rome.

ROME 1001. Beginning Italian I. (3 cr. max 10 cr.); Student Option; Every Fall, Spring & Summer
Basic listening, speaking, reading, writing, and communication skills. Cultural readings.

ROME 1002. Beginning Italian II. (3 cr. max 10 cr.); Student Option; Every Fall, Spring & Summer
Basic listening, speaking, reading, writing, and communication skills. Cultural readings.

ROME 1003. Intermediate Italian I. (3 cr. max 10 cr.); Student Option; Every Fall, Spring & Summer
Conversation/comprehension proficiency. Reading/writing skills. Grammar review.

ROME 1004. Intermediate Italian II. (3 cr. max 10 cr.); Student Option; Every Fall, Spring & Summer
Conversation/comprehension proficiency. Reading/writing skills. Grammar review.

ROME 1200. Intensive Italian Language and Culture. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad.

ROME 1300. Italian for Design. (1 cr. max 2 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 1500. Survival Italian. (1 cr.); Student Option; Every Fall, Spring & Summer
This course is designed as a survival language course with emphasis on developing the necessary language skills to handle the most frequent situations encountered while staying in Rome. It focuses on communication in everyday practical situations and aims at getting students started in learning Italian.

ROME 3001. Society, Citizenship, and Ethics in Post-Unification Italy. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Culture/identity from Italian historical perspective. Students visit Orvieto, a medieval hilltop town famous for its paintings, frescos, and 'underground city' of tunnels/passageways.

ROME 3002. Roman Art. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Uses Rome as a campus to address role of patrons, nationality of artists, and actual technical production of works of art. Students visit Pompeii, a city frozen in time that reveals the historical heritage of ancient Rome.

ROME 3003. Made in Italy. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
"Made in Italy" as brand and lifestyle. Lectures, site visits, development of a student group marketing plan. Students visit Castello Banfi Winery in Tuscany.

ROME 3004. Italian Communications: Popes, Politicians, and Popular Culture. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3005. The History of Art and Design in Italy: From Pompeii to Present. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3006. Community Engagement in Rome. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3007. Design Theory, Technology, and the Environment. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3008. Sustainable Foods of Italy. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3009. Italian Cinema. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3010. Neighborhoods of Modern Rome. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3011. Roman Design Studio. (3 cr. max 12 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3012. Intensive Italian Language and Culture. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3013. Internships in Rome: A Comparative Approach to the Italian Workforce. (3-6 cr. max 12 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3014. Sport and Society in Modern Italy. (3 cr. max 6 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3191. Materials and Design: Integrity and Innovation. (2 cr. max 4 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3192. Remapping of a Neighborhood for Students of Architecture. (2 cr. max 4 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3193. Exploring Identity: Community Design for Marginalized Groups. (2 cr. max 4 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

ROME 3194. As If People Mattered: Architectural & Urban Lessons in the Eternal City. (2 cr. max 4 cr.); Student Option; Every Fall, Spring & Summer
Study abroad course.

SC 2550. Business Statistics: Data Sources, Presentation, and Analysis. (4 cr.); A-F or Audit; Every Fall, Spring & Summer
Data analysis, basic inferential procedures, statistical sampling/design, regression/time series analysis. How statistical thinking contributes to improved decision making.

SC 3001. Supply Chain and Operations. (3 cr.); A-F or Audit; Every Fall & Spring
Managing the operations function within manufacturing and service organizations, and across the supply chains of these organizations. The supply chain is the set of organizations and the work that they complete to collectively create customer-valued goods and services. Course emphasizes decision making in work processes, including decision related to managing processes, quality, capacity, inventory, and supply chain activities. Quantitative and qualitative methods are used for improving management of operations.

SC 3041. Project Management. (2 cr.); A-F or Audit; Every Fall
Principles and methods useful for planning and controlling a project, including development of
Managers spend a significant amount of time making operations-related decisions. The courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

SC0 3045. Sourcing and Supply Management. (2 cr.; A-F only; Every Fall & Spring)
Strategic/operational role of purchasing/supply. Supply management. Supplier-selection criteria such as quantity, quality, cost/price considerations. Buyer-supplier relationships. prereq: 3001

SC0 3048. Transportation and Logistics Management. (2 cr.; A-F only; Every Fall)
Linkages between logistics/transportation and marketing, operations, and finance. How different industries integrate logistics, warehousing, transportation, and information systems. prereq: 3001

SC0 3051. Service Management. (2 cr.; A-F only; Every Fall)
Issues unique to managing service processes. Identifying service needs, designing services, and managing services. prereq: 3001

SC0 3056. Supply Chain Planning and Control. (4 cr.; A-F or Audit; Every Fall & Spring)
Decisions/tradeoffs when directing operations of supply chain. Forecasting, capacity/production planning, just-in-time, theory of constraints, supply chain flows, enterprise resource planning, supply chain design. prereq: 3001 or instr consent

SC0 3059. Quality Management and Lean Six Sigma. (4 cr.; A-F or Audit; Every Fall & Spring)
Process management from Quality Management and Six Sigma perspective. Managerial/technical aspects of improvement. Strategy, improvement tools/methods, Malcolm Baldrige Award, ISO 9000, Six Sigma. prereq: 3001 or equiv or instr consent

SC0 3072. Managing Technologies in the Supply Chain. (2 cr.; A-F only; Every Fall & Spring)
Technologies and technological change within/between firms as opportunities for professional leadership. Selecting technologies, nurturing their adoption, and ensuring their exploitation. prereq: 3001

SC0 4065W. Supply Chain and Operations Strategy. (WI 4 cr.; A-F only; Every Fall & Spring)
Senior capstone. How to achieve/sustain competitive advantage through consistent decisions in manufacturing/service operations. Marketing/business strategy in global context. Vertical integration, capacity, facilities, technology/infrastructure. prereq: 3001, 3056, 3059, 4 [OMS or SCO] elective cr

SC0 6041. Project Management. (2 cr.; A-F only; Every Fall & Spring)
The course of their careers, contemporary managers spend a significant amount of time either participating in or leading projects. Projects are frequently used as proving-grounds for high-potentials. The skills that are required in project management are often the very same attributes that are required for successfully managing a business. While every project is by definition unique, some concepts and tools (e.g., critical path method, time and cost tradeoffs, resource utilization, methods to deal with uncertainties) in project management apply to a wide range of different types of projects. The aim of this course is to equip students with these concepts and tools (e.g., Monte Carlo simulation, risk analysis) and to develop them into successful project managers, as well as team members.

SC0 6045. Strategic Sourcing. (2 cr.; A-F only; Every Spring)
Product development and supply management has become increasingly visible in a world where supply is a major determinant of organizational success. Supply chain performance influences not only operational and financial risks but also reputational risk. Although this course explores cost containment and supply process improvement methods, it also pushes into revenue enhancement. The job of the supply manager today goes way beyond the scope of value and efficiency to the search for competitive advantage through the supply network. In addition to organizing the supply function for strategic advantage, the course explores strategic sourcing, supplier selection and evaluation techniques, supplier development methods, global sourcing techniques, as well as legal and ethical challenges. High-performance supply managers live for the challenges associated with building and maintaining a high-performance supply chain.

SC0 6048. Logistics and Transportation. (2 cr.; A-F only; Every Spring)
As supply chains become increasingly global, managing the complexity of distribution and transportation is critical to supply chain performance. This course focuses on the role of logistics and distribution networks in customer order fulfillment. Particular emphasis is placed on the linkage among logistics, warehousing and information systems, and the trade-offs involved in alternative distribution strategies. The course also explores the role of third-party logistics providers. Students learn models and techniques related to designing distribution networks that align with the firm’s supply chain and corporate strategy

SC0 6051. Service Management. (2 cr.; A-F only; Every Fall)
Designing and managing business interactions with customers. Creating service innovations, and designing processes and systems for delivering value-added services to customers. prereq: [MBA 6220 or equiv], MBA student

SC0 6056. Managing Supply Chain Operations. (4 cr.; A-F only; Every Fall & Spring)
Decisions/tradeoffs managers face when directing operations of supply chain. How supply chain operations are coordinated within manufacturing, distribution, and retail organizations. prereq: [MBA 6220 or equiv], MBA student

SC0 6059. Quality Management and Lean Six Sigma. (4 cr.; A-F only; Every Fall)
Management/technical aspects of process improvement. Organizational performance and financial measures as they relate to process improvement. Strategy, improvement tools/methods. prereq: [MBA 6220 or equiv], MBA student

SC0 6061. New Product Design and Business Development. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Nine-month intensive course. Engineering and business students work in teams on actual product development projects sponsored by business organizations to design prototype products and develop business plans for commercialization. Lectures, workshops, guest speakers, team meetings, company visits.

SC0 6072. Managing Technologies in the Supply Chain. (2 cr.; A-F only; Every Spring)
Course prepares students to develop capabilities for (i) making well-informed technology choice decisions; (ii) effectively managing the development and implementation of technologies; and (iii) collaboratively engaging in crisis management and problem solving during technology development and implementation. The central question around which the course will be organized is: How can technologies and the related process and people issues be managed to design and sustain reliable, responsive, resilient, and responsible supply chains? Contemporary topics such as big data analytic applications to supply chain management; technology project management as it relates to offshoring and near-shoring; managing technologies in the context of supply chains in emerging economies; and managing technologies for sustainable supply chains will be covered in the course. Implications of globalization for managing technologies in supply chains will be a theme that will run through the entire duration of the course.

SC0 6081. Global Operations Strategy. (4 cr.; A-F only; Every Spring)
Operational implications of strategic decisions, such as global facility location, outsourcing, supplier selection and relationship management, process automation and standardization, concurrent product development. prereq: [MBA 6220 or equiv], MBA student

SC0 6082. International Operations Management. (2 cr.; A-F only; Every Fall)
Managing operations in global economy. Coordinating product design, technology transfer, sourcing, supply chains, quality standards, product assignment, facility location, and multicultural workforce management across national boundaries. Cross-functional decision making. prereq: [MBA 6220 or equiv], MBA student

SC0 6090. Sales, Inventory, and Operations Planning. (2 cr.; A-F only; Every Fall)
negotiation, and (iii) help students analyze their own behavior in negotiations. The course is largely experiential, providing an opportunity to develop skills by participating in supply chain negotiation exercises and integrating experiences with the principles presented in the assigned readings and class discussions.

SCO 6094. Responsible Supply Chain Management. (2 cr.; A-F only; Every Spring) Companies around the world are facing increasing pressure to perform well on the triple bottom line?People, Planet, and Profit?and responsible supply chain management is often a cornerstone of the CSR strategy for many companies. This course looks at how and why responsible supply chain management could be a powerful strategy to enhance a company’s triple bottom line. The course focuses on the social and environmental aspects of managing supply chain operations. Particular emphasis is placed on human rights, health and safety, and environmental issues faced by supply chain managers and the linkage to the firm’s supply chain strategy.

SCO 6095. Supply Chain Management in the Food and Agribusiness Sector. (2 cr.; A-F only; Periodic Spring) The food and agribusiness supply chain is complex. It spans input companies, farmers, traders, food companies, and retailers. The goal of this supply chain is to provide access to affordable food, feed, fiber, and fuel in a sustainable manner. The course covers topics relevant to achieving this goal such as supply management, production management, and demand management to consumers. Issues such as diversity of production and demand, bulkiness of produce, perishability, seasonality, and complexity of supply chains of food and agricultural products will be addressed.

SCO 6096. Supply Chain Management in the Health Care and Medical Devices Sector. (2 cr.; A-F only; Periodic Spring) This course identifies the inter-relationships between the partners in a health care supply chain that links the development of care to the delivery of care. Issues addressed in the course include managing health care supply chain with: increasing complexity of manufacturing pharmaceuticals and medical devices; increasing variety in drugs, devices and equipment to meet rapidly changing markets; increasing demand for affordable products from emerging economies; growing quality and compliance challenges with drugs and devices becoming more complex and regulatory scrutiny becoming stricter; and increasing failure rates. Some examples of specific problems in health care delivery are: capacity planning and management in hospitals, location of health care facilities, supply chain management of blood banks, ambulance service planning, etc.

SCO 6097. Supply Chain Management in the Retail Sector. (2 cr.; A-F only; Periodic Spring) This course reviews how the retail sector has evolved over the years and the significance of supply chain management in the retail sector. The course examines the various functional components of retail supply chain management, and focuses on analysis and metrics required to effectively manage a retail supply chain. The students learn the "language" of retailing and acquire the fundamental skills needed to effectively analyze the performance of retail supply chains. Cases are discussed to illustrate how customers are becoming more exacting and demanding ever-increasing levels of service; and how retailers are responding by increasing product variety, becoming more price competitive, striving towards higher service levels, and utilizing advances in computing capabilities, information technologies, and retail analytics to improve their supply chain efficiency.

SCO 6098. Operations Excellence via Lean Thinking. (2 cr.; A-F only; Every Fall) This course introduces the concepts and theory of quality control, philosophical foundations of lean thinking, and technical concepts related to flow and pull, and tools such as value stream mapping, A3, and SS. Students learn to identify, measure, and eliminate non-value added activities; process capability analysis; statistical process control; and acceptance sampling from extended value chains in manufacturing and service settings through hands-on exercises.

SCO 6190. Statistics. (2 cr.; A-F only; Every Fall) This course introduces quantitative and business statistics concepts for managerial decision making and problem solving. The course first focuses on the nature of statistical studies and the differences between observational and experimental studies. Methods for producing data, including sampling techniques, process monitoring, and designed experiments will be discussed. Students learn graphical and numerical methods for descriptive statistics. Foundations for statistical inference are covered, including basic probability, discrete and continuous probability distributions, and sampling distributions of statistics. Students then learn how to apply the two basic inferential methods of statistics, statistical estimation, and tests of statistical hypotheses. These methods are used to make inferences about population parameters including means, proportions, and standard deviations. The students also learn to identify sample size requirements.

SCO 6191. Big Data Analytics in Supply Chains. (2 cr.; A-F only; Every Fall) With the advancement of digital technologies and networking capabilities, firms are actively engaged in capturing big data related to their supply chains. Firms recognize the immense potential in mining big data for improving the quality and timeliness of decisions, and becoming proactive in sensing and responding to external and internal signals of threats and opportunities. Course develops the capability to analyze and interpret data that is fundamental to managing supply chains and provides an overall understanding of the data and information management framework. This includes an overview of

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
and supply chains to deliver the capabilities necessary to create a competitive advantage. This course helps students understand the strategic nature of decision making in operations, and allows them to apply such thinking to the design and improvement of global supply chain networks that span both developed and developing economies. The course contains an essential experiential component. Students will work with companies, either locally in Minnesota or across the world, on real world supply chain applications.

SCO 6850. Topics in Operations and Management Science. (2-4 cr. [max 12 cr.]; A-F only; Every Fall & Spring) Topics seminar. Provides forum for topics in operations/management science.

SCO 6851. Experimental Design. (3 cr.; A-F or Audit; Spring Even Year) Analysis of variance for one-way, two-way, and multi-way data. Basic concepts of statistical design and analysis of results. Randomized block, Latin square, cross-over, factorial designs, and blocking. Emphasis on various methods of obtaining unbiased estimates and their comparison. Exercise of data surfaces, interactions, and applications to management. prereq: MBA 6120 or equiv or business admin PhD student or instr consent; offered alt yrs

SCO 6852. Regression Analysis. (3 cr.; A-F or Audit; Periodic Spring) Regression and correlation models, inferences in simple and multiple regression, multicollinearity, indicator variables, variable selection techniques, treatment of assumption violations, applications to management problems, basic concepts of experimental design. prereq: MBA 6120 or equiv, business admin PhD student or instr consent; offered alt yrs

SCO 6871. Research in Operations Strategy. (3 cr.; A-F or Audit; Periodic Fall) Operations performance; competitive advantage; focused factory, product, and process innovation; and operations strategy implementation. Research results and methods. prereq: Business admin PhD student or instr consent; offered alt yrs

SCO 6872. Management of Technological Operations. (3 cr.; A-F or Audit; Periodic Spring) Theories and models used to address problems of managing technological operations and operations in manufacturing and service firms. Technology strategy, economic/organizational perspectives on technology, productivity analysis, technology evaluation, project selection and evaluation, learning, etc. prereq: Business admin PhD student or instr consent; offered alt yrs

SCO 6873. Supply Chain Management. (3 cr.; A-F or Audit; Periodic Spring) Research on forecasting, inventory control, materials requirements planning, just-in-time manufacturing, aggregate planning, scheduling, routing, sequencing, and dispatching in manufacturing and service industries. Research papers and methods are discussed. prereq: Business admin PhD student or instr consent

SCO 6874. Research on Quality Management. (3 cr.; A-F or Audit; Periodic Fall & Spring) Research literature, methods, and results. Research on quality, statistical process control, vendor management, off-line quality, and quality practice. prereq: Business admin PhD student or instr consent; offered alt yrs

SCO 6875. Behavioral Operations. (3 cr.; A-F only; Periodic Fall & Spring) Research and development of operations management in economics and in other business disciplines; identify behavioral problems within operations contexts; test/analyze operations phenomenon through experimental study, empirical methods, and analytical modeling. Supply chain problems. prereq: Business admin Ph.D. student or instr consent

SCO 6880. Readings in Operations and Management Science. (2-4 cr. [max 16 cr.]; A-F or Audit; Periodic Fall) Readings selected from new areas of research. Research methods, issues in operations/management science. prereq: Business admin Ph.D. student or instr consent

SCO 6894. Graduate Research in Operations and Management Science. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Individual research on an approved topic appropriate to student’s program and objectives. prereq: Business admin PhD student or instr consent

Surgery (SURG)


SURG 7502. Externship in the Surgical Intensive Care Unit. (2-6 cr.; H-N or Audit; Every Fall, Spring & Summer) This service provides the student with direct bedside experience and opportunities to apply the principles of physiology, biochemistry, and metabolism to critically ill and injured patients. Required reading: Abrams and Cerra, Essentials of Surgical Critical Care, Quality Medical Publishers, 1993. prereq: 7500

SURG 7503. Surgery Research. (4 cr. [max 8 cr.]; H-N only; Every Fall, Spring & Summer) The student will participate in a research experience designed around a specific topic, arranged on an individual basis by the Course
SUCR 7504. Externship in Hospital-based Nutrition. (3-6 cr.; H-N or Audit; Every Fall, Spring & Summer) This multidisciplinary patient care service is designed to provide one student with direct experience in hospital-based parenteral and enteral nutrition.


SUCR 7509. Burn Surgery. (4 cr.; H-N only; Every Fall, Spring & Summer) The student is exposed to all aspects of burn care including small outpatient burns as well as massive life threatening burns.

SUCR 7510. Advanced Surgery Externship. (4 cr. [max 6 cr.]; H-N only; Every Fall, Spring & Summer) Instruction and advanced experience in surgery and its components. Students participate in patient care at level similar to first year intern. Students work with team in general/vascular surgery, surgical oncology/colorceral or MIS/thoracic/foregut under faculty supervision and participate in care of patients, in operating room, and in clinics. Students take call on assigned service.

SUCR 7511. Advanced Surgery Externship (Subinternship) at VA Medical Center. (3-8 cr. [max 12 cr.]; H-N or Audit; Every Fall, Spring & Summer) Instruction/experience in surgery and its components. Students participate directly in patient care at a level of responsibility exceeding that given to beginning students. Students work under direct supervision of faculty and participate fully with surgical team on assigned service in care of hospitalized patients, in operating room, and in clinics. prereq: 7500, dept consent

SUCR 7522. Plastic & Reconstructive Surgery. (4 cr.; H-N only; Every Fall, Spring & Summer) The student is exposed to the full spectrum of plastic and reconstructive problems while on the rotation.

SUCR 7523. Colon and Rectal Surgery. (4 cr.; H-N only; Every Fall, Spring & Summer) Each student has the opportunity to become adept in the use of the sigmoidoscope as well as performing various outpatient anorectal procedures.

SUCR 7524. Externship in Outpatient and Ambulatory Surgery. (3 cr.; H-N or Audit; Every Fall, Spring & Summer) Surgery clinic. Operating room experience. Surgical pathology review. prereq: inst consent

SUCR 7525. Cardiovascular and Thoracic Surgery. (4 cr.; H-N only; Every Fall, Spring & Summer) Students will have the opportunity to become involved in the evaluation and management of patients with cardiac and thoracic surgical diseases. They will be incorporated at the level of a sub-intern on very busy clinical services. They will attend teaching conferences in addition to clinical duties. They may first or second assist on routine thoracic cases and second assist on some cardiac surgeries.

SUCR 7526. Pediatric Surgery. (4 cr.; H-N only; Every Fall, Spring & Summer) Students participate in all aspects of patient care. Initial evaluation, detailed history, physical exams, initiation/evaluation of diagnostic laboratory/radiologic testing. Formulating plans of resuscitation and patient care. Students also participate in outpatient clinics.

SUCR 7910. Surgery Medical Residency. (4 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Surgery medical residency.

SUCR 7930. Surgery Medical Fellowship. (4 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Surgery medical fellowship.

SUCR 8200. Clinical Surgical Problems in Management. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Diagnostic and management instruction in all phases of clinical surgery, inpatient and outpatient. prereq: Grad surg major

SUCR 8201. Surgery Roentgenological Pathology Conference. (1 cr.; A-F or Audit; Every Fall, Spring & Summer) Weekly review of surgical patients presenting interesting roentgen and pathological findings. Staff from the Departments of Surgery, Radiology, and Laboratory Medicine and Pathology. Basic science and management principles of the surgical patient. prereq: Grad surg major

SUCR 8202. Surgical Research. (3 cr.; A-F or Audit; Every Fall, Spring & Summer) Graduate students undertake original investigation of problems in either experimental or clinical surgery. prereq: Grad surg major

SUCR 8203. Surgery Complications and Research Conference. (1 cr.; A-F or Audit; Every Fall, Spring & Summer) Evaluation of surgical patients, including postoperative course. Discussion and critical evaluation of current research problems. prereq: Grad surg major

SUCR 8207. Transplantation Conference. (1 cr.; A-F or Audit; Every Fall, Spring & Summer) Interdepartmental discussion and evaluation of current clinical and research problems. prereq: Grad surg major

SUCR 8293. Applied Statistics. (1 cr.; S-N or Audit; Every Fall & Spring) Interactive computer course. Concepts of applied statistics. Examples, problem sets based on surgical research. How to independently set up appropriate experiments and perform basic descriptive/inferential analysis. prereq: Grad student in [surgery or experimental surgery or health sciences] or

SUCR 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master’s student, adviser and DGS consent

SUCR 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

SUCR 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

SUCR 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

SUCR 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall & Spring) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

SUCR 8990. Topics in Pancreatology. (1-4 cr.; A-F only; Every Fall) Presentations and discussion of translation of bench to bedside research in Pancreatology.

SUCR 8992. Directed Research. (2-4 cr. [max 8 cr.]; A-F only; Every Fall & Summer) Students will conduct basic or clinical research under the guidance of a faculty member in the Department of Surgery.

SUCR 8994. Directed Readings. (1-4 cr.; A-F only; Every Fall & Spring) Students will read and discuss publications related to their research projects and in their specialty areas.

Sustainability Studies (SUST)

SUST 3003. Sustainable People, Sustainable Planet. (ENV; 3 cr.; Student Option; Every Fall & Spring) Introduction to interdisciplinary Sustainability Studies minor. Scientific, cultural, ethical, and economic concepts that affect environmental sustainability and global economic justice. Key texts. Participatory classroom environment. prereq: Soph or jr or sr

SUST 3017. Environmental Justice. (DSJ; 3 cr.; A-F only; Every Spring) With a focus on understanding environmental justice, including interconnections between
health, economic and environmental disparities, this course shows students how they can take action for sustainability. Students synthesize multiple disciplinary perspectives and participate in small group collaborative activities, service learning, and digital mapping, all related to contemporary challenges.

**SUST 3480. Topics in Sustainability.** (1-4 cr. [max 24 cr.]; A-F only; Every Fall, Spring & Summer) Topics in sustainability encompass special courses related to issues such as renewable energy, food and waste systems, sustainable planning, water and climate change.

**SUST 3501. Environmental and Cultural Diversity in China.** (ENV.GP; 3 cr.; A-F only; Every Spring & Summer) This Global Seminar takes place in southwest China's Yunnan Province, a region of natural beauty and home to 26 ethnic minority groups. The program explores how an emerging international ecotourism sector affects the livelihoods and culture of remote ethnic communities at the edge of the Tibetan plateau. The ecology of the communities the class will visit, which are among the most biodiverse in the world, will be a focus for the program. Spectacular snow-capped mountains, alpine meadows, river gorges and grasslands are present. The climate is moderate and the air is clean in this region of China. A trek to a village not accessible by road and a homestay with a Tibetan farm family will be highlights for students in the course.

**SUST 4004. Sustainable Communities.** (3 cr.; A-F only; Every Fall & Spring) Students synthesize multiple disciplinary perspectives and integrate insights gained from various approaches/methods. Concepts/scholarship related to sustainability. Applying knowledge/experience to real sustainability problems. prereq: [3003 or GLOS 3304, jr or sr] in sustainability studies minor or instr consent

**SUST 4096. Sustainability Internship.** (2-4 cr. [max 8 cr.; A-F only; Every Fall & Spring) Four to ten hour per week internship experience related to a sustainability theme or approach, such as sustainable foods, green building, renewable energy or environmental justice. Intern in a nonprofit, governmental, educational or business organization, from choices provided or approved by instructor. prereq: Familiarity with sustainability concepts through academic work or other experiences

**Sustainable Agricultural Syst (SAGR)**

**SAGR 4096. Professional Experience Program: Internship in Sustainable Agriculture.** (1-3 cr. [max 6 cr.]; S-N or Audit; Every Fall, Spring & Summer) Professional experience in sustainable agriculture attained through supervised practical experience. Students create a learning agreement specific to their internship host and project, consulting with faculty advisers/hosts. This course meets the internship requirement for the Undergraduate Minor in Sustainable Agriculture. prereq: Undergraduate minor in sustainable agriculture

**SAGR 8010. Colloquium in Sustainable Agriculture.** (1 cr.; A-F or Audit; Every Fall) Forum for University faculty and students, and representatives of the farming community, including farmers, grassroots organizations, agricultural businesses, and representatives of state agencies, to engage in discussions on topics related to sustainability of food production. prereq; Coursework in biological or social sciences that provides intro to ag practices or issues

**SAGR 8020. Field Experience in Sustainable Agriculture.** (1-4 cr.; S-N or Audit; Every Fall, Spring & Summer) 3- to 14-week internship with growers or organizations working with sustainable agriculture issues. Students analyze issues in final written project, oral seminar. prereq: Coursework in biological or social sciences that provides intro to ag practices or issues

**Sustainable Systems Management (SSM)**

**SSM 1004. Sustainable Systems Management Orientation.** (1 cr.; S-N only; Every Fall) Students will receive an introduction to the Sustainable Systems Management Major. They will learn about internships in the field and about career paths that they may follow. There will also be presentations and assignments on preparing resumes and finding jobs in this area. Graduates and professionals in the related fields of sustainable systems will present for the class. Combining course work and field trips, this class will provide students with the opportunity to meet their fellow students and to form a cohort of students with similar interests and career aspirations. prereq: None

**SSM 2003. Systems Thinking: Development and Applications in Sustainability.** (3 cr.; A-F only; Every Fall) This course will provide introduction to basic systems thinking fundamentals: defining a systems perspective about any situation or problem, solving problems with that perspective, describing and modeling problems, and designing and improving upon system solutions.

**SSM 3301. Global Water Resource Use and Sustainability.** (ENV; 3 cr.; Student Option; Every Fall & Spring) What is the value of clean water? Explore the many facets of water, earth's most abundant resource. Ponder the value water for you, society, a region or nation; the complexities of ownership and protection; the influence of culture and traditions; and potential impacts of climate change. Consider realistic and holistic solutions to water issues.

**SSM 3503. Marketing of Bio-based Products.** (4 cr.; A-F or Audit; Every Fall) Intro to marketing function as it relates to current/emerging bio-based products industries (building materials, paper, fuels, etc.). Product positioning, pricing, promotion, and channel management within strategic planning and environmental marketing management.

**SSM 4407W. Sustainable Manufacturing Principles and Practices.** (WI; 3 cr.; A-F only; Every Fall) In this course students will learn about ways in which companies are embracing sustainability in their strategy and operations to increase growth and global competitiveness, including manufacturing processes for major sustainable products and biobased products. This includes processes and approaches for environmental mitigation and "green" manufacturing, reduce industrial waste and emissions, environmental footprint, and associated costs through more efficient manufacturing practices and incorporate bio-based product formulation. Students will acquire a working knowledge of management policies, tools and techniques to improve operational and environmental performance. prereq: Junior/Senior Status, Introductory Chemistry or instr consent

**SSM 4413. Systems Approach to Residential Construction.** (4 cr.; Student Option; Every Fall) Dynamic/interrelated issues of energy, moisture control, indoor air quality in residential bldgs. Design, construction, and operational aspects for energy efficient, durable structure/healthy living environment. Interaction between moisture and wood products within building system. prereq: Upper div or instr consent

**SSM 4414. Advanced Residential Building Science.** (4 cr.; Student Option; Fall Even Year) Theory, advanced applications for residential buildings. Focuses on heat/mass transfer. prereq: 2001

**SSM 4416. Building Testing and Diagnostics.** (2 cr.; Student Option; Spring Even Year) Theoretical basis for performance testing. Diagnostics applications for residential structures. Existing structures, retrofit/remedial applications. Digital differential pressure gauges, blower doors, airflow hoods/grids, duct pressure testing, infrared thermography. Hands-on equipment use, problem solving. prereq: 4413

**SSM 4418. Advanced Building Science: Applications.** (3 cr.; A-F or Audit; Every Spring) A capstone applications course, where students will learn how to apply key building science principles (from SSM 4414/5414: Advanced Building Science: Fundamentals) to common building enclosure and mechanical system problems. Students will be guided to develop both qualitative and quantitative solutions for many common energy, moisture, and indoor air quality problems facing contemporary buildings. prereq: SSM 4414 or SSM 5414

**SSM 4504W. Sustainable Products Systems Management.** (WI; 3 cr.; A-F only; Every Spring)
Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.

Concepts of new-product development and product management, their application to bio-based products. prereq: Jr or Sr or instr consent

SSM 4506W. Sustainable Systems Management Capstone. (WI; 3 cr.; A-F only; Every Spring)
This course provides students with an opportunity to conduct solutions-driven research in sustainable systems management. Students will work in groups on real-world problems that will require them to integrate the knowledge and skills they have developed in their previous coursework and internship experiences. Project topics will be solicited annually from industrial, corporate, governmental, and other external partners. All projects will require that students take an interdisciplinary systems thinking approach. Strong analytical and communicative skills will be emphasized and developed through iterative assignments. The course will be run by faculty teaching in the Sustainable Systems Management major. prereq: ESPM 3603 concurrent registration is required (or allowed) in Major seniors within two semesters of graduation.

SSM 5407. Sustainable Manufacturing Principles and Practices. (3 cr.; A-F only; Every Fall)
In this course, students will learn about ways in which companies are embracing sustainability in their strategy and operations to increase growth and global competitiveness, including manufacturing processes for major sustainable products and bio-based products. This includes processes and approaches for environmental mitigation and “green” manufacturing, reduce industrial waste and emissions, environmental footprint, and associated costs through more efficient manufacturing practices and incorporate bio-based product formulation. Students will acquire a working knowledge of management policies, tools and techniques to improve operational and environmental performance.

SSM 5413. A Systems Approach to Residential Construction. (4 cr.; Student Option; Every Fall)
Dynamic/interrelated issues of energy, moisture control, indoor air quality in residential bldgs. Emphasizes design, construction, and operational aspects to provide an energy efficient, durable structure, and healthy living environment. Interaction between moisture and wood products within building system.

SSM 5414. Advanced Residential Building Science. (4 cr.; Student Option; Fall Even Year)
Building science theory, advanced applications for residential buildings. Focuses on heat/mass transfer. prereq: Grad student or instr consent

SSM 5416. Building Testing & Diagnostics. (2 cr.; Student Option; Spring Even Year)
Theoretical basis for performance testing. Diagnostics applications for residential structures. Focuses on existing structures and retrofit/remedial applications. Digital differential pressure gauges, blower doors, airflow hoods/grids, duct pressure testing, infrared thermography. Hands-on sessions for equipment use, problem solving. prereq: Grad student or instr consent

SSM 5418. Advanced Building Science: Applications. (3 cr.; A-F or Audit; Every Spring)
This course is intended to be a capstone applications course, where students will learn how to apply key building science principles (from SSM 4414/5414: Advanced Building Science: Fundamentals) to common building enclosure and mechanical system problems. Students will be guided to develop both qualitative and quantitative solutions for many common energy, moisture, and indoor air quality problems facing contemporary buildings. prereq: SSM 4414 or SSM 5414

SSM 5503. Marketing of Bio-based Products. (4 cr.; A-F or Audit; Every Fall)
Introduction to marketing function as it relates to current/emerging bio-based products industries (building materials, paper, fuels, etc.). Product positioning, pricing, promotion, and channel management within strategic planning and environmental marketing management.

SSM 5504. Sustainable Products Systems Management. (3 cr.; A-F only; Every Spring)
Concepts of new product development and product management and their application to bio-based products.

Swahili (SWAH)

SWAH 1221. Beginning Swahili, Semester I. (5 cr.; Student Option; Every Fall)
Comprehension, speaking, reading, writing. prereq: 1221 or equiv

SWAH 1222. Beginning Swahili II. (5 cr.; Student Option; Every Spring)
Continuation of skill development from 1221. prereq: 1221 or equiv

SWAH 3225. Intermediate Swahili. (5 cr.; Student Option; Every Spring)
Readings of contemporary Swahili texts. Review of grammar and complex verb forms. Vocabulary, communication skills. prereq: 1 yr Swahili or equiv

SWAH 3226. Intermediate Swahili II. (5 cr.; Student Option; Every Spring)
Continuation of skill development from 3225. prereq: 3225 or equiv

SWAH 3425. Advanced Swahili. (5 cr.; A-F only; Every Fall)
Speaking, reading, writing. An emphasis on vocabulary development and refining of grammar points and cultural issues. The materials to supplement the standard textbook include literary texts, film, music, newspaper articles, radio and TV broadcasts, audio, video and computer interactive material, and government documents. This course presumes completion of intermediate level Swahili or its equivalent.

Swedish (SWED)

SWED 1001. Beginning Swedish. (5 cr.; Student Option; Every Fall)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.).

SWED 1002. Beginning Swedish. (5 cr.; Student Option; Every Spring)
Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and Swedish culture. prereq: 1001

SWED 1003. Intermediate Swedish. (5 cr.; Student Option; Every Fall)
Emphasis on intermediate proficiency in listening, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments. prereq: 1002

SWED 1004. Intermediate Swedish. (5 cr.; Student Option; Every Spring)
Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. prereq: 1003

SWED 4001. Beginning Swedish for Graduate Research. (5 cr.; Student Option; Every Fall)
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include everyday subjects (shopping, directions, family, food, housing, etc.). Meets concurrently with 1001.

SWED 4002. Beginning Swedish for Graduate Research. (; 5 cr.; Student Option; Every Fall) Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments. Meets concurrently with 1003.

SWED 4003. Intermediate Swedish for Graduate Research. (; 5 cr.; Student Option; Every Fall) Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. Meets concurrently with 1003.

SWED 4004. Intermediate Swedish for Graduate Research. (; 5 cr.; Student Option; Every Fall) Emphasis on developing intermediate mid-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments. Meets concurrently with 1003.

TMD & Orofacial Pain (TMDP)

TMDP 8440. Advanced Theory and Principles of TMD and Orofacial Pain. (0-3 cr.; A-F or Audit; Every Fall & Spring) Nature and pathophysiology of disorders causing chronic pain in TMJ and craniofacial regions; advanced principles and theory on assessment, diagnosis, and interdisciplinary management.

TMDP 8441. Seminar in Temporomandibular Disorders & Orofacial Pain. (1 cr.; A-F or Audit; Every Fall, Spring & Summer) Advanced topics on theories and application of recently developed techniques of data collection, diagnostic strategies, and management.

TMDP 8442. Advanced Clinical Temporomandibular Disorders and Orofacial Pain. (1-4 cr.; A-F or Audit; Every Fall, Spring & Summer) Interdisciplinary study of patients with TMD and orofacial pain using techniques of assessment currently being researched; background and clinical knowledge of patient synthesized with respect to current literature on management; management program is developed, discussed with faculty, and implemented. prereq: Participation in TMJ and orofacial pain advanced education program

Theatre Arts (TH)

TH 1101V. Honors Section: Introduction to the Theatre. (AH, WI; 3 cr.; max 4 cr.; A-F only; Every Fall & Spring) Introduction to art/craft of theater. Appreciation/critical analysis of plays/performances. Examples of theater's diverse interactions with society considered from various cultural perspectives. prereq: Honors student

TH 1101W. Introduction to the Theatre. (AH, WI; 3 cr.; max 4 cr.; Student Option; Every Fall & Spring) Introduction to art/craft of theatre. Appreciation/critical analysis of plays/performances. Examples of theater's diverse interactions with society considered from various cultural perspectives.

TH 1102. Stage, Screen, Society: Performance in the Media Age. (AH; 3 cr.; Student Option; Every Fall & Spring) Drama/cultural values implicit in media. Study of primary texts (biography, history, novel, plays), video clips, complete films. How film medium shapes cultural identity.

TH 1301. Acting/Non-Majors. (; 3 cr.; Student Option; Every Fall & Spring) Background/techniques of acting as viewed/practice in theatre, society, and student's own relationships.

TH 1321. Beginning Acting: Fundamentals of Performance. (; 3 cr.; Student Option; Every Fall & Spring) Vocabulary/techniques for practical performance studies. Use/training of body/voice. Creation of choices and dramatic phrases. Storytelling. Training the will, the instrument, and the imagination. prereq: 1101 or concurrent registration is required (or allowed) in 1101

TH 1322. Creating the Performance. (; 3 cr.; Student Option; Every Fall & Spring) Responsibilities/techniques of modern stage director as creative/interpretive artist. Creation of directed performance of invented/pre-existing forms, from happenings to traditional psychological/poetic realism. prereq: 1321 or concurrent registration is required (or allowed) in 1321 or 1501 or concurrent registration is required (or allowed) in 1501


TH 1381. New Voices. (; 1 cr.; S-N only; Every Fall) Instructors lead students in four Saturday workshop intensives. Student forge interdisciplinary collaborations as they journey through their respective programs. prereq: [Fr or transfer] student from BFA actor training or BA or BFA dance or BA theater

TH 1391. BFA Acting I. (; 3 cr.; A-F or Audit; Every Fall) Acting. prereq: Accepted into BFA acting program

TH 1392. BFA Voice and Speech I. (; 2 cr.; A-F or Audit; Every Fall & Spring) Study/practice in breath centering/expansion; vocal resonance, musicality, placement; ear training; strengthening and making more flexible the muscles of speech. prereq: Accepted into BFA acting prog

TH 1393. BFA Movement I. (; 2 cr.; A-F or Audit; Every Fall) Focuses on building a foundation for further work in program. prereq: BFA-acting major

TH 1395. BFA Acting II. (; 3 cr.; A-F or Audit; Periodic Fall & Spring) Continuing the process of interpreting dramatic material. prereq: 1391

TH 1396. BFA Voice and Speech II. (; 2 cr.; A-F or Audit; Periodic Fall & Spring) Building a foundation for further work in the program. Emphasizes practicing the sounds of good American speech and of the written phonetic alphabet. prereq: 1392

TH 1397. BFA Movement II. (; 2 cr.; A-F or Audit; Periodic Fall & Spring) May include sections such as African dance, yoga, movement for actors, and circus techniques. Focuses on building a foundation for further work in the program. prereq: 1393

TH 1501. Introduction to Design and Technology for Live Performance. (; 3 cr.; A-F only; Every Fall & Spring) Principles, processes, and possibilities in all areas of stage design and production. Process and relationship between artistic and production staff members. Collaboration, compromise, creation. Student are assigned to a lab in a technical area. prereq: 1101 or concurrent registration is required (or allowed) in 1101

TH 1911W. Attending (to) Theater. (WI; 3 cr.; A-F or Audit; Every Fall) How do we attend and attend to theater in the Twin Cities? This seminar introduces non-theater (and potential) majors to the richness of small and mid-sized theater in the Twin Cities such as Penumbra, Open Eye, and Ten Thousand Things, attending 8-10 performances together. Workshops and discussions with theater professionals will help us to develop critical and creative language to think, write about, and potentially create live performance. We’ll think together about how theater might forge a different kind of “commonwealth.”

TH 1913. The Great Actresses and Divas of Theatre, Films, Opera, and Musicals. (; 3 cr.; Student Option No Audit; Periodic Fall & Spring) This seminar highlights actresses and divas from Byzantium’s Empress Theodora in the sixth century to America’s Barbra Streisand in the 21st. The activities of their male contemporaries are well documented, but the female performers have been sadly neglected. The names of Sarah Bernhardt, Maria Callas,
Meryl Streep, and Julie Andrews are generally recognized, but what about Isabella Andreini, Lillian Gish, Marian Anderson, and Josephine Baker? All have made unique contributions to theatre, film, opera, and the musical as leading female performers of their time. They were and are the role models who inspire future generations.

TH 1914. Cyborgs and Hackers: The Ethics of Digital Life. (3 cr.; A-F only; Every Fall) Being with artificial intelligence have raised ethical questions ever since they were fictional characters, such as the robot in the silent film Metropolis (1927). As contemporary technology expands the use of artificial intelligence, principles of ethical responsibility are up for constant debate. We explore ethics in the age of technology by examining how humanity is imagined in the art, science, and everyday life of artificial intelligence. Theater plays and films about cyborgs invest them with feelings, and question their exploitation by humans. Meanwhile, contemporary drones and robots are programmed with data drawn from humans, and evoke different fears of machines taking over the planet. We compare cyborg and hacking cultures to see how human and artificial intelligence engage with each other, and how their battles shape our concepts of intention and responsibility.

TH 1915. The Dynamic History of Musical Theatre: From The Fairy Queen to Les Mis to Hamilton. (3 cr.; Student Option No Audit; Periodic Fall & Spring) This course focuses on the history of musical theatre as well as on its dynamic interpretation. Our goal is to explore a wide range of musical theatre forms and styles. Along with the annotation and performance of monologues and song lyrics, there will be in-class viewings and discussions of The Fairy Queen (Purcell), The Beggar’s Opera (Rich and Gay), and The Pirates of Penzance (Sullivan). Show Boat (Kern and Hammerstein), Oklahoma! (Rogers and Hammerstein), Into the Woods (Sondheim), The Making of the Broadway Album (Streisand), The London Concert (Peters), Les Misérables (Schönberg), Sweeney Todd (Sondheim), 2013 American Song Book (Chenoweth), and Hamilton (Miranda). Due to the performing emphasis of this course, attendance is required and will figure in grading. By the end of the course, students will have the knowledge and ability to interpret with confidence challenging texts of heightened language and lyrics.

TH 1950. Topics in Theater. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Topics specified in Class Schedule.

TH 2391. BFA Acting III. (3 cr.; A-F or Audit; Periodic Fall & Spring) Applying concepts of first year of training to an ensemble performance project. Beginning of Shakespeare foundation unit. prereq: BFA student in theatre arts

TH 2392. BFA Voice and Speech III. (2 cr.; A-F or Audit; Periodic Fall & Spring) Continuing to build a strong, healthy voice. Mastering written phonetics, sounds of good American speech for stage. Students begin to explore speaking of heightened verse, particularly Shakespearean text. prereq: BFA student in theatre arts

TH 2393. BFA Movement III. (2 cr.; A-F or Audit; Periodic Fall & Spring) Deepens/refines foundation laid in BFA Movement I/II. prereq: BFA student in theatre arts

TH 2395. BFA Acting IV. (3 cr.; A-F or Audit; Periodic Fall & Spring) Application of process towards performance. Emphasizes Shakespeare. prereq: BFA-Acting sophomore

TH 2396. BFA Voice and Speech IV. (2 cr.; A-F or Audit; Periodic Fall & Spring) Continuing to build a strong, healthy voice. Mastering written phonetics and the sounds of good American speech for the stage. Students begin basic dialect acquisition work for the stage. Emphasizes English/Irish dialects. prereq: BFA-acting sophomore

TH 2397. BFA Movement IV. (2 cr.; A-F or Audit; Periodic Fall & Spring) May include sections such as jazz dance, partner dances, and movement for actors. prereq: BFA-acting sophomore

TH 3100. Theatre Practicum. (1 cr. [max 4 cr.]; S-N or Audit; Every Fall, Spring & Summer) Participation in University Theatre main stage play as actor, construction/running crew personnel, or theatre management operations personnel.

TH 3115. Introduction to Playwriting. (3 cr.; Student Option; Every Fall & Spring) Study of traditional play structure, characterization, dialogue, dramatic action, and theme. Final project is a one-act play.

TH 3120. Theatre: Theory and Practice. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring) Introduction to diverse ways of thinking about theatre and its representational practices. Students explore traditional and non-traditional modes of performance through readings, discussions, and hands-on performance projects. Seminar-style course. prereq: 1101

TH 3152. Global Avant-Gardes: Theatre, Music, Modernity. (HIS; 3 cr.; Student Option; Every Spring) What does it mean to be an avant-garde artist in the Global South? In postcolonial Africa and Asia, where arts were linked to national modernization projects, artists have played a key role in shaping citizens? identity, alongside schools and universities. While participating in modernizing projects, avant-garde artists maintained independence from state institutions and voiced criticism of dictators. This course examines avant-garde performance in several locations of the Global South, analyzing dramas of national history, modernist music, activist theater, cosmopolitan dance, transnational cultural circuits, and politically radical performances. Reading historical, social, and performance studies, we will develop methods for analyzing performances that aim to make transformative social interventions. These include textual analysis, ethnography, performance analysis, and tracking transnational cultural exchange. You will apply select methods in your final research paper, which centers on an avant-gardist cultural phenomenon in the contemporary Global South.

TH 3171. History of the Theatre: Ancient Greece Through Neo-Classicism. (3 cr.; Student Option; Every Fall, Spring & Summer) History of Western theatre and drama: theatrical practices, staging conventions, and dramatic structure of plays. Ancient to mid-18th century.

TH 3172. History of the Theatre: Age of Enlightenment to Present. (3 cr.; Student Option; Every Fall, Spring & Summer) Theatrical practices, staging conventions, dramatic structure of plays. prereq: Th major or instr consent

TH 3311. Asian American Theater. (3 cr.; Student Option No Audit; Periodic Fall & Spring) Through submerging students in both theater history and practice, this class brings students closer to the history, experiences, and politics of Asian Americans. Why are Asian American stories needed, and how do we tell them? What are the artistic and social agendas driving the making of Asian American theater? How have the styles of performance shifted? While we will be actively working on readings and original theater projects, you don't need to be a theater expert to enjoy this class. Topics will include reading plays by Frank Chin, David Henry Hwang, Wakako Yamauchi, Naomi Iizuka, and others; looking at the history of Asian American theater companies; discussing creative approaches to casting, acting, directing, and design; and building collaborations among companies, audiences, and communities.

TH 3314. Text and the Actor. (3 cr.; A-F or Audit; Every Fall & Spring) Standard stage speech, international phonetic alphabet transcription, and textual analysis to perform heightened language texts such as Shakespearean/Shavian monologues. Chaucer's Canterbury Tales, and Beowulf: Videos viewed/discussed. prereq: 1101, 1321, 1322

TH 3316. Voice for the Actor. (3 cr.; A-F only; Every Fall & Spring) Analysis of text, character, and relationship in scenes/monologues from contemporary/modern psychologically-based drama, early
TH 3322. Advanced Techniques for Characterization. (3 cr.; Student Option; Every Fall & Spring)
Analysis of text, character, and relationship in scenes/monologues from contemporary/modern psychologically-based drama and from early 20th-century texts. Lecture, discussion, exercises, performance. prereq: 3321

TH 3330. Physical Approaches to Acting. (3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Dynamic physical approach to acting. Expanding expressiveness/creativity. Strengthening connections between physical/vocal expression. Uniting instinct and intellectual analysis. Techniques as advanced by Delsarte, Meyerhold, Grotowski, Kantor, Suzuki, Barba, etc. and structured improvisation, are incorporated in solo/collaborative performance projects. prereq: 1322, [3314 or concurrent registration is required (or allowed) in 3314], audition, instr consent

TH 3332. Circus Performance. (1 cr.; A-F only; Every Spring)
Strength/conditioning, aerial techniques. Acrobatics to improve timing/muscular structure. Juggling to improve hand-eye coordination and showmanship

TH 3361. Introductory Musical Theater. (3 cr.; A-F or Audit; Periodic Fall & Spring)

TH 3365. Intermediate Musical Theatre. (3 cr.; A-F or Audit; Periodic Fall & Spring)
Musical theatre varying styles. Incorporating music into devised work, as well as strategies on updating traditional performance. Singing, interpretation, dance techniques. Culminates in presentations in public class performance. prereq: 3361 or instr consent

TH 3370. BA Mentoring. (1 cr. [max 4 cr.]; A-F only; Every Fall & Spring)
Prepare BA theatre performance majors/minors with essential skills that will enhance performing careers as actors, directors, playwrights. Attend non-traditional performances by national/international touring companies. Engage in vigorous discussions led by those artists who are at the forefront of creation models. Rigorous skill-building workshops led by artists, scholars, technicians.

TH 3381. Theater Storytelling and Solo Performance. (3 cr.; Student Option; Every Spring)
Live storytelling and solo performance as theatrical art form. How to turn personal experiences into stage stories. Guests perform, discuss their work, and critique student work. Students develop short monologues/performances and conclude with original solo theater performance/story.

TH 3391. BFA Acting V. (3 cr.; A-F or Audit; Every Fall)
Experiencing a foreign theater culture/history. Applying process of interpreting dramatic material to plays of that culture.

TH 3392. BFA Voice and Speech V. (2 cr.; A-F or Audit; Every Fall & Spring)
Experiencing a foreign theater culture/history. Applying voice training to dramatic material of that culture.

TH 3393. BFA Movement V. (2 cr.; A-F or Audit; Every Fall)
Experiencing a foreign theatre culture/history, applying training to dramatic material of that culture. prereq: BFA student in theatre arts

TH 3395. BFA Intensive I. (2 cr.; A-F or Audit; Every Spring)
Incorporating disciplines of acting/voice/movement. prereq: BFA-acting jr

TH 3398. BFA Rehearsal & Performance I. (2 cr.; A-F or Audit; Periodic Fall & Spring)
Continuing the application of process towards performance. prereq: BFA-acting jr

TH 3399. BFA Rehearsal and Performance II. (2 cr.; A-F or Audit; Periodic Fall & Spring)
Continuing the application of process towards performance. prereq: BFA-acting jr

TH 3521. Introduction to Scenic Design for Theater and Performance. (3 cr.; Student Option; Every Spring)
Use of space/timelines to create environments for theater/performances. Collaborative vocabulary through script interpretation/analysis. Visual literacy through sketching, painting, and drafting. Individual/group projects. prereq: 3571

TH 3531. Introduction to Theatrical Costume Design. (3 cr.; Student Option; Every Spring)
Costume design process, including, researching, script analysis, the costume designer's role throughout the production process, and design problems. prereq: TH 3571

TH 3541. Introduction to Stage Lighting Design. (3 cr.; Student Option; Every Spring)
Composition, color theory, instrumentation, and control (dimming) as they apply to theater, opera, and dance. Collaborative process of the lighting designer through individual and group projects in a lab setting (i.e., a theater.) prereq: 3571

TH 3559. Introduction to Sound Design for the Theatre. (3 cr.; Student Option; Every Fall & Spring)
Basics of audio design for theatre. Script analysis, audio editing, music research, basic system design, paperwork, cue building. Basic components of audio design. Final project will involve applying skills to partially realized design. prereq: 1501

TH 3571. Introduction to Stage Technology. (3 cr.; A-F only; Every Fall & Spring)

TH 3711. Beginning Directing. (3 cr.; Student Option; Every Fall & Spring)
Introduction to/applications of techniques/theories of stage direction. Script analysis, composition, blocking, rehearsal methods, improvisation, actor coaching, scene production. prereq: 1101, 1321, 1322

TH 3716. Stage Management. (4 cr.; A-F only; Every Fall & Spring)
Production process, pre-production to maintaining/closing. Managing rehearsals, communication, conflict resolution. Individual/group projects: promptbook building, blocking notation, Cue placement/execution, scene breakdowns, creating/maintaining checklist, building a form library. prereq: 1501 or instr consent

TH 3950. Topics in Theatre. (1-4 cr. [max 8 cr.]; Student Option; Every Fall & Spring)
Topics specified in Class Schedule.

TH 3993. Directed Study. (1-6 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer)
Guided individual reading or study. prereq: 6 Th instr consent, dept consent, college consent

TH 4115. Intermediate Playwriting. (3 cr.; Student Option; Every Spring)
New methods of play construction.

TH 4117W. Survey of Dramatic Literature I: Strategic Interpretation. (WI; 3 cr.; Student Option; Every Fall & Summer)
Basic principles of script interpretation as applied to stage practice from traditional/postmodern approaches. Students read plays, critical perspectives. Discussion, critical writing, performance. prereq: [3171, 3172], [jr or sr] or instr consent

TH 4178W. Survey of Dramatic Literature II: Representation and its Effects. (WI; 3 cr.; Student Option; Every Spring)
In-depth look at how plays actively participate in production of social values and of society itself. Emphasizes consequences of choices theatre artists make. prereq: [3171, 3172], [jr or sr] or instr consent

TH 4181. Convicts, Crocodiles, and Contrasts: Exploring Australian Identity in Film and Literature. (GP; 3 cr.; A-F only; Periodic Spring)
What is “Australian”? The content of this course will employ a cultural, literary, and film studies approach to exploring the development and representation of Australian identity through the lens of film, drama, and literature. The course will be a three-week long study abroad course with pre-departure readings and films, on-
site readings and activities, and a final project due upon return. Australia is an isolated place considered to be on the "edge of the world," simultaneously the oldest continent and a young civil society. It is a place evocative of wild stunning landscape, exotic wildlife, and a history as a convict colony. Since the birth of the Australian film industry in the 1950's Australian filmmakers have sought to tell their own stories and to interrogate the idea of Australian culture. The global success of films such as Mad Max, Crocodile Dundee, and Priscilla Queen of the Desert have served to reinforce and disrupt stereotypes of Australia as a place and culture. In contrast, films such as Rabbit Proof Fence, Animal Kingdom and The Sapphires seek to tell alternative narratives. Themes such as the urban and rural divide, conquering nature, the place in society of indigenous communities, and fatalism are interrogated Similarly, Australian writers such as Colleen McCullough, Kate Grenville, Tim Winton, and Liane Moriarty have gained international readership. Their novels, as well as others, use landscape and storytelling to create and challenge simplistic ideas of Australian history and culture. By studying the history and works engaged in creating and interpreting this idea of Australian identity, from Australian artists, students will be asked to engage in a more complex way with the ideas of heritage, culture, and nation in general. Students will also read selected essays on Australian history and culture. The IDI (Intercultural Development Inventory) will also be used as a tool to engage with the dialogue on identity and culture in general.

TH 4321. Career Preparation for the Actor. (3 cr.; Student Option; Every Fall) Information/techniques necessary for professional acting career. prereq: 3322

TH 4322. Acting for the Camera. (3 cr.; Student Option; Every Fall & Spring) Differences between stage acting and acting for camera. Simulate experience with film equipment. Scenes monologues rehearsed and performed for camera. Videotape playback for class critique. prereq: 1301 or 3321

TH 4380. Creative Collaboration. (1-3 cr. [max 12 cr.]; Student Option; Every Fall & Spring) Ensemble creation of a single theatre performance work. Creative/dramaturgical work. Public showing of work, completed or in-progress. Students work collaboratively with faculty or affiliate guest artists. prereq: Audition, interview, instr consent

TH 4391. BFA Intensive II. (2 cr.; A-F or Audit; Every Fall) Applying first three years of training toward performance. Seventh in sequence of eight. Acting, voice, and movement. Integrating the disciplines. prereq: BFA student in theatre arts

TH 4393. BFA Rehearsal and Performance III. (2 cr.; A-F or Audit; Periodic Fall & Spring) Acting, voice, movement. Application of process toward performance. prereq: BFA student in theatre arts

TH 4394. BFA Rehearsal and Performance IV. (2 cr.; A-F or Audit; Periodic Fall & Spring) Acting, voice and movement. Application of process toward performance. prereq: BFA student in theatre arts

TH 4395. BFA Intensive III. (2 cr.; A-F or Audit; Every Spring) Incorporating the disciplines of acting/voice/movement. prereq: BFA-acting sr

TH 4398. BFA Rehearsal and Performance V. (2 cr.; A-F or Audit; Periodic Fall & Spring) Acting, voice and movement. Continuing the application of process towards performance. prereq: BFA-acting sr

TH 4399. BFA Rehearsal and Performance VI. (2 cr.; A-F or Audit; Periodic Fall & Spring) Acting, voice, and movement. Continuing the application of process towards performance. prereq: BFA-acting sr

TH 4532. Makeup for the Actor. (2 cr.; Student Option; Every Fall & Spring) Topics vary. May include functions/aesthetics of stage makeup, application techniques, prosthetics, and facial hair.

TH 4555. Audio Technology. (3 cr.; Student Option; Periodic Fall) Sound as science. Technology to create/ manipulate sound. Recording techniques. Effects/signal processing. Microphone/mixing techniques. prereq: 1501 or instr consent

TH 4556. Projection Media Design, Creation, and Development. (3 cr.; Student Option; Fall Odd Year) Focus of this course is to develop skills and explore creativity in designing and creating multimedia for use in projections for live performance. The course will address topics in the field including: communication and collaboration with the rest of the artistic team (director, choreographer, other designers); ways to incorporate the images into the production and supporting the action and storytelling on stage; use of software and other technologies for design and development; paper work, organization and communication to bring everything to a successful conclusion. Projects will include designing with multimedia and working with software and technologies to develop individual and group presentations. This course is about development and will not get into the specifics of projectors, playback, projection surfaces, systems design and hook up. That will be covered in TH4558 Projection Technology, Design, Engineering, and installation.

TH 4711. Intermediate Stage Direction. (3 cr.; Student Option; Every Fall & Spring) Coordinating/guiding collaborative artistic team. Script selection, textual analysis, concept development, space use, composition, movement, dialogue. Final presentation of scene. Intensive research, textual examination, journal. prereq: 1322 or instr consent

TH 4901. Senior Seminar. (2 cr.; S-N or Audit; Every Fall & Spring) Development of senior project, alone or in groups, under guidance of faculty members. prereq: Sr. [Th or Dnce major]

TH 4905H. Honors: Tutorial Seminar in Theatre Arts. (2-4 cr.; A-F only; Every Fall & Spring) Independent reading/research in preparing honors thesis or selected creative project. prereq: Credit will not be granted if credit has been received for: 4905H, honors, theatre arts, dept consent: limit [2 cr for [cum laude or magna cum laude], 4 cr for summa cum laude]

TH 5100. Theatre Practicum. (1-4 cr. [max 20 cr.]; Student Option; Every Fall & Spring) Individual creative projects in production of approved plays as an actor, director, dramaturg, or playwright. (See 5500 for design practicums.) prereq: instr consent, dept consent; 4 cr of 3100 for undergrads


TH 5117. Performance and Social Change. (3 cr.; A-F or Audit; Periodic Fall) Reading, writing, research, presentations and workshops explore activist performance projects. Theories of social formation and ideology provide framework to discuss/animate theater's potential for social change. prereq: Jr or sr or grad student

TH 5152. Global Avant-Gardes: Theatre, Music, Modernity. (HIS; 3 cr.; Student Option; Every Spring) What does it mean to be an avant-garde artist in the Global South? In postcolonial Africa and Asia, where arts were linked to national modernization projects, artists have played a key role in shaping citizens' identity, alongside schools and universities. While participating in modernizing projects, avant-garde artists maintain independence from state institutions and voiced criticism of dictators. This course examines avant-garde performance in several locations of the Global South, analyzing dramas of national history, modernist music, activist theater, cosmopolitan dance, transnational cultural circuits, and politically radical performances. Reading historical, social, and performance studies, we will develop methods for analyzing performances that aim to make transformative social interventions. These include textual analysis, ethnography, performance analysis, and tracking transnational cultural exchange. You will apply select methods in your final research paper, which centers on an avant-gardist cultural phenomenon in the contemporary Global South.

TH 5179W. Text and Performance. (WI; 3 cr.; A-F or Audit; Every Fall) How to read texts toward performance in various dramatic/nondramatic material.
Method of unlocking metaphoric energy of texts. Vocabulary/techniques of analysis that transform text from page to stage. prereq: [1322, [3171 or 3172]] or grad student

TH 5181W. Blacks in American Theatre. (Wt; 3 cr.; Student Option; Periodic Spring) Historical survey of significant events in the development of American black theatre traditions. Essays, plays, playwrights, and theatres from early colonial references to the Black Arts Movement.

TH 5182W. Contemporary Black Theatre: 1960-Present. (Wt; 3 cr.; Student Option; Spring Even Year) Essays, plays, playwrights, theatres that have contributed to contemporary Black theatre from beginning of Black Arts Movement to present.

TH 5183. Critical Literacy, Storytelling, and Creative Drama. (3 cr.; Student Option; Every Summer) How storytelling and creative drama can be used as tools to help develop K-12 students' critical literacy and to assist them in becoming more fluent readers/writers. prereq: Jr or sr or grad student

TH 5330. Comedy: Advanced Physical Performance Studio. (3 cr. [max 9 cr.]; A-F only; Every Spring) Mechanics of creating physical comedy. Focuses on process using clown, Comedia dell'arte, Bouffons, or improvisational comedy. Exercises on how comedy is born from tragedy and state of conflict within one's self. prereq: 3330, audition

TH 5340. Tragedy/Poetry: Advanced Physical Performance Studio. (3 cr. [max 6 cr.]; A-F only; Every Fall) Specific tragic/poetic training paradigms in physical theatre employed by Stanislavski, Grotowski, Brecht, LeCoeq, etc. Psychological, emotional, technical, and physical work. Tragic action in Greek tragedy, Shakespeare, Melodrama, operatic characterization, Brecht. Original tragic/poetic work. prereq: [5322, 3331, grad student] or instr consent

TH 5355. Puppetry: Techniques and Practice in Contemporary Theater. (3 cr.; Student Option; Every Fall & Spring) Fundamentals of puppet and object theater/performance are introduced through traditional/contemporary puppetry forms. Focuses on object theater, toy theater, hand puppets, and shadow/Bunraku-style puppets. Readings, in-class screenings of videos/slides. Students build/create series of short works for in-class performance. prereq: [3513 or concurrent registration is required (or allowed) in 3513], instr consent or grad student

TH 5370. Hand, Mind, and Gesture: An Independent Study in the Creation of Image Driven Performance. (3 cr.; Student Option; Every Spring) Create single or collaborative performance/event that lives in time/space. Work will draw from personal investigation, amplify personal signature, explore modalities of image driven forms. Propose, develop, construct, rehearse, present finished public performance. prereq: 5355, instr consent

TH 5500. Theatre Design Practicum. (1-3 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Individual projects in production of approved plays as a designer of scenery/properties, costumes, lighting, or sound. (See 5100 for other creative practicums.) prereq: Th 3521, 3531, or 3541

TH 5510. Drawing, Rendering, and Painting for the Theatre Designer I. (3 cr.; Student Option; Periodic Fall & Spring) Development of skills necessary for presentation of theatre scene/costume designs. Materials, layout, and techniques in scene painting. Basic drawing/graphic skills. prereq: 1501 or grad

TH 5520. Scene Design. (3 cr. [max 9 cr.]; Student Option; Every Fall & Spring) Conceiving/communicating design ideas in both two-dimensional sketches and three-dimensional models for theatre and allied venues. Drafting. prereq: 3521

TH 5530. Costume Design. (3 cr. [max 9 cr.]; Student Option; Every Fall) Theory and process of costume design for theatrical productions (e.g., dance, opera, film) through hypothetical productions. prereq: 3531

TH 5540. Lighting Design for the Theatre. (3 cr. [max 9 cr.]; Student Option; Every Spring) Design aesthetics and exploration of design for various stage forms and venues. Development of the lighting plot and paperwork; use of the computer in lighting design. prereq: 3541

TH 5545. Stage Lighting Technology. (3 cr.; Student Option; Periodic Fall) The lighting technician's skills and crafts: equipment, techniques, control operation, wiring, and maintenance. prereq: 3515 or grad or instr consent

TH 5559. Sound Design for Performance. (3 cr.; Student Option; Periodic Fall & Spring) Audio technology/psychology, their impact on audience in a performance. Communication, design process, psychoacoustics, script analysis. prereq: 4555 or instr consent

TH 5560. Drawing, Rendering, and Painting for the Theatre Designer II. (3 cr.; Student Option; Periodic Spring) Development of skills necessary for presentation of theatre scene/costume designs. Materials, layout, and techniques in scene painting. Rendering and scene painting skills. prereq: 5510

TH 5570. Properties/Scenery Technology. (1-3 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Management, structures, upholstery, mask-making, furniture construction, stage mechanics, soft properties, faux finishes. Topics specified in Class Schedule. prereq: 3515 or grad or instr consent

TH 5580. Costume Technology. (3 cr. [max 15 cr.]; Student Option; Every Fall & Spring) Fabric enhancement techniques, masks, wig-making, millinery, makeup prosthetics, pattern drafting, and draping. Topics specified in Class Schedule. prereq: 3571 or grad or instr consent

TH 5590. Theatre Technology Practicum. (1-3 cr. [max 15 cr.]; Student Option; Every Fall, Spring & Summer) Individual creative project in technology/craft area of theatre. Practical work in costume, lighting, makeup, props, scenery, sound, or theatre management. prereq: 3515, instr consent, dept consent; 4 cr max for undergrads

TH 5711. Advanced Stage Direction. (3 cr.; Student Option; Periodic Fall & Spring) Realistic/non-realistic dramatic forms. Theory/technique of rehearsal. Production problems. Includes directing of three one-act plays. prereq: [4711, instr consent] or grad student

TH 5716. Stage Management for the Theatre. (4 cr.; Student Option; Every Fall) Theories, practicalities, and techniques for rehearsal/performance. Organizing/managing various types of performance venues. prereq: [1101, 1321, soph] or grad

TH 5760. Advanced Stage Management. (2 cr.; Student Option: Every Fall & Spring) Practical experience in stage management for specific productions of the University Theatre with emphasis on rehearsal and performance. prereq: 5716 or concurrent registration is required (or allowed) in 5716, instr consent; 4 cr max for undergrads

TH 5950. Topics in Theatre. (1-4 cr. [max 80 cr.]; Student Option; Every Fall, Spring & Summer) Topics specified in Class Schedule.

TH 5993. Directed Study. (1-5 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Guided individual reading or study. Prereq 6 Th cr, instr consent, dept consent, college consent.

TH 6100. Theatre Practicum. (1-4 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Individual creative projects in production of approved plays as an actor, director, dramaturg, or playwright (see 8500 for design practicums). prereq: instr consent, dept consent

TH 8102. Theatre Historiography. (3 cr.; Student Option; Periodic Fall) Current trends in historiography; research strategies and methods.

TH 8111. History and Theory of Western Theatre: Ancient World and Early Medieval. (3 cr.; Student Option; Periodic Fall) History, theories, arts, and crafts of western theatre from the ancient world to the present.

TH 8112. History and Theory of Western Theatre: Medieval Through Renaissance. (3 cr.; Student Option; Periodic Fall) History, theories, arts, and crafts of western theatre from the ancient world to the present.

TH 8113. History and Theory of Western Theatre: National Theatres to the French Revolution. (3 cr.; Student Option; Periodic Fall & Spring) History, theories, arts, and crafts of western theatre from the ancient world to the present.
TH 8114. Theatre: Performance and Political Modernity. (: 3 cr.; Student Option; Periodic Fall & Spring)
History, theories, arts, and crafts of western theatre from the ancient world to the present.

TH 8115. History and Theory of Western Theatre: 20th Century Through World War II. (: 3 cr.; Student Option; Periodic Fall)
History, theories, arts, and crafts of western theatre from the ancient world to the present.

TH 8116. History and Theory of Western Theatre: 20th Century From 1945 to the Present. (: 3 cr.; Student Option; Periodic Fall)
History, theories, arts, and crafts of western theatre from the ancient world to the present.

TH 8120. Seminar. (3 cr. [max 12 cr.]; Student Option; Every Fall & Spring)
Selected research topics from various theatre fields and periods. Sample topics: Border Crossings—Theatre History and Representation; The Theatre and Drama of the Third Reich, 1927-1944.

TH 8333. FTE: Master’s. (: 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master’s student, adviser and DGS consent

TH 8444. FTE: Doctoral. (: 1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

TH 8500. Theatre Design Practicum. (: 1-3 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Individual creative projects in production of approved plays as a designer for scenery/properties, costumes, lighting, or sound (see 8100 for other creative practicums). prereq: instr consent, dept consent

TH 8510. Professional Design Workshop. (1-3 cr. [max 18 cr.]; A-F only; Every Fall & Spring)
Development of graduate student as individual artist working collaboratively in performing arts industry. Further mastery of designer collaboration, self-promotion, management, displaying of job materials. Attend both professional/university productions throughout semester. prereq: MFA candidate

TH 8590. Theatre Technology Practicum. (: 1-3 cr. [max 20 cr.]; Student Option; Every Fall & Spring)
Individual creative projects in the technology or craft of costume, lighting, makeup, props, scenery, sound, or theatre management. prereq: instr consent, dept consent

TH 8666. Doctoral Pre-Thesis Credits. (: 1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer)
tbd prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

TH 8711. Theory and Practice of the Modern Stage Director. (: 3 cr.; Student Option; Periodic Fall)
Survey of principal stage directors (e.g., Saxe-Meiningen, Meyerhold, Brecht, Strehler, Mnouchkine, Brook) and their theories and practices from 1871 to today using books, journals, firsthand accounts, and videos.

TH 8750. MFA Directing Practicum. (: 2-3 cr. [max 10 cr.]; A-F or Audit; Every Fall & Spring)
Rehearsed and performed production of published or original one-act (2 cr) or full-length play (3 cr) with budgeted design and technical support. prereq: MFA directing specialization

TH 8777. Thesis Credits: Master’s. (: 1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall & Spring)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

TH 8888. Thesis Credit: Doctoral. (: 1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

TH 8950. Topics in Theatre. (: 1-4 cr. [max 8 cr.]; Student Option; Every Spring)
Topics specified in Class Schedule.

TH 8980. Internship. (: 1-5 cr. [max 10 cr.]; Student Option; Every Fall & Spring)
tbd prereq: instr consent, dept consent

TH 8990. MFA Creative Thesis. (: 3-4 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
tbd prereq: instr consent, dept consent

TH 8994. Directed Research. (: 1-5 cr. [max 10 cr.]; Student Option; Every Fall & Spring)
tbd prereq: instr consent, dept consent

Therapeutic Radiology (TRAD)

TRAD 7170. Basic Radiological Physics. (: 3 cr.; H-N or Audit; Every Fall & Spring)
TRAD 7171. Physics of Nuclear Medicine. (: 2 cr.; H-N or Audit; Periodic Fall)
N/A prereq: 7170 or instr consent

TRAD 7174. Physics of Diagnostic Radiology. (: 2 cr.; H-N or Audit;)

TRAD 7177. Radiation Therapy Physics Laboratory: Radiation Physics Basics. (: 3 cr.; A-F only; Every Spring)
Hands-on experience with hardware/software used in radiation therapy clinic for physics measurements. prereq: 7170 or concurrent registration is required (or allowed) in 7173 or instr consent

TRAD 7505. Introduction to Radiation Oncology. (: 2 cr.; H-N only; Every Fall, Spring & Summer)
This course is designed not only for the student who plans to go into radiation therapy, but for those who plan to go into a field such as family practice, internal medicine, pediatrics, or surgery, where oncologic patients may be part of their practice. It provides training in clinical oncology, especially the diagnosis, disposition, and care of patients with cancer. The student attends all departmental and interdepartmental functions including follow-up clinics, new patient oncology conference, etc. Radiation physics will provide supplemental teaching. There is no night call.

TRAD 7507. Advanced Radiation Oncology. (: 4 cr.; H-N only; Every Fall, Spring & Summer)
Here the student will gain more familiarity with the role of radiation therapy in the treatment of cancer patients. The student will be able to work-up new patients and present to the staff, assist in the treatment planning and follow patients through therapy. The student will see follow-up patients and new patient in the clinic. Student will observe or assist in brachytherapy source implantation for gynecology cancer.

TRAD 7510. Radiation Oncology Research. (: 8 cr.; H-N only; Every Fall, Spring & Summer)
This elective provides an opportunity for each interested student to participate in a clinical research project designed around a specific topic related to radiation oncology. The student may choose to participate in an ongoing research project within the radiation oncology division or in an original investigative project of the student’s design arranged on an individual basis by the course director with staff members in the Department of Therapeutic Radiology-Radiation Oncology.

TRAD 7910. Therapeutic Radiology Residency. (: 6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer)
Therapeutic radiology residency.

TRAD 8149. Advanced Topics in Radiation Therapy Physics. (: 2 cr.; A-F only; Every Fall)
Special procedures, including total body irradiation, intensity-modulated radiation therapy, stereotactic radiosurgery/radiotherapy, image-guided radiation therapy. Treatment planning algorithms and techniques. Advanced techniques in brachytherapy. prereq: [7170, 7173] or [BPHY 5170, BPHY 5172]

Toledo International Program (TLDO)

TLDO 3001. 20th Century Spanish Literature. (: 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Spanish literature.

TLDO 3002. Survey of Spanish American Colonial Literature. (: 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Spanish American literature.

TLDO 3004. Marketing in European Business. (: 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course.

TLDO 3005. Introduction to Interpretation for Spanish Speakers. (: 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer)
Study abroad course
TLDO 3006. The Camino de Santiago: Past and Present. (3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course

TLDO 3022. Spanish for Business and Professional Life Development. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Vocabulary/usage of interest in business, economics, international relations, or tourism. prereq: Two yrs of college-level Spanish


TLDO 3025. Exploring Spanish Culture Through Digital Technology. (; 3 cr. [max 6 cr.]; A-F only; Every Summer) Study abroad course.

TLDO 3104W. Art of Reading Literary Texts. (Wi; 3 cr.; A-F only; Every Fall, Spring & Summer) Critical reading of Spanish and Spanish-American texts. Novels, dramas, poetry, essays. Diverse approaches. Terminology of criticism, literary problems, techniques. prereq: Two yrs of college-level Spanish

TLDO 3105W. Cultural Heritage of Spain. (Wi; 3 cr.; A-F only; Every Fall, Spring & Summer) Main periods of Spanish history. Political, social, anthropological, and economic characteristics of each. Spanish culture/society, from beginning of Franco regime in 1939 to present. Cultural trends in literature/arts in relation to social phenomena. prereq: Two yrs of college-level Spanish

TLDO 3107W. Introduction to the Study of Hispanic Linguistics. (Wi; 3 cr.; A-F only; Every Fall, Spring & Summer) Phonology, morphology, syntax, semantics, lexicology, pragmatics, discourse analysis, sociolinguistics. History of Spanish language. Introduction to Hispanic linguistics as a discipline in relation to social, cultural, and literary studies.

TLDO 3211. Writers of the Spanish Empire and Its Decline. (; 3 cr.; A-F or Audit; Every Fall) Masterpieces of Spain's most significant renaissance and golden age writers, including Lope de Vega, Calderon, Cervantes, Garcilaso, Gongora, Quevedo, and authors of picaresque novels and mystic poetry.

TLDO 3213. Spanish Feudal Society and Literature. (; 3 cr.; A-F or Audit; Every Spring) Major works of medieval Spain in connection with its social background, from Auto de los Reyes Magos and Cantar del Mio Cid to Celestina and other pre-Renaissance literature.

TLDO 3214. The Age of Don Quijote. (; 3 cr.; A-F or Audit; Every Spring) Major works of Cervantes, Don Quijote de la Mancha, and Novelas Ejemplares as stepping stones to understanding 16th/17th century Spain.

TLDO 3215. Spanish Golden Age Theater. (; 3 cr.; A-F or Audit; Every Spring) Spanish Baroque theater. Plays by Lope De Vega, Cervantes, Tirso de Molina, Calderon de la Barca, or Luis Velez de Guevara are read/discussed. Students attend theater in Toledo or Madrid.


TLDO 3217. Directed Studies in Literature. (; 3 cr.; A-F only; Every Fall, Spring & Summer) Individual research projects or readings in literature, under faculty direction, to meet objectives not covered by regular curriculum.

TLDO 3218. Discovering the Hispanic World Through the Baroque. (; 3 cr. [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Study abroad course.

TLDO 3222. Narrative in Spanish America. (; 3 cr.; A-F or Audit; Every Fall & Spring) Narrative currents in Spanish America, from Carpenter and emergence of magical realism to present day. Authors studied include Garcia Marquez, Borges, Fuentes, Vargas Llosa, and Cortazar.

TLDO 3230. Advanced Spanish Conversation. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Contemporary issues in Spain, other subjects of interest. Error evaluation. Review of frequent structural/grammatical problems. prereq: Two yrs of college-level Spanish

TLDO 3231. Spanish Composition and Communication. (; 3-4 cr.; Student Option; Every Fall, Spring & Summer) Difficult aspects of Spanish grammar/structures mastered through composition writing. Problems of style/language. Several compositions written outside class. Common errors. prereq: Two yrs of college-level Spanish


TLDO 3233. Christian, Muslim, Jewish Art: Toledo. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Art of three cultures are studied in/around Toledo.

TLDO 3234. Master Painters of Spain. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Development of Spanish painting studied in works of El Greco, Velazquez, Goya, Picasso, and Dali. Visits to Madrid's Museo del Prado and Centro de Arte Reina Sofia.

TLDO 3235. Politics and Society in Latin America. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Study abroad course.

TLDO 3236. Structure of Spanish: Phonology and Phonetics. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Contrasts in political/social structures of various Spanish-American nations in 20th century. Their diversity, common problems.

TLDO 3237. Spanish Transition Toward Democracy. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Changes in Spain from Franco's death in 1975 to Law for Political Reform and Constitution of 1978. Role of Monarchy, Army, political parties, and trade unions in shaping Constitution and defining Spain as semi-federal state.

TLDO 3238. Spain and the European Union. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Formation of EU. Impact of building a single European market on Spanish and greater European economies. Readings from daily press.

TLDO 3239. Management of Cultural Heritage. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Theoretical/practical approach to managing Spain's cultural heritage. Historical, artistic, social, and economic aspects of life in a patrimonial city.

TLDO 3240. Advanced Problems in Spanish Grammar. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Aspects of Spanish syntax in context of written language. Different methods in teaching Spanish grammar. prereq: Two yrs of college-level Spanish

TLDO 3241. Directed Studies in Art History. (; 3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Individual research projects or readings in art or archeology, under faculty direction, to meet objectives not covered by regular curriculum. prereq: Two yrs of college-level Spanish
Aspects of women's participation in economic world and in culture.

**TLDO 3699. Advanced Individualized Spanish.** (1-4 cr.; A-F only; Every Fall & Spring)
Directed study with individual tutoring to improve specific language skills identified by student and supervising professor. prereq: Two yrs of college-level Spanish

**TLDO 3703. History of the Spanish Language.** (3 cr.; A-F only; Every Spring & Summer)
Trends in historical development of Spanish. Emphasizes grammar and Spanish sound system.

**TLDO 3706. Colloquial Spanish.** (3 cr.; A-F only; Every Fall, Spring & Summer)
Characteristic phenomena of Spanish in its colloquial spoken form. Variations based on age, social, and regional background. New lexical, morphological, and syntactical coinages.

**TLDO 3800. Society Through Spanish and Latin American Film.** (3 cr.; A-F only; Every Fall)
Contemporary Spanish and Latin American societies explored through films with Spanish and Latin American artists. Approximately 10 films are analyzed from historic-sociological point of view. prereq: Two yrs of college level Spanish

**TLDO 3810. Seminar: Spanish Language and Literature.** (3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Societies explored through films with Spanish language and literature. prereq: Two yrs of college level Spanish

**TLDO 3832. Ethnology and Folklore of the Iberian Peninsula.** (3 cr.; A-F or Audit; Every Fall, Spring & Summer)
Traditional forms of life in Iberian Peninsula in terms of social/economic features. Literary, artistic, and religious aspects. prereq: Two yrs of college level Spanish

**TLDO 3900. Topics in Toledo.** (3 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer)
Seminar in Toledo. prereq: Two yrs of college level Spanish

**TXCL 5000. Directed Research in Toxicology.** (1-5 cr. [max 80 cr.]; A-F or Audit; Every Fall & Spring)
Special project that addresses specific issue in toxicology. Under guidance of faculty member. prereq: instr consent

**TXCL 5011. Principles of Toxicology.** (2 cr.; A-F or Audit; Periodic Fall)
Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers. prereq: Grad txcl major or instr consent

**TXCL 5012. Principles of Toxicology.** (3 cr.; A-F or Audit; Every Spring)
Science of toxicology. Biomedical principles. Regulatory practices governing protection of human health and environmental quality. prereq: At least one semester [biochemistry, calculus, cell biology]; at least one semester of [human or animal] physiology recommended

**TXCL 5013. Chemical Toxicology.** (3 cr.; A-F or Audit; Every Fall)
Signs, symptoms, and mechanism of toxicity of different classes of chemicals spanning several organ systems, including chemical carcinogenesis. prereq: 5012, instr consent

**TXCL 5101. Molecular and Cellular Basis of Nanoparticle Toxicology.** (3 cr. [max 6 cr.]; A-F or Audit; Fall Odd Year)
Introduction to science of nanotoxicology. Nanotechnology in scientific research. Assessment of impact on biological systems. prereq: Introductory toxicology course

**TXCL 5195. Veterinary Toxicology.** (3 cr.; A-F or Audit; Every Fall)
Toxicology of minerals, pesticides, venoms, and various toxicants. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons. prereq: Grad student or instr consent

**TXCL 5545. Introduction to Regulatory Medicine.** (2 cr.; A-F or Audit; Periodic Spring)
Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers. prereq: Grad txcl major or instr consent

**TXCL 8012. Advanced Toxicology I.** (3 cr.; A-F or Audit; Every Spring)
Absorption, distribution, metabolism, and excretion of xenobiotics; toxicokinetics; mechanisms of toxicity or specific classes of chemical agents. prereq: 5011 or BioC 4331, PubH 5104 or instr consent

**TXCL 8013. Advanced Toxicology II.** (3 cr.; A-F or Audit; Every Fall)
Kinetic and dynamic determinants of target organ toxicity; pathological alterations in structure/function relationships for major target organ systems; mechanisms of mutagenesis, carcinogenesis, and teratogenesis. prereq: 8012, BioC 4332, Phsl 5062 or Phsi 6101 or instr consent

**TXCL 8100. Investigative Toxicology.** (1 cr. [max 2 cr.]; A-F or Audit; Every Fall & Spring)
Evaluating toxicology research issues and literature. prereq: 8013 or instr consent

**TXCL 8333. FTE: Master's.** (1 cr.; No Grade Associated; Every Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent
TRIN 900. Special Education for Interpreters. (6 cr.; S-N only; Every Spring) Terminology, processes, concepts, and legalities involved in interpreting in special education settings.

TRIN 990. Interpreting in Special Education Settings. (0 cr.; S-N only; Every Fall) Advanced skills to apply special education protocols/concepts to simulated interpreting encounters. Self-assessment, glossary compilation, critical analysis, review of ethical procedures.

TRIN 1201. Health Care Terms and Concepts for Interpreters. (3 cr.; A-F or Audit; Every Fall) Technical vocabulary, oral discourse patterns used by health care providers in talking to patients, family members. Language of American health care interview.


TRIN 1901. Special Education Terms and Concepts for Interpreters. (3 cr.; Student Option: Periodic Fall & Spring) This course is designed to introduce students to the terminology, processes, concepts, and legalities involved in interpreting in special education settings.


TRIN 3002. Intermediate Translation. (3 cr.; max 6 cr.; Student Option; Periodic Spring) Additional instruction and supervised practice in translation. Prereq: 3001

TRIN 3005. Principles of Translation. (3 cr.; Student Option; Periodic Fall) Key linguistic principles that help us understand how language makes meaning. Applying principles to translation. Prereq: Fluent in English, proficient in a second language, not in CCE certificate prog in interpreting; basic knowledge of English grammar recommended.

TRIN 3101. Introduction to Interpreting. (3 cr.; Student Option; Every Fall & Spring) Practical and theoretical introduction to interpreting in health, human service, and legal settings. Emphasis on understanding the unique role of the interpreter, current models and modes of interpreting, ethical issues and professional standards of practice, and developing pre-interpreting skills. Prereq: High level of proficiency in spoken English and another language; 3001 recommended

TRIN 3102. Consecutive Interpreting. (3 cr.; Student Option; Every Spring) Practice/theory at professional level in interpreting in health, human service, legal settings. Emphasizes professional/client dialogues. Consecutive interpreting skills, vocabulary research/ storage, intercultural issues. Analyzing interpretive process. Performance assessment through audio/video taping. Subject languages (e.g., Spanish, Russian, Somali) specified for each section. Prereq: 3101, high level of proficiency in [spoken English, another language]

TRIN 3900. Topics in Translation and Interpreting. (6 cr.; [max 24 cr.]; Student Option; Periodic Summer) Topics specified in Class Schedule.


TRIN 4901. Interpreting in Special Education Settings. (3 cr.; Student Option; Periodic Fall, Spring & Summer) This course is designed to build interpreting capacity and competency in the specialized field of educational interpreting. It is also designed to give students simulated opportunities to employ the terminology, processes, concepts, and legalities studied in TRIN 1901.

TRIN 5993. Directed Study. (1-3 cr.; max 6 cr.; Student Option; Every Fall, Spring & Summer) Directed study in translation/interpretation.

**Turkish (TURK)**

TURK 3031. Advanced Turkish and Azeri I. (3 cr.; A-F only; Every Fall) This advanced course is designed to build proficiency in both Turkish and Azeri languages through encounters with a variety of authentic texts, audio, video and multimedia materials. The course will not only develop language skills but also explore the similarities, differences and relationships between these two languages and the cultures. The course will proceed in thematic units which have both Turkish and Azeri components. Students will have the opportunity to develop comprehensive and advanced grammer analysis through reading the authentic materials and listening comprehension through a variety of audio and video material, speaking competence through discussion and debate, and writing competence.

**Undergraduate Summer Research (UGRD)**

UGRD 4999. Undergraduate Summer Research. (0 cr.; No Grade Associated; Every Summer) Undergraduate Summer Research

**University College (UC)**

UC 1005. Global Perspectives on Higher Education. (2 cr.; max 4 cr.; Student Option; Every Fall & Spring) This course provides international students with the skills to understand and think critically about the academic norms, culture, and resources of the U.S. and other higher education systems. Students will analyze how core values, beliefs, and thought patterns inform cultural norms and behaviors, and they will compare and contrast their experience at a U.S. university with their previous educational experiences. Students will investigate university resources and conduct field research in order to find ways to be successful in their current and future intercultural environments. The instructor will support students as they develop their ability to communicate clearly in academic writing, presentations, and small group projects. Prereq: International student

UC 1485. Creativity: Photography. (4 cr.; Student Option; Every Fall & Spring) Conceptual, technical, and historical aspects of photography as art. Hands-on experience with camera control, film development, enlarging, and printing in black-and-white. Individual/group critiques of student portfolios.
URBS 3001W. Introduction to Urban Studies: The Complexity of Metropolitan Life. (Wi; 3 cr.: A-F or Audit; Every Fall & Spring)
Interdisciplinary course, ranging across spatial, historical, economic, political, and design perspectives, among many others.

URBS 3021. Urban Studies Colloquium. (1 cr. [max 4 cr.]: A-F or Audit; Every Fall)
Urban/metropolitan issues. Topics vary to reflect current concerns. In-depth reading, intensive group discussion.

URBS 3031W. American Cities As Settings for Cultural Diversity. (Wi; 3 cr.; Student Option; Every Fall)
Explores cultural diversity in American cities, considering patterns of and reasons for racial and class segregation and interaction. Its foci are the problems, conflicts, and successes of cultural diversity from a multidisciplinary perspective.

URBS 3500. Urban Studies Workshop. (3 cr. [max 9 cr.]: A-F or Audit; Every Fall & Spring)
Links academic learning to actual urban problems/issues and focuses on specific topic using local community as laboratory. Field work, contact with local institutions/agencies. prereq: instr consent

URBS 3751. Understanding the Urban Environment. (ENV; 3 cr.: A-F or Audit; Every Spring)
Examines links between cities and the environment with emphasis on air, soil, water, pollution, parks and green space, undesirable land uses, environmental justice, and the basic question of how to sustain urban development in an increasingly fragile global surrounding.

URBS 3771. Fundamentals of Transit. (3 cr.: A-F only; Spring Odd Year)
Importance of transit to an urban area. Issues surrounding development/operation of transit. Defining various modes of transit, evaluating why/where each may be used. Making capital improvements to transit system. Finance, travel demand forecasting, environmental assessment, scheduling, evaluation of effectiveness/accessibility.

URBS 3861. Financing Cities. (3 cr.: A-F only; Every Spring)
The most critical question in government is how you are going to pay for something. There is a plethora of good ideas but only so much money. This class looks at how cities are funded. It looks at tax systems, fee systems, grants, special revenues, private development funding and other ways that we pay for cities. It provides practical knowledge on how city activities are funded.

URBS 3871. A Suburban World. (3 cr.: Student Option; Fall Odd Year)
Suburbs as sites of urgent battles over resources, planning practices, land use, and economic development. How suburban life shapes values, political ideals, and worldviews of its populations.

URBS 3900. Urban Studies Internship Seminar. (2 cr. [max 4 cr.]: A-F or Audit; Every Fall, Spring & Summer)
Weekly seminar integrates internship experience with academic program. prereq: Sr, internship placement, dept consent, instr consent

URBS 3955W. Senior Paper Seminar. (WI; 2 cr.: A-F or Audit; Every Fall & Spring)
Methods/resources for research. Substantial writing, prerequisite: dept consent

URDU 1011. Beginning Urdu I. (5 cr.: Student Option No Audit; Every Fall)
Basic listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

URDU 1015. Accelerated Beginning Urdu. (5 cr.; Student Option No Audit; Every Fall)
Designed for students who already have good speaking skills (mainly heritage students) or those who studied Urdu in the past and can review basic knowledge of the language at a faster pace than that of regular language classes. This course focuses on all four skills (including cultural skills) to develop communicative competence at a novice-high level. The Urdu script will be introduced right from the beginning. Students will learn materials that are normally covered in a full academic year.

URDU 3031W. Accelerated Beginning Urdu for Graduate Student Research. (5 cr.: Student Option No Audit; Every Fall)
Development of reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

URDU 4003. Intermediate Urdu I for Graduate Student Research. (5 cr.; Student Option No Audit; Every Fall)
Development of reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations. Meets with URDU 1011.

URDU 4015. Accelerated Beginning Urdu for Graduate Research. (5 cr.; Student Option No Audit; Every Fall)
Designed for students who already have good speaking skills (mainly heritage students) or those who studied Urdu in the past and can review basic knowledge of the language at a faster pace than that of regular language classes. This course focuses on all four skills (including cultural skills) to develop communicative competence at a novice-high level. The Urdu script will be introduced right from the beginning. Students will learn materials that are normally covered in a full academic year. Meets with URDU 1015.
UROL 7253. Research in Urology. (; 3 cr.; No Grade Associated; Every Fall & Spring)

UROL 7400. Surgical Speciality: Urology Elective. (; 2.4 cr.; H-N or Audit; Periodic Fall & Spring)
Two-week urologic surgery externship. Principles of Urology students are use in a general medical practice. Urologic emergencies, infections, hematuria, stones, prostate cancer, and erectile dysfunction. How to read an IVP, place Foley catheters, and read a urinalysis. Frequent opportunities for student participation in rural consultations in primary care offices.

UROL 7500. Advanced Urological Surgery. (; 4 cr.; H-N only; Every Fall, Spring & Summer)
Advanced clinical urology rotation. Students act as sub-interns on busy clinical urology service. Students participate in weekly conferences and function as integral component of health care team.

UROL 7503. Urologic Research. (; 4-10 cr. [max 20 cr.]; H-N only; Every Fall, Spring & Summer)
This is a full-time laboratory course in which the student learns the basic techniques of cell biology as they apply to urologic research. Basic techniques of protein purification for amino acid composition and sequencing, electrophoresis, Western blots, immunocytochemistry, and tissue culture are used in a well-defined project. The mechanics of working in a lab and research methodology are covered in this course.

UROL 7910. Urologic Surgery Medical Residency. (; 6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Urologic surgery medical residency.

UROL 7930. Urologic Surgery Medical Fellowship. (; 6 cr. [max 120 cr.]; No Grade Associated; Every Fall, Spring & Summer) Urologic surgery medical fellowship.

UROL 8254. Urological Seminar. (; 2 cr.; Student Option; Every Spring & Summer) tbl

UROL 8255. Urological Radiological Conference. (; 2 cr.; Student Option; )

UROL 8256. Urological Pathological Conference. (; 2 cr.; Student Option; )

UROL 8257. Selected Topics in Genitourinary System. (; 1 cr.; Student Option; )

Veterinary & Biomedical Sc (VBS)


VBS 2032. General Microbiology With Laboratory. (; 5 cr.; A-F only; Every Fall & Spring)
Bacterial metabolism, growth/genetics, biology of viruses/fungi. Control of microorganisms. Host-microbe interactions, microorganisms/ disease, applied microbiology. prereq: One semester each of college chemistry, biology.

VBS 2100. Companion Animal Anatomy. (; 3 cr.; A-F only; Every Spring) Develop anatomical knowledge through study/dissection. Compare/contrast animal adaptations. Prereq: General Biology (e.g., BIOL 1005) is recommended.

Veterinary Clinical Sciences (VCS)

VCS 4606. Small Animal Management. (; 3 cr.; A-F or Audit; Every Fall & Spring) This online course provides an overview of small animal management. Species covered include dogs, cats, small mammals, reptiles, and birds. Course content covers public health, community education, general wellness care, and recognizing common diseases in small animals. Student learning is assessed through online quizzes, discussion participation, and group projects.

VCS 4992. Directed Readings in Veterinary Clinical Sciences. (; 1-6 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Students read seminal works in veterinary medicine and literature pertaining to their area of interest. Final project evaluated by faculty member. prereq: [One-page proposal, bibliography of works to be read] submitted to faculty.

VCS 4993. Directed Study in Veterinary Clinical Sciences. (; 1-6 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Students expand their knowledge of a specific area. Final project evaluated by faculty member. prereq: One-page proposal submitted to faculty member.

VCS 4994. Directed Research in Veterinary Clinical Sciences. (; 1-6 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer) Students perform research in lab setting. prereq: One-page proposal submitted to faculty member.

Veterinary Med Summer Research (VTMD)

VTMD 4999. Veterinary Medicine Summer Research. (; 0 cr.; No Grade Associated; Every Summer) Veterinary Medicine Summer Research.

Veterinary Medicine (CVM)

CVM 6000. Gopher Orientation and Leadership Experience. (; 2 cr. [max 4 cr.]; S-N only; Every Fall & Spring) Introduces first-year students to the veterinary college, program, and profession. Two-day and one-night off-site orientation program and monthly meetings are experiential in design and focus on leadership development, emotional intelligence, communication, and conflict management. Third orientation day on campus and subsequent noon meetings introduce students to the college facilities and resources and address logistics necessary for participation in the program. Students work in mentor groups of 9-11 students and 2-3 faculty mentors throughout the course. prereq: Admission to veterinary program

CVM 6001. Global and Intercultural Opportunities. (; 0.5 cr. [max 1 cr.]; S-N only; Every Fall) Finding and applying for opportunities. Securing funding. Travel safety. Topics in cultural competence. Presentations from students who have participated in international projects.


CVM 6006. Global One Health: Thailand. (3 cr.; S-N only; Periodic Spring) Self-guided study. Monthly in person seminars prior to three week study abroad in Thailand. Journal on recommended topics. Assessment via evidence of reading provided references through active participation in discussions, presentation of learning topics, active participation.

CVM 6007. Global Perspectives and Intercultural Development. (0.5 cr.; S-N only; Every Spring) This course provides information on international and cultural immersion opportunities including finding and applying for international opportunities, securing funding, and traveling safely. Additionally, students will explore cultural humility through the Intercultural Development inventory, case studies, and class activities. Students will also have the opportunity to view posters and ask questions from current students who have participated in international projects.

CVM 6026. Small Animal ICU Practicum: Year 4. (; 1 cr. [max 3 cr.]; S-N or Audit; Every Fall, Spring & Summer) Management of dogs/cats requiring urgent medical care, intensive medical management. Providing primary case support through patient evaluation, problem solving, health care delivery, equipment operation. Practicum in Small Animal Intensive Care Unit.

CVM 6027. Large Animal Practicum: Year 3. (1 cr.; S-N only; Every Fall & Spring) Experience in procedures/policies involved in after-hours care of hospitalized/emergency cases in the large-animal hospital. Prereq: 3rd DVM or [Instr consent, college consent]

CVM 6028. Large Animal Clerk Duty. (4 cr. [max 12 cr.]; S-N or Audit; Every Fall, Spring & Summer) Team leadership in procedures/policies involved in after hours care of hospitalized/emergency cases in large-animal hospital. prereq: All 4th year students in Food Animal,
Equine, Mixed tracks, as well as affiliate students.

CVM 6029. Small Animal Hospital Practicum: Year 3. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Management of dogs/cats requiring urgent medical care, intensive medical management. Providing primary case care and service support through patient evaluation, problem solving, health care delivery, equipment operation. Practicum is served in Small Animal Intensive Care Unit. prereq: DVM 3rd yr or instr consent

CVM 6030. Veterinary and Community Public Health. (2 cr.; A-F or Audit; Every Spring) Epidemiological approach to veterinary public health. Major zoonoses, animal sentinels, meat/milk inspection, preharvest food safety, environment, occupational health/safety, euthanasia, carcass disposal methods, cruelty investigations, welfare issues. Problem-solving examples. prereq: 6201, 6202, 6220

CVM 6137. Small Animal Clinical Nutrition. (2 cr. [max 6 cr.; A-F only; Every Fall, Spring & Summer) Students participate in clinical nutrition service of VMC, manage nutritional needs of patients, perform nutritional assessments of ICU patients, perform internal/referring nutritional consultations, and see outpatient appointments. prereq: 3rd or 4th yr DVM or instr consent

CVM 6206. Introduction to Integrative Medicine. (1 cr.; S-N only; Every Spring) This 1 week elective rotation is primarily provided for 4th year veterinary students. The integrative medicine rotation will cover traditional eastern veterinary medicine, animal chiropractic, nutritional therapy, nutraceuticals, physical therapy, and massage therapy.

CVM 6222. Advanced Clinical Epidemiology. (1 cr.; max 2 cr.; A-F only; Every Fall) Apply epidemiologic principles to control of infectious diseases in animal populations. Scientific literature. Global impacts of infectious diseases. Diagnostic tests, disease outbreak investigation, economics of disease control/surveillance.

CVM 6308. Lab Animal Medicine. (2 cr.; A-F only; Every Spring & Summer) This course is designed to introduce students to the field of laboratory animal medicine and provide a strong foundation in the discipline. Using a mix of didactic and hands-on training methods, students will gain proficiency in the veterinary care of lab animals, and apply their skills and knowledge gained in all previous courses in their veterinary curriculum. Discussions will be challenging and require independent thought and application of concepts to real-world situations. Students will be well-prepared for additional training in laboratory animal medicine as would occur though residency.

CVM 6312. Veterinary Dental Rotation (SDen). (2 cr. [max 6 cr.]; A-F only; Every Fall, Spring & Summer) Routine/complex dental problems. Students diagnose and formulate treatment plans. Hands-on training. Basic periodontal procedures, single/multi-rooted extractions, dental radiographic techniques, instrument/equipment care, dental charting, prereq: DVM 3rd or 4th yr student or instr consent

CVM 6404. Small Animal Dermatology: Advanced Block. (1 cr.; A-F or Audit; Every Spring) Case-base discussion of common dermatologic conditions that affect dogs/cats. Students work on clinical cases outside classroom. Cases are discussed in classroom.

CVM 6452. Metabolic Disorders II. (3 cr.; A-F or Audit; Periodic Fall) Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, and management protocols for metabolic and endocrine based disorders of domestic species. prereq: DVM 3rd yr or instr consent

CVM 6482. Small Animal Theriogenology. (1 cr. [max 2 cr.]; A-F only; Every Fall) Normal/abnormal reproduction in dogs/cats. Dystocia management. Diagnosis/treatment of reproductive tract disease. Exotics. prereq: 3rd yr DVM or instr consent


CVM 6500. Animal, Public, and Ecosystem Health. (2 cr. [max 4 cr.]; S-N only; Every Fall, Spring & Summer) Emphasize interactions with public health, policy, and regulatory partners to provide a basic understanding of the essential roles veterinarians play in public health, disease control, food safety, and ecosystem health. prereq: DVM 3rd or 4th yr or grad student or instr consent

CVM 6501. Advanced Veterinary Public Health: Current Topics. (1 cr. [max 2 cr.]; S-N only; Every Fall, Spring & Summer) Systems used to raise livestock/poultry, deliver through markets to slaughter or processing facilities, and deliver to consumers. Methods to assess/mitigate risks. Emphasizes public health/food safety issues. Field trips, problem solving, assignments. prereq: DVM or MPH or grad student or instr consent

CVM 6502. Necropsy. (2 cr. [max 40 cr.]; S-N only; Every Fall, Spring & Summer) Students perform necropsies, collect tissues for lab analysis, interpret clinicopathologic findings, prepare reports on animals submitted to Veterinary Diagnostic Lab, apply basic clinical science to diseases for animals and populations of animals. Students may participate in history taking. Case findings discussed daily. Student groups present case reports at weekly departmental seminar. prereq: DVM 3rd or 4th yr or instr consent

CVM 6503. Exotic Animal Necropsy Rotation. (2 cr.; A-F only; Every Fall, Spring & Summer) Zoo/wildlife pathology service similar to required necropsy rotation (CVM 6502). Perform necropsies of incoming cases of "nontraditional" animals. Write report and after discussion with faculty member choose appropriate additional tests. Perform histologic evaluation of selected organs. Small projects pertaining to exotic animal pathology (and medicine). Present during lab's Thursday seminar series.

CVM 6504. Remediation course... (0.5-9 cr. [max 27 cr.]; S-N or Audit; Periodic Fall, Spring & Summer) Remediation course.

CVM 6505. Topics course. (0-8 cr. [max 80 cr.]; Student Option; Every Fall, Spring & Summer) Topics Course

CVM 6506. Directed Studies in Large Animal Medicine (DistL). (1-2 cr. [max 40 cr.]; S-N or Audit; Every Fall, Spring & Summer) Students, under guidance of a faculty member, conduct a special project addressing an issue in large animal medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser and approval by the College of Veterinary Medicine's curriculum committee. prereq: DVM 4th yr or instr consent

CVM 6507. Directed Studies in Small Animal Medicine (DistS). (1-2 cr. [max 40 cr.]; S-N or Audit; Every Fall, Spring & Summer) Students, under guidance of a faculty member, conduct special project addressing an issue in small animal medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser and approval by CVM's curriculum committee. prereq: DVM 4th yr or instr consent

CVM 6508. Directed Studies: Pathobiology (DistB). (1-2 cr. [max 40 cr.]; S-N or Audit; Every Fall, Spring & Summer) Students, under guidance of a faculty member, conduct special project addressing an issue in veterinary pathobiology. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser and approval by CVM's curriculum committee. prereq: DVM 4th yr or instr consent

CVM 6509. Directed Studies: Diagnostic Medicine (DistD). (1-2 cr. [max 40 cr.]; S-N or Audit; Every Fall, Spring & Summer) Students, under guidance of a faculty member, conduct special project addressing an issue in diagnostic medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by faculty adviser and approval by CVM's curriculum committee. prereq: DVM 4th yr or instr consent

CVM 6510. MPH Project: PHP. (1-3 cr. [max 9 cr.]; S-N only; Every Fall, Spring & Summer)
Directed field research. Original or secondary analysis of data sets related to public health practice. prereq: DVM student or instr consent

**CVM 6512. Zoo and Wildlife Rounds.** (1-2 cr.; [max 3 cr.]; S-N or Audit; Every Fall & Spring)
Zoo, wildlife, and exotic pet conservation. Seminars involving topics of exotic animal conservation, medicine, and pathology encountered at Minnesota, Como, and Lake Superior zoos; Raptor Center; and Minnesota Veterinary Diagnostic Laboratory. Basic biology of the affected animals, clinical aspects, and pathology of encountered diseases. Apply principles of basic clinical science to address the cause of disease for individual animals as well as populations of #animal.

**CVM 6513. Topics on Climate Change and Agriculture.** (1 cr.; A-F only; Every Spring)
Science of climate change, role of agriculture and steps that are being taken to mitigate effects. Readings/discussions on a series of topics including, evidence for climate change, policy actions, carbon credits, soil sequestration, role of livestock, anaerobic digesters, and carbon footprint.

**CVM 6514. Directed Studies in Food Animal Medicine (DistFA).** (1-2 cr.; S-N only; Every Fall, Spring & Summer)
Conduct special project addressing issue in food animal medicine under guidance of faculty member. Project proposals include hypothesis, objectives, plan of study, product for evaluation by adviser/approval by CVM's curriculum committee.

**CVM 6515. Externship (Extern).** (1-2 cr.; [max 24 cr.]; S-N or Audit; Every Fall, Spring & Summer)
Students spend two weeks/rotation in a practice or other professional setting. prereq: DVM 3rd or 4th yr or instr consent

**CVM 6516. Field Experience in Public Health Practice.** (0.5-8 cr.; [max 24 cr.]; S-N only; Every Fall, Spring & Summer)
Directed field experience or clinical rotation/practicum in selected community or public health agencies/institutions. Integration of knowledge/skills in population science for public health. prereq: DVM student or instr consent

**CVM 6519. Wildlife Rehabilitation Center Summer Internship.** (0.1 cr. [max 0.25 cr.]; S-N only; Every Summer)
Six-week summer internship (15 hr/ wk) at Wildlife Rehabilitation Center. Hands-on learning in clinical medicine; avian, waterfowl, and mammal nurseries; wildlife handling and management; and wildlife rehabilitation. Final project. prereq: DVM student

**CVM 6520. Small Animal Theriogenology and Pediatrics.** (1 cr.; A-F only; Every Fall, Spring & Summer)
On-line rotation consisting of individualized study and directed review of advanced topics in small animal theriogenology.

**CVM 6521. Avian & Exotic Medicine.** (2 cr.; A-F only; Every Fall, Spring & Summer)
Develop the knowledge and technical skills needed to manage common medical and surgical issues of popular avian and exotic species.

**CVM 6522. RaOI Large Animal Medicine.** (1-2 cr.; [max 4 cr.]; Student Option; Every Fall, Spring & Summer)
Large Animal Medicine Rotation at another accredited veterinary college and used to meet a core medicine requirement.

**CVM 6523. Shelter Medicine Rotation at Other Institution.** (1-2 cr.; [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Shelter Medicine (spay and neuter) at another accredited veterinary college and used to meet a core requirement.

**CVM 6524. Ambulatory Medicine Rotation at Other Institution.** (1-2 cr.; [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Ambulatory Medicine at another accredited veterinary college and used to meet a core requirement.

**CVM 6525. Rotation at Other Institution (RAO).** (1-2 cr.; [max 40 cr.]; S-N only; Every Fall, Spring & Summer)
Students to spend one-six weeks in an organized program at another degree-granting institution, in an area either not offered at the University or in one that complements experience in a clinical rotation at the University. prereq: DVM 4th yr or instr consent

**CVM 6526. Dermatology Rotation at Other Institution.** (1-2 cr.; [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Rotation through or in one that students may take a required dermatology course at another accredited veterinary college. prereq: DVM 3rd or 4th year or instr consent

**CVM 6527. Anesthesiology Rotation at Other Institution.** (1-2 cr.; [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Rotation offered allowing students to fulfill their anesthesiology rotation requirement at another accredited veterinary college. prereq: DVM 3rd or 4th year or instr consent

**CVM 6528. Radiology Rotation at Other Institution.** (1-2 cr.; [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Radiology core rotation taken at another accredited veterinary college and used to meet core requirements. prereq: DVM 3rd or 4th year or instr consent

**CVM 6529. Large Animal Surgery Rotation at Other Institution.** (1-2 cr.; [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Equine Medicine Rotation at another accredited veterinary college and used to meet a core medicine requirement. prereq: DVM 3rd or 4th year or instr consent

**CVM 6531. Biosecurity and Bioccontainment for Food Animals.** (2 cr.; A-F only; Every Spring & Summer)
Rotation. Bioccontainment and biosecurity measures and strategies that are being used in the food animal industry (swine, poultry and dairy) to prevent the spread of disease. Hands on experience for students interested in developing biosecurity plans for farms. Pathogen transmission and between populations, the routes of pathogen dissemination and measures and strategies used to prevent disease dissemination. Hands on biosecurity audits/develop recommendations for system improvement.

**CVM 6532. Clinical Laboratory Medicine (Labs).** (2 cr.; [max 4 cr.]; A-F only; Every Fall & Summer)
One-week intensive rotation in veterinary clinical lab medicine. Hematology, cytology, clinical chemistry, endocrinology, microbiology. Sample submission. Lab test methodology. Didactic teaching, small group discussion, case-based/guided self-instruction, microscopy. prereq: DVM 3rd or 4th yr or instr consent

**CVM 6535. RaOI Large Animal Surgery and Lameness.** (2 cr.; A-F only; Every Fall, Spring & Summer)
Large Animal Surgery Rotation at another accredited veterinary college and used to meet a core medicine requirement.

**CVM 6538. Lakefield Clinical Rotation.** (2 cr.; A-F only; Every Fall, Spring & Summer)

**CVM 6539. Wellhaven.** (2 cr.; A-F only; Every Fall, Spring & Summer)
The intent of this rotation is to provide the student with experience, instruction and supervision managing a general clinical caseload in a non-referral, non-academic setting. The student will use knowledge gained in didactic coursework to refine their medical knowledge base. The student will be provided the opportunity to improve their clinical skills working with patients seen at a Wellhaven hospital under the supervision of an assigned Wellhaven mentor and staff.

**CVM 6540. Advanced Veterinary Toxicology.** (2-8 cr.; [max 40 cr.]; S-N or Audit; Every Fall, Spring & Summer)
In-depth examination of toxins. Clinical, diagnostic, mechanistic, and therapeutic aspects of biotoxins, organic, and inorganic toxins that affect livestock, poultry, wildlife, and companion animals or that threaten public health. prereq: DVM 3rd or 4th yr or instr consent

**CVM 6560. Public Health Issues and Veterinary Medicine Opportunities.** (1 cr.; [max 2 cr.]; A-F only; Every Fall & Spring)
Public health practice and veterinary medicine. Day-to-day work of public health professionals. Public health principles in context. Veterinary medicine related to public health research/practice. Students interact with advocacy groups, media, lobbyists, legislators, regulatory officials, industry leaders, and public health professionals.

**CVM 6601. Small Animal Internal Medicine:** (SAM A). (2 cr.; [max 4 cr.]; Student Option; Every Fall, Spring & Summer)
Primary case responsibility for wide range of clinical diseases. History taking, physical examination, problem definition, diagnostic/therapeutic plans on assigned cases. Cases typically relate to gastroenterology, urology, nephrology, oncology, neurology, and cardiology. Daily rounds. Students present case discussion topics and interpret lab data, radiographic evaluations, and biopsy information. Emphasizes effective communications with clients/referring veterinarians. prereq; DVM 3rd or 4th yr or instr consent

CVM 6602. Small Animal Internal Medicine: (SAM B). (2 cr. [max 52 cr.]; Student Option; Every Fall, Spring & Summer)
Problem-solving skills, clinical skills, communication skills, record keeping, ethical issues in referral cases. Methods of knowledge acquisition, including computerized searches and diagnostic programs. Small group round discussions. Students assist clinicians in management of referral/emergency cases. Cases typically related to gastroenterology, nephrology, urology, oncology, nutrition, neurology, and cardiology. prereq; [6601, DVM 3rd or 4th yr] or instr consent

CVM 6605. Banfield Elective Clinical Rotation. (2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer)

CVM 6609. Emergency/Critical Care (ECC). (2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Emergency/critical-care cases in small animal practice or emergency practice. History taking, physical exams. Creating problem lists, proposing diagnostic/therapeutic plans. prereq; Sr

CVM 6630. Behavior. (2 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Students participate in behavior consultations: history taking, diagnosis, outline of treatment protocols, sample collection, demonstration of training techniques, writing of treatment plans, case follow-up. Students present one case, prepare one topic of their choice for presentation during rounds. Daily rounds include discussion of cases, review of behavior-related articles, discussion of problem complexes. prereq; DVM [3rd or 4th yr] or grad student or instr consent

CVM 6632. Dermatology (Derm). (2 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer)
Routine dermatologic problems in companion animal practice. History taking, clinical diagnosis, patient management, client education. Students participate in all phases of diagnosis/management of cases. Small-group discussions. prereq; DVM 3rd or 4th yr or instr consent

CVM 6634. Ophthalmology. (2 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Enter-level ophthalmology. Diagnosis, treatment. Outside readings, review papers, final essay exam. prereq; DVM 3rd or 4th yr or instr consent

CVM 6636. Cardiology. (2 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Clinical problem solving. Cases of cardiopulmonary disease, including canine/feline congenital heart disease, acquired valvular/myocardial disease, dirofilariasis, arrhythmias, pulmonary disorders. Hands-on experience in conducting physical exams, recording electrocardiograms/echocardiograms, and reading thoracic radiographs. Group discussions, rounds. prereq; DVM 4th yr or CVM grad or instr consent

CVM 6644. Primary Care A. (2 cr. [max 40 cr.]; Student Option; Every Fall, Spring & Summer)
Students manage their own cases including developing diagnostic, treatment, and preventative health maintenance plans for each patient, performing routine medical and surgical procedures, and conducting client communication and education. Wide variety of cases.

CVM 6648. Advanced Clinical Oncology Rotation. (2 cr. [max 4 cr.]; Student Option; Every Fall, Spring & Summer)
Case management, self-directed research. Students receive oncology referrals, work with emergency cases and special procedures, assist in treatment decisions and therapeutic options for new cases, and manage ongoing chemotherapy/radiation therapy patients. Emphasizes principles of oncology and patient care. prereq; DVM 3rd or 4th yr or grad student or instr consent

CVM 6649. Primary Care B. (2 cr. [max 8 cr.]; Every Fall, Spring & Summer)
Students manage their own cases including developing diagnostic, treatment, and preventative health maintenance plans for each patient, performing routine medical and surgical procedures, and conducting client communication and education. Wide variety of cases.

CVM 6651. Small Animal Ultrasound. (2 cr. [max 8 cr.]; A-F only; Every Fall, Spring & Summer)
Students practice routine abdominal ultrasound. Principles for interpretation of exam. Learning through use of clinical caseload. Daily practice of particular ultrasound skills. Students scan clinical patients and interpret radiographic procedures as needed. prereq; [3rd or 4th yr] DVM or instr consent

CVM 6656. Small Animal Radiography. (2 cr. [max 4 cr.]; Student Option; Periodic Fall & Spring)
Contrast agents and procedures used to examine various body systems or anatomical areas. prereq; DVM 3rd or 4th yr or grad or instr consent

CVM 6666. Special Procedures in Veterinary Radiology. (2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Making high quality radiographs. Students practice routine and special procedures. Principles for interpretation. Exposure to CT and MRI. Daily radiographic interpretation in small animal species. Issues related to radiation protection. prereq; DVM 3rd or 4th yr or instr consent

CVM 6669. Radiology: Mixed Animal. (2 cr. [max 4 cr.]; A-F only; Every Fall, Spring & Summer)
Making high-quality radiographs. Students practice routine and special procedures. Principles for interpretation. Exposure to CT and MRI. Daily radiographic interpretation in small animal species. Issues related to radiation protection. prereq; DVM 3rd or 4th yr or instr consent
CVM 6690. Integrative Medicine. (1 cr.; S-N only; Every Spring) History/principles of acupuncture, chiropractic, and other commonly used complementary approaches to care of domestic animals. Training requirements for certification. Lectures, case examples, demonstrations. prereq: 2nd yr DVM student or instr consent

CVM 6691. Veterinary Acupuncture (AcPunct). (2 cr.; [max 6 cr.]; Student Option; Every Fall, Spring & Summer) Basic veterinary acupuncture theory, point combination, treatment, diagnosis of diseases, hands-on veterinary acupuncture technique. prereq: [6690, yr 3 or 4 DVM] or instr consent

CVM 6702. Large Animal Palpation Labs. (1.5 cr.; max 2 cr.; S-N only; Every Fall) Hands-on clinical experiences in equine, bovine, or large animal reproductive status/disorders. Students select species. prereq: DVM or instr consent

CVM 6704. Reproductive Diseases of Cattle. (2 cr.; max 6 cr.; A-F or Audit; Every Fall) Common diseases affecting reproductive function in cattle, swine, and small ruminants. prereq: 3rd yr DVM or instr consent

CVM 6711. Large Animal Medicine (LAM). (2 cr.; max 8 cr.; Student Option; Every Fall, Spring & Summer) Medical diseases of horses, cattle, small ruminants, South American camellids, and penned pigs. History taking, clinical diagnosis, patient management. Assessment of treatment responses. Clinic case material, opportunities to practice common procedures. Small group discussions on clinical diagnosis, treatment, and prevention of common medical disorders. prereq: DVM 3rd or 4th yr or instr consent

CVM 6712. Equine Ambulatory Rotation. (2 cr.; max 4 cr.; A-F only; Every Fall, Spring & Summer) Equine ambulatory rotation meeting for two weeks performing farm calls, call backs, x-ray development, and restocking the van. Student and practitioner discuss cases as calls are being made.

CVM 6715. Large Animal Surgery and Lameness. (2 cr.; max 10 cr.; Student Option; Every Fall, Spring & Summer) General surgery, lameness cases. Emphasizes horses. Some cattle, small ruminants/camelids. Diagnostic/therapeutic management in hospital setting. Cases, rounds, exercises. Students work as part of surgical management or advanced diagnostic/therapeutic techniques available in a referral setting. prereq: 3rd or 4th yr DVM student or instr consent

CVM 6720. Problem Solving in Equine Medicine. (2 cr.; A-F or Audit; Every Spring) Evidence-based medicine and clinical epidemiology concepts are integrated into discussion of cases. Assignments include reading of journal articles, working through case scenarios on Web CT, and answering case-based questions. prereq: DVM 3rd yr or instr consent

CVM 6721. Large Animal Neonatology. (1 cr.; max 2 cr.; S-N or Audit; Every Fall) Instruction, emergency duty, practical application of principles in evaluating/treating sick equine neonates. Seasonal participation in clinically managing hospitalized foals/penniets periodically reviewing past cases.

CVM 6727. Equine Palpation. (0.5 cr.; max 1 cr.; S-N only; Every Fall) Hands-on clinical experience in evaluation of equine reproductive status and reproductive disorders. prereq: DVM or instr consent

CVM 6728. Reproductive Diseases of the Horse. (1 cr.; A-F or Audit; Every Fall) Reproduction patterns, breeding practices, management, artificial insemination, economics of reproductive performance, and infertility in horses. prereq: DVM 3rd yr or instr consent

CVM 6732. Equine Dentistry and Preventative Medicine. (2 cr.; max 4 cr.; A-F only; Every Fall, Spring & Summer) Two-week rotation on dental health care and general preventative health care for horses. Field trips, presentations, labs, case studies, clinical cases. prereq: 3rd or 4th yr DVM or instr consent; intended for equine track or mixed track students

CVM 6733. Equine Dentistry and Nutrition. (2 cr.; max 4 cr.; A-F only; Every Fall & Spring) Equine dentistry and practical abilities for diagnosis/treatment of dental disorders. Equine nutrition and the practical application of common nutrition related health problems. Lectures, hands on activities, group work, and case correlates.

CVM 6736. Equine Lameness and Podiatry. (2 cr.; max 4 cr.; A-F only; Every Fall, Spring & Summer) Rotation introduces diagnosis/treatment of equine lameness/hoof disorders. Clinical cases, presentations, case studies, labs. prereq: Intended for equine track or mixed track students

CVM 6737. Equine Sports Medicine. (2 cr.; S-N or Audit; Every Fall) Equine lameness and podiatry. Develop lameness and evaluation skills. Diagnostic principles for identifying lameness. Medical, surgical and rehabilitation therapies available to treat lameness. Didactic material, labs, and clinical cases. prereq: 6736

CVM 6747. Equine Theriogenology. (2 cr.; max 16 cr.; Student Option; Every Fall, Spring & Summer) Techniques in equine reproduction. Handling of stallions and mares. Testing for estrus detection. Rectal palpation, ultrasound exam of reproductive tract. Breeding management, hormone treatments, vaginal examination, uterine culture, cytology and biopsy, semen collection and evaluation, intrauterine therapy, artificial insemination.

CVM 6750. Equine Sports and Rehabilitation Medicine. (2 cr.; max 4 cr.; A-F only; Every Fall & Spring) Rotation on equine sports medicine, exercise physiology, and rehabilitation therapy. Common injuries, prevention/management protocols. Principles/practices of athletic conditioning, performance testing, and rehabilitation therapy. Field trips, presentations, labs, case studies, clinical cases. prereq: DVM 3rd or 4th yr or instr consent; intended for equine track or mixed track students

CVM 6798. Fresh Dairy Doe and Newborn Goat Kid Management. (2 cr.; max 4 cr.; A-F only; Every Spring) Rotation at Poplar Hill Goat Dairy during fresh doe/goat kid season. How to recognize, diagnose, and treat kid illnesses. Health strategies to control Johnne’s, caprine arthritis encephalitis virus, coccidiosis, neonatal diarrheas, mastitis, parasitism, and nutritional deficiencies.

CVM 6792. Small Ruminant Health and Production Rotation (SmRu). (2 cr.; max 4 cr.; Student Option; Every Fall, Spring & Summer) Sheep, goat, llama, farmed-deer production, medicine, and health. Nutrition/health management, new stock, facility maintenance, husbandry, diagnosis, record keeping, zoonosis, necropsy. Reproductive management. Breeding soundness examination, body condition, vasectomy, ultrasound, castration, tail docking, disbudding, dehorning, vaccination, parasites, restraint/handling, venipuncture, foot trimming, tuberculin testing. Farm visits. prereq: DVM 3rd or 4th yr or instr consent

CVM 6794. Camelid Medicine, Surgery, Reproduction, and Health Management. (2 cr.; max 4 cr.; A-F only; Every Spring) Two-week rotation. Approximately 15 farm visits are made to alpaca/llama farms. Approximately 10 alpacas/llamas are evaluated at VMC. Hands-on learning environment. Physical exam, venipuncture, ultrasound. Field surgeries such as castration, dental work, foot trimming, venipuncture, body condition score, preventive herd health management, pharmaceuticals. Common medical/reproductive problems. Interstate health certificates. Tuberculosis testing and necropsy. prereq: 3rd or 4th yr DVM or instr consent


CVM 6797. Beef Production Systems Medicine: Cow-Calf (BPSCC). (2 cr.; max 4 cr.; A-F only; Every Fall, Spring & Summer) Beef production medicine and health management. How cow-calf medicine fits within the larger North American beef
CVM 6798. Beef Production Systems Medicine: Feedlot A. (2 cr. [max 4 cr.]; A-F only; Every Fall)
Beef cattle feedlot production, medicine, health management. Production systems. Receiving protocols, economics. Livestock selection/evaluation, health management, facility evaluation. Pre-conditioning, pre-immunization, environmental pollution monitoring, transportation/vaccine protocols, nutrition, respiratory diseases, epidemics/disease. Evaluation of small/large feedlot operations. Body condition scoring, castration, dehorning/parasite control. Necropsy, Field pathology sampling. Feedlot A rotation is located in Canada. Students are required to fund travel expense. prereq: DVM 3rd or 4th yr student or inst consent

CVM 6799. Beef Productions Medicine: Feedlot B. (2 cr. [max 4 cr.]; A-F only; Every Fall & Summer)
Beef cattle feedlot production, medicine, health management. Production systems. Receiving protocols, economics. Livestock selection/evaluation, health management, facility evaluation. Pre-conditioning, pre-immunization environmental pollution monitoring, transportation/vaccine protocols, nutrition, respiratory diseases, epidemics/disease. Evaluation of small/large feedlot operations. Body condition scoring, castration, dehorning/parasite control. Necropsy, Field pathology sampling. Feedlot B rotation is located in Nebraska. Students are required to fund travel expense. prereq: DVM 3rd or 4th yr student or inst consent

CVM 6800. Bovine Balpation. (1 cr.; S-N only; Every Fall) Practice in diagnostic evaluation of bovine reproductive tract. prereq: DVM or instr consent

CVM 6806. Food Animal Disease and Diagnostics. (2 cr. [max 4 cr.]; Student Option; Every Spring)
Two-week rotation. Food animal necropsies, diagnostic assays. prereq: 3rd or 4th yr DVM student or inst consent

CVM 6807. Food Animal Surgery & Anesthesia. (2 cr.; A-F only; Every Fall & Spring)
This course is designed to provide intensive training in ruminant surgery to senior students. The course is unusual in format from most veterinary curriculum offerings and provides an in-depth evaluation of food animal surgery principles as well as hands-on laboratory components to solidify understanding of the material.

CVM 6811. Overview of Bovine Theriogenology and Lameness (OBTL). (2 cr. [max 20 cr.]; A-F only; Every Fall, Spring & Summer)
This is a senior rotation that will focus on improving students’ clinical skills in the examination of the bovine female. Students will participate during this rotation in routine veterinary (reproductive and lameness related) procedures provided by the instructors’ dairies. Students will be taught topics related to diagnostics, correction and management of reproductive and foot diseases of dairy cows, topics related to reproductive and lameness management of dairy herds, and on-farm data analysis related to reproductive and health performance. prereq: inst consent

CVM 6813. Miracle of Birth. (2 cr. [max 4 cr.]; A-F only; Every Fall & Summer)
Delivery of calves, lambs, and piglets at the Minnesota State Fair. Assist in public education about large animal veterinary medicine processes. Birthing and veterinary assistance of the birthing process. Media relations and interviews. Students work with large animal veterinarians, FFA students, and instructors in this rotation.

CVM 6817. Bovine Theriogenology & Lameness Advanced. (2 cr.; A-F only; Every Fall, Spring & Summer)
Rotation will build on bovine theriogenology and lameness overview and offer more advanced techniques for bovine-interested students.

CVM 6821. Dairy on Farm Clinical. (2 cr. [max 12 cr.]; A-F only; Every Fall, Spring & Summer)
Typical transition cow management, clinical veterinary care. Students assist in all aspects of day-to-day management of TFM. Fresh cow screening/therapies, calvings, routine animal management. Students live at TFM during rotation. prereq: 3rd or 4th yr DVM student or inst consent

CVM 6831. Overview of Dairy Production Medicine. (2 cr.; A-F only; Every Spring)
Gives students the background necessary to promote animal welfare, prevent disease and assist clients in making decisions that enhance their farms productivity and financial well-being.

CVM 6842. Swine Disease Diagnostics, Therapeutics, and Prevention. (2 cr. [max 4 cr.]; Student Option; Every Fall & Spring)
Field trips of high/low-health farms, abattoir for slaughter check. Problem solving, discussion of on-farm disease cases. In-clinic diagnostic techniques. prereq: DVM 3rd or 4th yr or inst consent

CVM 6845. Swine Production Training (SPTr). (2 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer)
Day-to-day management of modern swine farm. Students assist with all techniques, protocols, and practices encountered daily in swine unit, conduct any necessary necropsies or surgical techniques, investigate production/health problems. On final day of rotation, students lead herd visit, summarize findings with producer and course coordinator, and write a herd report. prereq: 3rd or 4th yr DVM or inst consent

CVM 6854. Introduction to Swine Health and Production. (2 cr. [max 12 cr.]; Student Option; Every Summer)
Clinical problem solving based on case examples, first-hand field experiences. Students visit/assist enterprises representing all components of pork chain, from feed milling, to animal production, to slaughter/processing. Roles/responsibilities veterinarians have in food animal production. Problem definition/investigation. Formal follow up, report writing, oral presentation of recommendations.

CVM 6856. Advanced Swine Health and Production. (2 cr. [max 4 cr.]; Student Option; Every Spring)
Capstone course. Complex field problems. Student teams take a field case, work it up, and propose steps for farm to resolve problem. Lectures, in-class exercises, field trips.

CVM 6860. Integrating Laboratory Diagnostics With Field Investigations of Swine Disease. (2 cr. [max 4 cr.]; Student Option; Every Summer)
Students follow selected swine disease investigations, from farm through diagnostic lab and back, determine impact of specific swine diseases on productivity and cost of production, design a control program, and collect/submit quality samples to diagnostic lab. prereq: DVM 3rd or 4th yr or inst consent

CVM 6865. Introduction to Swine Production Medicine. (1 cr. [max 2 cr.]; A-F only; Every Spring)
Contemporary approaches to swine practice. Swine production, disease diagnosis. Control, treatment, eradication. prereq: DVM student or inst consent

CVM 6883. Raptor. (2 cr. [max 4 cr.]; Student Option; Every Fall, Spring & Summer)
Students participate in all aspects of raptor medicine, surgery, and rehabilitation and gain avian experience. Conservation medicine. prereq: 6497, DVM 3rd or 4th yr, inst consent

CVM 6884. Poultry Medicine Clerkship (PMC). (2 cr. [max 8 cr.]; A-F only; Periodic Fall, Spring & Summer)
Broiler, layer, and turkey industries, performance analysis, disease diagnosis, management techniques for prevention/control of disease, food safety problems and diagnostic pathology in a laboratory setting. Classroom presentations, discussions, on-farm evaluations.

CVM 6900. Microscopic Anatomy I. (2 cr.; A-F only; Every Fall)
Identification, description, and understanding of basic structure and elements of cells and basic tissues. Identify and describe structure and organization of organ systems presented.

CVM 6901. Physiology I. (5 cr.; A-F only; Every Fall)

CVM 6902. Veterinary Biochemistry, Nutrition & Genetics. (3 cr.; A-F only; Every Fall)
Principles of biochemistry, genetics, nutrition. Background information/how it is used to understand animal health/disease. Examples reinforced with in-class/out-of-class problems.

CVM 6903. Anatomy I. (4 cr.; A-F only; Every Fall)
Sequential integration of normal gross/radiographic anatomy of carnivore. Knowledge gained provides solid foundation for current/subsequent courses within veterinary professional curriculum.

CVM 6904. Clinical Skills I. (1 cr. [max 2 cr.]; S-N only; Every Fall)
Introduction to small/large animal species. Fundamental clinical skills for small/large animal species. Proper physical exam, safe handling/restraint, behavior/animal safety, frequently used clinical skill procedures. Large animal practicum. prerequisites: 1st year clinical skills course

CVM 6905. Professional Development I. (1 cr.; S-N only)

CVM 6906. Critical Scientific Reading. (1 cr. [max 2 cr.]; S-N only; Every Fall)
Skill development in reading of scientific literature. Papers critiqued for experimental design, statistical analysis, validity of results, contributions to literature, merit of study conclusions. Major aim of the course is to prepare veterinary students to think scientifically, for multiple career pathways, and an increasingly important role for veterinarians in comparative medicine.

CVM 6907. Professional Development II. (1.5 cr.; S-N only; Every Spring)
Develop knowledge/proficiency needed to be successful veterinarian in areas such as communication, ethics, clinical decision-making, medical record keeping. Lecture, hands-on experiences, small group/mentor group discussions. The course will provide an overview of One-Health, animal welfare, legislative/current issues, and field trips to visit animal production facilities.

CVM 6908. Anatomy II. (3 cr. [max 5 cr.]; A-F only; Every Spring)
Sequential integration of normal gross/radiographic anatomy of ungulates. Knowledge gained will provide solid foundation for current/subsequent courses within veterinary professional curriculum.

CVM 6909. Clinical Skills II. (1 cr.; S-N only; Every Spring)
Every Spring
Clinical animal behavior. Basic small animal handling/management skills. Introduction to hospital. Small-animal clerk duty is required.

CVM 6910. Physiology I. (5 cr.; A-F only; Every Spring)
Anatomic strategies adopted by different animal species to achieve same/similar function. Important physiologic processes used by animals to maintain homeostasis. Neural, endocrine, paracrine regulation of organ systems. Intermediate metabolism.

CVM 6911. Immunology. (2 cr.; A-F only; Every Fall)
This course is structured as an introductory and multidisciplinary unit consisting of a series of lectures to provide a basic understanding of the cells, molecules, and mechanisms of immunology against microbial pathogens and neoplasia, as well as immune-mediated pathologies such as allergies and autoimmunity.

CVM 6912. Basic Pathology. (2 cr.; A-F only; Every Spring)
Mechanisms in reactions of cells/tissues to injury. Regressive changes in cells, cell death, pigments, circulatory disturbances, inflammation, alterations of cell growth (including neoplasia). Application to evaluation of gross/microscopic tissue alterations.

CVM 6913. Agents of Disease I. (4 cr.; A-F only; Every Spring)

CVM 6914. Preventive Medicine. (4 cr.; A-F only; Every Fall & Spring)
Concepts of preventive medicine. Information reinforced in other coursework. Short video lectures/notes on website for access throughout training.

CVM 6915. Clinical Pathology I. (2 cr.; A-F only; Every Fall)
Normal/abnormal function of hematopoietic system. Pathophysiologic changes underlying serum biochemical abnormalities. Principles/clinical application of cytology as diagnostic tool. How clinical laboratory data is generated/interpreted.

CVM 6916. Clinical Pathology II. (2 cr.; A-F only; Every Spring)
Normal/abnormal function of hematopoietic system. Pathophysiologic changes underlying serum biochemical abnormalities. Principles/clinical application of cytology as diagnostic tool. How clinical laboratory data is generated/interpreted.

CVM 6917. Agents of Disease II. (5 cr.; A-F only; Every Fall)
This course is the second part of the Agents of Disease series dealing with diseases caused by infectious agents. This course extends the foundational information obtained on viruses, bacteria and parasites in Agents of Disease I, into understanding diseases caused by these agents in species of veterinary importance. In this course we will continue to integrate concepts on pathogenesis, life cycle, host response, diagnostic tests, and transmission of agents of diseases into developing solutions for diagnosis, prevention and control of infectious diseases in animals.

CVM 6918. Pharmacology I. (2 cr.; A-F only; Every Fall)
Principles of drug action, disposition, and clinical applications in animal patients. Provide a solid base of general knowledge of pharmacology that will be important for later coursework in veterinary medicine and future successful veterinary practice. Students completing this course should have developed an understanding of how drugs from several medicinal classes are processed by animals and how these drugs exert their beneficial and adverse effects in animals.

CVM 6919. Systemic Pathology. (5 cr. [max 10 cr.]; A-F only; Every Fall)
Basic mechanisms of disease in various organ systems. Organ response to injury. Describe or interpret lesions in order to formulate morphological diagnoses/differential diagnoses (etiology). Correlate clinical/laboratory findings with clinical signs or lesions that might occur.

CVM 6920. Clinical Pathology II. (2.5 cr.; A-F only; Every Fall)
Understand/explain normal/abnormal function of hematopoietic system. Principles/clinical application of cytology as diagnostic tool. How clinical laboratory data is generated/interpreted.

CVM 6921. Clinical Skills III. (2 cr.; S-N only; Every Fall)
Builds on clinical application of first year clinical skills. Include 2-3 clinical skills labs throughout year. Hands on practical experience with live animals. Other options include VMC mini rotations, Humane Society visits, SIRVS, RAVS, Gelding Project, VIDA, VetTouch other student specific proposals.

CVM 6922. Clinical Epidemiology. (1.5 cr. [max 2 cr.]; A-F only; Every Fall)
This course introduces the concepts, principles, and applications of veterinary epidemiology. Veterinary epidemiology is the foundation of health management of animal populations, be they companion animals, livestock or wild populations. Clinical epidemiology provides the basis for medical decision-making in clinical practice.

CVM 6923. Public Health and Community Practice. (2 cr.; A-F only; Every Fall)
Mixture of didactic classroom lectures/in-class discussions/exercises to provide overview of common zoonotic agents/other veterinary public health issues. Emphasis on case-based public health situations.

CVM 6924. Small Animal Medicine I. (2 cr.; A-F only; Every Fall)
Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, management protocol of common/important
hematologic, immunologic, infectious diseases of dogs/cats.

**CVM 6925. Diagnostic Laboratory.** (2 cr.; A-F only; Every Fall) Laboratory experiences designed to help veterinary students practice common clinical tests, understand principles of various types of tests, gain better appreciation of test selection/interpretation. Urinalysis, hematology, serology, detection of parasitic/microbial agents of disease. This course represents an effort to collect the relevant clinical laboratory information needed by the practicing veterinarian.


**CVM 6927. Small Animal Surgery I.** (3 cr.; A-F only; Every Spring) Provide students with the basic knowledge and skills needed to evaluate and treat common small animal surgical diseases. Provide students with background knowledge, problem-solving, and technical skills that will be the basis for clinical rotations and initial years in practice.

**CVM 6928. Large Animal Medicine I.** (2 cr. [max 4 cr.]; A-F only; Every Fall) This course will address the core medical problems of swine; multisystemic infectious diseases of horses and ruminants; and common medical disorders affecting the hematologic, immunologic, urinary, and gastrointestinal systems of horses, ruminants, and camelds. It will provide part of the large animal clinical content needed to pass the National Board Examination, as well as foundation knowledge for subsequent large animal elective courses.

**CVM 6929. Large Animal Surgery I.** (3 cr.; A-F only; Every Spring) This class addresses common surgical conditions in large animal species (equine, bovine, camelid and small ruminants) related to wounds, gastrointestinal disorders and musculoskeletal disorders.

**CVM 6931. Diseases of Zoo Animals and Exotic Pets.** (1 cr.; S-N or Audit; Periodic Fall) Diseases of and management procedures for zoo animals and exotic pets. Restraint procedures, medication, diagnosis; prereq: DVM or grad or instr consent

**CVM 6932. Introduction to Non-Domestic Veterinary Medicine.** (1 cr.; S-N only; Every Fall) Professions, including zoo, rehabilitation, wildlife, and conservation medicine. Job activities/availability, preparation to obtain a position. Restraint, evaluation, treatment and management of non-domestic species. prereq: 1st yr DVM or instr consent

**CVM 6933. Zoological Medicine (MNZM).** (2 cr. [max 20 cr.]; Student Option; Every Fall, Spring & Summer) Introduction to all aspects of health care of zoo animals. Housing, nutrition, preventative health programs. Students assist zoo veterinarians with immobilizations, examinations, necropsies, laboratory work, records keeping, prereq: DVM 3rd or 4th yr or instr consent

**CVM 6934. Selected Topics in Zoo Animal Medicine.** (2 cr. [max 10 cr.]; A-F only; Periodic Fall & Spring) Year-long course. Expertise needed by a zoo veterinarian, applications to specific captive species. Manage an animal problem or animal group problem, develop diagnostic/management/therapeutic recommendations, research three topics on an assigned species, build reference materials for case care, present findings to keepers at a selected zoo, develop an item for public education. prereq: [DVM 1st or 2nd yr] or instr consent

**CVM 6935. Veterinary Imaging I.** (4 cr.; A-F only; Every Spring) Introduction to radiographic imaging, foundational principles, imaging modalities, and musculoskeletal, general adenent and alimentary tract systems. Interpretation of radiographic studies and clinical applications germane to common animal diseases. Lectures and exercises using a body systems approach to imaging of large/small animals.

**CVM 6936. Microbiologic Anatomy II.** (2 cr.; A-F only; Every Spring) Identification, description, and understanding of basic structure and elements of cells and basic tissues. Identify and describe structure and organization of organ systems presented.

**CVM 6937. Pharmacology II.** (2 cr.; A-F only; Every Spring) This course covers principles and clinical practices of veterinary toxicology. Mechanisms of action, pharmacokinetics and therapeutic uses of drugs affecting various systems and organs. Basic pharmacodynamics and pharmacokinetic aspects of anti-bacterial, anti-fungal, anthelmintic and anti-neoplastic drugs, including drug mechanism and spectrum of action, side effects and toxicity, and modes of drug resistance that diminish clinical efficacy.

**CVM 6938. Professional Development III.** (1 cr. [max 2 cr.]; S-N only; Every Fall) Integrates subjects in veterinary professional curriculum. Introduction to/practice of professional skills. Communication, ethics, teamwork, leadership. As a result of taking this course, students will be able to define medical professionalism, understand the concepts, organization, and hierarchy of problem oriented thinking by demonstrating problem definition and problem refinement. Students will identify, list and utilize resources available for answering clinical questions. Students will utilize clinical skills (history and physical examination) to assess individual or populations of animals in order to develop diagnostic and therapeutic plans. Students will effectively communicate problem oriented approach to colleagues in oral and written format. Students will effectively communicate the medical plan, treatment options, prognosis and cost of recommendations to owner.

**CVM 6939. Non-Traditional Pet Core.** (1 cr.; S-N only; Every Spring) Introduction to the care and handling of a variety of small animals including reptiles, amphibians, rodents, rabbits and ferrets, seen by veterinarians in primary care practice. This course provides an overview of gross and radiographic anatomy, major infectious diseases and their management, and normal behavior in domestic environments.

**CVM 6941. Clinical Skills IV.** (2 cr.; S-N only; Every Spring) Builds on clinical application of first/2nd year fall clinical skills. Includes clinical skills labs throughout year. Hands on practical experience with live animals. Other options include VMC mini rotations, Humane Society visits, SIRVS, RAVS, Gelding Project, VIDA, VetTouch other student specific proposals.

**CVM 6942. Veterinary Clinical Pathology II.** (3 cr.; A-F only; Every Spring) Required readings, didactic classroom lectures, on-line tutorials, group discussions, homework to cover veterinary clinical patholgy. Integration of all clinical pathology data available for patient with opportunity for students to distinguish diseases with similar clinic or clinic-pathologic findings.

**CVM 6943. Avian Core.** (2 cr.; A-F only; Every Spring) This course will present information on birds. Successful completion will provide a firm foundation for more advanced avian studies such as companion bird medicine, poultry health, raptor rehabilitation and avian surgery. Through a blend of didactic lectures, hands-on laboratories, and student-driven inquiry, topics of ornithology, behavior, anatomy, physiology, production management, diseases and basic clinical procedures will be presented. Fundamentals of flock management and nutrition will be covered along with principles of biosecurity and recognition of diseases will be addressed.

**CVM 6944. Small Animal Surgery II & Anesthesia.** (3 cr.; A-F only; Every Fall) This course will introduce the principles of small animal anesthesia, critical care, and will continue the principles of surgery from Surgery I (CVM 6927). The course will consist of lectures laboratories, and a case discussion session.

**CVM 6945. Large Animal Medicine II.** (3 cr.; A-F only; Every Fall) Course addresses common medical disorders of the large animal neurological, muscular, cardiovascular, and respiratory systems, as well as core medical problems of swine. It will provide part of the large animal clinical content needed to pass the National Board Examination, as well as foundation knowledge for subsequent large animal elective courses.

**CVM 6946. Large Animal Surgery II.** (1.5 cr.; A-F only; Every Fall) Course concentrates on the principles of anesthesia, identifying surgical conditions of the cardiopulmonary and urogenital systems, common urogenital surgeries and
miscellaneous conditions of the head and tail. Species discussed include horses, cattle, small ruminants and pot-bellied pigs.

**CVM 6947. Veterinary Imaging II.** (2 cr.; A-F only; Every Fall)
Imaging of the thorax, urogenital tract, and spine. Emphasis on interpretation of radiographic studies and clinical applications germane to common animal diseases. Lectures and active learning exercises using a body systems approach to imaging (primarily radiographic) of small and large animals.

**CVM 6949. Comparative Theriogenology.** (3 cr.; A-F only; Every Fall)
This course develops a broad clinical knowledge of common reproductive management strategies and clinical conditions associated with reproduction in the major domestic species. It provides information and strategies for the conduct of breeding soundness examination and infertility work-ups in the male; estrous cycle characteristics, diagnostics and control in females; breeding management strategies, pregnancy diagnosis and management of gestation; investigation and control strategies for pregnancy loss; management of parturition and treatment of dystocia; normal post-partum changes and diseases of the peri-partum period and the pathophysiology and treatment of uterine infections. Material is presented in both a comparative and species specific manner.

**CVM 6952. Clinical Skills V.** (1 cr.; S-N only; Every Fall)
This course aims to build on the clinical application of the first two years clinical skills course including further development of physical examination competence and frequently used clinical skill procedures. The course will incorporate a variety of opportunities to practice clinical skills including 1-2 clinical skills labs in the fall, small and large animal hospital practicum and outside veterinary hospital visits. Other experiences that can be chosen include Humane Society visits, SIRVS, RAVS, Gelding Project, VIDA, VetTouch and other student specific proposals.

**CVM 6953. Professional Development IV.** (2.5 cr.; S-N only; Every Fall)
This class will prepare students for practice from both a legal and logistical perspective (Practice Management) and provide you with opportunities to hone your communication skills and thereby equip you to build your future relationships with your clients.

**CVM 6954. Small Animal Medicine III.** (5 cr.; A-F only; Every Fall)
Pathophysiology, clinical presentation, diagnostic approach, therapeutic options and management protocols, and prognosis of cardiopulmonary, neurologic and neoplastic diseases of dogs and cats.

**CVM 6956. Small Animal Selective I.** (4 cr.; A-F only; Every Spring)
This course is intended to integrate clinical core knowledge for small animal primary care. Included in this course are the entry level competencies for small animal care in the areas of preventive care, anesthesia, emergency medicine, cardiology, surgery, nutrition, dermatology and dentistry. Students will develop the skills and knowledge to maintain health, identify and treat or manage common small animal conditions.

**CVM 6957. Small Animal Selective II.** (4 cr.; A-F only; Every Spring)
Explore advanced content related to small animal practice. Specialties covered in this course include nutrition, dentistry, cardiology, anesthesia, surgery, oncology, ultrasound, and emergency and critical care. Develop the skills and knowledge to treat a variety of small animal diseases and conditions. Practice advanced dental and surgical skills in a laboratory setting.

**CVM 6958. Small Animal Problems.** (2 cr.; A-F only; Every Spring)
This course uses a mixture of didactic classroom mini-lecture and group discussion and case-based homework to cover a variety of problems encountered in small animal medicine. Problems may be ones listed as presenting complaints by owners of dogs and cats, problems found on physical examination, or laboratory abnormalities encountered in case evaluation. Emphasis will be placed on selection of laboratory tests, interpretation of results, and using results to guide development of a diagnostic and treatment plan for patients. The course will emphasize integration of information introduced in core companion animal systems courses with clinical pathology.

**CVM 6959. Orientation to Clinical Rotations.** (2.5 cr.; S-N only; Every Spring)
Provides students with an overview and exposure to various topics, issues, and procedures that will be encountered during their senior rotations. The goal of the Orientation to Clinical Rotations course is to facilitate student transition into clinics. The course will include didactic lectures, group exercises, and open discussions. Topics that will be covered include: CVM and VMC policies and procedures, patient flow, SOAPs, discharges, admissions, ICU/wards, patient care, UVIS, client communications, infection control, safety, pharmacy, licensure, and rotation.

**CVM 6960. Equine Selective I.** (2.5 cr.; A-F only; Every Spring)
The primary objective of this elective is to provide the opportunity for third year students interested in equine practice to expand their knowledge and clinical skills beyond core levels achieved in the preceding curriculum. This course includes content and skills that are considered entry level requirements for students who plan to provide clinical care for horses at any level in their practice after graduation. It is the minimum required for students with an interest in care of horses in a mixed animal practice setting and serves as a foundation for further learning and skill development provided in the Equine Selective II, as well as for the equine rotations for senior students.

**CVM 6961. Equine Selective II.** (3 cr.; A-F only; Every Spring)
This elective is designed to provide further opportunity for third-year students focused on equine practice to expand their knowledge and skills beyond core levels achieved in the preceding curriculum and Equine Selective I. Content has been chosen to prepare the student for equine work on the large animal rotations and equine or mixed animal practice. Students will study equine disorders, diagnostic testing, anesthesia, and surgical techniques in greater detail through a combination of lectures and labs, and will practice working through clinical cases in a problem-based format. By the end of the course, students will have improved their general knowledge of equine medicine and practice; recognize common medical disorders; select initial diagnostic tests; be able to perform neurologic and urinary tract examinations; be able to perform transrectal wash and bronchoalveolar lavage procedures; and explain therapeutic options for common disorders.

**CVM 6962. Equine Problems.** (2 cr.; A-F only; Every Spring)
This course is intended for third year students in the veterinary medicine curriculum. Each two-hour class period will include a review of evidence-based medicine concepts integrated into the discussion or one or more cases during the class period. This course is designed to: 1) Enhance student knowledge of diagnosis, pathophysiology and treatment equine diseases; 2) allow students to develop critical clinical thinking and problem solving skills; 3) to demonstrate the use evidence based medicine in solving clinical problems; 4) to give students the tools necessary to become life-long learners and stay current with advances in veterinary medicine after completion of veterinary school. Students will have the opportunity to create differential diagnosis lists for several common equine presenting complaints, review pertinent literature, and work through several real life cases throughout the semester. By the end of the semester students will be comfortable with the process of case work-up and will be prepared to implement this process during their clinical year.

**CVM 6963. Food and Fiber Selective I: Food and Fiber Practice.** (4 cr.; A-F only; Every Spring)
Introduction to food animal practice at any level from mixed practice with backyard producers to dedicated species practitioners. Course will cover principles common to all food animal species. Students will gain exposure to common house and production systems, approaches to treatment and management of common diseases as well as field anesthesia and surgery.

**CVM 6964. Food & Fiber Selective II: Production Medicine.** (4 cr.; A-F only; Every Spring)
The course will provide a detailed understanding of general principles of swine and ruminant health and production, analytical skills applied to production records and economics, and therapeutic and preventative...
 decision-making for prevalent clinical diseases and syndromes in US swine and ruminant herds.
CVM 6966. Applied Small Ruminant and Camelid Practice. (1 cr.; A-F only; Every Spring)
This course will build upon previously taught core material focusing on diagnosing, treating, and preventing common problems seen in routine veterinary practice with sheep, goats, and camels. This course will be a prerequisite for 4th year Small Ruminant and Doe/Kid rotations (unless instructor permission is given).
CVM 6967. Food and Fiber Animal Problems. (2 cr.; A-F only; Every Spring)
This course uses a mixture of classroom group discussion and case-based assignments to cover a variety of problems encountered in food animal production medicine. Problems may be ones listed as presenting complaints by owners/producers of food animals (e.g. cattle, swine, small ruminants) problems found on physical examination/health visits, or abnormalities encountered in case/records evaluation. Emphasis will be placed on applying an epidemiological approach for herd investigations, including records analysis, selection of laboratory tests and interpretation of results. Following diagnosis, students will formulate a plan for treating individual affected animals and develop a preventative health management plan for the herd, as applicable. The course will emphasize integration of information introduced in core food animal systems courses with clinical pathology
CVM 6968. Obstetrics Lab. (0.5 cr.; S-N only; Every Spring)
This is a practical laboratory in which students will have the opportunity to practice obstetric procedures, including a full fetotomy, that were described in lecture during the fall semester Comparative Theriogenology course. Students will be grouped and each group will have two labs occurring on consecutive days; one for correction of dystocia and the second concentrating on fetal manipulation/health visits, or abnormalities encountered in case/records evaluation. Emphasis will be placed on applying an epidemiological approach for herd investigations, including records analysis, selection of laboratory tests and interpretation of results. Following diagnosis, students will formulate a plan for treating individual affected animals and develop a preventative health management plan for the herd, as applicable. The course will emphasize integration of information introduced in core food animal systems courses with clinical pathology.
CVM 6970. Professional Development V. (1 cr.; S-N only; Every Spring)
Practice of professional skills: communication, ethics, teamwork, and leadership. Students will be able to define medical professionalism, understand the concepts, organization, and hierarchy of problem oriented thinking by demonstrating problem definition and problem refinement. Students will identify, list, and utilize resources available for answering clinical questions, and utilize clinical skills (history and physical exam) to assess individual or populations of animals in order to develop diagnostic and therapeutic plans. Students will effectively communicate a problem-oriented approach to colleagues in oral and written format, as well as a medical plan, treatment options, prognosis, and cost of recommendations to owner.
CVM 6971. Dermatology. (2 cr.; A-F only; Every Spring)
Case-base discussion of common dermatological conditions that affect dogs and cats. Students work on clinical cases outside classroom. Cases are discussed in classroom.
CVM 6972. Ophthalmology. (1.5 cr.; A-F only; Every Fall)
Common procedures for evaluation, diagnosis, and treatment of eye disorders in domestic species.
CVM 6973. Behavior. (1 cr.; S-N only; Every Spring)
Introduction to abnormal and undesired animal behavior, diagnostic procedures, and behavioral and pharmacological modifications.
CVM 6974. Veterinary Toxicology. (2 cr.; A-F only; Every Fall)
Mechanisms by which common toxicants encountered in residential, natural, and agricultural or industrial settings exert their deleterious effects in animals. Approaches to treating common toxicoses arising from toxicant exposure.
CVM 6975. Mixed Animal Problems. (2 cr.; A-F only; Every Spring)
This course uses a mixture of didactic classroom mini-lecture and group discussion and case-based homework to cover a variety of problems encountered in small and large animal medicine and laboratory animal medicine.
CVM 6976. Small Ruminant Practice Elective. (1 cr.; max 2 cr.; A-F only; Every Spring)
This course will build upon previously taught core FA material focusing on diagnosing, treating, and preventing common problems seen in routine veterinary practice with sheep and goats. This course will be a prerequisite for 4th year Small Ruminant and Doe/Kid rotations (unless instructor permission is given).
CVM 6977. Advanced Dairy Production Medicine I. (2 cr.; A-F only; Every Spring & Summer)
This rotation will give students the background necessary to provide production medicine related services. The concepts introduced in ODPM will be used as a basis to explore topics further. This will allow participants to assist clients in making decisions that enhance their farms productivity, promote animal and financial well-being.
CVM 6978. Advanced Dairy Production Medicine II. (2 cr.; A-F only; Every Spring & Summer)
This rotation will give students the background necessary to provide production medicine related services. The concepts introduced in ODPM will be used as a basis to explore topics further. This will allow participants to assist clients in making decisions that enhance their farms productivity, promote animal and financial well-being.
CVM 6981. Clinical Correlations I. (1 cr.; S-N only; Every Spring)
This course design follows principles of research in learning; prepares students for clinical work as well and what will be expected of them in senior year and, for most, in their career; and prepares students for life-long learning by requiring them to find resources.
CVM 6982. Clinical Correlations II. (1 cr.; S-N only; Every Spring)
This course design follows principles of research in learning; prepares students for clinical work as well and what will be expected of them in senior year and, for most, in their career; and prepares students for life-long learning by requiring them to find resources.
CVM 6983. Study Strategies for Success. (1 cr.; S-N only; Every Fall & Spring)
This elective course will provide students with information about how learning works and with training in the skills of metacognition to best permit them to develop successful study strategies. Specific skills addressed will include those for study preparation (time management, creating a study space, the role of external factors such as distractions, exercise, and sleep), reading to ensure understanding, review of writing skills, taking notes from readings and in lecture, active review to enhance retention, and test-taking strategies. The course will conclude with information about problem-solving and specific strategies for learning in a clinical environment.
CVM 6984. Introduction to Laboratory Animal Medicine. (1 cr.; A-F only; Every Spring)
Understand varying ethical perspectives on the use of animals as research subjects and identify the role and mechanism of regulatory oversight of animal research. Learn basic concepts related to care and husbandry of laboratory animal species and understand the unique anatomic, behavioral, and physiological aspects of common laboratory animal species and identify common clinical diseases of laboratory animals, including pathogenesis, diagnosis, and treatment.
CVM 6985. PhD Project. (2 cr.; max 12 cr.; S-N only; Every Fall, Spring & Summer)
Preparation and research for PhD dissertation.
CVM 6986. MS Project. (2 cr.; max 12 cr.; S-N only; Every Fall, Spring & Summer)
Preparation and research for MS thesis.

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CVM 6999. Directed Study for Out of Sync Student. (0 cr. ; No Grade Associated; Every Fall, Spring & Summer) Directed study.

Veterinary Medicine, Graduate (VMED)

VMED 5080. Problems in Veterinary Epidemiology and Public Health. (1-3 cr. ; A-F or Audit; Every Fall & Spring) Individual study on problem of interest to epidemiology or public health student.

VMED 5082. Diagnostic Epidemiology of Infectious Diseases. (2 cr. ; A-F only; Every Spring) Theoretical principles, practical applications of diagnostic testing in populations. Examples related to infectious diseases in veterinary/human health. Basis of test performance, limitations, interpretations. prereq: Statistics course or instr consent

VMED 5090. Seminar: Veterinary Epidemiology. (1 cr. ; max 3 cr.; ; S-N or Audit; Every Fall & Spring) Each student leads at least one seminar. Reviews of current research, literature reviews, and technique development. Students and participating faculty participate in presentation, discussion, and administration of the seminars. prereq: Veterinary Medicine grad student

VMED 5101. Molecular and Cellular Basis of Nanoparticle Toxicity. (3 cr. ; max 6 cr.; ; A-F or Audit; Every Fall) Use of nanotechnology in scientific research. Impact of nanomaterials on biological systems.

VMED 5165. Surveillance of Foodborne Diseases and Food Safety Hazards. (2 cr. ; Student Option; Every Spring) Principles/methods for surveillance of foodborne diseases. Investigation of outbreaks. Assessment of food safety hazards. Focuses on integration of epidemiologic/lab methods. prereq: [PUBH 5330, [professional school or grad student]] or instr consent

VMED 5180. Ecology of Infectious Disease. (3 cr. ; Student Option; Every Fall) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5181. Spatial Analysis in Infectious Disease Epidemiology. (3 cr. ; Student Option No Audit; Every Spring) Spatial distribution of disease events. Exposures/outcomes. Factors that determine where diseases occur. Analyzing spatial disease data in public health, geography, epidemiology. Focuses on human/animal health related examples. prereq: Intro to epidemiology, statistics,

VMED 5182. Molecular biology for the Public Health Professional. (2 cr. ; Student Option; Every Spring) This course focuses on introducing students to molecular biology lab tools that are used to investigate infectious diseases in public health settings. The course combines laboratory sessions during which students will learn and run molecular assays with computer lab sessions during which students will analyze molecular data.

VMED 5190. Seminar and Presentation Development. (2 cr. ; S-N only; Every Fall) Skills needed to research, organize, develop, and deliver an oral scientific presentation or to assist in finding, compiling, and organizing information for presentations, theses, or papers suitable for publication. prereq: Grad student

VMED 5193. Dairy Decision Making in a Financial Context for Veterinarians. (3 cr. ; A-F only; Every Fall) Concepts/tools of economic analysis needed to support decision making on dairy farms, particularly as those decisions relate to health, disease impact, nutrition, general farm management. Prereq Eearned DVM, instr consent

VMED 5210. Advanced Large Animal Physiology I. (1-3 cr. ; [max 6 cr.]; ; Student Option; Every Fall) Review of large animal physiology at level needed for specialty board certification or beginning research. Students present topics in physiology and supplement reading with clinical case material or journal articles. prereq: instr consent; 5210 recommended

VMED 5211. Advanced Large Animal Physiology II. (1-3 cr. ; A-F or Audit; Every Spring) Large animal physiology for specialty board certification or beginning research. Students present topics in physiology and supplement reading with clinical case material or journal articles. prereq: instr consent; 5210 recommended

VMED 5223. Comparative Clinical Veterinary Dermatologic Pathology. (1 cr. ; max 2 cr.; ; Every Fall & Spring) Microscopic pathology of basic dermatologic reactions and of variable disease states. prereq: DVM degree or foreign equiv

VMED 5240. Advanced Small Animal Pathobiology I. (1 cr. ; A-F only; Fall Even Year) Biology, physiology, pathophysiology, and medicine of disciplines relevant to companion animals. Pathogenesis/treatment of diseases. Developing hypotheses that can be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5241. Advanced Small Animal Pathobiology II. (1 cr. ; A-F only; Spring Even Year) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5242. Advanced Small Animal Pathobiology III. (1 cr. ; A-F only; Fall Odd Year) Overview of biology, physiology, pathophysiology, and medicine. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5243. Advanced Small Animal Pathobiology IV. (1 cr. ; A-F only; Spring Odd Year) Overview of biology, physiology, pathophysiology, and medicine. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5251. Spatial Analysis in Infectious Disease Epidemiology. (1 cr. ; max 3 cr.; ; S-N only; Every Fall & Spring) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5295. Problems in Large Animal Clinical Medicine/Surgery and Theriogenology. (1 cr. ; max 3 cr.; ; A-F or Audit; Every Fall & Spring) Hospital cases using standardized format, audiovisual aids. Review literature pertaining to case. One or two cases presented by enrolled participants per month. prereq: VMED grad student, possess DVM

VMED 5310. Topics in Veterinary Clinical Pathology. (1 cr. ; max 2 cr.; ; S-N only; Every Fall & Spring) Modified rounds format. Cases from VMC used to explore cytology with associated chemistry/hematology data. Attendees/clinicians can request lab topics for discussion. Past topics have included lab measurement of chemical analytes, test sensitivity or specificity (e.g., ethylene glycol test, FELV test), lab testing for infectious agents. prereq: Grad student in CVM

VMED 5319. Veterinary Gross Pathology. (1 cr. ; max 3 cr.; ; S-N only; Every Fall & Spring) Diseases and Food Safety Hazards. Investigation of outbreaks. Assessment of food safety hazards. Focuses on integration of epidemiologic/lab methods. prereq: [PUBH 5330, [professional school or grad student]] or instr consent

VMED 5320. Advanced Veterinary Systemic Pathology I. (3 cr. ; A-F only; Every Fall Even Year) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5321. Advanced Veterinary Systemic Pathology II. (3 cr. ; A-F only; Every Spring) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5324. Advanced Veterinary Systemic Pathology III. (3 cr. ; A-F only; Every Fall) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5325. Advanced Veterinary Systemic Pathology IV. (3 cr. ; A-F only; Every Spring) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5330. Veterinary Descriptive Pathology. (1 cr. ; max 3 cr.; ; All Even Years; S-N only) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5340. Advanced Veterinary Systemic Pathology I. (3 cr. ; A-F only; Every Fall Even Year) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5341. Advanced Veterinary Systemic Pathology II. (3 cr. ; A-F only; Every Spring) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5342. Advanced Veterinary Systemic Pathology III. (3 cr. ; A-F only; Every Fall) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5343. Advanced Veterinary Systemic Pathology IV. (3 cr. ; A-F only; Every Spring) How host, agent, environmental interactions influence transmission of infectious agents. Environmental dissemination, eradication/ control, evolution of virulence. Use of analytical/molecular tools.

VMED 5350. Veterinary Gross Pathology. (1 cr. ; max 3 cr.; ; S-N only; Every Fall & Spring) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5360. Veterinary Descriptive Pathology. (1 cr. ; max 3 cr.; ; All Even Years; S-N only) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5370. Veterinary Gross Pathology. (1 cr. ; max 3 cr.; ; S-N only; Every Fall & Spring) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5380. Veterinary Descriptive Pathology. (1 cr. ; max 3 cr.; ; All Even Years; S-N only) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5390. Veterinary Gross Pathology. (1 cr. ; max 3 cr.; ; S-N only; Every Fall & Spring) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5400. Veterinary Descriptive Pathology. (1 cr. ; max 3 cr.; ; All Even Years; S-N only) Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

VMED 5410. Scientific Writing and Speaking. (2 cr. ; A-F only; Fall Odd Year) Overview of biology, physiology, pathophysiology, and medicine. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research. Prereq CVM grad student, [DVM or foreign equiv] degree.

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**VMED 5430. HIV/AIDS: Pathogenesis, Treatment, and Prevention.** (1 cr.; Student Option; Every Fall) Exposure to pathogenesis, treatment, and prevention of HIV/AIDS from clinical faculty who are dealing with AIDS patients. Developing new questions and design experiments that have greatest chance of translating to clinical setting. prereq: Grad student

**VMED 5440. Using Risk Analysis Tools: Estimating Food Safety Risks on the Farm to Table Continuum.** (2 cr. [max 3 cr.]; A-F only; Every Spring) This applications-based course will provide the necessary risk-based tools to evaluate and mitigate the microbial and chemical risks in a food production chain-from the farm until consumption. Students will follow the risk analysis process as an integral part of science-based decision-making to estimate and manage food safety risks. Students will apply different qualitative and quantitative tools by using a computer.

**VMED 5442. Quantitative Methods for Population Health.** (3 cr. [max 6 cr.]; Student Option No Audit; Every Spring) This course reviews the principles and application of advanced methods for analysis of population health data, with a focus on animal health and infectious diseases. Analytical techniques that will be taught and applied during the course include risk assessment, spatial analysis, disease modeling, and disease economics. prereq: basic statistics (PUBH6450 or equivalent) and basic epidemiology (CVM6922 or PUBH6341 or equivalent) or instructor approval

**VMED 5492. Seminar: One Health and Infectious Diseases of Wildlife.** (2 cr.; S-N only; Every Fall) The course will explore the applied concept of One Health and infectious diseases of wildlife in weekly case studies. In each case study, students will gain an understanding of system dynamics, infer the interplay between humans, animals and the environment in the context of a given wildlife disease, and confront current disease management practices and challenges for successfully mediating transmission and spread.

**VMED 5496. Training in Swine Production and Management.** (4 cr.; S-N only; Every Fall & Spring) Production module introduces techniques/protocols for swine production system operation. Research module covers applied research trials for viral/bacterial pathogens in pigs. prereq: VMED grad student or instr consent

**VMED 5594. Research in Veterinary Medicine.** (1-4 cr. [max 8 cr.]; Student Option; Every Fall, Spring & Summer) Independent study as determined by instructor. Usual activity includes conducting research in instructor’s lab, though research in field may also be included. prereq: Jr. instr consent

**VMED 5596. Swine Diseases and Diagnostics.** (2-3 cr. [max 2 cr.]; Student Option; Every Fall & Spring) Review of recent advances in swine diseases; farm visits for on-farm disease diagnostics and control programs.

**VMED 5612. Principles of Veterinary Anesthesiology.** (2 cr.; A-F only; Every Spring) In-depth training in principles of veterinary anesthesiology. Lectures, anesthesia labs, presentations by students. prereq: VMed grad student, [DVM degree or foreign equiv], instr consent

**VMED 5670. Bovine Surgery Practicum.** (2 cr.; S-N only; Every Fall & Spring) Intensive training in ruminant surgery. Evaluation of food animal surgery principles, hands-on laboratory components. prereq: [VMed grad student, [DVM or equiv foreign degree]] or instr consent

**VMED 5895. Veterinary Public Health Integrated Learning Experience.** (1-3 cr.; S-N only; Every Fall, Spring & Summer) Part of the curriculum for the master’s degree includes an opportunity for students to develop a written document detailing applications of public health practice. Completion of the ILE allows students to synthesize aspects of public health into a document that can be utilized by public health professionals.

**VMED 5896. Veterinary Public Health Applied Practice Experience.** (0.5-6 cr.; S-N only; Every Fall, Spring & Summer) The APEX, applied practice experience provides students an opportunity to learn first-hand about the organization, operations, and special activities of selected agencies, institutions and industries concerns with public health practice. This is a means of gaining additional insight into public health programs, personnel management, governmental relations, public relations, legislative support and, particularly, knowledge of special investigations or responses conducted by these organizations. Participation in the activities of public health practice programs external to the University adds a dimension of experience to the curriculum that enriches the student’s training and may be beneficial in seeking employment.

**VMED 5910. Grant Writing: What Makes a Winning Proposal?.** (2 cr.; Student Option; Every Spring) Components of a strong proposal. Grant submission process. What reviewers look for. How to locate grant announcements that match research interests.

**VMED 5915. Essential Statistics for Life Sciences.** (3 cr.; A-F or Audit; Every Fall) This course is a broad overview of the principles and methods of statistical analysis used in life sciences research, including biological, veterinary, and translational research, and provides the background a new researcher needs to understand and apply commonly used statistical methods and the preparation needed for more advanced coursework. Classes will include general instruction and background information, detailed examples of how to perform the analyses, with actual data sets, and discussion on how the topic has been applied in biological research, including reading and assessing papers in the field. Computing will be performed using the R software environment, though students may use alternate software with permission. Topics will include: ? Descriptive statistics and exploratory graphics ? Understanding statistical inference and interpreting P-values and confidence intervals. ? One and two sample inference, including t-tests, proportion tests, and non-parametric alternatives ? Linear regression, including the effects of confounders ? ANOVA methods, including pairwise comparisons and multiple comparisons

**VMED 5920. Food Defense: Prepare, Respond, Recover.** (3 cr.; A-F only; Every Fall) Basic principles of preparedness/emergency response. Instructor may substitute topics if timelier topic arises. prereq: Grad or professional student or instr consent

**VMED 5921. Seminar in Food Protection and Defense.** (1 cr.; Student Option; Every Fall & Spring) Complexities of our food systems. Natural/intentional threats to food security within various industry sectors. Which agencies are responsible for regulating food chains, monitoring food safety, responding to contamination events.

**VMED 5990. Veterinary Public Practice Seminar.** (0.5 cr. [max 2 cr.]; Student Option; Every Fall & Spring) Interactive review of current public practice topics in environmental health/toxicology, infectious/parasitic diseases, public health administration/education, epidemiology and biostatistics, and food safety.

**VMED 5994. Advanced Clinical Epidemiology.** (1 cr.; A-F only; Every Fall) An in-depth focus on infectious disease epidemiology, with opportunities to apply epidemiologic principles to control infectious diseases in animal populations.

**VMED 8080. Epidemiology of Zoonoses and Diseases Common to Animals and Humans.** (3 cr.; A-F or Audit; Every Fall & Spring) Major human zoonotic diseases, methods of transmission, diagnosis, control, and prevention. prereq: Epidemiology and infectious disease course or instr consent

**VMED 8134. Ethical Conduct of Animal Research.** (1 cr.; Student Option; Every Fall) Ethical considerations in use of animal subjects in agricultural, veterinary, and biomedical research. Federal, state, and University guidelines relating to proper conduct for acquisition/use of animals for laboratory, observational, epidemiological, and clinical research. Regulatory requirements. Bases for

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proper conduct. Societal impact on scientific investigations utilizing animal subjects.

VMED 8192. Dairy Health Management: Critical Thinking. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Group discussions surrounding critical evaluations of scientific journal articles and dairy-related scientific presentations. Facilitated by both students and faculty.

VMED 8193. Welfare of Farmed Animals. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
This course covers topics on the evaluation and assessment of the welfare of farmed animals. Literature review, discussions, and analyses are used to increase skills needed to evaluate methods for improving the welfare of farmed animals in various situations.

VMED 8220. Advanced Nephrology/Urology Clinics. (1-3 cr.; Student Option; Every Fall & Spring)
Clinical investigation of naturally occurring urinary diseases in patients admitted to Veterinary Medical Center. prereq: instr consent

VMED 8230. Medical Conference. (1 cr. [max 2 cr.]; Student Option; Every Fall & Spring)
Participation in weekly conferences about internal medical disorders. prereq: instr consent

VMED 8250. Problems in Acid-base, Electrolyte, and Fluid Metabolism. (2-4 cr.; A-F or Audit; Every Fall & Spring)
Clinical problems and physiology of acid-base, electrolyte, and fluid disorders of dogs and cats. prereq: instr consent

VMED 8292. Journal Club: Large Animal Internal Medicine. (1 cr. [max 3 cr.]; A-F or Audit; Periodic Fall & Spring)
Students/faculty keep abreast of current literature in large animal internal medicine. Students critically evaluate the literature. prereq: instr consent

VMED 8293. Advanced Studies in Nephrology and Urology. (1-3 cr.; A-F or Audit; Every Fall & Spring)
Studies of urinary tract disease with goal of generating new knowledge. prereq: instr consent

VMED 8333. FTE: Master's. (1 cr. [max 2 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Master's student, adviser and DGS consent

VMED 8360. Evidence-based Medicine. (2 cr.; A-F or Audit; Periodic Spring)
Concepts of evidence-based medicine with emphasis on veterinary clinical evidence will be presented. Clinical questions, development of study designs, identification of literature and assessment of the impact of the literature on clinical decisions. prereq: instr consent

VMED 8394. Research in Veterinary Medicine. (1-3 cr. [max 6 cr.]; Student Option; Every Fall & Spring)
Research problems relating to any aspect of internal medicine or to the various systems in animals. prereq: instr consent

VMED 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Doctoral student, adviser and DGS consent

VMED 8492. Seminar: Infectious Diseases and Swine Medicine. (1 cr. [max 2 cr.]; Student Option; Every Fall & Spring)
Students, faculty, and guest speakers present seminars on current research in diagnosis, control, and treatment of infectious diseases.

VMED 8520. Advanced Immunology. (2 cr.; Student Option; Every Spring)
Lectures and case presentations.

VMED 8550. Veterinary Medicine Seminar. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
Seminar. Exposure to research activities of CMB and VMED students and faculty. Students prepare/present a 20 minute seminar on their original research. prereq: Grad student

VMED 8560. Research and Literature Reports in Veterinary Medicine. (1 cr. [max 2 cr.]; S-N only; Every Fall & Spring)
A combination of literature review, group discussions and analyses are utilized to improve participants’ capacity to critically evaluate scientific journal articles. Scientific research presentations will be led by students or faculty.

VMED 8592. Infectious Disease Journals: Critical Thinking. (1 cr. [max 2 cr.]; A-F only; Every Fall & Spring)
This course is intended to discuss published papers, experimental methods, approaches, diseases and animal health problems with the goal of promoting critical thinking. Students will be responsible for identifying, reviewing and sharing relevant material as well as leading discussion of their assigned class meeting.

VMED 8593. Advanced Veterinary Virology and Serology. (3 cr.; Student Option; Every Fall & Spring)
Discussion and laboratory practice.

VMED 8682. Advanced Large Animal Surgery. (2 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring)
Surgery of various systems in large animals, with preoperative and postoperative evaluation and management. prereq: DVM or equiv degree, instr consent

VMED 8684. Surgical Physiology. (1-3 cr.; Student Option; Periodic Fall & Spring)
Discussions on pathophysiology of surgical diseases in dogs and cats.

VMED 8685. Neurosurgery. (2-3 cr.; A-F or Audit; Every Fall & Spring)
Advanced neurosurgical diseases of small animals amenable to surgical treatment.

VMED 8686. Thoracic and Cardiovascular Surgery. (2-4 cr.; A-F or Audit; Every Fall & Spring)
Advanced thoracic and cardiovascular diseases of small animals amenable to surgical treatment.

VMED 8693. Seminar: Large Animal Surgery. (1 cr. [max 6 cr.]; A-F or Audit; Every Fall & Spring)
Discussion of current literature and surgery board preparation. prereq: DVM or equiv degree, instr consent

VMED 8696. Research in Critical Care/Emergency Medicine. (1-3 cr.; Student Option; Every Fall & Spring)
Special problems course. Controlled study; prospective and retrospective models of evaluation are defined, critiqued, and used for experimental design and data collection to validate research methods. prereq: DVM or equiv degree

VMED 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

VMED 8780. Advanced Avian Critical Care: Principles and Procedures. (2 cr.; A-F or Audit; Every Spring)
Procedures and protocols for managing avian medical emergencies such as starvation, toxicities, respiratory failure, and massive trauma. prereq: Course each in vet pathology, physiology, pharmacology, anatomy, small animal anesthesiology and critical care

VMED 8781. Seminar: Advanced Veterinary Anesthesiology. (1-3 cr.; A-F or Audit; Every Fall)
Active interaction around topics of advanced anesthesiology in veterinary species. prereq: [[CVM 6321, CVM 6322] or equiv]. grad student

VMED 8788. Seminar: Veterinary Critical Care/Emergency Medicine. (1 cr.; A-F or Audit; Every Fall & Spring)
Current topics. prereq: DVM or equiv degree

VMED 8789. Seminar: Veterinary Anesthesiology. (1-2 cr. [max 4 cr.]; A-F or Audit; Every Fall & Spring)
Discussion and presentations; for veterinary anesthesiology and surgery residents and graduate students. prereq: [CVM 6321 or equiv]. DVM degree

VMED 8786. Avian Anesthesia and Orthopedic Surgery. (1-3 cr.; A-F or Audit; Every Fall & Spring)
Current methods for anesthetizing raptors, psittacine birds, and waterfowl. Lecture and lab on current methods for avian fracture bone fixation. prereq: courses in vet anesthesia, vet small animal orthopedics

VMED 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer)
(No description) prereq: Max 18 cr per semester or summer; 24 cr required

VMED 8910. Statistical Principles of Research Design. (3 cr.; A-F or Audit; Every Spring)
This course is a broad overview of the principles and techniques of research design and methods used in veterinary and translational research, and provides the background a new researcher needs to understand the literature and make good decisions about what is appropriate for their
research, prereq: entry level graduate stats course or equivalent

**Veterinary Population Medicine (VPM)**

VPM 1550. Introduction to the horse including care, handling, and recognizing behaviors. (1 cr.; Student Option; Every Fall, Spring & Summer)

VPM 1560. Introduction to Horseback Riding and Horse Health. (3 cr.; Student Option; Every Fall, Spring & Summer)

Basic motor skills/commands necessary to ride horse. Focus on interaction of human body with horse’s body to create movement. Basic horse care skills, grooming, taking temperature, using hoof tester, etc.

VPM 1901. Aquatic Toxicology, Water Safety, and the Society. (2 cr.; A-F only; Every Fall)

Our planet Earth is dominated (>70%) by water. The hydrosphere contains about 1.36 billion cubic kilometers of water mostly in the form of a liquid (water) that occupies topographic depressions on the Earth. The second most common form of the water molecule on our planet is ice. If all our planet’s ice melted, sea-level would rise by about 70 meters. Water is also essential for life. Most animals and plants contain more than 60% water by volume. Without water, life would probably never have developed on our planet. Water contains nutrients that are essential for life. Nutrients are extracted from rocks and sediments. At present, human activity is dumping harmful pollutants (poisons) in surface and ground water. Poisons distribute between water and sediments, depending on the properties of the toxin, soil characteristics and water chemistry. Therefore, poisons present in water may contaminate both the aquatic and the soil dwellers, and plants, thus contaminating the food chain for humans as well as animals. The overall aim of this course is to discuss (i) effects of water pollution on aquatic and terrestrial organism including humans, (ii) water quality issues and (iii) water safety. After completing this course, participants will be able to: (Understand physicochemical and solubility properties of water. (Compare and contrast toxins? behavior in water, soil, air and organisms. (Understand the concept of clean and polluted water. (Understand some effects of toxic chemicals, types of effects from the molecular to the ecosystem level, and detoxification processes. (Understand food-chain contamination and ensuing toxicity.

VPM 1902. Garbage, Government, and the Globe. (2 cr.; A-F only; Every Fall)

Garbage, in a broad sense, can be defined as anything (solids, liquid or gas) carelessly discarded because it is perceived to be worthless in our homes, businesses, institutions and factories. When humans were hunters and gatherers, they consumed what was needed, discarded what could not be used and moved on. Being part of nature, the discarded items degraded into reusable nutrients. The humans’ interaction with the environment was well balanced and humans’ footprints on the Earth were very minute, if at all. However, as the industrial revolution led to the development of large industries, humans began to invent things that were not part of nature, thus the natural balance began to imbalance. This results in accumulation of garbage into the environment, resulting in pollution of the atmosphere, land and water sources. Recently, economic globalization has further increased the magnitude of environmental pollution and ensuing deterioration of public health.

VPM 1903. Poison, Poisoning and Society. (2 cr.; A-F only; Every Fall)

In the United States, approximately 50,000 people die each year as a result of unintentional poisoning, and another 800,000 are treated in emergency departments. The human-caused pollution of the environment (such as oil spill, poisonous gas leak, water pollution, global warming gas release, etc.) seriously impacts the health of millions of people and animals around the world. Despite such serious health consequences, people do not fully understand poisons or poisoning. In this course, students will learn some important aspects regarding poisons including, but not limited to the following. (What are poisons and what is poisoning? -Where do poisons come from? (What are the adverse effects of different types of poisons? (How to prevent poisoning? (What are the impacts of poisoning to the society? Chemicals encountered in everyday life will be used as examples to evaluate the hazards and risk of exposure and put them into perspective. Students will learn the basic principles of toxicology, tools for assessing the toxicology of chemicals, effects of chemicals on the body, and why some people are more sensitive to chemicals than others.

VPM 2400. Managed Captive Wildlife. (3 cr.; A-F or Audit; Every Fall)

This course is an introduction to key issues at the interface of humans and managed captive wildlife. Topics include: the role of managed captive wildlife species in conservation, education, exhibition, agriculture, and research; biodiversity, urban wildlife, biosentinel science, ethics, and animal welfare; and an introduction to the principles and techniques of the care and management of wildlife species in captive settings.

VPM 2500. Equine Breeding and Genetics. (2 cr.; A-F or Audit; Every Spring)

This course is designed to improve knowledge of principles and concepts underlying genetic improvement of horses, and develop applied skill in breeding stock selection and mating decisions.

VPM 3101. Animal Toxicology and the Environment. (3 cr.; A-F only; Every Spring)

Different aspects of Animal Toxicology/its relationship to environment.

VPM 3102. Aquatic-Sediment Ecological Toxicology. (3 cr.; A-F or Audit; Every Fall)

The fate, toxicity and risk assessment will be discussed for aquatic and terrestrial organisms exposed to various toxins. Students will devise strategies for toxicity testing and environmental bioremediation.

VPM 3550. Introduction to Equine Exercise Physiology. (2 cr.; A-F or Audit; Every Fall, Spring & Summer)

VPM 3550 is an introduction to equine exercise physiology. Students must have successfully completed a physiology or anatomy course prior to taking this course. The course will include lecture, in class work, and work with live horses. All class materials will be found on the Moodle course website. Work assignments and tests will be either in class or through the Moodle site. Grades will be based on assignment completion, tests and demonstration of active participation in class assignments. Students must demonstrate an understanding of equine physiology as it relates to the horse as an athlete and the effect of exercise on the cardiovascular system, the respiratory system and the musculoskeletal system.

VPM 3700. Equine Reproduction and Breeding Management. (2 cr.; A-F only; Every Spring)


VPM 3850W. Health and Biodiversity. (ENV.WI; 3 cr.; A-F only; Every Fall)

Basics of biodiversity, human/animal health, interdependence. Strategies for sustainable health. prereq: At least one year of college Biology or equivalent

VPM 4131. Immunology. (3 cr.; Student Option; Every Spring)


VPM 4400. Diseases in free-ranging and captive wildlife. (3 cr.; A-F or Audit; Every Spring)

Courses listed in this catalog are current as of 2018-08-23. For up-to-date information, visit www.catalogs.umn.edu.
This course will provide a basic understanding of animal health and disease in free-ranging and managed captive wildlife. Topics include: epidemiology of disease, infectious and non-infectious diseases, and potential impacts of disease on human health, managed agriculture and wildlife for both individuals and populations.

**Vienna Executive MBA (VMBA)**


VMBA 5701. Data Analysis and Decision Making. (4 cr.; A-F or Audit; Every Fall & Spring) Exploratory data analysis, basic inferential procedures, statistical process control, regression analysis, decision models.

VMBA 5702. Financial Management. (4 cr.; A-F or Audit; Every Spring & Summer) Theory/practice of finance from an analytical approach. Emphasizes making decisions, return, valuation to decisions that a corporate financial officer or person engaged in small business must make about sources/uses of funds during changing financial markets.

VMBA 5703. Marketing Management. (4 cr.; A-F or Audit; Every Spring & Summer) Developing/implementing most appropriate combination of variables to carry out a firm's strategy in its target markets. Analytic perspectives, concepts, decision tools of marketing for product offering decisions, distribution channel decisions, pricing decisions, communication program decisions.

VMBA 5704. Managing People and Organizations. (4 cr.; A-F or Audit; Every Spring) Theories/frameworks for analyzing behavior of individuals, groups, organization itself. Emphasizes making decisions, developing action plans. Concepts/principles associated with function of human resource management (e.g., personnel selection, reward/compensation, collective bargaining).

VMBA 5705. Operations Management. (4 cr.; A-F or Audit; Every Fall) Operations management function in different types of organizations. Emphasizes productive, innovative, competitive operations. Concepts/principles related to management of quality/innovation within service/manufacturing organizations.


VMBA 5707. Economics in Transition. (4 cr.; A-F or Audit; Every Fall) Technological, political, and ethical forces that are shaping the competitive environment. Theoretical considerations. Business responses to specific issues. Projects/cases for companies in East Central Europe.

VMBA 5709. Info Tech Mgmt. (4 cr.; max 16 cr.; A-F or Audit; Every Spring) Various information technologies, their applications. Competitive advantages associated with information technology, organizational/managerial implications.


VMBA 5713. Negotiations and Conflict Management. (4 cr.; A-F only; Every Spring) Typical challenges faced when negotiating. Strategies for managing challenges and improving skills as a negotiator and conflict manager.


VMBA 5715. Corporate and Entrepreneurial Strategy. (4 cr.; A-F or Audit; Every Fall & Spring) The objective of the course is to help develop analytic skills in the identification of key issues and in the formulation of appropriate strategies for firms, both established and entrepreneurial, facing complex business situations. We also examine the process through which strategic decisions are made and implemented and discuss how strategy is different in the age of the internet.

**Warsaw Executive MBA (WMBA)**


WMBA 5662. Macroeconomic Business Environment. (3 cr.; A-F or Audit; Every Spring) Students apply methods of decision-making, and of business/public policy analysis, in various real situations drawn from experience of developed market economies.

**Water Resources Science (WRS)**

WRS 5050. Special Topics in Water Resources Science. (1-3 cr.; A-F or Audit; Periodic Fall & Spring) Practical topics for local water resource management. Policy and institutions, watershed science, civic engagement, assessment, communication, implementation practices, and administration. Requires working with a mentor in local water resource management. Online only.

WRS 5101. Water Policy. (3 cr.; Student Option; Every Spring) Socio-cultural, legal, and economic forces that affect use of water resources by individuals/institutions. Historical trends in water policy, resulting water laws in the United States. Institutional structures whereby water resources are managed at federal, state, and local levels.

WRS 5150. Watershed Specialist Training. (2 cr.; S-N only; Every Fall & Spring) Practical topics for water resource management professionals. Current policies and institutions, watershed science, civic engagement, assessment, communication, implementation practices, and administration. Requires working with a mentor in local water resource management. Online only.

WRS 5241. Ecological Risk Assessment. (3 cr.; Student Option; Every Spring) Evaluating current/potential impact of physical, chemical, and biological agents on ecosystems. Identifying ecological stressors, assessing level of exposure, measuring ecological responses, communicating/managing risks. Class participation, two reaction papers, final exam, small-group project. prereq: instr consent

WRS 8050. Special Topics in Water Resources Science. (1-3 cr.; max 6 cr.; A-F or Audit; Every Fall & Spring) Special topics in water resources science.

WRS 8060. Directed Studies in Water Resources Science. (1-3 cr.; max 6 cr.; A-F or Audit; Every Fall & Spring) Directed studies in water resources science. prereq: instr consent

WRS 8095. Plan B Project. (3 cr.; S-N or Audit; Every Fall & Spring) Optional course for M.S. Plan B students. Can be taken once for up to 3 credits, and may count towards credit minimum.

WRS 8100. Interdisciplinary Seminar in Water Resources. (0.5 cr.; Student Option; Every Fall & Spring)
Interdisciplinary Seminar in Water Resources

WRS 8333. FTE: Master's. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Master's student, adviser and DGS consent

WRS 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Doctoral student, adviser and DGS consent

WRS 8581. Research and Professional Ethics in Water Resources and Environmental Science. (0.5 cr.; S-N or Audit; Every Spring) Ethics of water resources science and environmental engineering research/practice. Societal responsibility, plagiarism, recording-keeping, authorship, confidentiality, conflicts of interest, professional relationships, fraud, reporting misconduct. Meets during first eight weeks of spring semester, prerequisite: [Environmental engineering or water resources science] grad student or instr consent

WRS 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) TBD prerequisite: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr

WRS 8777. Thesis Credits: Master's. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prerequisite: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

WRS 8888. Thesis Credit: Doctoral. (1-24 cr. [max 96 cr.]; No Grade Associated; Every Fall, Spring & Summer) Thesis credit: doctoral. 24 cr required

Writing Studies (WRIT)


WRIT 1301. University Writing. (4 cr.; A-F only; Every Fall, Spring & Summer) Drafting, revising, editing. Academic genres. Critical reading, rhetorical analysis for principles of audience, purpose, and argumentative strategies. Emphasizes electronic/print library. Critical analysis, annotated bibliography, research paper, prerequisite: Placement in WRIT 1301

WRIT 1401. Writing and Academic Inquiry. (4 cr.; A-F only; Every Fall, Spring & Summer) How writing works in varying contexts/genres, how it presents complex arguments. Students read/analyze increasingly challenging texts. Concepts of audience, purpose, and context. Library research, guided revision. prerequisite: Placement in WRIT 1401

WRIT 1915W. Arguing with Authority: The Past, Present, and Future of Higher Education. (3 cr.; Student Option; Every Fall) This freshman seminar will introduce students to the intellectual projects of studying and participating in higher education as a participatory institution by inviting freshmen into critical dialogue with past, present, popular, and academic representations of higher education and its civic purposes. We will examine the shifting role of the university in public life and the roles that students and other constituencies have played in shaping the character of higher education through writing and other activities. Designed specifically for first-year students, the course will combine academic skill-building with personal and collective reflection on the actual and possible purposes and values of higher education for individuals and the society.

WRIT 1925W. Magazines and New Media. (3 cr.; Student Option; Every Fall) In this seminar, we will study magazines and other smaller publications - some of which you’ve already read, some of which you haven’t - to discuss and write about their significance as cultural artifacts. How can magazines, when seen as “composed” objects, help us with our own writing? How is the rise of the zine and e-zine responding to the evolving digital age? We will examine all aspects of the magazine, including its art, political statements, target audience, and history. Students will practice some of the forms that the class reads and create an e-magazine.

WRIT 3001. Introduction to Technical Writing and Communication. (3 cr.; A-F only; Every Fall) Research origins/history. Technical communication. Audience, purpose, ethics, global communication, collaboration, usability, digital writing technologies. Journal articles, student/professional organizations, guest presentations, interviews, digital portfolio. Oral presentations, research.

WRIT 3029W. Business and Professional Writing. (3 cr.; Student Option; Every Fall & Spring) Practice writing for various professional purposes/audiences, using appropriate styles, tones, and organizational elements. Potential genres include proposals, reports, web content, email, executive summaries, job search portfolios. Attention to workplace collaboration and broader issues of professional literacy.

WRIT 3101W. Writing Arguments. (3 cr.; A-F or Audit; Every Fall & Spring) Students learn about argument, drawn from a number of theories of argument. This goal is pragmatic: those theories provide a vocabulary for talking about argument and for developing and refining students’ own written arguments. Students get regular practice, coaching, and feedback on their writing skills, primarily as these concern argumentative writing. Students also learn how to analyze argumentative texts, drawn from popular culture, academic fields, and the public realm.

WRIT 3102W. Public Writing. (3 cr.; A-F only; Every Fall) Practice and study of public writing beyond the academy or professions. Examine public documents and apply critical/rhetorical analysis regarding audience, purpose, message, power, and context. Students conduct research/write documents for public audiences on contemporary issues of interest. prerequisite: Soph or jr or sr

WRIT 3152W. Writing on Issues of Science and Technology. (WI; 3 cr.; A-F or Audit; Every Fall & Spring) Read books/articles, discuss, and write about major issues in science/technology. Possible topics: DNA and human genome. Animal human interaction. Global warming; Alternative energies; Animal/human cloning and stem-cell research. Vaccines from Smallpox to AIDS. Why civilizations collapse.

WRIT 3211W. Communication Modes and Methods. (WI; 3 cr.; A-F only; Every Fall & Spring) Theories and practices of interpersonal, small group, organizational, and scientific and technical communication. Lecture, discussion, simulations, small group work.

WRIT 3244W. Critical Literacies: How Words Change the World. (AH,WI,DSJ; 3 cr.; A-F or Audit; Every Spring) Language as creating rather than simply describing "reality." Reading and writing as arenas of active human struggle over social group power. Techniques for analyzing, interpreting, and participating in the conversation of critical literacies.

WRIT 3257. Technical and Professional Presentations. (3 cr.; Student Option No Audit; Every Fall & Spring) Oral presentation skills for technical or professional topics. Visual communication, audience analysis, organizing presentation, presenting complex research material. Emphasizes use of digital technologies. Recommend that students take Comm 1101 or equivalent first

WRIT 3291. Technical Communication Certificate Capstone Project. (1 cr.; A-F only; Every Fall, Spring & Summer) The capstone project is taken in conjunction with a concurrent WRIT course for the Technical Communication Certificate. The project extends an assignment in the selected WRIT course to further explore an aspect of technical communication. Students develop their project in consultation with the instructor of the selected course. Project formats include a paper, report, podcast, video, scientific poster, or electronic presentation. prerequisite: instr consent

WRIT 3315. Writing on Issues of Land and the Environment. (AH,DSJ; 3 cr.; A-F or Audit; Every Spring) Land in America as idea and as actual space. History of cultural values and the meanings land holds for us. Contrasting views of land,
especially those of certain Native American peoples. Rise of the conservation movement and the urbanization of U.S. space.

**WRIT 3361. Literature of Social Movements in the United States: 1950 to Present.** (CIV,LITR; 3 cr.; A-F or Audit; Every Spring) Literature (fictional, nonfictional) of social movements in United States in last half of 20th century. Artistic truth in relation to historical truth. Roles/obligations of citizens to protest/ change social structures. prereq: Soph or jr or sr or instr consent

**WRIT 3371W. Technology, Self, and Society.** (TS, WI; 3 cr.; A-F only; Every Fall) Cultural history of American technology. Social values that technology represents in shifts from handicraft to mass production/consumption, in modern transportation, communication, bioengineering. Ethical issues in power, work, identity, our relation to nature.

**WRIT 3381W. Writing and Modern Cultural Movements.** (AH,WI; 3 cr.; A-F or Audit; Every Fall) How written texts contribute to movements in art and culture. How such texts are written with particular audiences, purposes, styles, and forms. Readings, lectures, discussions, analysis of texts.

**WRIT 3405W. Humanistic Healthcare and Communication.** (AH,WI; 3 cr.; Student Option: Every Spring) Relationships in art between communication, humanism in healthcare, empathy.

**WRIT 3441. Editing, Critique, and Style.** (; 3 cr.; A-F only; Every Fall & Spring) Editing for style, correctness, and content. Grammar/punctuation, Copyediting/proofreading. Working with a writer to develop, organize, write, and polish a document. Editing technical/scientific information. Paper/electronic assignments. prereq: Soph or jr or sr

**WRIT 3562V. Honors: Technical and Professional Writing.** (WI; 4 cr.; A-F only; Every Fall) Written and oral communication in professional settings, gathering research, analyzing audience, assessing and practicing multiple genres. Draft, test, revise present findings in oral presentation. Honors section includes discussion on scholarly readings in technical and professional writing as well as a final project that must be addressed to a real-world audience.

**WRIT 3562W. Technical and Professional Writing.** (WI; 4 cr.; A-F only; Every Fall, Spring & Summer) Technical and professional writing communicates complex information to solve problems or complete tasks. It requires not only knowledge of workplace genres, but also a skill of composing such genres. This course allows students to practice rhetorically analyzing writing situations and composing workplace genres: memos, proposals, instructions, research reports, and presentations.

**WRIT 3577W. Rhetoric, Technology, and the Internet.** (TS, WI; 3 cr.; A-F only; Every Fall & Spring) How persuasive communication is tailored to the Internet; how Internet technologies enable/limit persuasion; how to adapt rhetorical theory to 21st century digital writing; ethical issues, including free speech, copyright, fair use, privacy; rhetorics of social networks. prereq: Soph or jr or sr or instr consent

**WRIT 3671. Visual Rhetoric and Document Design.** (3 cr.; A-F only; Every Fall & Spring) Rhetorical principles applied to visual displays of information/data in print/online documents. Analyze/create examples of visual communication/design for selected documents combined with various writing strategies.

**WRIT 3672W. Project Design and Development.** (WI; 3 cr.; A-F or Audit; Every Spring) Students study, plan, research, design, and develop technical communication print documents, including documentation, brochures, and newsletters. Workplace project processes. Develop production-quality documents. prereq: Jr or sr

**WRIT 3701W. Rhetorical Theory for Writing Studies.** (WI; 3 cr.; A-F only; Every Fall & Spring) Principles/history of rhetorical theory/criticism. Classical theories. Aristotle's Rhetoric applied to examples of contemporary communication. Relationship of classical theory to scientific discourse, technical communication. prereq: TWC or Sconcurrent registration is required (or allowed) in TC Major, Soph or jr or sr or instr consent

**WRIT 3751W. Seminar: Theory and Practice of Writing Consultancy.** (WI; 3 cr.; Student Option: Every Fall) How writers learn to write, how writing is taught in the academy, and how rhetorical conventions vary across disciplines. prereq: Currently working in a University writing center, instr consent

**WRIT 3993. Directed Study.** (1-4 cr. [max 8 cr.]; Student Option: Every Fall, Spring & Summer) Supervised reading/research on topics not covered in regularly scheduled offerings. Intended primarily for upper division undergraduate students. prereq: instr consent, dept consent, college consent

**WRIT 4196. Internship in Technical Writing and Communication.** (; 3 cr.; A-F only; Every Fall, Spring & Summer) Internships sites may include University, industry, or government agencies. Internship proposal, progress report, internship journal (optional), final report with letter from internship supervisor. prereq: Writ 3562W and 24 credits completed in the Technical Writing & Communication major

**WRIT 4431W. Science, Technology, and the Law.** (CIV, WI; 3 cr.; A-F only; Every Fall) How issues in science/technology affect 21st century practice of law. Ownership, access, ethics, information, technology used to frame topics. Intellectual property, privacy, health law, research practice. prereq: Jr or sr or grad student or instr consent

**WRIT 4501. Usability and Human Factors in Technical Communication.** (; 3 cr.; A-F only; Every Spring) Principles/concepts of human factors/usability testing. Developing objectives, criteria, and measures. Conducting tests in lab, field, and virtual environments. Using software programs to analyze qualitative/quantitative data.

**WRIT 4562. International Professional Communication.** (; 3 cr.; A-F only; Every Spring) The increasingly global nature of communication presents new challenges and opportunities as communicators develop content for and with clients and colleagues from other cultures. Moreover, professionals increasingly perform their work as part of global virtual teams using multiple synchronous and asynchronous technologies. Thus, this course includes resources and experiences designed to increase a student's skill at communicating with multicultural audiences, working as a member of international teams, and using multiple technologies as part of this work.

**WRIT 4573W. Writing Proposals and Grant Management.** (WI; 3 cr.; A-F or Audit; Every Fall) Research funding sources. Interpreting RFP or program announcement. Letters of intent. Grant preparation, following guidelines of RFP or program announcement. Proposals for nonprofits or research/business.

**WRIT 4662W. Writing With Digital Technologies.** (WI; 3 cr.; A-F only; Every Fall) WRIT 4662W is an advanced level Writing Studies course that explores various digital writing technologies and provides multiple opportunities to assess writing situations and make appropriate rhetorical decisions about digital form and production. Students will learn the basic building blocks of writing in Internet environments (text, sound, images, video) as well as the vocabularies, functionalities, and organizing structures of Web 2.0 environments, how these impact understanding and use of information, and how to produce these environments (i.e., multimedia internet documents) for interactivity and use. This course includes design projects and practice with apps, markup language, content management systems, video, and social media. prereq: Jr or sr or grad student or instr consent

**WRIT 4664W. Science, Medical, and Health Writing.** (WI; 3 cr.; A-F or Audit; Fall Odd Year) Read various kinds of science, medical, and health writing. Develop heuristics for science, medical, and health writing grounded in rhetorical theory. Research, draft, and write a variety of science, medical, and health genres for a range of audiences and print/digital outlets.

**WRIT 4995. Technical Writing and Communication Capstone.** (1 cr.; A-F only; Every Fall, Spring & Summer) Capstone project addressing topic in writing studies related to WRIT course. Must be done
in conjunction with concurrent 3xxx or 4xxx level course in Writing Studies that student is taking. Instructor permission required for registration.

WRIT 4995H. Technical Writing and Communication Honors Thesis. (1 cr. [max 2 cr.]; A-F only; Every Fall, Spring & Summer) Technical Writing and Communication Honors Thesis addresses a topic in writing studies related to a WRIT course that the student is taking or has taken. Students will define and investigate a topic in depth, and complete an extended written reflection of their results & understanding. An honors thesis is required of all students graduating with any level of Latin honors. Completing the honors thesis is a year long effort. Students graduating with Latin Honors should enroll in WRIT 4995H both fall and spring semesters of their senior year. Students not graduating with Latin Honors should register for WRIT 4995.

WRIT 5001. Introduction to Graduate Studies in Scientific and Technical Communication. (3 cr.; A-F only; Every Fall) History of technical communication. Different audiences, purposes, genres, and emerging trends. International/intercultural issues. Students participate within a community of technical communication professionals. prereq: Grad student or instr consent

WRIT 5051. Graduate Research Writing for International Students. (3 cr.; Student Option; Every Fall, Spring & Summer) Graduate-level writing techniques/formats for summaries, critiques, research, and abstracts. Persuasion, documentation, structure, grammar, vocabulary, field-specific requirements. Writing through several drafts, using mentor in specific field of study. Revising/editing to meet graduate standards. Discussions. prereq: Grad student

WRIT 5052. Graduate Research Presentations and Conference Writing for Non-Native Speakers of English. (3 cr.; Student Option; Every Fall & Spring) Practice in writing/presenting graduate-level research for conferences or professional seminars. Delivery of professional academic presentations to U.S. audiences. Conference abstract, paper, and poster presentation. Communication in research process. Students select topics from their own research/studies. Format, style, transitions, topic narrowing, non-verbal presentation skills. prereq: [Grad student, non-native speaker of English] or instr consent

WRIT 5112. Information Design: Theory and Practice. (3 cr.; A-F or Audit; Periodic Spring) This course examines how verbal, visual, data, and other forms of content can be designed and combined to create meaning, improve comprehension, and make information more usable. In particular, we will study the rhetorical roles visual elements play in print and digital communications, and how we as technical communicators can use visual means to reach audiences, convey information, and achieve rhetorical goals. We will read and discuss theory, practice information design skills, and apply both to real communications projects suitable for inclusion in a professional portfolio. prereq: Grad student or instr consent

WRIT 5196. Internship in Scientific and Technical Communication. (3-6 cr.; S-N or Audit; Every Fall, Spring & Summer) Internship sites may include the University, industry, or government agencies. An internship proposal, progress report, internship journal (optional), and final report with a letter from the internship supervisor are required.

WRIT 5270. Special Topics. (WI; 3 cr. [max 9 cr.]; Student Option; Periodic Fall & Spring) Topics specified in Class Schedule.

WRIT 5291. Independent Study, Reading, and Research. (1-3 cr.; Student Option; Every Fall, Spring & Summer) Supervised reading/research on advanced projects not covered in regularly scheduled offerings. prereq: instr consent, dept consent

WRIT 5531. Introduction to Writing Theory and Pedagogy. (3 cr.; A-F or Audit; Every Fall) Pedagogical philosophy/methodology in composition, primarily first-year writing. Theories underlying teaching/tutoring with technology. prereq: Grad student

WRIT 5532. Writing Pedagogy Practicum. (1 cr. [max 3 cr.]; S-N only; Every Spring) Discussion/activities that support development of sound pedagogical practices. Practical details of classroom. Professionalization, theory/research. prereq: Grad student

WRIT 5561. Editing and Style for Technical Communicators. (3 cr.; A-F only; Every Spring & Summer) Proofreading, copy-editing, comprehensive editing. Students primarily use electronic editing methods. Editor's responsibilities, relationship to writers, roles within an organization, style guides, ethical choices. Editing in global setting. Editing/style for visual design and online documents. prereq: [Grad student, knowledge of grammar/punctuation rules] or instr consent

WRIT 5570. Minnesota Writing Project Directed Studies. (1-3 cr. [max 9 cr.]; A-F or Audit; Every Summer) Guided individual research into current theories/practices of writing and writing pedagogy.

WRIT 5671. Visual Rhetoric. (3 cr.; A-F only; Every Spring) Range/development of visuals, especially those in science/technology. Vocabulary for commenting on, criticizing, and creating visuals. prereq: Jr or Sr or grad student

WRIT 5775. The Rhetorical Tradition: Classical Period. (3 cr.; A-F only; Every Fall) Rhetoric in the Classical world and recurring themes that constitute "the rhetorical tradition." Epistemological/ethical status and sociopolitical importance of ancient rhetorical training and discourse. Works by Isocrates, Plato, Aristotle, Cicero, Quintilian, and others. Prepares students for preliminary examinations/seminars in rhetoric.

WRIT 5776. The Rhetorical Tradition: Modern Era. (3 cr.; A-F or Audit; Periodic Spring) Core works in modern/contemporary rhetorical theory. Twentieth-century revivals of and challenges to the Aristotelian rhetorical tradition. Units devoted to Enlightenment rhetorics; the New Rhetorics of I. A. Richards, Kenneth Burke, and Chaim Perelman; feminist rhetorical theory, historiography, and critique; deconstruction/post-structuralism. Prepares students for preliminary examinations/seminars in rhetoric.

WRIT 8011. Research Methods in Writing Studies and Technical Communication. (3 cr.; A-F or Audit; Periodic Fall) Survey of qualitative/quantitative research methods. Theoretical perspectives that demonstrate/test analytical approaches to scientific/technological rhetoric. prereq: STC/RSTC grad student or instr consent

WRIT 8012. Applied Research Methods in Writing Studies and Technical Communication. (3 cr.; [max 6 cr.]; A-F or Audit; Every Fall & Spring) Introduction to one or two quantitative or qualitative research methods in scientific/technical communication or rhetoric (e.g., ethnography, case studies, discourse analysis). prereq: [grad student] or instr consent

WRIT 8333. FTE: Master’s. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Master's student, adviser and DGS consent

WRIT 8444. FTE: Doctoral. (1 cr.; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Doctoral student, adviser and DGS consent

WRIT 8505. Professional Practice. (3 cr.; S-N only; Every Fall, Spring & Summer) Extended problem-solving situation in business, government, or industry. Student acts as consultant to explore problem, identify possible solutions, introduce solution, apply it.

WRIT 8510. Seminar in Rhetoric. (3 cr.; [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Topics may include theories, history, criticism, major figures, movements, visual or material rhetoric. Topics vary. See the Class Schedule.

WRIT 8520. Seminar in Scientific and Technical Communication. (3 cr.; [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Topics may include theories, landmark studies, history, gender, ethics. Topics vary. See the Class Schedule.

WRIT 8540. Seminar in Technical Communication and Composition Pedagogies. (3 cr.; [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Topics may include theories of pedagogy or research studies that inform the classroom or workplace, social and ethical concerns, landmark studies, current controversies. Topics vary. See the Class Schedule.
WRIT 8550. Seminar in Technology, Culture, and Communication. (3 cr. [max 12 cr.]; A-F or Audit; Periodic Fall & Spring) Topics may include computer-mediated communication, democracy/technology, controversies over digital communication, privacy/ethics issues, feminist theory and interactions of gender with science and technology, communication in legal or medical settings. Topics vary. See the Class Schedule.

WRIT 8560. Seminar in Writing Studies and Usability. (3 cr. [max 12 cr.]; A-F; Every Fall & Spring) Topics may include literacy, genre, history of writing, narrative theory and practice, writing as textual practice. Topics vary. See the Class Schedule.

WRIT 8666. Doctoral Pre-Thesis Credits. (1-6 cr. [max 12 cr.]; No Grade Associated; Every Fall, Spring & Summer) Doctoral Pre-Thesis Credits prereq: Doctoral student who has not passed prelim oral; no required consent for 1st/2nd registrations, up to 12 combined cr; dept consent for 3rd/4th registrations, up to 24 combined cr; doctoral student admitted before summer 2007 may register up to four times, up to 60 combined cr.

WRIT 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 10 cr total required [Plan A only]

WRIT 8792. Independent Study, Reading, and Research. (1-4 cr. [max 12 cr.]; S-N only; Every Fall, Spring & Summer) Supervised study, reading, or research on projects not covered in regularly scheduled offerings. prereq: instr consent

WRIT 8794. Directed Research. (1-4 cr. [max 12 cr.]; S-N only; Every Fall, Spring & Summer) Supervised research project. prereq: instr consent

WRIT 8888. Thesis Credit: Doctoral. (1-24 cr. [max 100 cr.]; No Grade Associated; Every Fall, Spring & Summer) (No description) prereq: Max 18 cr per semester or summer; 24 cr required

Youth Development and Research (YOST)

YOST 1001. Seeing Youth, Thinking Youth: Media, Popular Media, and Scholarship. (CIV: 3 cr.; Student Option; Every Fall & Spring) Use of life-experience, news and popular media to explore everyday realities of being a young person, as it varies by age social class, race/ethnicity, geography, time period, sexual orientation, and capacity.

YOST 1366. Stories of Resistance & Change: Youth, Race, Power & Privilege in the U.S.. (DSJ; 3 cr.; Student Option; Every Fall & Spring) Young people in their everyday lives often experience themselves as invisible, or as trouble, troubled, or in trouble with adult authority. This course will use literature as an opportunity to complement social sciences understandings of youth, to help those who work with children and adolescents to better understand their lived experiences. This course will use classic and contemporary literary texts that respond to the needs, wants, and existential questions that surround young people's lives, and makes them visible to learners in the class who want to better understand children and adolescents in diverse settings across the United States.

YOST 1368W. Youth Global Perspectives: Stories from the Arab, Islamic, and Middle Eastern Worlds. (GP, WI, LITR; 4 cr.; Student Option; Every Fall & Spring) This course helps students build a critical understanding of our current moment, including Islamophobia, conflicts with Iran, and the U.S. role in the relationship between Israel and Palestinians. We accomplish this through a youth studies perspective by reading stories that invite questions. Reading plays, stories, novels, and essays from young Muslim-American, Egyptian, Palestinian, Israeli, Persian, and Yemeni authors, we consider the role of storytelling in/excluding social media in youth-led social movements. Students practice skills of literary analysis through an interactive and collaborative classroom designed to support diverse learning styles. Through literary works, students gain insight into the forces that shape social interactions and social change on small and large scales in a global context. We work within a social justice framework that aims to understand the complex power dynamics that have shaped the modern Middle East and Western perspectives towards Arabs and Muslims.

YOST 2101. Urban Youth and Youth Issues. (DSJ; 4 cr.; Student Option; Every Fall & Spring) What it is like to be a young person in a city, in the United States and worldwide. prereq: 1001 or instr consent

YOST 2241. Experiential Learning. (4 cr.; Student Option; Every Fall & Spring) History/theory of experiential learning, its application in youthwork. Observation, reflection, program design, and evaluation skills grounded in experiential learning theory. 15 hours of field observation required. prereq: [1001, 2001] or instr consent

YOST 3001. Introduction to History & Philosophy of Youthwork. (4 cr.; Student Option; Every Fall & Spring) Foundations of youthwork. Where contemporary American youthwork stands, particularly in comparison with international perspectives on youth/youthwork. prereq: 2xxx or instr consent

YOST 3011. Young Voices: The Fight for Social Change in Croatia. (GP; 3 cr.; A-F only; Periodic Summer) This international immersion course explores the history, struggles, accomplishments, and experiences of Croatian young people who have engaged in social change efforts. Our focus will be on young people's involvement in a diverse range of social change movements and how these emerged, how they worked, and what caused them to decline.

YOST 3031. International Youthwork. (3 cr.; A-F only; Periodic Fall, Spring & Summer) Lives of young people living outside the United States and of immigrants/refugees now resident in this country. Working with and on behalf of such groups. Socio-political analysis of globalization, its impact on young people, youthwork, and youth policy worldwide. prereq: 2xxx or instr consent

YOST 3032. Adolescent and Youth Development for Youthworkers. (4 cr.; Student Option; Every Fall & Spring) Application of theory/research about children/adolescents. How findings can be used. How theories facilitate understanding of behavior. prereq: 1001 or 2002W or 2101, [any Psych or CPay course]

YOST 3101. Youthwork: Orientations and Approaches. (4 cr.; Student Option; Every Spring) Historical/contemporary approaches to youthwork, diverse settings in which it is done, importance of worker's life experience in crafting ethical, effective practice. At least 15 hours of field experience. prereq: One gen psy course, one gen soc course

YOST 3234. Youth Agencies, Organizations, and Youth Service Systems. (3 cr.; Student Option; Every Spring) Communities/governmental responses to young people as potential problems through agencies, programs, and other organizational forms. Purpose, structure, and activities of such forms. How the forms are/are not integrated into youth service systems. prereq: [Two soc/anth courses, work experience in youth [agency or org]] or instr consent

YOST 3235. Community Building, Civic Engagement, and Civic Youthwork. (4 cr.; Student Option; Every Spring) Reciprocities between youth development and community development brought about by young people's civic engagement. Individual, social, and political change by/for young people and their community. prereq: [2001, One basic course in Pol, one basic course in Soc] or instr consent

YOST 3240. Special Topics in Youth Studies. (2-8 cr. [max 10 cr.]; Student Option; Every Fall, Spring & Summer) In-depth investigation of one area of youth studies. Teaching procedure/approach determined by specific topic and student needs. Topic announced in advance. prereq: [Two social sci courses, exp working with youth] or instr consent

YOST 3291. Independent Study in Youth Studies. (1-9 cr. [max 18 cr.]; Student Option; Every Fall, Spring & Summer) Independent reading or research under faculty supervision. prereq: instr consent

YOST 3325V. Honors: Project-Based Writing For Education and Human Development
Majors. (WI; 4 cr.; A-F only; Every Fall & Spring)
Writing project focused on problem or issue in field of study. Propose project, identify audience, gather information through primary/secondary research. Create product tailored to audience needs. Collaborative activities/assignments.

YOST 3325W. Project-Based Writing For Education and Human Development Majors. (WI; 4 cr.; Student Option; Every Fall & Spring)
Writing project focused on problem or issue in field of study. Propose project, identify audience, gather information through primary/secondary research. Create product tailored to audience needs. Collaborative activities/assignments. prereq: 60+ undergraduate credits, declared major

YOST 4196. Youwork Internship. (4 cr.; Student Option; Every Fall & Spring)
Supervised field learning in school/community-based organizations/agencies. Emphasizes youwork practice. prereq: Declaration of youth studies major, instr consent

YOST 4301. Communicating With Adolescents About Sexuality. (3 cr.; Student Option; Periodic Fall & Spring)
How to communicate sensitively/efficiently with adolescents and their concerned persons about sexuality in everyday life. Focuses on healthy sexual development (physical, emotional, ethical) and sexual diversities. Adolescent sexual issues; gender, body image, disease, sexual violence, intimacy, sex in cyberspace. prereq: 1001 or instr consent

YOST 4314. Theater Activities in Youthwork and Education. (2 cr.; Student Option; Every Spring)
Empowering methods of personal/creative development using experiential learning and theater activities to enhance creativity/imagination. Approaches to working with youth in school and youth agency settings. Experiential learning, improvisational theater/teaching. prereq: 1001 or 2101

YOST 4315. Youwork in Schools. (4 cr.; Student Option; Every Fall & Spring)
Craft of youthwork as a framework to understand life-worlds of young people and a practice in everyday life. Focuses on healthy social development (physical, emotional, ethical) and sexual diversities. Adolescent sexual issues; gender, body image, disease, sexual violence, intimacy, sex in cyberspace. prereq: 1001 or 2101

YOST 4316. Media and Youth: Learning, Teaching, and Doing. (2 cr.; Student Option; Every Spring)
How to use various media sources with young people to enhance their development and civic engagement. prereq: 1001 or 2101 or instr consent

YOST 4317. Youwork in Contested Spaces. (3 cr.; Student Option; Periodic Fall, Spring & Summer)
Consequences of ragnized violence on everyday lives/futures of youth. Violence in conflict/post-conflict societies. Role of youthwork under these circumstances.

Field research practicum. Basic social science approaches to the study of youth. Evaluating youth programs. Students complete a simple youth research/evaluation study. prereq: Basic research methods course or instr consent

YOST 4319. Understanding Youth Subcultures. (3 cr.; Student Option; Periodic Fall, Spring & Summer)
Young people's participation in and understanding of subcultures, life-styles, and event cultures. Place of these in young people's identity, friendship, and life chances. prereq: [1001, one basic course in [ANTH or SOC]] or instr consent

YOST 4321. Work with Youth: Individual. (2 cr.; Student Option; Every Fall)
Assumptions underlying individual work with youth. Issues/concerns of adolescents and of persons who work with them in one-to-one interactions. prereq: 1001 or 2101 or instr consent

YOST 4322. Work with Youth: Families. (2 cr.; Student Option; Every Fall)
Theories and techniques of working with youth and their families. Emphasizes practical methods of structural change, developing effective communication, decision-making and problem-solving systems, winning the family's cooperation. Role of professional in influencing healthy family development. prereq: 1001 or 2002W or instr consent

YOST 4323. Work with Youth: Groups. (2 cr.; A-F only; Every Fall)
Social group work, adolescent group needs/associations. Group process. Working with diverse groups of youth in community, in group living situations, and in group therapy. prereq: [1001 or 2002W], 4321 or instr consent

YOST 4325. Improving Everyday Youwork: Practical Program Evaluation. (3 cr.; Student Option; Every Fall)
Purpose, methods, and uses of program evaluation. How young people can develop/enhance programs and secure funding. Evaluation as political/moral imperative. prereq: [1001 or 2101, 3234] or instr consent

YOST 4401W. Young People's Spirituality and Youwork: An Introduction. (WI; 4 cr.; Student Option; Spring Odd Year)
Adolescent spirituality, its relation to working with young people. Faith/spirituality as necessary for healthy youth development. Knowledge, attitudes, and skills to recognize spirituality in cultural, social, economic, and political worlds. prereq: 1001 or 2002W or instr consent

YOST 4402. Youth Policy: Enhancing Healthy Development in Everyday Life. (4 cr.; Student Option; Periodic Fall & Spring)
Youth policy as formulated in response to youth issues, problems, and community/public concerns. Policy as political response to youth panics, as indirect youthwork, and as a community's moral compact with its young people. Perspectives explored are specific to student interests. prereq: [1001, 2002W] or instr consent

YOST 4411. Youth Research and Youth Program Evaluation. (4 cr.; Student Option; Every Spring)

YOST 5011. Youth Voices: The Fight for Social Change in Croatia. (3 cr.; A-F only; Periodic Summer)
This international immersion course explores the history, struggles, accomplishments, and experiences of Croatian young people who have engaged in social change efforts. Our focus will be on young people's involvement in a diverse range of social change movements and how these emerged, how they worked, and what caused them to decline.

YOST 5030. Youth Voices: The Fight for Social Change in Croatia. (3 cr.; A-F only; Periodic Summer)
This international immersion course explores the history, struggles, accomplishments, and experiences of Croatian young people who have engaged in social change efforts. Our focus will be on young people's involvement in a diverse range of social change movements and how these emerged, how they worked, and what caused them to decline.

YOST 5031. International Youwork. (3 cr.; Student Option; Every Fall)
Lives of young people living outside the United States and of immigrants/refugees now resident in this country. Working with and on behalf of such groups. Socio-political analysis of globalization. Its impact on young people, youthwork, and youth policy worldwide. prereq: 2xxx or instr consent

YOST 5032. Adolescent and Youth Development for Youthworkers. (4 cr.; Student Option; Every Fall & Spring)
Application of theory/research about children/adolescents. How findings/theories facilitate understanding of behavior. prereq: [1001 or 2001 or 2002W or 2101], [any Psych or CPsy course]

YOST 5234. Youth Agencies, Organizations, and Youth Service System. (3 cr.; Student Option; Every Spring)
Communities and governmental responses to young people as potential problems through agencies and programs and other organizational forms. Purpose, structure, and activities of such forms. How forms are/are not integrated into youth service systems. prereq: [Two soci/anth courses, work experience in [youth agency or org]] or instr consent

YOST 5235. Community Building, Civic Engagement, and Civic Youwork. (4 cr.; Student Option; Every Spring)
Reciprocity between youth development and community development brought about by young people's civic engagement. Individual, social, and political change by/for young people and their community. prereq: [2001, one basic course in Pol, one basic course in Soc] or instr consent

YOST 5240. Special Topics in Youth Studies. (2-8 cr.; max 40 cr. ; Student Option; Every Fall, Spring & Summer)
In-depth investigation of one area of youth studies. Teaching procedure and approach determined by specific topic and student needs. Topic announced in advance. Prereq: Two social sci courses, exper working with youth or instr consent.

YOST 5291. Independent Study in Youth Studies. (1-8 cr. [max 16 cr.]; Student Option; Every Fall, Spring & Summer) Independent reading and/or research under faculty supervision.

YOST 5301. Communicating With Adolescents About Sexuality. (3 cr.; Student Option; Every Summer) How to communicate sensitively/effectively with adolescents and their concerned persons about sexuality in everyday life. Healthy sexual development (physical, emotional, ethical), sexual diversities. Gender/body image, disease, sexual violence, intimacy, sex in cyberspace. Prereq: [Upper div AdPy course, exper working with youth] or instr consent.

YOST 5314. Theatre Activities in Youthwork and Education. (2 cr.; Student Option; Every Spring) Using experiential learning and theater activities to enhance creativity and imagination of youth workers and educators. Approaches to working with youth in school and agency settings. Application of experiential learning and improvisational theater theory/praxis. Prereq: 1001 or 2101.

YOST 5315. Youthwork in Schools. (4 cr.; Student Option; Every Fall & Spring) Craft of youthwork as a framework to understand life-worlds of young people and a practice to enhance healthy development. How young people often make artificially/harmfully divide their lives into "school" and "not school." Prereq: Introductory course in education or instr consent.

YOST 5316. Media & Youth: Learning, Teaching, and Doing. (2 cr.; Student Option; Every Spring) Youth as targets, producers, and consumers of a variety of media. This course is about understanding and learning to use a variety of these sources with young people to enhance their development and civic engagement. Prereq: 1001 or 2101 or instr consent.

YOST 5319. Understanding Youth Subcultures. (3 cr.; Student Option; Every Summer) Young people's participation in and understanding of subcultures, life-styles, and event cultures. Place of these in young people's identity, friendship, and life chances. Prereq: 2001 or one course each in [Anth, Soc] or instr consent.

YOST 5321. Work With Youth: Individual. (2 cr.; Student Option; Every Fall, Spring & Summer) Basic assumptions underlying individual work with youth. Special issues and concerns of adolescents and of persons who work with them, especially those who work with youth in one-to-one interactions. Prereq: 1001 or 2002W or instr consent.

YOST 5322. Work With Youth: Families. (2 cr.; Student Option; Every Fall, Spring & Summer) Theories and techniques of working with youth and their families. Practical methods of structural change. Developing effective communication. Decision-making and problem-solving systems. Winning the family's cooperation. Role of professional in influencing healthy family development. Prereq: 1001 or 2002W or instr consent.

YOST 5323. Work with Youth: Groups. (2 cr.; Student Option; Every Fall & Summer) Social group work. Adolescent group needs and associations. Group process. Working with diverse groups of youth in community, in group living situations, and in group therapy. Prereq: 1001 or 2002W or instr consent.


YOST 5402. Youth Policy: Enhancing Healthy Development in Everyday Life. (4 cr.; Student Option; Periodic Fall & Spring) Youth policy as formulated in response to youth issues, problems, and community and public concerns. Policy as political response to youth panics, as indirect youthwork, and as a community's moral compact with its young people. Perspectives are explored specific to student interests. Prereq: [2001, one course each in [FSos, PolSci, Soc]] or instr consent.

YOST 5956. Organizational Approaches to Youth Development. (3 cr.; A-F or Audit; Every Fall) Historical contexts, theoretical frameworks, organizational practices, and public policies that shape nonformal educational experiences of youth in community-based or school-linked settings.

YOST 5957. Community: Context for Youth Development Leadership. (3 cr.; A-F or Audit; Every Spring) Issues/policies in family, school, and community that drive the professional practice of community-based youth work. Practical projects explore what it means to be local, to build social capital for youth, and to involve youth in community change.

YOST 5960. Seminar in Youth Development Leadership. (1 cr.; max 4 cr.; S-N only; Every Fall, Spring & Summer) Group study of topics/issues. Course proposal, educational program development. Students participate in co-created learning experience with a group of peers. Four-course sequence. Prereq: YDL student or instr consent.

YOST 5962. Leadership Field Experience: Youth Development. (4 cr.; S-N only; Every Fall, Spring & Summer) Demonstration of leadership in practice. Project on youth, experiential pedagogy, and community/program settings. Focuses on public policy, advocacy, evaluation, pedagogical issues, program design, curriculum development, or applied research. Prereq: YDL student.