## University of Minnesota Twin Cities
### 2010-12 Undergraduate Catalog

### Course Descriptions

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For a guide to course numbers, symbols, and abbreviations, see page 376.
Course Numbers, Symbols, and Abbreviations

The courses in this catalog are current as of April 1, 2010. 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.

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.

Credit will not be granted if credit has been received for the course listed after this symbol.
Academic Health Center Shared (AHS)

AHS 1101. Orientation to Health Careers. (1 cr = AHS 1102)
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 = max 2 cr = AHS 1101)
Self-assessment of values, interests, and behavioral styles; health professions/academic programs; professionalism and inter-professional communication; developing a career action plan.

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

AHS 1601. The Future Physician II. (1 cr; Stdnt Opt. Prereq-Permission number; 1600 recommended)
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.

AHS 1602. The Future Physician III: Experiences in Health. (2 cr; Stdnt Opt. Prereq-Permission number)
Online course for students who are confident in their decision to prepare for medical school. Exercises designed to help them learn about and prepare for a career in medicine. Community-based volunteer experience (35 hours) in a setting that employs physicians and serves patients. At completion, students will have completed their required volunteer hours and a Medical School Action Plan providing them a course of action for application to medical school.

AHS 2300. Orientation to Clinical Research. (1 cr; A-F only. Prereq-# [referral from UMTC academic adviser or faculty member], interview, application essay, GPA of at least 3.50)
Seminar. Field of clinical research. Ethical conduct/professionalism. Research methods pertinent to dentistry, medicine, public health, pharmacy, and nursing. Field experience.

AHS 2707H. Global Health Challenges for Future Health Professionals. (2 cr = max 8 cr; A-F only)
Global health issues. Challenges/opportunities choosing a career as health professional. Students hear from health professionals regarding their work relation to each health challenge.

AHS 4300. Directed Study. (1-3 cr = max 6 cr; Stdnt Opt. Prereq-#)
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.

Accounting (ACCT)

Department of Accounting

Curtis L. Carlson School of Management

ACCT 2050. Introduction to Financial Reporting. (4 cr; A-F or Aud. Prereq-1251. Prereq-Soph)
Introduction to financial accounting for U.S. organizations. Reading financial statements.

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

ACCT 3001. Introduction to Management Accounting. (3 cr; A-F or Aud; Prereq-2050)
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.

ACCT 3199. Internship in Public Accounting. (2 cr; S-N or Aud. Prereq-3125, #)
Full-time work for a public accounting firm plus a written report on the work experience.

ACCT 3201. Intermediate Management Accounting. (2 cr; A-F or Aud; Prereq-3001, acct or finance major)
Activity-based costing techniques in specific industries including service firms. Other topics could include costing for Just-in-Time manufacturing, tracking customer profitability, and costing quality.

ACCT 3299. Internship in Management Accounting. (2 cr; S-N or Aud. Prereq-Acct 3201, #)
Full-time work in general accounting, cost accounting, or internal auditing in an industrial or governmental organization plus a written report analyzing the work experience.

ACCT 5100. Corporate Financial Reporting. (4 cr; A-F or Aud. Prereq-Mgmt student, non-accounting major)
Overview of activity-based valuation and income measurement. Focus on how economic events are reported in the financial statements. Examines accounting theory and the accounting standard-setting process.

ACCT 5101. Intermediate Accounting I. (4 cr; A-F or Aud. Prereq-Grade of at least B- in 2050, [mgmt major or mgmt grad student])
Valuation, measurement, and reporting issues related to selected assets/liabilities of a firm. Theory underlying accounting issues. Applying accounting principles.

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

ACCT 5125. Auditing Principles and Procedures. (4 cr; A-F or Aud. Prereq-[3101 or 5101 or 5100 or 6100], A-F or Aud; Prereq-[3101 or 5101 or 5100 or 6100], acct major or grad mgmt student])
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).

ACCT 5126. Internal Auditing. (2 cr; A-F or Aud)
Financial/operational auditing. Standards. Managing the function.

ACCT 5135. Fundamentals of Federal Income Tax. (4 cr; A-F or Aud. Prereq-[2050 or MBA 6030], [mgmt or grad mgmt student])
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.

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

ACCT 5180. Consolidations and Advanced Reporting. (2 cr; A-F or Aud. Prereq-[5102, mgmt or grad mgmt student])
Theory underlying the preparation of consolidated financial statements, as well as the mechanical computations needed to prepare the statements themselves.

ACCT 5234. Introduction to Taxation of Business. (2 cr; A-F or Aud. Prereq-5135, acct major)
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.

ACCT 5237. Foreign National Tax Consulting. (2 cr; S-N only. Prereq-5135, accounting major)
Tax return preparation/consulting experience. Partnership between U, IRS, Minnesota State Department of Revenue to provide free tax help to foreign national students, researchers, and visiting professors. Students preparing tax returns for nonresident aliens use commercial tax preparation software.

ACCT 5271. Accounting Information Systems. (2 cr; Stdnt Opt. Prereq-3101/5101 or 5100/6100)
Applications of electronic data processing systems in accounting, including modeling, financial planning, auditing, and data security. Analysis/design of accounting information systems.

ACCT 5310. International Accounting. (2 cr; A-F or Aud. Prereq-5101; [5102 or 5102] recommended)
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.

ACCT 5320. Current Topics in Accounting. (2 cr; S-N only)
Topics vary.
ACCT 5420. MAcc directed study. (1-4 cr; max 4 cr; A-F or Aud. Prereq-MAcc student) Internship or directed study in Master of Accountancy degree program.

Addiction Studies (ADDS)

College of Continuing Education

ADDS 4001. Professional Practice of Addictions Counseling. (3 cr; A-F only. Prereq-Adds student, #) Core addictions counseling functions including clinical assessment, case management, documentation, treatment planning, and ethical issues. Students begin process of securing internship.

ADDS 4002. Internship in Substance Abuse Counseling I. (2-8 cr; max 8 cr; S-N or Aud. Prereq-Adds 4001, Adds student, #) Supervised field work experience. Practical application of substance abuse counseling skills such as assessment, treatment planning, and case management.


ADDS 5002. Models, Methods, and Intervention Skills for Substance Abuse Counselors. (2 cr; A-F or Aud) Concepts/practices of several therapeutic models: existential therapy, person centered therapy, behavior therapy, cognitive therapy. Postmodern models such as solution-focused and narrative. Contemporary change model: motivational interviewing. Ambivalence, confidence, motivation, resistance, commitment to change.

ADDS 5003. Applied Psychopharmacology for Human Service Professionals. (2 cr; A-F or Aud) Categories of psychoactive drugs. Medications to treat mental disorders. Legal drugs such as alcohol, nicotine, cocaine, and marijuana. What is occurring physiologically when someone takes a psychoactive drug.

ADDS 5004. Co-Occurring Addictive and Mental Health Disorders. (2 cr; A-F or Aud. Prereq-Cannot be taken for cr by MSW students) Mentally ill, chemically abusive, or dependent clients. Intervention, advocacy, education, and support for client and those who are part of his or her environment. Social, environmental, and multicultural factors. Meets partial state requirements for becoming licensed as an alcohol/drug counselor.

ADDS 5005. Group Therapy: Theory and Practice. (3 cr; Stdnt Opt) Designing/facilitating therapy groups. Intra-/inter-personal dynamics, leadership skills, developmental aspects, ethical issues. Application to therapy ofchemically addicted individuals. Lectures, discussion, experiential exercises, small groups, readings.

ADDS 5006. Introduction to Resilience/Health Realization. (2 cr; Stdnt Opt) Resilience, health realization, and the link between them. Applications in students’ personal, professional, and organizational lives. Relevant literature, theory, and research.

ADDS 5007. Adolescence and Substance Abuse. (2 cr; A-F only) Screening, assessing, and treating adolescents. How to involve family and others. Interventions, approaches, best practices. Legal/ethical issues. Lectures, discussion, readings, exercises.

ADDS 5010. Special Topics. (1-3 cr [max 6 cr]; Stdnt Opt) Topics specified in Class Schedule.

ADDS 5011. Directed Study. (1-3 cr [max 3 cr]; Stdnt Opt) Directed study.

Adult Education (ADED)

Department of Educational Policy and Administration

College of Education and Human Development

ADED 3001. Adult Education Overview. (1 cr; A-F or Aud) Theory/practice of adult learning/development.

ADED 3101. Introduction to Strategies for Teaching Adults. (3 cr; A-F or Aud) Theories of adult learning, learning/teaching styles, methods/perspectives of teaching, applications of teaching in various settings.

ADED 5101. Strategies for Teaching Adults. (5 cr; A-F or Aud. Prereq-Grad student only) 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.

ADED 5102. Perspectives of Adult Learning and Development. (3 cr; Stdnt Opt) 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.

ADED 5103. Designing the Adult Education Program. (3 cr; A-F or Aud) Designing and implementing educational programs for adults. Application of concepts, theories, and models in different adult learning situations.

ADED 5196. Field Experience in Adult Education. (3-6 cr [max 6 cr]; S-N or Aud) Supervised fieldwork and practice. Presentations and evaluations of adult education practices.

ADED 5201. Introduction to Adult Literacy. (5 cr; Stdnt Opt) Definitions of literacy: workplace, community, and family. Issues: poverty/welfare, ethnicity, cultural diversity, social class, language/learning, immigrants.


ADED 5211. Introduction to the Undereducated Adult. (1 cr; A-F or Aud) Definitions of literacy in workplace, community, and family. Issues: poverty/welfare, ethnicity, cultural diversity, social class, language/learning, immigrants.

ADED 5212. Introduction to Adult Literacy in the Workplace. (1 cr; A-F or Aud. Prereq-5211) Review workplace literacy programs, funding, program planning, and needs assessment. Reaching/recruiting workers. Role of employers and the unions. Writing for low literacy employees.

ADED 5213. Introduction to Adult Literacy in the Community. (1 cr; A-F or Aud. Prereq-5211) Reviews role of the community programs in the United States in literacy building, the family in developing 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, and immigrant groups. Social action approaches to literacy education.

ADED 5224. Formal Assessment of Adult Literacy. (1 cr; A-F or Aud. Prereq-5211) Assessment of adult English/literacy skills needed for work, family, community, and continuing education. Formal testing policy, techniques, standardized tests. Underlying assumptions about testing, cultural bias, and interpretation of formal tests. Test preparation programs.

ADED 5226. Advanced Assessment of Adult Literacy. (1 cr; A-F or Aud. Prereq-5211, 5224, 5225) Applications and case studies. Educational planning for work, family, and community.

AER EC 5255. Methods of Teaching Advanced Adult Literacy. (1 cr; A-F or Aud. Prereq-5211, 5234) Advanced approaches to teaching reading, writing, and communication skills. Preparing students for college and continuing education. Reading/study skills. English in workplace and on Internet. Problem solving, analytical thinking. Technology as teaching tool. Evaluating commercial material/software.

AER EC 5700. Special Topics in Adult Education. (1-8 cr [max 12 cr]; Stndt Opt) Exploration of issues, methods, and knowledge in areas of adult education. Content varies.

Aerospace Engineering and Mechanics (AEM)

Department of Aerospace Engineering and Mechanics

College of Science and Engineering

AEM 1905. Freshman Seminar: Spaceflight With Ballooning. (2 cr Prereq-Fr) Inexpensive methods for reaching outer space. Students design/build mini-spacecraft, use high-altitude helium balloons to reach near-space. Launch/recovery on Saturday in October/November. Analysis of mission data.


AEM 4000H. Honors Research Seminar. (0 cr; S-N only. Prereq-Honors student, permission of University Honors Program, AEM major) Research seminars in aerospace engineering and mechanics, given by faculty members and visiting scholars.


AEM 4203. Aerospace Propulsion. (4 cr; A-F or Aud. Prereq-4202, [IT upper div or grad student]) Basic one-dimensional flows: isentropic, area change, heat addition. Overall performance characteristics of propellers, ramjets, turbojets, turbofans, rockets. Performance analysis of inlets, exhaust nozzles, compressors, burners, and turbines. Rocket flight performance, single-/multi-stage chemical rockets, liquid/solid propellants.


AEM 4301. Orbital Mechanics. (3 cr; A-F. Only. Prereq-[2012 or equiv], [Math 2373 or equiv], [IT upper div or grad student]) Two-body problem, Earth-satellite operations, rocket performance, reentry dynamics, space environments, restricted three-body problem, interplanetary trajectories, numerical simulations. Design project.


AEM 4305. Spacecraft Attitude Dynamics and Control. (5 cr; A-F or Aud. Prereq-[4301, [4303W or ME 3281], IT upper div or grad student]) 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 functions. Linear control theory. PID controllers. Applications. Matlab/Simulink simulations. Design project.

AEM 4321. Automatic Control Systems. (3 cr; A-F only. Prereq-[4303 or equiv or ME 3281 or EE 3015], [IT upper div or grad student]) Modeling, characteristics, and performance of feedback control systems. Stability, root locus, frequency response methods. Nyquist/Bode diagrams. Lead-lag, PID compensators. Digital implementation, hardware considerations.

AEM 4331. Aerospace Vehicle Design. (4 cr; A-F only. Prereq-[2301, 4202, AEM sr or #) Student teams design aerospace vehicle. Mission requirements, trade studies, vessel sizing, CAD/vehicle integration, performance, propulsion, systems/equipment, operating envelopes, stability/control, trajectory analysis, baseline specification, certification. Professional ethics/responsibilities. Design log, oral conceptual design review, written report.

AEM 4332W. Aerospace Vehicle Design II: Space Vehicles, Missions, and Systems. (4 cr; A-F or Aud. Prereq-[4331 or #], [ENG 1011 or equiv]) Student teams design space vehicle, system, or mission with realistic design constraints, detailed design proposals, schedules/milestones, CAD/CAM, space environments, atmosphere entry, attitude determination/control, configuration/structure, thermal environment, power propulsion, and telecommunications. Students keep design log/notebook, prepare status reports, written report, and oral presentation.

AEM 4333. Aerospace Design: Special Projects. (3 cr [max 6 cr]; Stndt Opt. Prereq-4331 or #) Student teams 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.


AEM 4495. Problems in Dynamics and Control. (1-3 cr [max 6 cr]; Stndt Opt. Prereq-%) Topics of Current interest. Individual projects with consent of faculty sponsor.

For a guide to course numbers, symbols, and abbreviations, see page 376. 379
AEM 4501. Aerospace Structures. (3 cr; A-F or Aud. Prereq-IT upper div or grad, 3031 or equiv)
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.

AEM 4502. Computational Structural Analysis. (3 cr; Stdtnt Opt. Prereq-[Grade of at least C in 4501, [IT upper div or grad student]] or #)

AEM 4511. Mechanics of Composite Materials. (3 cr; Stdtnt Opt. Prereq-3031, [IT upper div or grad student])
Analysis, design, and applications of laminated and chopped fiber reinforced composites. Micro-/macro-mechanical analysis of elastic constants, failure, and environmental degradation. Design project.

AEM 4581. Mechanics of Solids. (3 cr; Stdtnt Opt. Prereq-3031, [Math 3273 or equiv], [IT upper div or grad student])
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.

AEM 4595. Problems in Mechanics and Materials. (1-3 cr; max 6 cr; Stdtnt Opt. Prereq-%)
Topics of current interest. Individual projects with consent of faculty sponsor.

AEM 4601. Instrumentation Laboratory. (3 cr; A-F or Aud. Prereq-CSCI 1113, EE 3005, EE 3006, [upper div IT or grad student])

AEM 4602W. Aeromechanics Laboratory. (4 cr; A-F or Aud. Prereq-IT upper div or grad, 4201, 4501, 4601, EngC 1011 or equiv)

AEM 4796. Professional Experience. (5 cr; A-F or Aud. Prereq-IT upper div, AEM major, %)
Work experience with substantive engineering component. Written report.

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

AEM 4896. International Professional Experience. (3 cr; A-F only, Prereq-IT upper div, AEM major, %)
International work experience with substantive engineering component. Written report.

AEM 5245. Hypersonic Aerodynamics. (3 cr; A-F or Aud. Prereq-4202, [grad student or upper div IT])

AEM 5251. Computational Fluid Mechanics. (3 cr; A-F or Aud. Prereq-[4201 or equiv], [CSCI 1013 or equiv], [IT upper div or grad student])
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.

AEM 5321. Modern Feedback Control. (3 cr; Stdtnt Opt. Prereq-4321 or EE 4231 or ME 5281 or equiv)
State space theory for multiple-input-multiple-output aerospace systems. Singular value decomposition technique, applications to performance/robustness. Linear quadratic gaussian and eigenstructure assignment design methods. Topics in H[infinity symbol]. Applications.

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

AEM 5431. Trajectory Optimization. (3 cr; A-F or Aud. Prereq-4321 or EE 4231 or ME 5281 or equiv)

AEM 5441. Structural Dynamics. (3 cr; A-F or Aud. Prereq-2012, 3031, [grad student or IT upper div])
Frequency, time domain analysis of multidegree of freedom mechanical systems. Natural frequencies, normal modes of vibration. Free/forced vibrations of strings, rods, and shafts beams. Introduction to finite elements in structural dynamics.

AEM 5451. Optimal Estimation. (3 cr; A-F or Aud. Prereq-EE 5251, Prereq [(MATH 2243 or STAT 3021 or equiv), [4231 or EE 4231 or ME 5281 or equiv] or #)

AEM 5495. Topics in Aerospace Systems. (1-4 cr [max 4 cr]; A-F or Aud, Prereq-%)
Topics of current interest. Individual projects with faculty sponsor.

AEM 5501. Continuum Mechanics. (3 cr; Stdtnt Opt. Prereq-IT upper div or grad, 3031, Math 2243 or equiv or #)
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.

AEM 5503. Theory of Elasticity. (3 cr; A-F or Aud. Prereq-4501 or equiv, Math 2243 or equiv or #)
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 linear elasticity. Topics from nonlinear elasticity, micromechanics, contact problems, fracture mechanics.

AEM 5561. Aeroelasticity. (3 cr; A-F or Aud. Prereq-4202, 4301, [grad student or IT upper div])

Aerospace Studies (AIR)

Undergraduate Education Administration

AIR 1105. Introduction to the Air Force Today I. (1 cr; A-F or Aud)
Mission and organization of the Air Force, officer/ship and professionalism, military customs and courtesies, Air Force officer opportunities, group leadership problems, and introduction to communication skills.

AIR 1105. Introduction to the Air Force Today II. (1 cr; A-F or Aud)
Structure and missions of Air Force organizations. Communicative skills. How cadets are selected for the Professional Officer Course, categorization into specific career areas.
AFRO 1009. History of Women in Africa: 1500 to the Present. (3 cr; Stdnt Opt)
Histories of women on African frontiers. Women in relations with their families, with other African/non-African people. Women of borders of Sahil-Savanna, Savanna-Forest, within country of Morocco, and of Swahili Coast and Atlantic Coast frontiers.

AFRO 1011. Introduction to African American Studies. (4 cr; Stdnt Opt)
The study of peoples of African descent including the evolution of African American culture, comparative race relations, feminism and social policy change.

AFRO 1012. Black Worlds in Global Perspective: Challenges and Changes. (3 cr; Stdnt Opt)

AFRO 1021. Introduction to Africa. (4 cr; Stdnt Opt)
Diverse themes and disciplines in African Studies from prehistory to post-colonial period. Introduction to methodologies of inquiry.

AFRO 1131. Contemporary Issues in Africa. (3 cr; Stdnt Opt)

AFRO 1201. Racial Formation and Transformation in the United States. (3 cr; Stdnt Opt)
How aggrieved racialized groups struggle over identity, culture, place, and meaning. Histories of racialization of groups. Rectification of historical injustices from dispossession, slavery, exploitation, and exclusion.

AFRO 1902. Freshman Seminar: Your Television Will Be Colorized: Black TV Comedies’ Riffs on Race. (3 cr; Stdnt Opt, Prereq-Fr)
Topics specified in Class Schedule.

AFRO 1904. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Fr or less than 30 cr)
Topics specific in Class Schedule.

AFRO 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Fr with no more than 30 cr)
Topics specified in Class Schedule.

AFRO 3002. West African History: 1800 to Present. (3 cr; Stdnt Opt)
West African history from late-18th century to present. Themes include study of continuities with the past and profound changes including new 19th century state formation, European colonialism, and post-colonial issues.

AFRO 3006. Impact of African Migrations in the Atlantic World. (3 cr; A-F or Aud)

AFRO 3061. The Black Family. (3 cr; Stdnt Opt)
A sociological view of African American family life in the United States.

AFRO 3072. Racism and Psychological Consequences for Black Americans. (3 cr; Stdnt Opt)
Racism and its effects on African Americans; definitions, determinants, and dynamics. Examined in an experiential context to reflect individual and institutional racism.

AFRO 3108. Black Music: A History of Jazz. (3 cr; Stdnt Opt)
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 3110. Study of an African Language. (4 cr [max 8 cr]; Stdnt Opt. Prereq-Enrolled in Minnesota Studies in International Development in-country language course in [Swahili or Wolof or Twi]). Introduction to a selected African language. Emphasizes oral communication skills and cultural context.

AFRO 3112. In the Heart of the Beat: the Poetry of Rap. (3 cr; A-F or Aud)
Contemporary African American poetry as expressed by popular culture contributors. Students analyze/evaluate poems used in rap, in context of African American literature, American culture, and aesthetics.

AFRO 3131. Contemporary Issues in Africa. (3 cr; Stdnt Opt)
Why peace has been elusive throughout history of Africa, from period of slave raids through colonialism and until today. Intractable conflicts in Great Lakes Region, Horn of Africa, South Africa, Nigeria, Liberia/Sierra Leone, Mauritania, Sudan. Why no peaceful resolution despite multiple mediation efforts. Case studies.

AFRO 3141. Africa. (5 cr; Stdnt Opt. =GEOG 3141)
Regional differentiation of human groups and environments; cultural contact and problems of underdeveloped countries south of the Sahara.

AFRO 3204. History of South Africa to 1910. (3 cr; Stdnt Opt. =HIST 3434)
Introductory survey of the history of South Africa from early humans to the arrival of the first Dutch settlers at the Cape of Good Hope in 1652 to the formation of the Union of South Africa in 1910.

AFRO 3205. History of South Africa from 1910. (3 cr; Stdnt Opt. =HIST 3435)
The history of South Africa from the Union to the present. Focus on such issues as African and Africaner nationalism, structures of apartheid, forced population removals, divestment and sanctions, and the post-apartheid era.

AFRO 3251W. Sociological Perspectives on Race, Class, and Gender. (5 cr; A-F or Aud. =SOC 3251W)
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.
AFRO 3301. The Music of Black Americans. (3 cr; Stdnt Opt) Musical contributions of African American artists and innovators from 1619 to the present. Musical genres explored include spirituals, blues, ragtime, gospel, art music, and jazz.

AFRO 3334. Black Women: Interdisciplinary Perspectives. (4 cr; Stdnt Opt) Interdisciplinary study of the experience of African American women, including economic, political, and social factors, psycho-social development, and family roles.

AFRO 3405. The African American Child. (3 cr; Stdnt Opt. +AFRO 5405) Research carried out by African American psychologists and behavioral/social scientists, and by experts on African American child/youth development.


AFRO 3433. General Survey of Development in Africa. (3 cr; Stdnt Opt. +APEC 5061, Prereq-APEC 1001 or ECON 1101) Socioeconomic, political, and cultural development in Sub-Saharan Africa post-independence.


AFRO 3437. History of East Africa. (3 cr; A-F or Aud. +HIST 5437, AFRO 5437, HIST 3437) Major themes in history of East Africa, from era of early human cultural development to present. Methods that historians use to reconstruct history. Varying interpretations/constructions of history over time.

AFRO 3543. Psychology and the Black American Experience. (3 cr; Stdnt Opt) Historical and contemporary perspectives of the relationship between the area of psychology and African Americans in research and practice.

AFRO 3578. Arts of Africa. (3 cr; Stdnt Opt. +ARTH 3578) Survey of the diverse arts of Africa, from ancient times to present. Visual arts of several civilizations. Relation of visual arts to larger cultural issues (religion, cosmology, gender, identity, political power).

AFRO 3585. African American Art. (3 cr; A-F or Aud. +ARTH 3585) Four hundred year history of African American art. How/why African Americans created artwork at specific times, in specific places. Arts of African Americans within their own communities, National arts movements, and American life during historical junctures.

AFRO 3591W. Introduction to African American Literature. (4 cr; Stdnt Opt. +ENGL 3591W, ENGL 3598, ENGL 3597W) African American autobiography, fiction, essay, poetry, drama, and folklore from late-18th century to present.

AFRO 3592W. Introduction to Black Women Writers in the United States. (3 cr; Stdnt Opt) 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 3594W. Introduction to Contemporary Black Writers. (3 cr; A-F or Aud) Major contemporary Black fiction writers such as Gayle Jones, Ernest Gaines, Charles Johnson, Toni Morrison, Gloria Naylor, and John Edgar Wideman, among others, whose works span 1970-90s.

AFRO 3597W. Introduction to African American Literature and Culture I. (4 cr; Stdnt Opt) 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. (4 cr; Stdnt Opt) African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

AFRO 3601W. African Literature. (5 cr; Stdnt Opt) Oral/written literature of 19th/20th centuries. Emphasizes literature written in English/French. All readings in English.


AFRO 3626. Literature of African American Men: Sex, Family, and Relationships. (3 cr; A-F or Aud) African American male fiction writers’ approach to subject of family and relationships. Social, economic, and psychological consequences of racism/oppression, and effect on African American men writing about themselves within context of family/relationships. Manhood/masculinity as interpreted/articulated in fiction.

AFRO 3634. Blues & Rhythm and Blues. (3 cr; Stdnt Opt) Black American culture as expressed by blues and by rhythm and blues. Evolution of blues from work songs to music (slave/trade, emancipation through postwar blues sounds of Louis Jordan, through expressions of pre-rock-n-roll rhythm and blues, and to more current expressions of performers like Brian McKnight.

AFRO 3654. African Cinema. (4 cr; Stdnt Opt) 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 3741. People of Color and the Mass Media. (3 cr; A-F or Aud) Past and present depictions of minority individuals and groups in movies (i.e., slavery), television, radio, etc., as seen against anthropological, psychological, and sociological knowledge and experience. Emphasis on personal and political effects of media depictions.


AFRO 3865. African American History: 1865 to the Present. (4 cr; Stdnt Opt. +HIST 3865) Internal migrations, industrialization/unionization, the Great Depression, world wars, large scale movements for social/political change.


AFRO 3868. Race, War, and Race Wars in American History. (3 cr; A-F only) Role that race has played in American war history. Impact that wars have had on race and race relations in the U.S. and the world.
AFRO 3910. Topics in the Diaspora. (1-3 cr. [max 9 cr.]; Stdnt Opt)
How Black Studies evolved to become Africana Studies in 1960s and an academic field in major universities. How Africana Studies became a discipline that encompassed both Africa and Africans in Diaspora (African American Studies).

AFRO 3920. Topics in African American and Africn Studies. (3 cr. [max 6 cr.]; Stdnt Opt)
Topics specified in Class Schedule.

AFRO 3993. Directed Study. (1-3 cr. [max 5 cr.]; Stdnt Opt. Prereq – %, @)
Guided individual research and study.

The changing role and status of women in South America from precolonial era to the present, and relationships to political, social, and economic development.

AFRO 4105. Ways of Knowing in Africa and the Diaspora. (3 cr; A-F only)
Explores 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. Prereq 3112)

Examination of 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 4301. The African Novel. (3 cr.; Stdnt Opt)

AFRO 4302H. Honors: Women’s Personal Narratives. (3 cr.; Stdnt Opt)
Focus is on literary autobiography, journals, travel narratives, essays, slave narratives, testimonial, and ethnographies to consider the content and the methodological, theoretical, and aesthetic issues of the construction and production of women’s experience.

AFRO 4352. Black Families in the Diaspora: Comparative Perspectives. (3 cr.; Stdnt Opt)
Cross-cultural perspectives of family formation, social structure, and gender patterns of families of African descent.

AFRO 4478. Contemporary Politics in Africa and the Colonial Legacy. (3 cr; A-F or Aud. +POL 4478W, POL 5478, AFRO 4478)
How current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by pre-colonial/colonial processes. Reality of independence, recurrent political/ economic crises, global context, prospects for effective democracy.

AFRO 4593. The African American Novel. (3 cr.; Stdnt Opt. +ENGL 4593)
Contextual readings of 19th- and 20th-century black novelists, including Chesnut, Hurston, Wright, Baldwin, Petry, Morrison, and Reed.


AFRO 4622. Caribbean Writers: Rethinking Caribbean Literature in a World Context. (3 cr.; Stdnt Opt)
Literary/historical issues explored by Caribbean writers in English, French, and Spanish-speaking Caribbean through autobiographies, short stories, novels, poetry, and films.

AFRO 4623. Black Francophone Writers in Translation. (3 cr.; Stdnt Opt)
Exploration of ideas, particularly negritude and issues of creoleness, central to male and female writers in France from Africa and the Caribbean. Novels, essays, short stories, and plays.

AFRO 4800. African Studies Seminar. (3 cr.; Stdnt Opt)
Topics vary and reflect instructor’s research interests. Topics specified in Class Schedule.

AFRO 4991W. Thesis Research and Writing. (3 cr.; Stdnt Opt. Prereq – %)
Preparing a research paper that satisfies major project requirement. Defining a research problem. Collecting/analyzing data. Writing the research paper.

AFRO 5072. Racism: Social and Psychological Consequences for Black Americans. (3 cr.; Stdnt Opt)
Racism and its effects on African Americans; definitions, determinants, and dynamics. Examined in an experiential context to reflect individual and institutional racism.

AFRO 5101. Seminar: Introduction to Africa and the African Diaspora. (3 cr.; Stdnt Opt)
Comparative frameworks, related theories, and pivotal texts in study of Africa and African Diaspora.

AFRO 5103. African History from the Perspective of the African Diaspora. (3 cr; A-F or Aud)

AFRO 5120. Social and Intellectual Movements in the African Diaspora. (3 cr; A-F or Aud. +AFRO 3120)

AFRO 5182. Contemporary Black Theatre: 1960 -Present. (3 cr; Stdnt Opt. +TH 5182)
Essays, plays, playwrights, and theaters that have contributed significantly to contemporary black theater. From the beginning of the Black Arts movement to the present.

AFRO 5191. Seminar: The African American Experience in South Africa. (3 cr; Stdnt Opt. +HIST 5438)
Ideological, political, religious, and cultural ties that have informed African American and black South African relations from late 18th century to present.

AFRO 5405. The African American Child. (3 cr; Stdnt Opt. +AFRO 3405)
Research conducted by African American psychologists and behavioral/social scientists and by experts on African American child/youth development.

AFRO 5429. Slavery in Africa and the Americas, 1400 to 1880. (3 cr; A-F or Aud. +AFRO 3429)

AFRO 5478. Contemporary Politics in Africa and the Colonial Legacy. (4 cr; A-F or Aud. +POL 4478W, POL 5478, AFRO 4478)
Reread-POL 1054 or POL 3051 or non-pol sci grad student or @)
How current politics in mainly, though not exclusively, sub-Saharan Africa have been shaped by pre-colonial/colonial processes. Reality of independence, recurrent political/economic crises. Global context, prospects for effective democracy.

AFRO 5597. Seminar: Harlem Renaissance. (3 cr; Stdnt Opt. +ENGL 5597)
A multidisciplinary review of the Jazz Age’s Harlem Renaissance: literature, popular culture, visual arts, political journalism, and major black and white figures.

AFRO 5701. Prossemia: Classic Works in African American Studies. (3 cr; Stdnt Opt)
AFRO 5741. Minorities and Mass Media. (3 cr; A-F or Aud. Prereq-Jour major or minor, Jour 3004, #) Analysis of relationships between mass media and communities of color in the United States. Focuses on issues of content and control.

AFRO 5864. Seminar: African-American History. (3-4 cr [max 4 cr], Stdnt Opt) Prereq-# Examination of issues including slavery, Reconstruction, the Great Depression, and civil rights movement using cultural and intellectual history and autobiography/biography. Focuses on dynamics of race, gender, class, region, sexuality, and religion.


AFRO 5910. Topics in African American and African Studies. (1-3 cr [max 9 cr], Stdnt Opt) Topics specified in Class Schedule.

AFRO 5993. Directed Study. (1-3 cr [max 3 cr], Stdnt Opt. Prereq-#) Guided individual reading/study for qualified seniors and graduate students.

Agricultural Industries and Marketing (AIM)

Department of Soil, Water, and Climate College of Food, Agricultural and Natural Resource Sciences AIM 4011. Student Project/Field Investigation. (3 cr; Stdnt Opt) Application of marketing knowledge that involves building a complete marketing plan for an agricultural product or device. Team projects are used.

Agricultural, Food, and Environmental Education (AFEE)

Department of Applied Economics College of Food, Agricultural and Natural Resource Sciences AFEE 1001. Introduction to Agricultural Education and Extension. (1 cr; Stdnt Opt) 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; Stdnt Opt) 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. Professional Practicum in Agricultural Education: Early Experience. (1-3 cr [max 3 cr]; A-F or Aud) Observes schools, extension offices, and agricultural oriented businesses to learn about the work and workplaces in agricultural education.

AFEE 2221. People Skills for Leadership. (3 cr; A-F or Aud) How to be an effective leader in profit/non-profit agricultural settings. Roles, responsibilities, knowledge, attitudes, and skills to hire staff, set goals, coach, motivate, manage teams, and improve communication.

AFEE 3112. Technical Drawing and Production Technologies. (3 cr; A-F or Aud. +BIE 3112) Experiences in technical drawing, design technology, and production technologies related to construction and manufacturing. Develop manipulative skills and techniques; understand principles and processes of technologies through hands-on work in a multiple activity laboratory.

AFEE 3221. Presentations and Meeting Management for Agricultural Industry. (3 cr; A-F or Aud) Planning/delivering formal/informal presentations in agricultural business/non-profit settings. Skill development in parliamentary procedure. Using appropriate technology for data summary and presentations with individuals and large/small audiences. Instruction is student-centered, relies on the interaction/participation.

AFEE 4221. Rural Leadership Development. (3 cr; Stdnt Opt) 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 5111W. Agricultural Education: Methods of Teaching. (4 cr; Stdnt Opt) 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; Stdnt Opt) Development of community school program in agriculture, agribusiness, and environmental science. Program to meet graduation outcomes and determine student needs.

AFEE 5113. Adult Agricultural Education Program Development and Technology. (3 cr; A-F or Aud) Organization and implementation of education programs for farmers, farm managers, and agribusiness personnel using community and environmental resources, agricultural and instructional technology, and management information systems to attain family and business goals.


AFEE 5118. Strategies for Managing and Advising the FFA Organization. (2 cr; A-F or Aud. Prereq-Agricultural education major or #) Principles/techniques to advise an FFA chapter. Historical/philosophical basis of FFA, organization/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], Stdnt Opt) Content varies by offering.

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

AFEE 5235. Advanced Supervised Agricultural Experience Programs. (2 cr; Stdnt Opt) The organization and administration of agricultural experience programs for middle and secondary level students: career exploration, improvement projects, experiments, placement in production/business/community settings, entrepreneurship. Current state and national programs and resource material.

AFEE 5239. Program Organization and Management in Agricultural Education. (2 cr; Stdnt Opt) Analysis of organization, management, and assessment of agricultural education programs at the middle, high school, and adult levels.

AFEE 5280. Current Issues for the Beginning Agricultural Education Teacher. (1-3 cr [max 3 cr], Stdnt Opt) Reflection, analysis on current problems and issues confronting beginning teachers of agricultural education. Issues in teaching methods, classroom and program management, discipline, curriculum, FFA and SAE development, school-to-work relationships.

AFEE 5331. History, Philosophy, and Systems of Extension. (3 cr; A-F or Aud)
History and philosophy of extension; modification and adaptation to worldwide methods and approved practices; extension methodologies; innovative approaches; systems appropriate to development environments.

AFEE 5361. World Development Problems. (3 cr; A-F or Aud)
Introduction to development problems throughout the world. Development in Third World countries. Examples of First World development problems. Interdisciplinary focus on population, health and disease, education, agriculture, industry, finance, politics, and human rights.

AFEE 5371. Farming Systems Research and Extension. (3 cr; A-F or Aud)
Introduction to the theory and practice of linking farming systems, research, and extension. An interdisciplinary and holistic approach to rural development for individuals and communities throughout the world.

AFEE 5405. Advanced Farm Financial Analysis Methodology and Concepts. (1 cr; Stdnt Opt.)
Farm financial analysis concepts, whole entity financial analysis issues/tools, enterprise analysis options/methodologies. Evaluation of industry standardization efforts. Analysis of where each option fits.

AFEE 5409. Seminar: Teaching Strategic Farm Business Planning. (1 cr; Stdnt Opt. =AGUM 2222)
Teaching strategic business planning to farm managers and agricultural professionals. Philosophy of strategic management, components of a strategic business plan. Materials/tools to apply strategic farm business planning in educational programs. Students apply strategic planning methods/concepts to case farm businesses.

AFEE 5415. Seminar: Teaching Effective Use of Commodity Marketing Tools. (1 cr; Stdnt Opt. =AGUM 2224)
Teaching commodity marketing tools to farm managers and agricultural professionals. Commodity marketing tools, including cash forward contracts, futures, and options, and how to use them to enhance price and protect income. How to choose marketing tools, given financial/market conditions.

AFEE 5697. Teaching Internship: School and Classroom Setting. (2 cr; Stdnt Opt. Prereq-WHRE 5696 for initial licensure program)
Part-time supervised teaching experience in a school. Seminars on managing student’s learning in context of work and human resource education programs in contemporary schools and on becoming a reflective educator.

AFEE 5698. Teaching Internship. (3-8 cr; Stdnt Opt. Prereq-WHRE 5698. Prereq-Admission to initial licensure program)
Teaching experience in a school system that provides programs to grades 5-12.

AFEE 5993. Directed Study in Agricultural Education and Extension. (1-9 cr; Stdnt Opt.)
Topics may be chosen to permit study of areas within education or to supplement areas of inquiry not provided in the regular course structure.

AFEE 5995. Integrating Paper--Master of Education: Agricultural and Extension Education. (1-4 cr; max 4 cr; A-F or Aud)
Students prepare paper dealing with issues in agricultural education applied to professional responsibilities.

Agronomy and Plant Genetics (AGRO)

College of Food, Agricultural and Natural Resource Sciences

AGRO 1007. Horse in Your Backyard. (2 cr; A-F or Aud. =ANSC 1007)
Role of horses in society. How to keep a horse well fed and healthy. Fundamentals of horse nutrition, feedstuffs, pasture, and horse health. How to seek/interpret information to make decisions on vaccination, worming, nutrition, grazing management, hay selection, manure handling, and use of dietary feed additives/enhancers.

AGRO 1093. Directed Studies. (1-4 cr; max 12 cr; Stdnt Opt. Prereq-4 cr in agronomy, #)
Allows study of agronomy in greater depth or in areas not currently offered in formal courses. Tutorial instruction under staff guidance.

AGRO 1101. Biology of Plant Food Systems. (4 cr; Stdnt Opt.)
Fundamental concepts of biology at the molecular, cellular, organismal, and ecosystem levels. Plants and plant use by humans. Lab, greenhouse, field, and classroom discussions.

AGRO 1103. Crops, Environment, and Society. (4 cr; Stdnt Opt. =AGUM 2222)
Plants that supply food, fiber, beverages, and medicine to humans. Plant identification, plant physiology, plant breeding/biotechnology, plant ecology, crop culture/management.

AGRO 1660. First-Year Colloquium/Experiences in Agroecosystems Analysis. (2 cr; A-F or Aud. Prereq-1st yr in major hosted by Department of Agronomy and Plant Genetics)
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.

AGRO 2104. Grain and Seed Technology. (2 cr; Stdnt Opt. Prereq-[1103, APEC 3411] recommended)
Practice/principles of grain grading using Federal Grain Inspection Service (FGIS) standards with examples of commodity, classes, subclasses, defects, and special grades. Seed analysis identifying common crops and weed seeds. Seed laws, seed handling, conditioning/viability testing. Primarily laboratory discussion, practice, and problem solving.

AGRO 2501. Plant Identification for Urban and Rural Landscapes. (2 cr; Stdnt Opt. =AGUM 2240. Prereq-BIOL 1001 or equiv)
Plant/weed species important in turf, horticulture, forestry, and crop production systems. Emphasizes identification of native grasses/forbs, field crops, and weed species in Minnesota and Upper Midwest. Plant life cycles, habitats, and relationships to humans.

AGRO 3131. Student Organic Farm Planning, Growing, and Marketing. (3 cr; Stdnt Opt. +AGRO 5131, HORT 5131, HORT 3131. Prereq-[1101, 1103, BIOL 1001, 1009, HORT 1001] or #)
Students plan/implement cropping/marketing strategies for organic produce/flowers from Student Organic Farm on St. Paul campus.

AGRO 3203W. Environment, Global Food Production, and the Citizen. (3 cr; Stdnt Opt. =ANSC 3203W, AGUM 2224. Prereq-BIOL 1009 or equiv)
Ecological and ethical concerns of food production systems in global agriculture–past, present, future. Examines underlying ethical positions about how agroecosystems should be configured. Decision cases, discussions, videos, other media.

AGRO 3660. Plant Genetic Resources: Identification, Conservation, and Utilization. (3 cr; A-F only. Prereq-Introductory biology)

AGRO 4005. Applied Crop Physiology and Development. (4 cr; max 8 cr; Stdnt Opt. Prereq-CHEM 1011 or CHEM 1021 or equiv), 8 cr in [biol or plant sciences]
Applications of plant physiology processes of water relations, photosynthesis, mineral uptake/function, transpiration, translocation, and their relationships to plant growth/development from seed germination to maturation and dry down for harvest. Emphasizes inquiry, field problems, and group activity. Lecture, laboratory.

AGRO 4093. Directed Studies for Advanced Students. (1-4 cr; max 12 cr; Stdnt Opt. Prereq-15 cr in agronomy, #)
Allows study of agronomy in greater depth or in areas not currently offered in formal courses. Tutorial instruction under staff guidance.

AGRO 4096. Professional Experience Program: Internship. (1-3 cr; max 6 cr; S-N or Aud. Prereq-CFANS undergrad, #, completed internship contract from CFANS)
Supervised professional experience in agribusiness firms or government agencies. Evaluative reports/consultations with faculty advisers and employers.

AGRO 4097. Undergraduate Research Thesis. (1-6 cr; max 12 cr; A-F only. Prereq-Jr or sr)
Research/thesis conducted under supervision of CFANS faculty member. Written thesis describing research results.

AGRO 4101. Agricultural Decision Making and Experimentation. (5 cr; Stdnt Opt. Prereq-Jr or sr science)
Principles of field plot techniques and design applied to field demonstrations/experiments. Inductive/deductive reasoning, analysis of data, tests of significance. Treatment comparisons, decision making. Computers used for data processing and statistical analysis.

For a guide to course numbers, symbols, and abbreviations, see page 376. 385
AGRO 4103. World Food Problems. (3 cr; Stdt Opt. +FSCN 4103, CVM 6600, APEC 4103, Prereq-Jr or sr or grad)
Multiple disciplinary look at problems and possible solutions affecting food production, storage, and utilization in developing countries. Presentations/discussions introduce conflicting views on population, technology, and ethical and cultural values of people in various parts of the world.

AGRO 4401. Plant Genetics and Breeding. (4 cr; Stdt Opt. +HORT 4401. Prereq-[Biol 1009 or equiv or grad]. #)
Principles of plant genetics and environmental variation. Applications of genetics to crop evolution and breeding of self-pollinated, cross-pollinated, and asexually propagated crops. Lab experiments in hybridization, variation, and selection.

AGRO 4505. Biology, Ecology, and Management of Invasive Plants. (3 cr; Stdt Opt. Prereq-4005, [BIOL 3002 or equiv], SOIL2125, [AGRO 2501 or HORT 1011])
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.

AGRO 4603. Field Crop Scouting and Problem Diagnosis. (3 cr; Stdt Opt. Prereq-3005, Soil 3416, [2501, Ent 3001, PlPa 2002] or Agri 3001), [jr or sr], 16-20 cr in major)
Insects, diseases, weeds. Nutrient status. Environmental stresses due to wind, hail, frost, soil conditions, and chemical injury. Calibration of equipment associated with crop protection. Pesticide use, safety procedures. Crop growth staging and growing degree day as components of decision-making and precision agriculture. Intensive summer training sessions at selected Minnesota agricultural research and outreach centers.

AGRO 4605. Management Strategies for Crop Production. (3 cr; Stdt Opt. Prereq-[Jr or sr or grad student]. [program committee approval or #])
Crop management situations/needs in various climate zones, soil types, from seed selection to crop storage. Cropping systems involving corn, soybeans, small grains, and forages. Long-term productivity, profitability, and sustainability. Lecture, discussion, field trips.

AGRO 4660. Senior Capstone. (2 cr; A-F or Aud. Prereq-4096)
Complexities of agricultural issues. Exercises/discussions integrating previous educational situations. Linked to undergraduate internships and experiential learning opportunities such as thesis or directed studies or service learning. Written/oral assignments.

AGRO 4888. Issues in Sustainable Agriculture. (2 cr; Stdt Opt. Prereq-1103, Soil 1125 or 2125 or equiv)
Agroecological sustainable practices, production economies, 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.

American Indian Studies (AMIN)
Department of American Indian Studies

College of Liberal Arts

AMIN 1002. Indigenous Peoples in Global Perspective. (3 cr; A-F or Aud. +POL 1019)
Colonial experiences of selected indigenous peoples in Americas, Eurasia, Pacific Rim.

AMIN 1003. American Indians in Minnesota. (3 cr; A-F or Aud)
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 Anishinaa and Dakota peoples.

AMIN 1201. Racial Formation and Transformation in the United States. (3 cr; Stdt Opt.)
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 1902. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman)
Topic specified in Course Guide.

AMIN 1905. Freshman Seminar. (3 cr; A-F only. Prereq-Fr)
Topics specified in Course Guide.

AMIN 1908W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

AMIN 3107. Structure of Anishinaabemowin, the Ojibwe Language. (3 cr; A-F or Aud. +AMIN 3107, Prereq-3103)
Analysis of grammatical structures of Anishinaabemowin.

AMIN 3109. Anishinaabemowin. (3 cr; A-F or Aud. +AMIN 3109, Prereq-3103)
Readings in Anishinaabemowin oral literature.

AMIN 3143. Language in American Indian Culture and Society. (3 cr; A-F or Aud. +ANTH 3143)
Survey of North American indigenous languages in social/cultural contexts, from before European contact to present.

AMIN 3203W. American Indian Aesthetics. (3 cr; A-F or Aud)
Ways in which American Indians have distinguished themselves as artistic thinkers. Regional traditions of American Indian art. Ways in which art was connected with everyday life and with religious practices. How American Indians thought about art differently from their Western counterparts. Innovations that contemporary American Indian artists have made in the way art is done and thought about by Indians/non-Indians.
American Indian Studies (AMIN)

AMIN 3303. American Indians and Photography. (3 cr; Stdnt Opt. = AMIN 5303) Historical/comparative overview of photos in which American Indian people are central subjects. Primary features of images in American Indian photos. Relationships among those involved in making/viewing photos. Ways in which photos are interpreted. Relation of photos to social contexts in which they are produced and to agencies of those who stand behind their making.

AMIN 3401. American Indian Art. (4 cr; Stdnt Opt.) Visual arts depicting rituals, traditions, values, and worldviews of major American Indian civilizations. Experiences processes from pre-contact times through contemporary art. Emphasis placed on style, technique, materials and imagery, and symbolism.

AMIN 3402. American Indians and the Cinema. (3 cr; A-F or Aud) 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 3701. Ojibwe Culture and History. (3 cr; Stdnt Opt.) 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. (3 cr; Stdnt Opt.) Dakota culture, language, history, literature. Contemporary issues, the arts.

AMIN 3713. Lands and Homelands in the American Indian Great Lakes. (3 cr; AMST 3713) Tribes that have strong historic ties to Minnesota region, such as the Ojibwe, Dakota, and Ho-Chunk Nations. Integrity/viability of American Indian societies. Conflict of cultures that occurred with Native American and Euroamerican contact in Minnesota and the Great Lakes.

AMIN 3870. Topics in American Indian History. (3 cr; Stdnt Opt. = HIST 3870) Topics may include social history, oral history, history of particular regions, political systems, education, and policy. Designed for undergraduates.

AMIN 3871. American Indian History: Pre-Contact to 1830. (3 cr; Stdnt Opt. = HIST 3871) 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. (3 cr; Stdnt Opt. = HIST 3872) American Indian history from 1830 to the present. Impact of federal Indian policy on American Indian cultures and societies.

AMIN 3876. American Indian Education. (3 cr; Stdnt Opt.) Educational processes in American Indian cultures; history of school programs established for tribes by missionaries and the U.S. and Canadian governments; the importance of boarding schools in shaping the lives, families, communities, and educational expectations of Indian people in the late-19th and early-20th centuries.

AMIN 4201. Topics in American Indian Literature. (3 cr; Stdnt Opt) Topics organized around issues of theme or genre or region or tribe or genre.

AMIN 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr; Stdnt Opt. = CHIC 4231, AAS 4231, AFRO 4231) 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 4301. American Indian Intellectuals. (3 cr; A-F or Aud) Contributions that American Indians have made to understanding American Indian topics and the world around them. Works that have stood as paradigms of American Indian thinking. Emphasizes works written after 1945.


AMIN 4525W. Federal Indian Policy. (3 cr; Stdnt Opt. = POL 4525W) 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 4991. Independent Study. (1-12 cr; max 12 cr; Stdnt Opt. Prereq: #, %, @) IND 4991) Individually arranged research with faculty to meet student needs and interests.

AMIN 4994. Directed Research. (1-12 cr; max 18 cr; Stdnt Opt. Prereq: #, %, @) Individually arranged research with faculty to meet student needs and interests.

AMIN 507. The Structure of Anishinaabemowin, the Ojibwe Language. (3 cr; A-F or Aud. = AMIN 5107, Prereq: 3104) Analysis of grammatical structures of Anishinaabemowin.

AMIN 5109. Anishinaabemowin Language. (3 cr; A-F or Aud. = AMIN 5109, Prereq: 3107 or 5107 or #) Readings in Anishinaabemowin oral literature.


AMIN 5303. American Indians and Photography. (3 cr; Stdnt Opt. = AMIN 3303) Historical/comparative overview of photos in which American Indian people are central subjects. Primary features of images in American Indian photos. Relationships among those involved in making/viewing photos. Ways in which photos are interpreted. Relation of photos to social contexts in which they are produced and to agencies of those who stand behind their making.

AMIN 5402. American Indians and the Cinema. (3 cr; A-F or Aud) 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 5407. Craft and Conventions of American Indian Ethnohistory. (3 cr; A-F only) Conventions and paradigmatic approaches scholars follow to represent/interpret written documents and oral traditions in constructing their narratives. Craft of ethnohistory: techniques, methods, styles of criticism.

AMIN 5890. Problems in American Indian History. (3 cr; Stdnt Opt. = HIST 5890) Prereq: #) Intensive consideration of topics in American Indian history. Possible topics include social history, Indian history of particular regions, political systems, education, and American Indian policy.

AMIN 5920. Topics in American Indian Studies. (3 cr [max 12 cr]; A-F or Aud) Various topics in American Indian studies, depending upon instructor/semester.

American Sign Language (ASL)
Department of Educational Psychology
College of Education and Human Development


ASL 1702. American Sign Language II. (5 cr; Stdnt Opt. Prereq-1701 with grade of at least [S or C-] or %) 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.

ASL 3703. American Sign Language III. (5 cr; Stdnt Opt. Prereq-1702 with grade of at least [S or C-] or %) 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.

ASL 3704. American Sign Language IV. (5 cr; Stdnt Opt. Prereq-3703 with grade of at least [S or C-] or %) 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.

ASL 3705. Cultural Perspectives of Deafness. (3 cr; Stdnt Opt) Introduction to the deaf community as a linguistic and cultural minority group. Role of deaf people in the larger society; political activism; laws; access to information; educational philosophies and methods; and communication systems.

ASL 5642. Classroom Communication Through ASL. (1-2 cr [max 5 cr]; S-N or Aud. Prereq-Fluency in ASL. # required) American Sign Language (ASL) form/function, vocabulary production, grammatical features needed by professionals working with children, storytelling strategies, technical sign language for classroom teachers. Content progresses in repeated segments.

American Studies
(AMST)
Department of American Studies
College of Liberal Arts

AMST 1002. American Popular Arts and Public Life, 1940 to Present. (4 cr; Stdnt Opt) Interdisciplinary study of American society from industrialization through the present. Examination of American literature, art, music, and popular culture in historical context.

AMST 1011. Religions and American Identity in the United States from World War II to the Present. (3 cr; Stdnt Opt) Political/cultural history of the American religious landscape. The role of religion in shaping the nation.

AMST 1012. Migrants, Refugees, Citizens, and Exiles: The U.S. as an Immigrant Planet. (5 cr; Stdnt Opt) 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. Global Perspectives on ‘Sissies’, ‘Sex Workers’, and ‘Shipmates’. (3 cr; Stdnt Opt) Gender/sexual practices/identities within international framework. How such practices/identities reflect/refract national ideals and express national/international division.

AMST 1902. Freshman Seminar. (3 cr; Stdnt Opt, Prereq-Freshman) Topics specified in Class Schedule.

AMST 1905. Freshman Seminar. (3 cr; Stdnt Opt) Topics specified in Course Schedule.


AMST 1908W. Freshman Seminar. (3 cr; Stdnt Opt, Prereq-Freshman) Topics specified in Class Schedule.


AMST 2011. The United States since September 11. (3 cr; Stdnt Opt) 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 2021. Bodies and Their Discontents. (3 cr; Stdnt Opt) Aesthetic/cultural ideal of the beautiful normal body as it has developed as a marker of citizenship in the U.S. and been shaped by ideas of race, gender, sexuality and class. Ways that institutions, governments, social groups, and individuals have produced norms and assumptions about “the good,” “the beautiful,” and “the healthy.” How these norms have been institutionalized in media, aesthetics, politics, and commerce.


AMST 3003. Public History. (3 cr; A-F or Aud. Prereq-AMST Jr or sr, #) Interpretations of a collective past as produced in various public venues, including museum exhibitions, films, theme parks, and web sites. Intellectual/political issues associated with history produced for public audiences. Introduction to career opportunities in the field.

AMST 3113W. America’s Diverse Cultures. (3 cr; Stdnt Opt) 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. (5 cr; Stdnt Opt) 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 3116. Jews and Popular Culture in 20th Century United States. (3 cr; Stdnt Opt. = JAMS 3116) How theater, film, music, humor, and television were affected by Jews. innovations, social marginality, and wish to assimilate or resist assimilation to the culture. How the nation was and was not reshaped in the process.


AMST 3212. Dissident Sexualities in U.S. History. (3 cr; A-F or Aud. = GLBT 3212; Prereq-AmST Jr or sr, #) History of sexuality in the United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transgender, bisexual, lesbian, and gay
identities/communities. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.


AMST 3629W. Jewish Women in the United States. (3 cr; Stdnt Opt. = JWST 3629W) History of American Jewish women. Uses literary/religious texts, primary documents, films, and histories to analyze Jewish women’s experiences in the United States and their transformation of Judaism, political activism, and their role in the bourgeois family. How they are represented, how they represent themselves. Interdisciplinary approach.

AMST 3920. Topics in American Studies. (1-5 cr [max 6 cr]; Stdnt Opt) Topics in political/social history of Minnesota and its region in 19th/20th centuries.

AMST 3920. Directed Studies. (1-9 cr [max 9 cr]; Stdnt Opt. Prereq.#) Guided individual reading or study.

AMST 4101. Gender, Sexuality, and Politics in America. (3 cr; Stdnt Opt) 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 4962W. Second Proseminar in American Studies. (3 cr; Stdnt Opt. Prereq- AmSt Jr or #) Problem related to representative theme, figure, or period. Students research/write senior theses.


AMST 5920. Topics in American Studies. (1-4 cr [max 9 cr]; Stdnt Opt) Topics specified in Class Schedule.

Animal Science (ANSC)

Department of Animal Science

College of Food, Agricultural and Natural Resource Sciences

ANSC 101. Orientation to Animal Science. (1 cr; S-N or Aud) Current issues, career planning, professional development. Interviews with faculty and other resource persons.


ANSC 1021. Avian Sampler. (1 cr; Stdnt Opt) Aspects of avian biology. Planned environmental/conservation practices. Wildlife rehabilitation programs for maintaining healthy populations of wild birds in Minnesota. Emphasizes care, management, and health considerations of avian species such as domestic poultry, raptors, and companion birds.

ANSC 1101. Introductory Animal Science. (4 cr; Stdnt Opt) 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.

ANSC 1403. Companion Animal Nutrition and Care. (3 cr; Stdnt Opt) For those without animal or nutrition training who have an interest in animal care. Nutrition of healthy animals and factors including behavior, environmental conditions, food type and availability. Focus on companion animals.
ANSC 1511. Food Animal Products for Consumers. (3 cr; Stdnt Opt. *FSCN 1511) 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. (3 cr; Stdnt Opt) How relationship between horses and humans in diverse global locations over time affected daily life, religion, warfare, trade, and transportation. Students work with primary sources to interpret past, based on historians’ questions, sources, and methods.

ANSC 2101. Dairy Cattle Judging. (2 cr; Stdnt Opt. Prereq-#) 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.


ANSC 2055. Horse Management. (2 cr; Stdnt Opt) Develop theoretical knowledge and practical skills related to horse health/management through lecture, class discussion, group projects, presentations, and hands-on skill development. Best management practices for horse husbandry. Horse industry. Strategies for prevention of disease. Environmental hygiene, principles of good nutrition, parasite control, prevention of infectious disease through vaccination. Hands-on sessions develop practical skills such as identifying anatomy, body condition scoring, estimation of body weight, intramuscular injections, bandaging methods, and basic physical examination techniques.


ANSC 3302. Equine Anatomy and Exercise Physiology. (4 cr; Stdnt Opt. Prereq-Jr or sr; 3301 recommended) Interrelationship between physical structure/function. Emphasizes ways in which specialized aspects of anatomy/physiology contribute to unique athletic performance capabilities of horse.

ANSC 3309. Undergraduate Research in Animal Science. (1 cr; max of 6 cr; A-F only) Students conduct research project under supervision of faculty member.

ANSC 3314. Advanced Dairy Judging. (1 cr; Stdnt Opt. Prereq-2011 or #) Training in presentation of oral reasons in dairy cattle judging. Selected students from this course participate in fall intercollegiate dairy judging contest.


ANSC 3303W. Environment, Global Food Production, and the Citizen. (3 cr; Stdnt Opt. *AGUM 2224, AGRO 3303W) 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 3201. Animal Breeding. (4 cr; Stdnt Opt) Application of qualitative and quantitative genetics to animal breeding. Concepts of livestock improvement through selection and mating programs.


ANSC 3301. Farm Animal Environment. (3 cr; Stdnt Opt. Prereq-[3301, jr or #]) Biological/physical processes involved in adjustment of animals to ambient environments. Applications to farm animal management.

ANSC 3309. Animal Biotechnology. (3 cr; Stdnt Opt. Prereq-BIOL 4003 or #) Scientific, social, and ethical issues related to current topics in animal biotechnology. Introduction to molecular genetics. Use of animals as biological reagents/tools, topics in reproductive biotechnology, methods for genetic modification of animals.


University of Minnesota Twin Cities 2010-12 Undergraduate Catalog

Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.
ANSC 3609. Business Planning for Animal Enterprises. (2 cr; Stdnt Opt.)

ANSC 3801. Livestock Merchandising. (3 cr; Stdnt Opt. Prereq-4601, 3511 recommended)
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.

ANSC 4011. Dairy Cattle Breeding. (3 cr; Stdnt Opt. Prereq-3221)
Applying quantitative genetic principles to the breeding of dairy cattle. Primary emphasis on the evaluation of males, females, and systems of mating. Rates of genetic improvement with and without AI.

ANSC 4092. Special Problems in Animal Science. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#)
Independent study in an area of animal science, under supervision of faculty member.

ANSC 4093. Tutorial in Animal Science. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#)
Informally structured to encourage in-depth study of specific disciplines in animal science. Pertinent readings; preparation of written essays of high quality required.

ANSC 4094. Directed Research in Animal Science. (1-3 cr [max 3 cr]; Stdnt Opt) Research in an area of animal science, under supervision of faculty member. Written report on the research is required.

ANSC 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; S-N or Aud. Prereq-CFANS undergrad, #, agreement form)
Supervised professional experience in animal industries and farm enterprise systems. Various aspects of the industry and related fields. Evaluative reports. Consultations with faculty advisors and employers.

ANSC 4099. Special Workshop in Animal Science. (1-4 cr [max 24 cr]; Stdnt Opt) Workshops on a variety of topics in animal science. Consult Class Schedule or department for offerings. Topics may use guest lecturers/experts.

ANSC 4102. Equine Management. (3 cr; Stdnt Opt. Prereq-2102)
Fundamentals of horse management. Record keeping (traditional, computer based). Marketing, sales techniques. Legal aspects (e.g., contracts, zoning, liability, insurance). A management project involves establishing, maintaining, improving an equine business.

ANSC 4401. Swine Nutrition. (3 cr; Stdnt Opt. Prereq-2401, 3511 recommended)
A comprehensive review of major considerations in providing optimum, cost-effective nutrition to swine in all stages of production.

ANSC 4403. Ruminant Nutrition. (3 cr; Stdnt Opt. Prereq-2401)
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.


Interrelationships of business, marketing, and biological performance of pigs in various types of production systems.

ANSC 4602. Sheep Production Systems Management. (4 cr; Stdnt Opt.)

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.

ANSC 4604. Dairy Production Systems Management. (4 cr; Stdnt Opt. Prereq. Concurrent registration is not allowed in 4614)
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.

Physiology, genetics, diseases, nutrition of poultry, relation to management practices for production of eggs, broilers, and turkeys. Technical/practical phases of production/ marketing, underlying principles. Visits to commercial production units.

Analysis of pork production systems. Case studies, visits to pork production operations.

ANSC 4612. Tools for Dairy Consultants in the 21st Century. (2 cr; A-F only. Prereq-4604)

Half semester course. Student enterprise-analysis teams evaluate a beef cattle enterprise and solve problems in marketing, selection, reproduction, nutrition, or health management.

Analysis of dairy production systems. Case studies, visits to dairies.

ANSC 5099. Special Workshop in Animal Science. (1-6 cr [max 12 cr]; A-F or Aud. Prereq-#)
Topics vary. See Class Schedule or department. Topics may use guest lecturers/experts.

ANSC 5200. Statistical Genetics and Genomics. (4 cr; Stdnt Opt. =CMB 5200. Prereq-[Stat 3021 or equiv]. [Biol 4003 or equiv])
Linkage analysis for mapping genes with codominance, dominance, imprinting inheritance modes, linkage/transmission disequilibrium. Radiation hybrid mapping. Parentage testing. Testing/estimation of candidate gene effects. Experimental designs, statistical analysis for mapping quantitative trait loci (QTL) with additive, dominance, and epistasis effects, and for gene expression studies using microarrays. QTL analysis of gene expression data for mapping transcriptional regulation factors.

ANSC 5700. Cell Physiology. (4 cr; A-F only, Prereq-[Two semesters of physics/chemistry, calculus, one semester of systems-level physiology] or #)
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.

Anthropology (ANTH)

Department of Anthropology
College of Liberal Arts

ANTH 1001. Human Evolution. (4 cr; Stdnt Opt)
From ancestors of chimpanzees and humans to origins of modern humans. Principles of evolutionary theory, behavioral biology, and comparative anatomy used to reconstruct the major events in human evolution and the behavior of ourselves and our ancestors.

ANTH 1002. Cultural Heritage and Archaeology. (4 cr; Stdnt Opt) 
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 1003Y. Understanding Cultures: Honors. (4 cr; Stdnt Opt. Prereq-Honors) 

ANTH 1003W. Understanding Cultures. (4 cr; Stdnt Opt) 
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 1005Y. Introduction to Cultural Diversity and the World System. (4 cr; A-F or Aud) 
Anthropology of cultural diversity in the United States and around the world. Comparative study of relationship between local cultures, global processes. Race/ethnicity, economic/social organization, political/religious systems, gender, social change.

ANTH 1111. Human Origins. (3 cr; A-F or Aud) 
World prehistory as investigated by anthropologists. Methods/concepts used to study prehistoric human biological/cultural development.

ANTH 1902. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1903. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1904. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1905. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1906W. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1908W. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1909W. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Freshman) 
Topics specified in Class Schedule.

ANTH 3001. Introduction to Archaeology. (4 cr; Stdnt Opt) 
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 Aud) 
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 3003. Cultural Anthropology. (3 cr; Stdnt Opt. =GLOS 3003) 

ANTH 3004. Great Controversies in Anthropology. (3 cr; A-F or Aud) 
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. (4 cr; Stdnt Opt) 
Studying sociocultural forms by analyzing linguistic data obtained in fieldwork setting. Students work with fluent speaker of non-English language to explore an unfamiliar culture in manner of an ethnographer working with a key informant.

ANTH 3008. Introduction to Flintknapping. (5 cr; A-F or Aud) 
Hands-on experience in replication of prehistoric stone tools, as basis for archaeological analysis and as art form in itself.

ANTH 3010. Native North Americans in Regional Perspective. (3-4 cr [max 4 cr]; Stdnt Opt) 
An in-depth cultural and historical survey of native peoples who inhabit a particular region of North America (e.g., the greater southwest, prairie/woodland transition zone, Great Lakes area, Northwest coast, etc.).

ANTH 3015W. Biology, Evolution, and cultural Development of Language. (3 cr; Stdnt Opt. =ANTH 5015W) 
ANTH 3029. Archaeology of Native Americans. (3 cr; Stdnt Opt) Pre-European contact and contact period archaeology of American Indians north of Mexico.

ANTH 3031. Altering States: After Communism. (3 cr; Stdnt Opt) Post-socialist transitions in Central/Eastern Europe from anthropological perspective. Daily life under socialism. Collapse of socialist rule in relation to key areas of social life such as gender, identity, nationalism, and ethnicity.

ANTH 3033. Introduction to Folklore. (3 cr; Stdnt Opt) Ethnographic study of folklore. Folktales, myths, foodways, music, material arts, personal narratives, magic, legends, drama, and traditions from a wide range of periods, cultures, and regions. Readings, lectures, videos, projects.


ANTH 3036. The Body in Society. (3 cr; Stdnt Opt) Body-related practices throughout the world. Readings, documentaries, mass media.


ANTH 3043. Art, Aesthetics and Anthropology. (3 cr; Stdnt Opt) 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 3045. Religion and Culture. (3 cr; Stdnt Opt. Prereq-1003 or 1005 or #) Religious beliefs and world views cross-culturally. Religious dimensions of human life through theories of origins, functions, and forms (e.g., myth, ritual, and symbolisms) of religion in society.

ANTH 3047W. Gender in Cross-Cultural Perspectives. (3 cr; Stdnt Opt) Relationship of biology and culture; cultural construction of gender and sexuality; variations in economic organization; women’s involvement in ritual and religion; impact of colonialism on gender; rise of the state and gender issues.

ANTH 3212. Globalization, Markets, and Inequality. (3 cr; A-F or Aud. =GLOS 3212) 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 downsizings.

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


ANTH 3310. Topics in Biological and Physical Anthropology. (3-6 cr [max 6 cr]; Stdnt Opt. Prereq-1001) Topics may include faunal analysis, the human skeleton and osteology, primate and human evolution, and forensic anthropology. Topics vary according to student and faculty interest.

ANTH 3401. The Human Fossil Record. (3 cr; A-F only, +ANTH 5401. Prereq-1001 or #) Fossil evidence palaeoanthropologists use to reconstruct human evolutionary history. Taxonomy, phylology, behavior, ecology, tool use, land use, biogeography. Hands-on examination of fossil casts, readings from primary/secondary professional sources.

ANTH 3402. Zooarchaeology Laboratory. (3 cr; A-F only) How archaeologists reconstruct past societies, diets, and environments. Bones and bone fragments to skeletal element (e.g., femur, humerus, rib, side, age, and taxon (e.g., horse, bison, antelope, hyena). Adaptations and functional morphology of animals’ anatomy. Tool marks, tooth marks, burning, and types of bone breakage. Past societies’ hunting, sharing, cooking practices as well as environmental reconstruction using vertebrates.


ANTH 3913. Senior Project Planning. (1 cr; Stdnt Opt. Prereq-[Jr or sr] anth major, #) Evaluation of work to date. Planning future course work and prospectus for senior research project. Defining senior project, finding an adviser, developing preliminary bibliography.

ANTH 3980. Topics in Anthropology. (3 cr; Stdnt Opt, +ANTH 4001. Prereq-1001 or 1005) Topics specified in Class Schedule.

ANTH 4001. Advanced Method and Theory in Archaeology. (3 cr; Stdnt Opt. Prereq-1001 or 3001) Survey and in-depth discussion of past and contemporary archaeological, theoretical, and methodological issues and approaches. Projects incorporating theories and methods. Emphasis on problem solving and integrating method and theory.

ANTH 4003W. Contemporary Perspectives in Cultural Anthropology. (3 cr; A-F or Aud. Prereq-[1003 or 1005], Jr or #) Concept of culture, practice of fieldwork as they relate to various social institutions. Anthropological perspectives on race, ethnicity, gender.

ANTH 4007. Laboratory Techniques in Archaeology. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#) Plant remains, material culture, faunal remains, human osteology. Emphasizes lab experience.

ANTH 4009W. Warfare and Human Evolution. (3 cr; A-F or Aud) 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 4011. Senior Seminar. (3 cr; A-F or Aud. Prereq-Sr, anth major) Research seminar. Topics/methodologies differ according to staff, student interests. Students complete substantial research paper.

ANTH 4012. Senior Project. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-Sr major, #) Independent research project fulfilling the senior option; directed by a faculty member.

ANTH 4019. Symbolic Anthropology. (3 cr; Stdnt Opt. =ANTH 8211. Prereq-1003 or 1005 or grad student or #) Pragmatic/structural aspects of social symbolisms cross-culturally. Focuses on power, exchange, social boundaries, gender, and rituals of transition/reversal.

ANTH 4023W. Culture Theory. (3 cr; A-F or Aud. Prereq-Jr or sr or grad or #) In-depth examination of key developments in the culture concept, from Darwin to present-day postmodern approaches. Examines the view that cultures have an inherent order that cannot be explained psychologically or biologically, and reactions to this view.

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

ANTH 4035. Ethnographic Research Methods. (3 cr; Stdnt Opt. Prereq-1003 or 1005 or grad student) History of and current issues in ethnographic research. Research projects, including participant observation, interviewing, research design, note taking, life history, and other ethnographic methods.
anth 4043. archaeology of northern europe. (4 cr; stdnt opt)
archaeology of scandinavia, british isles, and northern parts of continental europe, from late-bronze age through viking period. themes include art and symbolism; growth of towns; societal interactions; religion and ritual; introduction of christianity; and development of long-distance trade.

anth 4045. gender and power in south asia. (3 cr; stdnt opt)
analysis of the politics of gender in south asia, especially india, focusing on colonial and nationalist constructions of gender and “tradition”; kinship, class and gender; gender and women as nationalist feminism in india; fundamentalism and postcolonial identities; gender and violence.

anth 4049. religion and culture. (3 cr; stdnt opt. prereq-1003 or 1005 or #)
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.

anth 4051. kinship, gender, and diversity. (3 cr; stdnt opt. prereq-1003 or 1005)
cross-cultural variation in meanings, expectations, and practices related to marriage, family, sexuality and parenthood. applies knowledge of variations to cultural diversity and other issues in u.s. society (e.g. changing marriage and family forms, incest, reproductive rights, reproductive technology).

anth 4057. politics and law. (5 cr; stdnt opt. prereq-1003 or 1005 or grad student)
problems of inequality, order and authority in nonstate as well as state-based societies. historical and cross-cultural survey of the concepts through which these problems have been understood. comparative political/legal systems, featuring case studies from africa, burma, new guinea, indonesia, and the united states.

anth 4069. environmental archaeology. (3 cr; stdnt opt. prereq-1001, 3001 or grad)
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. (5 cr; a-f or aud. prereq-1003 or 1005 or 3003 or #)
evaluation of main trends in study of race. psychological, sociological, symbolic, and “critical” approaches that treat race as a sociodiscursive phenomenon. racist discourse as a practice that defines an “other” and subjugates that other to strategies of exclusion.

anth 4075. cultural histories of healing. (3 cr; a-f or aud)
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; stdnt opt. prereq-1001 or 3001 or 3002 or #)
paleontological/archaeological record. students reconstruct behavioral similarities/differences between neanderthals and modern humans. why humans alone survived end of pleistocene.

anth 4101. archival analysis for anthropologists. (3 cr; stdnt opt)
methods for anthropological archival research. preservation, curation, and organization of archival material. uses and limitations of archival research.

anth 4103. archaeologies of colonialism. (3 cr; stdnt opt. prereq-1xxx anthropology course or #)
thoretical and/or methodological issues in study of power/knowledge of historical contexts. comparative analysis of colonialism in different world regions.

anth 4344. europe and its margins. (3 cr; a-f only. prereq-one course in ANTH or GLOS)
europe and its margins, an anthropological/ethnographic perspective. key topics in the study of europe and european societies. anthropology, fiction, film.

anth 4980. topics in sociocultural anthropology. (3 cr [max 6 cr]; stdnt opt)
topics specified in class schedule.

anth 4990. topics in archaeology: seminar. (3 cr [max 6 cr]; stdnt opt)
discussion/review/analysis of specific current theoretical and/or methodological issues in archaeology. topics specified in class schedule.

anth 4991. independent study. (1-6 cr [max 6 cr]; stdnt opt. prereq-#)
under special circumstances and with the approval of the instructor, qualified students may register for a listed course on a tutorial basis.

anth 4992. directed readings. (1-6 cr [max 6 cr]; stdnt opt. prereq-#)
allows students to pursue special interests in anthropology through reading materials under the guidance of a faculty member.

anth 4993. directed study. (1-6 cr [max 6 cr]; stdnt opt. prereq-#)
allows students to pursue special interests in anthropology under the guidance of a faculty member.

anth 4994. directed research. (1-6 cr [max 6 cr]; stdnt opt. prereq-#)
qualifying students may conduct a well-defined research project under the guidance of a faculty member.

anth 5008. advanced flintknapping. (3 cr; a-f or aud. prereq-3008 or 5269 or #)
hands-on training in techniques of advanced stone tool production, artifact reproduction, and lithic experimental design for academic/artistic purposes.

anth 5021w. anthropology of the middle east. (3 cr; stdnt opt. *anths 3021w)
archaeological field methods of analyzing/interpreting middle eastern cultures/societies.
**Anthropology (ANTH)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 5402</td>
<td>Zooarchaeology Laboratory</td>
<td>3 cr</td>
<td>A-F only</td>
<td>How archaeologists reconstruct the past through the study of animal bones associated with artifacts at archaeological sites. Skeletal element (e.g., humerus, femur, tibia), and taxon (e.g., horse, antelope, sheep, bison, hyena) when confronted with bone. Comparative collection of bones from known taxa.</td>
</tr>
<tr>
<td>ANTH 5403</td>
<td>Quantitative Methods in Biological Anthropology</td>
<td>4 cr</td>
<td>A-F only, Prereq-Basic univariate statistics course or #</td>
<td>Quantitative methods used by biological anthropologists. Applying these methods to real anthropometric data. Lectures, complementary sessions in computer lab.</td>
</tr>
<tr>
<td>ANTH 5405</td>
<td>Human Skeletal Analysis</td>
<td>3 cr</td>
<td>A-F only, ANTH 5405, Prereq-1001 or #</td>
<td>Structure, design, and variability of modern human skeleton. Anatomy, functional morphology, development, evolutionary history. Bone histology/biology, excavation, preservation, taphonomy, pathology, forensic analyses. Differentiating between males/females, adults/sub-adults, and humans/non-humans. Quizzes, exams, research paper, project.</td>
</tr>
<tr>
<td>ANTH 5422</td>
<td>Anthropologies of Citizenship and Nationalism</td>
<td>3 cr</td>
<td>A-F only</td>
<td>Why/how citizenship and nationalism have been constructed over time as a force of cultural identity/belonging. Key theories, recent developments in citizenship theory. Defining an anthropological approach to citizenship.</td>
</tr>
<tr>
<td>ANTH 5446</td>
<td>Archaeology of Representation as Communication</td>
<td>3 cr</td>
<td>A-F only</td>
<td>Seminar. Uses of paintings, sculptures, drawings, and photographs as means of communication. Topics from earliest representations of 30,000 years ago to present day.</td>
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<tr>
<td>ANTH 5590</td>
<td>Topics in Anthropology</td>
<td>3 cr</td>
<td>[max 6 cr], Stdnt Opt</td>
<td>Topics specified in Class Schedule.</td>
</tr>
<tr>
<td>ANTH 5990</td>
<td>Topics in Archaeology</td>
<td>3 cr</td>
<td>[max 9 cr], A-F or Aud, Prereq-#</td>
<td>Topics specified in Class Schedule.</td>
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**Apparel Design (ADES)**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADES 1170</td>
<td>Topics in Apparel Design</td>
<td>1-4 cr</td>
<td>[max 16 cr], A-F or Aud</td>
<td>In-depth investigation of specific topic, announced in advance.</td>
</tr>
<tr>
<td>ADES 1201</td>
<td>Apparel Assembly Fundamentals</td>
<td>3 cr</td>
<td>A-F or Aud, Prereq-Pre-apparel design major or #</td>
<td>Methods/applications of apparel assembly, from micro to macro perspective.</td>
</tr>
<tr>
<td>ADES 1906</td>
<td>Work Experience in Apparel Design</td>
<td>1-4 cr</td>
<td>[max 8 cr], S-N only, Prereq-Plan submitted/approved by [advisor, internship supervisor], written approval of supervisor, #</td>
<td>Supervised work experience in business, industry, or government. Integrative paper or project.</td>
</tr>
<tr>
<td>ADES 2211</td>
<td>Illustration for Apparel Design</td>
<td>3 cr</td>
<td>A-F or Aud, Prereq-Pass portfolio review or #</td>
<td>Illustration skills specific to garments/textiles. Traditional media/CAD applications. Critique/analysis of visual communication of apparel design concepts.</td>
</tr>
<tr>
<td>ADES 2222</td>
<td>Apparel Design Studio I</td>
<td>4 cr</td>
<td>A-F or Aud, Prereq-[DHA 1201 or RM 1201], [2221 or DHA 2221], apparel design premajor</td>
<td>Theories/methods in designing apparel for various user groups. Relation of two-dimensional pattern shape to three-dimensional body. Introduction to flat-pattern draping.</td>
</tr>
<tr>
<td>ADES 2225</td>
<td>Apparel Design Research</td>
<td>4 cr</td>
<td>A-F or Aud, Prereq-[DHA 2221 or DHA 2222] with a grade of at least C-, Apparel Design major, pass portfolio review</td>
<td>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.</td>
</tr>
<tr>
<td>ADES 3170</td>
<td>Topics in Apparel Design</td>
<td>1-4 cr</td>
<td>[max 32 cr], A-F or Aud</td>
<td>In-depth investigation of specific topic.</td>
</tr>
<tr>
<td>ADES 3196</td>
<td>Field Study</td>
<td>National or International</td>
<td>1-10 cr</td>
<td>A-F or Aud, Prereq- #</td>
</tr>
<tr>
<td>ADES 3217</td>
<td>Fashion: Trends and Communication</td>
<td>3 cr</td>
<td>A-F or Aud</td>
<td>Relation of fashion trends to visual analysis of apparel. Application to design/retail.</td>
</tr>
<tr>
<td>ADES 3223</td>
<td>Apparel Design Studio III</td>
<td>4 cr</td>
<td>A-F or Aud, Prereq-[2222 or DHA 2222] with grade of at least C-, Apparel Design major, pass portfolio review</td>
<td>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.</td>
</tr>
<tr>
<td>ADES 4121</td>
<td>History of Costume</td>
<td>4 cr</td>
<td>A-F or Aud</td>
<td>Survey of apparel/appearances in Western cultures, from 18th century to present. Role of culture, race, and class with respect to change in dress within historical moments and social contexts. Research approaches/methods in study/interpretation of dress.</td>
</tr>
<tr>
<td>ADES 4160H</td>
<td>Honors Capstone Project</td>
<td>2 cr</td>
<td>A-F only, Prereq-DHA honors</td>
<td>Individualizes honors experience by connecting aspects of major program with special academic interests.</td>
</tr>
<tr>
<td>ADES 4193</td>
<td>Directed Study in Apparel Design</td>
<td>3 cr</td>
<td>A-F or Aud, Prereq-Undergrad, #</td>
<td>Independent study in Design, Housing, and Apparel under tutorial guidance.</td>
</tr>
<tr>
<td>ADES 4196</td>
<td>Internship in Apparel Design</td>
<td>3 cr</td>
<td>S-N or Aud, AIDES 4196, RM 4196, GDES 4196, HSG 4196</td>
<td>Supervised work experience relating activity in business, industry, or government to student’s area of study. Integrative paper or project may be required.</td>
</tr>
<tr>
<td>ADES 4215</td>
<td>Product Development: Softlines</td>
<td>4 cr</td>
<td>A-F or Aud, Prereq-2213 or DHA 2213</td>
<td>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.</td>
</tr>
<tr>
<td>ADES 4225</td>
<td>Apparel Design Studio V</td>
<td>3 cr</td>
<td>A-F or Aud, Prereq-[3224 or DHA 3224], [3225 or DHA 3225] with grade of at least C-, apparel design major</td>
<td>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.</td>
</tr>
</tbody>
</table>
| ADES 4226 | Apparel Design Studio VI | 4 cr | A-F or Aud, Prereq-[4225 or DHA 4225] with grade of at least C-, apparel design major | Synthesis of apparel design work based on concepts in previous studio classes. Principles of mass production applied to design projects completed in 4225. Implementation of public...
Apparel Studies (APST)

DHA Clothing Design

College of Design
APST 5117. Retail Environments and Human Behavior. (3 cr; A-F or Aud. Prereq-Grad student or #)
Theory/research related to designed environment across retail channels.
APST 5123. Living in a Consumer Society. (3 cr; A-F only. Prereq-Grad or sr student)
APST 5124. Consumers of Design. (3 cr; A-F only. Prereq-5123 or DHA 5123 or equiv or #)
Contemporary approaches to consumer behavior.
APST 5170. Topics in Apparel Studies. (1-4 cr [max 32 cr]; A-F or Aud. Prereq-Jr or sr or grad student)
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 Aud. Prereq #)
Independent study in apparel studies under tutorial guidance.
APST 5196. Field Study: National/International. (1-10 cr [max 10 cr]; A-F or Aud.
+GDES 5196, HSG 5196, DES 5196, IDES 5196. Prereq #)
Faculty-directed field study in national or international setting.
APST 5216. Retail Promotion and Consumer Decision-Making. (4 cr; A-F or Aud. +RM 4216. Prereq-Grad student)
Consumer behavior theories/concepts as related to apparel. Application to understanding/developing retail promotional strategies: advertising/promotion.

Applied Business (ABUS)

College of Continuing Education
ABUS 3051. Career Skills in the Professional Environment. (2 cr; Stndnt Opt. Prereq-60 semester cr)
ABUS 3301. Introduction to Quality Management. (3 cr; A-F or Aud. Prereq-Introductory statistics)
ABUS 4012. Strategic Decision Making and Problem Solving. (3 cr; A-F or Aud. Prereq-45 cr)
ABUS 4022. Management in Organizations. (5 cr; A-F or Aud. Prereq-45 cr completed)
ABUS 4104. Management and Human Resource Practices. (3 cr; A-F or Aud. Prereq-45 cr completed)
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.
ABUS 4151. Innovation for Leaders and Organizations. (3 cr; A-F or Aud. Prereq-45 cr)
Innovation as cornerstone of knowledge economy. History of innovation process, importance to individuals/organizations. Strategies to foster innovation. Responsibilities in innovation skill-building/leadership.
ABUS 4321. Evaluating Performance Excellence in Organizations. (3 cr; 5-N or Aud. Prereq-Submit MNQA evaluator application)
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.
ABUS 4509. New Product Development. (3 cr; A-F or Aud. Prereq-[[4103 or 4701 or Mktg 3001], at least 45 cr or #)
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.
ABUS 4515. Strategy and Management for a Sustainable Future. (5 cr; A-F or Aud. Prereq-45 cr completed)
ABUS 4701. Introduction to Marketing. (3 cr; A-F or Aud. Prereq-[Macroeconomics or microeconomics], 45 cr)
Conceptual tools for creating a marketing plan. How marketing relates to other functional areas of business. Importance of an ethical, global view.
ABUS 4703. Marketing for the Professional Practice. (3 cr; A-F or Aud. Prereq-45 semester cr) 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.

ABUS 4991. Special Topics in Applied Business. (3 cr; A-F or Aud. Prereq-At least 45 cr) Management issues in a changing workplace. Topics vary.

ABUS 4993. Directed Study. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-#) Specially arranged projects, trips, or field work.

Applied Economics (APEC)

Department of Applied Economics
College of Food, Agricultural and Natural Resource Sciences

APEC 1001. Orientation to Applied Economics. (1 cr; A-F or Aud) 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.

APEC 1101H. Principles of Microeconomics. (4 cr; Stdnt Opt. =ECON 1101, APEC 1101H, ECON 1101H) Theory of the household and firm; demand and supply; price determination; government in the market; market structures; agriculture and food; externalities and the environment; labor markets and unions; capital and interest; project evaluation; human capital.


APEC 1251. Principles of Accounting. (3 cr; A-F only. =ACCT 2050, Prereg-30 cr; intended for non-business majors; call 612-625-0213 or email instructor for permission) Financial accounting. Theory, concepts, principles, procedures. Preparation/understanding of the four financial statements.

APEC 1905. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-Fr) Topics vary.

APEC 3000. Seminar in International Agriculture. (1 cr [max 3 cr]; Stdnt Opt. Prereq-#) Presentation and discussion of students’ research papers, literature reviews of selected topics, or discussions by students and faculty of their experiences in international agriculture.

APEC 3001. Applied Microeconomics: Consumers, Producers, and Markets. (4 cr; Stdnt Opt. =ECON 3010, ECON 301, ECON 301H, Prereg-[1101 or ECON 1101 or 1101H or ECON 1101H], [MATH 112 or MATH 1271] or #; intended for undergrads in Ag/Bus Food Mgmt, Appl Econ) Consumer/producer decisions. Theory of supply/demand. Markets, pricing, investment, effect regulation, market failures.

APEC 3002. Applied Microeconomics: Managerial Economics. (4 cr; Stdnt Opt. Prereg-[1101 or ECON 3010], [OMS 2550 or STAT 301] or #) 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.


APEC 3007. Applied Macroeconomics: Policy, Trade, and Development. (3 cr; Stdnt Opt. Prereg-[1101 or Econ 1101], [1101H or ECON 1101H], [1102 or Econ 1102], [1102H or ECON 1102H]; [3001 or 3006 recommended]) 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 institutions/institutions.

APEC 3041W. Economic Development of U.S. Agriculture. (3 cr; Stdnt Opt. Prereg-1101 or Econ 1101) Economic, political, social, and technical forces that have shaped development of U.S. agriculture. Role of agricultural development in national economic development in the United States. Implications for developing countries.

APEC 3061. General Survey of Development in Africa. (3 cr; Stdnt Opt. =AFRO 3433, Prereg-1101 or Econ 1101) Socioeconomic, political, and cultural development in Sub-Saharan Africa post-independence.

APEC 3071. Agriculture and Economic Growth in Developing Countries. (3 cr; Stdnt Opt. Prereg-1101, 1102, Econ 1101, 1102 or #) Characteristics and performance of peasant agriculture; potential role of agriculture in economic development, and design of economic policies to achieve agriculture and economic development; role of women in agricultural development.


APEC 3451. Food and Agricultural Sales. (3 cr; Stdnt Opt. Prereg-1101 or Econ 1101) 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.

APEC 3501. Agribusiness Finance. (3 cr; Stdnt Opt. =FINA 3001, FINA 3000, Prereg-[1151 or Acct 2050], 60 cr or #) 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.


APEC 3801. Health Economics and Policy. (3 cr; Stdnt Opt. =PUBH 3801, Prereg-[1101 or Econ 1101], knowledge of plane geometry) or #) Economics of health care markets. Problems faced by consumers and health care services. Builds on microeconomic principles of supply/demand for health, health care, health insurance, and role of government. Theoretical/empirical models, applications.

APEC 3811. Principles of Farm Management. (3 cr; Stdnt Opt. Prereg-1101 or Econ 1101) 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.
APEC 3821. Retail Center Management. (3 cr; Stdt Opt. Prereq- [1101 or Econ 1101], [251 or Acct 2050])
Management of garden centers, grocery stores, and other retail units selling perishable agricultural products.

APEC 3991. Independent Study in Applied Economics. (1-4 cr [max 4 cr]; Stdt Opt. Prereq-#)
Independent study and supervised reading and research on subjects and problems not covered in regularly offered courses.

APEC 4096. Professional Experience Program: Internship. (1-3 cr [max 6 cr]; S-N or Aud. Prereq-CFANS undergrad, #, completed internship contract)
Professional experience in agribusiness firms or government agencies gained through supervised practical experience. Evaluative reports and consultations with faculty advisers and employers.

APEC 4103. World Food Problems. (3 cr; Stdt Opt. «FSCN 4103, AGRO 4103, CVM 6060. Prereq-jr or sr or grad)
A multi-disciplinary look at problems and possible solutions affecting food production, storage, and utilization in developing countries. Presentations and discussions introduce conflicting views on population, technology, and ethical and cultural values of people in various parts of the world.

APEC 4311. Tourism Development: Principles, Processes, Policies. (3 cr; Stdt Opt. Prereq-1101, 1102 or Econ 1101, 1102)
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.

APEC 4451W. Food Marketing Economics. (3 cr; Stdt Opt. «APEC 5451. Prereq-[[1101 or Econ 1101], 1101H or Econ 1101H, MKTG 3001, 60 cr or #)
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.

APEC 4461. Horticultural Marketing. (3 cr; A-F only. «HORT 461. Prereq-1101 or Econ 1101)
Difference between horticultural products and commercial commodities. Core marketing components that should be used by every small horticultural business. Basic approaches of consumer research.

APEC 4481. Futures and Options Markets. (3 cr; Stdt Opt. «APEC 5481. Prereq-[[3001 or Econ 3101], [ANSc 2211 or QMS 1550 or Stat 3011], 60 cr or #)

APEC 4501. Financial Modeling. (3 cr; A-F or Aud. Prereq-[[3501 or FINA 3001], [1251 or ACCT 2050])

APEC 4821W. Business Economics and Strategy. (3 cr; Stdt Opt. Prereq-3002, [3501 or FINA 3001], MGMT 3001)

APEC 5031. Methods of Economic Data Analysis. (3 cr; Stdt Opt. Prereq-MATH 1271, STAT 5021, knowledge of matrix algebra)
Statistical and econometrics techniques for applied economists. Theory and application of multivariate regression model using data sets from published economic studies. Emphasis on use of statistical technique to understand market behavior.

APEC 5032. Economic Data Analysis for Managerial and Policy Decisions. (3 cr; Stdt Opt. Prereq-5053 or #, familiarity with SAS)
Statistical/econometric methods for the analysis of large data sets to support managerial/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. Emphasizes clarity of reporting and design of procedures for maintaining/updating data estimates.

APEC 5131. Applied Microeconomics: Firm and Household. (3 cr; Stdt Opt. Prereq-3001 or Math 1271 or Math 2243 or equiv or grad student or #)
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.

APEC 5151. Applied Macroeconomics: Income and Employment. (3 cr; Stdt Opt. Prereq-3001 or Math 1271 or Math 2243 or equiv or grad student or #)
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.

APEC 5321. Regional Economic Analysis. (3 cr; Stdt Opt. Prereq-3006 or ECON 3102 or #)

APEC 5341. Public Finance. (3 cr; A-F or Aud. Prereq-3001 or Econ 3101 or PA 5021)
Which services should the public sector provide? Which level of government should provide them? How should governments fund those services? Which types of taxes should be levied and on whom? Applying economic theory/analysis to spending, revenue, and tax policy issues facing governments.

APEC 5451. Food Marketing Economics. (3 cr; A-F or Aud. «APEC 4451W. Prereq-Grad student)

APEC 5481. Futures and Options Markets. (3 cr; Stdt Opt. «APEC 4481. Prereq-Grad student)
Economic concepts related to futures/options trading. Hedging, speculation.

APEC 5511. Labor Economics. (3 cr; Stdt Opt. Prereq-[[3001 or Econ 3101 or PA 5021], [PA 5032 or equiv], grad student] or #)
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.

APEC 5581. Human Capital and Household Economics. (3 cr; Stdt Opt. Prereq-3001 or Econ 3101 or #)
Household economics and investment in human capital (e.g., children, education, health and nutrition); labor force participation, lifetime earnings, and nonmarket work; time allocation and substitution of capital for labor in the household in the western and third world.

APEC 5611. Economic Aspects of Environmental Management. (3 cr; A-F or Aud. Prereq-[Sr or grad student] in [biological science or conservation biology or ecology] or fisheries or forestry or public affairs or water resources or wildlife conservation] or CLA or #)
Economist approach to environmental problems such as water/air pollution. Application of supply-demand concepts to evaluation of environmental resources. Methods of evaluation. Analysis of pollution control policies from economic point of view.

APEC 5651. Economics of Natural Resource and Environmental Policy. (3 cr; Stdt Opt. Prereq-[[3001 or Econ 3101], [461I or Econ 3601 or NRES 2211W]) or #)
Economic analyses, including project evaluation of current natural resource/environmental issues. Emphasizes intertemporal use of natural resources, natural resource scarcity/adequacy, environmental quality, and mechanisms for pollution control and their implications for public policy.

APEC 5711. U.S. Agricultural and Environmental Policy. (3 cr; Stdt Opt. Prereq-3001 or Econ 3101)
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.

398 Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.
APEC 5721. Economics of Science and Technology Policy. (3 cr; Stdnt Opt. Prereq: [5151 or 85151], PA 5022 or #) Economics of innovation, technical change, and research/development. Productivity measurement. Knowledge stocks, research lags/spillovers. Econometric/welfare surplus methods for evaluating economic consequences of R&D. Economics of intellectual property rights.


APEC 5811. Cooperative Organization. (3 cr; Stdnt Opt. Prereq: 3001 or Econ 3101 or PA 5021 or #) Application of economic analysis to cooperative form of organization. Producer/consumer cooperatives used to examine economic issues such as changing market organization, financing, management incentives, taxation, and antitrust regulations. Cooperatives as a tool for economic development.

APEC 5891. Independent Study: Advanced Topics in Farm and Agribusiness Management. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq: #) Special topics or individual work suited to the needs of particular groups of students.

APEC 5991. Special Topics and Independent Study in Applied Economics. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq: #) Special classes, independent study, and supervised reading/research on subjects/problems not covered in regularly offered courses.

Arabic (ARAB)

Department of Asian Languages and Literatures

College of Liberal Arts


ARAB 1102. Beginning Arabic II. (5 cr; Stdnt Opt. =ARAB 4102) Prereq: 1101 or equiv or #) Comprehension, oral practice, and reading of standard Arabic.

ARAB 1201. Reading in Arabic I. (4 cr; Stdnt Opt. Prereq: 1101 or equiv or #) Reading authentic texts/articles in Arabic. Translation, interpretation.

ARAB 1202. Reading in Arabic II. (4 cr; Stdnt Opt. Prereq: 1201 or equiv or #) Reading authentic texts/articles in Arabic. Translation, interpretation.

ARAB 3036. Islam: Religion and Culture. (3 cr; Stdnt Opt. =HIST 3493, RELS 3712) Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies--Asia, Europe, the Americas.


ARAB 3102. Intermediate Arabic II. (5 cr; Stdnt Opt. Prereq: 3101 or #) Advanced grammar, analyses of readings, oral comprehension.

ARAB 3290. Arabic Language Teaching Tutorial. (1 cr [max 2 cr]; S-N only. Prereq: Grade of A in 3102/3122) Students tutor beginning students of Arabic and are part of department’s Arabic language team.

ARAB 3491. Classical Islamic Civilization. (3 cr; Stdnt Opt. =MELC 3491, ARAB 5491, HIST 3491) Islamic legacy in the classical age (800-1400), including medical and natural sciences, mathematics, philosophy, literature, and their transmission to Europe.

ARAB 3505. Survey of the Middle East. (3 cr; Stdnt Opt. =MELC 3505, HIST 3505, ARAB 5505) Peoples, lands, and cultures of the Middle East. Historical survey from earliest civilizations to the present.


ARAB 3543. Arts Under Mamluks and Ottomans: 1300-1920. (3 cr; Stdnt Opt. =ARAB 5543, MELC 3543, HIST 3543) Struggle against Crusaders and Mongols. Disintegration and reemergence under Muhammad Ali of Egypt; dynastic struggles in Syria; rise of Young Turks; Arab revolt.

ARAB 3544. Arab World 1920 to the Present. (3 cr; Stdnt Opt. =HIST 3544, MELC 3544, ARAB 5544) Struggle in the Arab world for independence and its course since independence. Emphasis on development, political stability and unity; political structures of the Arab-Israeli conflict.

ARAB 3547. The Ottoman Empire. (3 cr; Stdnt Opt. =HIST 3547) Founding of Ottoman society and state to empire, 1300 to end of the empire in 1920. Lands, institutions, peoples, legacy, impact on Europe.

ARAB 3900. Topics in Arabic Culture and Literature. (4 cr [max 8 cr]; Stdnt Opt) Topics specified in Course Guide.

ARAB 3993. Directed Study. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq: #) For advanced students with individual faculty members.

ARAB 4102. Beginning Arabic II. (3 cr; Stdnt Opt. =ARAB 4102 or equiv, grad student) Comprehension, oral practice, reading of standard Arabic. Meets with 1102.


ARAB 4212. Intermediate Arabic II. (3 cr; Stdnt Opt. Prereq: 4121 or equiv, grad student) Advanced grammar, analysis of readings, oral comprehension.

ARAB 5001. Research Methods in Arabic Studies. (3 cr; Stdnt Opt) Skills and techniques required to deal with medieval and modern works in Arabic literature and Islam. A survey of the most important research bibliographies in Arabic and Islamic studies. Bibliographic references in English and, when appropriate, Arabic.

ARAB 5036. Islam: Religion and Culture. (3 cr; Stdnt Opt) Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies - Asia, Europe, Americas.

ARAB 5101. Advanced Arabic I. (3 cr [max 4 cr]; Stdnt Opt. Prereq: 3102 or equiv or #) Advanced readings in classical and modern Arabic. Compositions based on texts.


ARAB 5491. Classical Islamic Civilization. (3 cr; Stdnt Opt. =MELC 3491, ARAB 3491, HIST 3491) Islamic legacy in the classical age (800-1400), including medical/natural sciences, mathematics, philosophy, literature, and their transmission to Europe.

ARAB 5501. Modern Arabic Poetry in Translation. (3 cr; Stdnt Opt) Free verse movement and its major trends: post-romantic, social realist, symbolist, resistance, prose poem. Emphasizes leading poets such as al-Mala’ika, al-Sayyab, al-Bayati, and Adunis. Theoretical/critical essays. All readings in English.

ARAB 5502. Arabic Drama in Translation. (3 cr; Stdnt Opt) Emergence and development of drama as a European-inspired genre in Arabic literature. Emphasizes major trends and playwrights. All readings in English.
ARAB 5541. Islam in the Catholic Age: Arab Phase 600 A.D. to 900 A.D. (3 cr; Stdtnt Opt. +HIST 3541, MELC 3541, ARAB 3541)

The rise of Islam in its Arabian setting. Roles of the prophet, the Orthodox and Umayyad Caliphs. Development of the Islamic state and empire. Status of Muslims and non-Muslims.

ARAB 5543. Arabs Under Mamluks and Ottomans: 1300-1920. (3 cr; Stdtnt Opt. +MELC 3543, HIST 3543. ARAB 3543)

Struggle against Crusaders and Mongols. Disintegration and reemergence under Muhammad Ali of Egypt; dynastic struggles in Syria; rise of Young Turks; Arab revolt.

ARAB 5544. Arab World 1920 to the Present. (3 cr [max 4 cr]; Stdtnt Opt. +HIST 3544. ARAB 3544. MELC 3544)

Struggle in the Arab world for independence and its course since independence. Emphasis on development, political stability and unity; political structures; the Arab-Israeli conflict.

ARAB 5900. Topics in Arabic Literature and Culture. (3 cr [max 9 cr]; Stdtnt Opt. Prereq-5102 or #)

Readings and discussion of selected works in Arabic. Topics specified in Class Schedule.

ARAB 5992. Directed Readings. (1-3 cr [max 3 cr]; Stdtnt Opt. Prereq-#)

Individual research and readings for advanced students.

Aramaic (ARM)

Department of Classical and Near Eastern Studies

ARM 5011. Biblical Aramaic and Old Aramaic Inscriptions. (3 cr; Stdtnt Opt. Prereq-1 yr Hebrew or Arabic or #)

Biblical Aramaic—grammar, fluency in reading Biblical Aramaic and Old Aramaic inscriptions.

Architecture (ARCH)

School of Architecture

College of Design

ARCH 1281. Design Fundamentals I. (4 cr; A-F only)

Introduction to design thinking in architecture through project-based learning. Lectures, films, field trips. Four design projects, including an off-campus service learning.

ARCH 1701. The Designed Environment. (3 cr; A-F only)

Examination of seminal issues in the designed environment, including 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.

ARCH 1701H. Honors: The Designed Environment. (3 cr; A-F only. Prereq-[Fr or soph] honors)

Seminal issues in the designed environment. Relationships between place/space, ideal/real, public/private. How architecture, landscape architecture, and urban design have explored those issues.

ARCH 2281. Design Fundamentals II. (4 cr; A-F only. Prereq-[1301 or 2301]. Arch major)

Foundation architectural design studio. Design principles, technical drawing, material manipulation.

ARCH 2301. Introduction to Drawing in Architecture. (4 cr; A-F only. Prereq-Arch major. No prereq in summer)

Perceiving/representing the material environment. Sketching/drawing conventions of visual phenomena/forms.

ARCH 3150. Topics in Architecture. (1-6 cr [max 2 cr]; Stdtnt Opt)

Selected topics in architecture design, theory, representation, or history.

ARCH 3520. Design Workshop. (1-6 cr [max 12 cr]; A-F only. Prereq-2281, [Arch BA or BDA major])

Design process as it relates to architecture. Hands-on projects involving interactive design process. Students develop rigorous/inventive graphic means of communicating.

ARCH 3821. Undergraduate Architecture Studio I. (6 cr; A-F only. Prereq-BS Arch major)

Introduction to architectural design in relation to site.

ARCH 3822. Undergraduate Architecture Studio II. (6 cr; A-F only. Prereq-[3281 or 4281]. BS Arch major)

Introduction to architectural design in relation to program.

ARCH 3301. Drawing for Design in Architecture. (3 cr; A-F or Aud. Prereq-[1301 or LA 1301 or 2301]. [Arch or BED major])

Introduction to practical/conceptual function of drawing in architecture.

ARCH 3351. AutoCAD I. (5 cr; Stdtnt Opt. +ARCH 4351. Arch major or BED major or #)

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.

ARCH 3361. Introduction to Computer Aided Architectural Design. (3 cr; A-F or Aud. Prereq-Arch major or BED major or #)

Introduction to computer-aided design, 3-D modeling, animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management.

ARCH 3411V. Architectural History to 1750. (3 cr; A-F only. Prereq-Soph or above)

History of architecture/city planning from antiquity to 1750, as illustrated by major monuments from western/non-western cultures.

ARCH 3411W. Architectural History to 1750. (3 cr; A-F or Aud. Prereq-Soph or above)

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 culture.

ARCH 3412. Architectural History Since 1750. (3 cr; A-F or Aud. Prereq-Soph or above)

History/theories of architecture and related landscapes/urban forms since 1750.

ARCH 3421H. Honors: Architectural History Since 1750. (3 cr; A-F or Aud. Prereq-Soph, honors)

History/theories of architecture and related landscapes and urban forms since 1750.

ARCH 3490H. Honors Theory Seminar. (3 cr; A-F or Aud. Prereq-[CLA BA or CALA BS] honors or #)

Topics selected by faculty, from their area of scholarship, in contemporary issues from literature of architecture. Specific buildings or building types, or areas of architectural thought, history, representation, design, technology. See Class Schedule.

ARCH 3641. Introduction to Heritage Preservation. (3 cr; A-F only. Prereq-Jr or sr only)

Potential of, and challenges to, heritage preservation in the United States. Preservation’s pros/cons. Lectures, readings, films, class discussions, assignments, local field trips, case studies.

ARCH 3711V. Honors: Environmental Design and the Sociocultural Context. (3 cr; A-F only. Prereq-Honors, [soph or above])

Designed environment as cultural medium and as product of a sociocultural process and expression of values, ideas, and behavioral patterns. Design/construction as complex political process.

ARCH 3711W. Environmental Design and the Sociocultural Context. (3 cr; A-F only. Prereq-Soph or above)

Designed environment as cultural medium/product of sociocultural processes and as expression of values, ideas, and behavioral patterns. Design/construction as complex political process.

ARCH 3993. Directed Study. (1-3 cr [max 6 cr]; A-F only. Prereq-#)

Guided individual reading or study.

ARCH 4150. Topics in Architecture. (1-4 cr [max 24 cr]; A-F or Aud. Prereq-Arch major or #)

Design, technology, history, theory, representation, or urbanism.

ARCH 4283. Undergraduate Architecture Studio III. (6 cr; A-F only. Prereq-[3282 or 4282]. BS Arch major)

Introduction to architectural design in relation to materials, construction methods.

ARCH 4284. Undergraduate Architecture Studio IV. (6 cr; A-F only. Prereq-4283, BS Arch major)

Topical design studio.

ARCH 4301. Conceptual Drawing. (3 cr; A-F only. Prereq-[1301 or 2301]. Arch major)

Drawing as way of analyzing, exploring, and generating design ideas. Projection systems, diagramming, mapping. Different modes of visual perception. Nonverbal structures.

ARCH 4311. Theory of Architectural Representation. (3 cr; A-F or Aud. +ARCH 5311. Prereq-[3301, [BA or BS or BED]]. BA or BS or BED) honors or #)

Integration of emerging computer graphics with photography and architectural graphic conventions. Historical, theoretical, and critical issues of representation. Influence of visual media on architectural field.
ARCH 4313. Visual Communication Techniques in Architecture. (3 cr; A-F or Aud. =ARCH 5313. Prereq-3301 or 4301) Delineation, presentation, and design techniques. Various visual media, methods of investigation.


ARCH 4361. 3-D Computer Architectural Modeling and Design. (3 cr; A-F or Aud. =ARCH 5361. Prereq-3351, Arch major) Use of 3D computer modeling for representation in abstract/realistic 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.

ARCH 4382. Computer-Aided Architectural Design. (3 cr; A-F or Aud. =ARCH 5382. Prereq-3381 or 5381) Computer-aided tools as used in design. Practice in 2-/3-D CAD, image manipulation. Advanced multimedia visualization techniques, including solid modeling, photo realistic imaging, animation, and video editing/recording.

ARCH 4421W. Architecture and Interpretation: The Cave and the Light. (3 cr; A-F or Aud. =ARCH 5421. Prereq-[3411, 3412 or #) Historical/hermeneutical investigation of iconography of grotto. Interwoven themes of descent into earth and ascent to light, from earliest strata of human culture to present day.

ARCH 4423. Gothic Architecture. (3 cr; A-F or Aud. =ARCH 5423. Prereq-3411 or #) History of architecture and urban design in Western Europe, from 1150 to 1400.

ARCH 4424. Renaissance Architecture. (3 cr; A-F or Aud. =ARCH 5424. Prereq-3411 or #) 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).

ARCH 4425. Baroque Architecture. (3 cr; A-F or Aud. =ARCH 5425. Prereq-3411 or #) Architecture and urban design in Italy, from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin).

ARCH 4431W. Eighteenth-Century Architecture and the Enlightenment. (3 cr; A-F or Aud. =ARCH 5431. Prereq-[3411, 3412 or #) Architecture, urban planning, and garden design in Europe and America, 1650 to 1850.

ARCH 4432. Modern Architecture. (3 cr; A-F or Aud. =ARCH 5432. Prereq-3412 or #) Architecture and urban design in Europe and the United States from early 19th century to World War II.

ARCH 4434. Contemporary Architecture. (3 cr; A-F or Aud. =ARCH 5434. Prereq-3412 or #) Developments, theories, movements, and trends in architecture and urban design from World War II to present.

ARCH 4441. Minnesota: Architecture and Landscapes. (3 cr; A-F only. =ARCH 5441. Prereq-[3411, 3412] recommended) History of major architectural monuments, urban phenomena, and landscape forms of Minnesota. Interrelationships between architecture, geography, and people.

ARCH 4445W. Suburbia. (3 cr; A-F only. =ARCH 5445) Suburbia, from origins in 18th-century England to present. Historical changes and present challenges, especially in America. Ideology, mythology, planning, development, geography, transportation, the family. Specific sites/designs. Representations in film, television, popular literature, and music.

ARCH 4446. Architecture Since World War II: Post-War Experimentation; Aesthetics and Politics of Architecture. (3 cr; A-F only. =ARCH 5446. Prereq-3412 or #) Avant-garde responses to post-war consciousness of social/meaning in architecture. Eroding communal identity, common man, architectural symbolism, monumentality, critical regionalism, place/technology in form making, popular culture, rise of theory.

ARCH 4461. North American Indian Architecture. (3 cr; A-F only. =ARCH 5461. Prereq-[Arch 4242, Arch or Art major]) Historic/contemporary principles/theories of North American Indian architecture. Culture, technology, environment, art, and craft of North American Indians in their settlements/architecture.


ARCH 4701W. Introduction to Urban Form and Theory. (3 cr; A-F only. =ARCH 5701. Prereq-[3411, 3412 or #) Urban form, related issues of design/theory/culture. Thematic history of cities. Lectures, discussions, assignments.

ARCH 4731. Territorial City. (3 cr; A-F only. =ARCH 5731. Prereq-#) 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 4750. Introduction to Urban Form and Issues. (3 cr; A-F or Aud. =ARCH 5750. Prereq-Undergrad Arch major or #) Special topics in theory/practice of urban design.


ARCH 5110. Architecture as Catalyst. (1 cr [max 3 cr]; S-N only. =ARCH 6110. Prereq-M.Arch) Topical workshops on design methods, theories, or emerging practices.

ARCH 5133. Architectural Thesis. (8 cr; A-F or Aud. =ARCH 5133. Prereq-5122, 5241. BA Arch major; students must submit thesis plan in semester before writing thesis) Student’s choice, study and solution of an architectural problem to demonstrate proficiency in all phases of design.


ARCH 5291. Accelerated Undergraduate Architecture Studio I. (9 cr; A-F or Aud. Prereq—#) Selected architectural problems developed by faculty to deepen/enrich ideas introduced in required architectural studio sequence.

ARCH 5292. Accelerated Undergraduate Architecture Studio II. (6 cr; A-F or Aud. Prereq [5291, accelerated status] or #) Architectural problems. Emphasizes development of structures as integral part of design, site planning, design process.

ARCH 5301. Conceptual Drawing. (3 cr; A-F only. Prereq—M Arch major or #) Drawing as way of analyzing, exploring, and generating design ideas. Projection systems, diagramming, mapping. Different modes of visual perception. Nonverbal structures.

ARCH 5311. Theory of Architectural Representation. (3 cr; A-F or Aud. +ARCH 4311. Prereq—5371, 5372, M Arch or instr consent) Integration of emerging computer graphics with photography and architectural graphic conventions. Historical, theoretical, and critical issues of representation. Influence of visual media on architectural field.

ARCH 5313. Visual Communication Techniques in Architecture. (3 cr; A-F or Aud. +ARCH 4313. Prereq—M Arch major or instr consent) Delineation, presentation, and design techniques. Various visual media and methods of investigation.

ARCH 5321. Architecture in Watercolor. (3 cr; A-F or Aud. +ARCH 4321. Prereq—M Arch grad student or #) Watercolor as a tool in design process. Foundation principles, techniques, medium, tools, materials. Color relationships, mixing, composition, applications to design.

ARCH 5350. Topics in Architectural Representation. (1-3 cr [max 3 cr]; A-F or Aud. Prereq [5321, [Arch major or M. Arch major] or #) Selected topics in architectural representation.

ARCH 5361. 3-D Computer Architectural Modeling and Design. (3 cr; A-F or Aud. +ARCH 4361. Prereq—M Arch major) 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.

ARCH 5371. Computer Methods I. (1 cr; S-N or Aud. +LA 5371. Prereq—Concurrent enrollment 8251, M Arch major or #) Introduction to current techniques, computer programs, and their application to architectural computing.

ARCH 5372. Computer Methods II. (1 cr; S-N or Aud. +LA 5372. Prereq—5371, 88252 and M Arch major or #) Current techniques, computer programs, and their application to architectural computing and design.

ARCH 5373. Computer Methods III. (1 cr; S-N or Aud. +LA 5373. Prereq—5372, 88253, M Arch major or #) Advanced techniques, computer programs, and their application to architectural computing in design, theory, and technology.

ARCH 5374. Computer Methods IV. (1 cr; Stdnt Opt. Prereq—5373, 88254, M Arch major or #) Advanced architectural computing applications in design, history, theory, representation, and technology.

ARCH 5382. Computer Aided Architectural Design. (3 cr; A-F or Aud. Prereq—5381 or arch grad major or #) 2-D/3-D CAD, image manipulation. Advanced multimedia visualization techniques for design, including solid modeling, photo-realist imaging, animation, video-editing/recording.

ARCH 5410. Topics in Architectural History. (3 cr [max 12 cr]; A-F or Aud. Prereq—MS Arch or M Arch major or #) Advanced study in architectural history. Readings, research, seminar reports.

ARCH 5411. Principles of Design Theory. (3 cr; A-F or Aud. Prereq—M Arch major or #) 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.

ARCH 5421. Architecture and Interpretation: The Cave and the Light. (3 cr; A-F only. +ARCH 4421W. Prereq—5411, 5412 or #) 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.

ARCH 5423. Gothic Architecture. (3 cr; A-F or Aud. +ARCH 4423. Prereq—MS Arch or M Arch major or #) History of architecture and urban design in Western Europe, from 1150 to 1400.

ARCH 5424. Renaissance Architecture. (3 cr; A-F or Aud. +ARCH 4424. Prereq—MS Arch or M Arch major or #) 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).

ARCH 5425. Baroque Architecture. (3 cr; A-F or Aud. +ARCH 4425. Prereq—MS Arch or M Arch major or #) Architecture and urban design in Italy, from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin).


ARCH 5431. Eighteenth-Century Architecture and the Enlightenment. (3 cr; A-F or Aud. +ARCH 4431W. Prereq—M Arch grad student or #) Architecture, urban planning, and garden design in Europe and America from 1650 to 1850.

ARCH 5432. Modern Architecture. (3 cr; A-F or Aud. +ARCH 4432. Prereq—MS Arch or M Arch major or #) Architecture and urban design in Europe and the United States, from early 19th century to World War II.

ARCH 5434. Contemporary Architecture. (3 cr; A-F or Aud. +ARCH 4434. Prereq—MS Arch or M Arch major or #) Developments, theories, movements, and trends in architecture and urban design, from World War II to present.

ARCH 5439. History of Architectural Theory. (3 cr; A-F or Aud. +ARCH 4439. Prereq—5411, 5412 recommended) History of major architectural monuments, urban phenomena, and landscape forms of Minnesota. Interrelationships between architecture, geography, and people.

ARCH 5445. Suburbia. (3 cr; A-F only. +ARCH 4445W) Suburbia, from origins in 18th-century England to present. Historical changes and present challenges, especially in America. Ideology, mythology, planning, development, geography, transportation, the family. Specific sites/designs. Representations in film, television, popular literature, and music.


ARCH 5450. Topics in Architectural Theory. (1-3 cr [max 9 cr]; A-F or Aud. Prereq—Arch major or M Arch major or #) Selected topics in architectural theory and criticism.

ARCH 5451. Architecture: Defining the Discipline. (4 cr; A-F only. Prereq—M Arch major) Paradigms through which architecture has defined itself. Implications for its practice, product, and architecture in general. Lecture, discussion, design exercises.

ARCH 5452. Architecture: Design, Form, Order, and Meaning. (4 cr; A-F or Aud. Prereq—M Arch major or #) Architecture and the issue of meaning. Explores fundamental and constituent elements of architectural form and order; their inherent tectonic, phenomenal, experiential, and
symbolic characteristics; their potential and implications for the creation and structure of meaningful human places.

ARCH 5455. Typology and Architecture: Theories of Analysis and Synthesis. (3 cr; A-F or Aud. Prereq. 5451, M Arch major. #) Theoretical traditions and development of typology’s role in architecture. Investigates works of Laugier, Quatremere de Quincy, Viollet-Le Duc, Ledoux, Durand, Camillo Sitte, and Le Corbusier. Recent developments and theoretical positions of neo-rational and contextual arguments for contemporary applications of the idea of type.

ARCH 5458. Architecture and Culture. (3 cr; A-F or Aud. Prereq. 3412, Arch major or grad student or #) Architecture as a cultural medium. Relationships among architecture, people, and culture; research findings and design; vernacular and high style architecture. Physiological and symbolic messages; reception theory in architecture; cultural critique and change; implications for architectural practice.

ARCH 5459. Gender and Architecture. (3 cr; Stdnt Opt. Prereq-Arch or WoSt major or M Arch major or #) Examination of ideas related to gender and architecture, gendered and non-gendered places and practices, and their relations to cultural norms and change.


ARCH 5465. LeCorbusier’s Search for Theory and Identity in His Formative Years. (3 cr; A-F only. Prereq-M Arch major) Seminar. Charles-Edouard Jeanneret’s transition from apprentice of watchcase engraving to student of architecture, 1903-20. Early education, travels, design of houses in La Chaux de Fonds, transition to life in Paris, success in establishing theoretical identity.

ARCH 5468. Constructing Sacred Space. (4 cr; A-F only. Prereq-mArch or MS) Speculative understandings of space, form, and expression of sacred space in historic/contemporary cultural/social contexts, using Islamic art/architecture. Language of architecture.


ARCH 5512. Building Methods in Architecture. (3 cr; A-F or Aud. Prereq. 5511, M Arch major or #) Analysis of architectural materials, building systems, and construction operations related to enclosure systems design, building infrastructure, and detailing. Application of legal constraints and regulations (e.g., ADA, building codes, life-safety issues) in preparation of drawings, specifications, and construction documents for building design.

ARCH 5513. Environmental Technology I: Thermal Design in Architecture. (3 cr; A-F or Aud. Prereq-M Arch major or #) Thermal and climatic issues in the design of small and mid-size buildings. Investigations in built and mechanical methods to modify climate. Evaluation of the impact of design techniques on energy use, the environment, and architectural meaning.

ARCH 5514. Environmental Technology II: Lighting and Acoustic Design. (3 cr; A-F or Aud. Prereq-M Arch major or #) Principles of daylighting, electric lighting, and acoustic design in architecture. Relationship between luminous and acoustic environments, human comfort and architectural experience. Analytical methods, design process, and modeling of daylighting.


ARCH 5516. Technology Two: Luminous and Thermal Design. (6 cr; A-F only. Prereq-M Arch) 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.


ARCH 5521. Material Investigation: Concrete. (4 cr; A-F only. Prereq-MArch or MS) Design projects identify common problems/improvements, investigate alternatives, and develop solutions where concrete is primary building material.

ARCH 5523. Material Investigation: Steel and Glass. (4 cr; A-F only. Prereq-Grad student) Design projects identify common problems and improvements, investigate alternatives and develop solutions where steel and glass are the primary building materials.

ARCH 5525. Design in Masonry. (3 cr; A-F or Aud. Prereq-5521, M Arch major or #) Design principles, construction methods, and document production for masonry structures.

ARCH 5527. Material Investigations: Stone and Water. (4 cr; A-F only. Prereq-MArch or MS) Design projects identify common problems/improvements, investigate alternatives, and develop solutions where wood is primary building material.

ARCH 5539. Daylighting and Architecture Design. (4 cr; A-F only. Prereq-M Arch major) 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.

ARCH 5550. Topics in Technology. (1-4 cr [max 12 cr]; A-F only. Prereq-MArch major) Selected topics in architectural technology, e.g., construction, environmental management, energy performance, lighting, materials.


ARCH 5572. Architectural Structures II: Concrete and Masonry Design. (3 cr; A-F or Aud. Prereq-5571, M Arch major or #) Overview of advanced materials: reinforced fiberglass, structural glass, and structural tensile fabrics. Impact of construction technology on architecture and methods of integrating knowledge of structural materials and construction methods into the design process.

ARCH 5611. Design in the Digital Age. (5 cr; A-F or Aud. Prereq-Grad student or upper level undergrad student) 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 5621. Professional Practice in Architecture. (3 cr; A-F or Aud. Prereq-M Arch major or #) Legal, ethical, business, and practical requirements of architectural practice. Contemporary and historical models of contract formation, business principles, accounting, project management, design services, and marketing.

ARCH 5631. Legal Contracts in Architecture. (3 cr; A-F or Aud. Prereq-M Arch major or #) Legal subject matter relevant to the work of architects and design professionals.

ARCH 5650. Topics in Architectural Practice. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq. 5621, Arch major or 5621, M Arch major or #) Topics in architectural practice, methods of design production, marketing, operation, and relationships among clients, architecture, and society.
ARCH 5670. Topics in Historic Preservation. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-MS Arch or M Arch major or #) Selected topics in the theory, philosophy, research, and methods of architectural historic preservation.

ARCH 5671. Historic Preservation. (3 cr; Stdnt Opt. Prereq-3412 or #) Philosophy, theory, and origins of historic preservation. Historic archaeology and research, descriptive analysis, and documentation of historic buildings. Government's role in historic preservation, preservation standards and guidelines, preservation and building codes, neighborhood preservation, preservation advocacy, and future directions for historic preservation. Research on architectural and historical aspects of historic sites using primary and secondary resources and on controversial aspects of preservation.


ARCH 5673. Historic Building Research and Documentation. (3 cr; Stdnt Opt. Prereq-3412, 5672 or #) Historic building research, descriptive analysis of buildings, building documentation, historical archaeology, and architectural taxonomy.

ARCH 5721. Case Studies in Urban Design. (3 cr; A-F or Aud. + LA 5721. Prereq-5711 or #) 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.

ARCH 5731. Territorial City. (3 cr; A-F only) 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 4 cr]; A-F or Aud. Prereq-Arch major) Special topics in theory/practice of urban design.

ARCH 5770. Field Studies in Urban Design. (2-6 cr [max 6 cr]; A-F only) Travel study of urbanism through guided field trips and lectures by local experts. Relationship between built environment, land, water, and transit. Planning and development policies. On-site graphic documentation and analysis. Design or written papers.

ARCH 5790. Special Topics in Metropolitan Design. (3 cr [max 6 cr]; A-F or Aud. + LA 5790. Prereq-Enrollment in CMD prog or #) Introduction to conceptual and historical aspects of architecture as a creative medium using digital technology. Digital image capture, related software, digital output and studio procedures. Historical issues, contemporary practice.

**Art (ARTS)**

**Department of Art**

**College of Liberal Arts**


**ARTS 1011. Drawing. (4 cr; Stdnt Opt)** Introduction to fundamental principles and processes of drawing; exploration of various drawing media. Work from still life, nature, the life model, and imagination.

**ARTS 1022. Painting. (4 cr; Stdnt Opt. Prereq-1011 or #)** Introduction to painting with attention to understanding and applying the fundamental principles of spatial organization and color interaction.


**ARTS 1505. Dimensional Painting. (4 cr; Stdnt Opt. Prereq-1001, 1101, 1102)** Further exploration and understanding of drawing elements with emphasis on developing visual judgment, drawing process, and execution. Specific problems to promote the understanding of pictorial structure and personal expression.

**ARTS 1506. Drawing: Interpreting the Site. (4 cr; Stdnt Opt. Prereq-1001, 1101)** Field trips to draw or paint in various metropolitan area locations. Site interpretations, experimentation with symbols. Focuses on personal content inspired by site.


Focuses on sculptural practice outside traditional media/approaches. Theoretical constructions of space as primary medium of sculpture. Installation, theater, public art, architecture.

ARTS 3303. Sculpture: Metalcasting. (4 cr; Stdnt Opt. Prereq-1001, 1301)
Metal casting of sculpture in bronze, iron, aluminum, or other metals. Studio practice, investigation of historical/contemporary methods/concepts.

Carving/construction using wood, other materials. Studio practice, investigation of historical/contemporary methods and concepts.

The exploration of movement in sculpture (wind, water, electric). Studio practice, investigation of historical/contemporary methods and concepts.

Studio practice, investigation of forms of expression involving narrative, performance, installation. Hybrid art forms introduced by Dada movement in 1920’s, continued by Fluxus movement in 1950’s, to contemporary performance/installation artists.

ARTS 3307. Contemporary and Traditional Approaches to Figurative Sculpture. (4 cr; Stdnt Opt. Prereq-1001, 1301)
Clay modeling of human figure, other forms. Mold-making, plaster casting with historical/contemporary systems. Studio practice, investigation of traditional sculptural methods/concepts.

ARTS 3401W. Critical Theories and Their Construction From a Studio Perspective. (3 cr; Stdnt Opt. Prereq-1001, jr, or #)
Primary critical theories that shape the analysis of works of art. Evaluation of works from the artist’s perspective. Theory as an organizational structure from which to understand contemporary works.

ARTS 3403. Women’s Images and Images of Women. (5 cr; Stdnt Opt. Arts 3403, Prereq-1001 or #)
Women’s place in Western art from the artist’s perspective. Women as artists and the imagery they have created. Women as the object of imagery and the social and political attitudes those images convey. Survey of women artists from late-Renaissance through contemporary feminism; relevant issues.

ARTS 3411H. Honors Tutorial in Visual Arts. (1-4 cr [max 6 cr]; A-F or Aud. Prereq-Honors, #)
Individual consultation with a faculty member on visual work, research project, presentation, paper, or bibliography.

ARTS 3415H. Honors Exhibition. (2 cr; A-F or Aud. Prereq-[Magna or summa honors candidate], #, %)
Advanced projects in studio and research, leading to a magna or summa exhibition.

ARTS 3416H. Honors Thesis: Supporting Paper. (1 cr; A-F or Aud. Prereq-Summa level honors candidate, #)
Summa thesis paper written in support of honors exhibition or in relation to candidate’s visual/conceptual interests.

ARTS 3420. Visiting Artists Program. (1 cr [max 2 cr]; S-N only)
Guest speakers, artist presentations. Identification of themes, correlations between ideas presented by guest artists and critical discussion of student work.

ARTS 3444. Major Project. (1-3 cr [max 3 cr]; S-N or Aud. Prereq-#)
Option one: students develop professional skills (resume, artist’s statement, exhibition protocols) and attend four presentations by visiting artists and designated local exhibitions. Option two: students clarify their own visual concepts through a project agreed upon with sponsoring faculty prior to registration. All students participate in a group exhibition in Regis public spaces.

ARTS 3496. Internship in the Arts. (1-3 cr [max 3 cr]; S-N or Aud. Prereq-BFA Art major, #)
Field work at local, regional, national, or international arts organization or with professional artist provides experience in activities/administration of art/art-based organizations.

In-depth investigation of intaglio/screenprinting. Application of traditional/contemporary techniques. Emphasizes individual artist’s artistic expression. Review of historical/cultural development of the media.

ARTS 3502. Printmaking: Relief and Lithography. (4 cr; Stdnt Opt. Prereq-1001, 1501)
Expressive/formal aesthetics of woodcut relief, hand lithography. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages.

ARTS 3505. Papermaking as an Art Form. (4 cr; Stdnt Opt. Prereq-1001, 1505)
Further exploration of Eastern, Western, and sculptural applications of papermaking as an art form. Development of visual vocabulary through experimentation and focused inquiry into historical and contemporary methods.

The print as vehicle for conceptual/personal expression. Traditional printmaking techniques, evolving contemporary processes for realizing visual concepts. Historical/cultural development of multiple/matrix as means of communication.

ARTS 3601. New Media: Making Art Interactive. (4 cr; Stdnt Opt. Prereq-1001W, 1601)


ARTS 3603. Experimental Video. (4 cr; Stdnt Opt. Prereq-1001W, 1601)

ARTS 3604. Animation. (4 cr; Stdnt Opt. Prereq-1001W, 1601)

Sound Art practice/theory. Students produce creative projects using sound as primary material. History of experimental sound art from early 20th century to present. Critiques, readings, writing, public presentations.

Cultural conceptions of the most personal of new media’s hybrid domains of physical/virtual interplay. Readings of contemporary/historic conceptions of the body and the machine. Boundaries/membranes, responses/reaction. The biological, the computational, the bionic. Aesthetic explorations with interactive, sensing, and programmable technologies.

Classical photographic practice, concentrating on camera/darkroom controls. Historical overview of the medium. Conceptual/contemporary approaches to traditional themes.

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.

Photographic digital imaging in fine arts. Manipulation, computer applications. Editing in photo imaging software.

ARTS 3801. Ceramics: Wheel Throwing. (4 cr [max 8 cr]; Stdnt Opt. Prereq-1001, 1601)
Expands wheel-throwing skills, develops aesthetic awareness of ceramic forms. Kiln firing, glaze formulation.


ARTS 5104. The Nature of Abstraction. (4 cr; Stdnt Opt. Prereq-3102 or #) Exploring abstraction as a conceptual tool. Studio practice with attention to developing personal work. Emphasizes understanding of topics relevant to abstraction. Approached from discipline of painting, open to various material sensibilities.


ARTS 5106. Advanced Drawing: Interpreting the Site. (4 cr; Stdnt Opt. Prereq-3106 or #) Search for personal content as inspired by site. Field trips (2/3 of course) to draw or paint from various metropolitan area locations. Interpretations enhanced by experimentation with new marks/symbols.


ARTS 5120. Advanced Painting. (4 cr [max 12 cr]; Stdnt Opt. Prereq-3102 or #) Developing personal vision/content through painting. Emphasizes critical thinking, self-evaluation, and independent pursuit of ideas.


ARTS 5320. Advanced Sculpture: Spatial Problems. (4 cr [max 12 cr]; Stdnt Opt. Prereq-3302 or #) Sculptural practice outside traditional media/approaches. Installation, theater, public art, architecture as topics for individual investigations into spatial organization.


ARTS 5403. Women’s Images and Images of Women. (3 cr; Stdnt Opt. +ARTS 3403. Prereq-1001 or #) Women’s place in Western art from the artist’s perspective. Women as artists and the imagery they have created. Women as the object of imagery and the social and political attitudes those images convey. Survey of women artists from late-Renaissance through contemporary feminism; relevant issues.


ARTS 5444. Bachelor of Fine Arts Exhibition. (1 cr; S-N only. Prereq-5400, BFA candidate, sr) Final solo or small group exhibition and artist’s statement developed in consultation with faculty adviser. Visual documentation of work and statement as appropriate to media.

ARTS 5490. Workshop in Art. (1-4 cr [max 12 cr]; Stdnt Opt.) Selected topics and intensive studio activity. Topics vary yearly.


ARTS 5550. Advanced Papermaking. (4 cr [max 12 cr]; Stdnt Opt. Prereq-3505 or #) Distinct expressive qualities of handmade paper, its versatility as contemporary art form. Independent research pursued in consultation with instructor.


ARTS 5650. Advanced Sound Art. (4 cr [max 12 cr]; Stdnt Opt. Prereq: 3605)
Sound art practice/theory. Emphasizes individual creative projects using sound as primary material. History of experimental sound art from early 20th century to present. Critiques, readings, writing, public presentations.

ARTS 5660. The Body Electric: Sensing New Domains for Creative Expression. (4 cr [max 12 cr]; N-H or Aud)
Cultural conceptions of the most personal of new media: the body as the site of dimension. Readings of contemporary/ historic conceptions of body/machine. Boundaries/membranes, response/reactivity. The biological, the computational, the bionic. Advanced projects with interactive, sensing, and programmable technologies.

ARTS 5670. Interdisciplinary Media Collaborations. (3 cr [max 9 cr]; Stdnt Opt. Prereq: Upper-division undergraduate or graduate student in art, creative writing, dance, music or theater)
Interdisciplinary, collaborative artist teams explore modes of creative expression at intersections of the arts. Students collaborate to co-author/produce works of art for public presentation. Emphasizes integration of media arts and other forms of art, visual art, music, dance, and theater to produce interdisciplinary/collaborative art.

Studio course. Use of image-based media to document various artistic, site-specific acts that may otherwise go unnoticed. Relationship between original event (performance, social intervention, sculptural prop, ephemeral gesture) and memory trace left in image/record.

ARTS 5710. Advanced Photography. (4 cr [max 12 cr]; Stdnt Opt. Prereq-Two semesters of 3xxx photography or #)
Design/implementation of individual advanced photography projects. Demonstrations, lectures, critique. Reading, writing, discussion of related articles/ exhibitions.

ARTS 5810. Advanced Ceramics. (4 cr [max 12 cr]; Stdnt Opt. Prereq-[3801, 3802, 3810] or #)
Critical discourse of aesthetics. History of contemporary issues in clay and criticism. Independent, advanced projects.

ARTS 5821. Ceramic Materials Analysis. (4 cr; Stdnt Opt. Prereq-[3801 or 3802 or #)
Ceramic materials, their interrelationships. Advanced investigation of glazes, slab formulation, clay bodies in high/low temperature ranges. Individual interests related to students' aesthetic needs.

ARTS 5990. Independent Study in Art. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-Major, completed regular course with instructor, #)
Independent study project designed by student in consultation with instructor.

Art History (ARTH)

Department of Art History
College of Liberal Arts

ARTH 1001. Introduction to Art History: Prehistoric to Contemporary. (3 cr; Stdnt Opt)
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 1002Y. WHY ART MATTERS. (4 cr; Stdnt Opt)
Introduction to history of topics that investigate power/importance of art both globally and in its diverse forms, from architecture/painting to video/prints. Sacred space, propaganda, the museum, art/gender, art/authority, tourism.

ARTH 1002W. Why Art Matters. (4 cr; Stdnt Opt)
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 print. Sacred space, propaganda, the museum, art/gender, art/authority, tourism.

ARTH 1004W. Introduction to Asian Art. (4 cr; Stdnt Opt. +ARTH 1004V)
Issues/themes of South Asian, Southeast Asian, and East Asian art from earliest times to present.

ARTH 1905. Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Fr)
Topics specified in Class Schedule.

ARTH 1907W. Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Fr or up to 30 cr)
Topics specified in Class Schedule.

ARTH 1909W. Topics: Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Freshman)
Topics specified in One Stop Course Guide.

ARTH 1910W. The Taj Mahal and Attitudes towards Islam. (5 cr; A-F or Aud. Prereq-Fr)
Topics specified in One Stop Course Guide.

ARTH 1911W. Introduction to Film Study. (4 cr; Stdnt Opt. +ARTH 1911)
Fundamentals of film language, major theories of cinema. Detailed analysis of several films, including John Ford's Stagecoach, Jean-Luc Godard's Breathless.

ARTH 3005. American Art. (4 cr; Stdnt Opt)
Survey of American art from colonial to the present with special emphasis on the relationship of painting, sculpture, the decorative arts, architecture, costume, and material culture to current interpretations of American history.

ARTH 3008. History of Ancient Art. (4 cr; Stdnt Opt. +CNES 3008)
Architecture, sculpture, and painting of selected early cultures; emphasis on influences contributing to the development of Western art.

ARTH 3009. History of Medieval Art. (4 cr; Stdnt Opt)
Emphasis on principal monuments, their decoration and function (e.g. Old St. Peter's, Rome; Hagia Sophia, Istanbul; Palace Chapel, Aachen; St. Sernin, Toulouse; Cathedral of Chartres, Paris, Rheims).

ARTH 3012. 19th and 20th Century Art. (3 cr; Stdnt Opt)

ARTH 3013. Introduction to East Asian Art. (3 cr [max 4 cr]; Stdnt Opt. +EAS 3013)
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. (4 cr; Stdnt Opt. +RELS 3415W, ALL 3014W)
Indian sculpture, architecture, and painting from the prehistoric Indus Valley civilization to the present day.

ARTH 3015W. Art of Islam. (4 cr; Stdnt Opt)
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 3017. Islamic Culture. (4 cr; Stdnt Opt)
Emphasis on visual arts and literature produced by the Muslim world from Spain to the Indian sub-continent. Analysis of original visual and literary sources will form the basis for understanding diverse cultural developments.

ARTH 3035. Classical Myth in Western Art. (4 cr; Stdnt Opt. +CNES 3035)
An exploration of the role of myth in the visual arts through examination of major figures and stories that became popular in the ancient world and have fascinated artists and audiences ever since.

ARTH 3142. Art of Egypt. (4 cr; Stdnt Opt. +CNES 3142)
Arts and architecture of Egypt from prehistoric times to the emergence of modern Egypt, with emphasis on elements of continuity and change that have shaped Egyptian culture.

ARTH 3152. Art and Archaeology of Ancient Greece. (4 cr; Stdnt Opt. +CNES 3152)
Introduction to the civilization of ancient Greece through art and material culture. Case studies of selected monuments and sites.

ARTH 3162. Roman Art and Archaeology. (4 cr; Stdnt Opt. +CNES 3162)
Introduction to the art and material culture of the Roman World: origins, changes and continuities, “progress” or “decay” in the later Empire, legacy to the modern world.

ARTH 3205. Pre-Columbian Art of the Americas. (3 cr; Stdnt Opt)
Art and architecture of the native peoples of the Americas from the twelfth century B.C. until the arrival of Europeans to the Americas in the sixteenth century. Ways that people living in diverse areas of South America and Mesoamerica prior to the Spanish conquest produced, shaped, and used art and architecture. Tools to investigate Pre-Columbian art at more advanced levels.
ARTH 3309. Renaissance Art in Europe. (3 cr; A-F only) 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 3312. European Art of the Eighteenth Century: Rococo to Revolution. (3 cr; Stdtnt Opt) 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. (3 cr; Stdtnt Opt) 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, Dürer, Vermeer, Rembrandt). Artfulness of scientific imagery/diagrams, geographical maps, cabinets of curiosities, and new visual technologies such as the telescope and microscope.


ARTH 3340. Practicum in Archaeological Field and Computer Technologies. (3 cr; Stdtnt Opt. =CLCV 3340, ARTH 5340, CNES 5340) Prereg-One course in ancient art/archaeology or #) Methods for excavation of Old/New World sites. Meets at archaeometry/computer lab for part of semester and at selected site in Minnesota for day-long sessions for 9 to 10 weeks.

ARTH 3342. Off the Wall: History of Graphic Arts in Europe and America in the Modern Age. (4 cr; Stdtnt Opt) History/theory of creation of lithography, social caricature (e.g., Daumier, Gavarni), revival of etching (e.g., Goya/mid-century practitioners, Whistler), and color lithography (e.g., Toulouse-Lautrec, Vuillard, Bonnard). Media changes of 20th century. Revolution ary nature of new media.

ARTH 3344. Art Since 1945. (4 cr; Stdtnt Opt) 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 3585. African American Art. (3 cr; A-F or Aud. =AFRO 3585) Four hundred year history of African American art. How/why African Americans created artwork at specific times, in specific places. Arts of African Americans within their own communities, National arts movements, and American life during historical junctures.


ARTH 3921W. Art of the Film. (4 cr; Stdtnt Opt) History of the motion picture as an art form; major films, directors, genres, and styles. Films discussed include Birth of a Nation, Citizen Kane, Bicycle Thief, Rashomon, and Jules and Jim.

ARTH 3927. Documentary Cinema. (4 cr; Stdtnt Opt) History of nonfiction filmmaking, from early forms of reportage and birth of documentary to emergence of “film-verite” and “guerrilla television” and work by independents (e.g., Errol Morris, Michael Moore).

ARTH 3930H. Honors: Junior-Senior Seminar. (3 cr; A-F or Aud. Prereg-Honors [jr or sr] ArtH major) Major art-historical theme, artist, period, or genre.

ARTH 3940. Topics in Art History. (3 cr [max 36 cr]; Stdtnt Opt) Topics specified in Class Schedule.

ARTH 3971W. Honors: Major Project. (1 cr; A-F or Aud. Prereg-Honors ArtH major, #) Completion of research paper begun in a 5xxx course.

ARTH 3971W. Major Project. (1 cr; A-F or Aud. Prereg-ArtH major, #) Completion of research paper begun in a 5xxx course.

ARTH 3975. Directed Museum Experience. (1-2 cr [max 2 cr] Prereg-#) Internship or docentship in approved program, art institution, or museum.

ARTH 3993. Directed Study. (1-4 cr [max 12 cr]; A-F or Aud. Prereg-#)

ARTH 3994. Directed Research. (1-4 cr; A-F or Aud. Prereg-#)

ARTH 5103. Hellenistic and Early Roman Art and Archaeology. (3 cr; Stdtnt Opt. =CNES 5103, Prereg-Clas/ArtH 3008, jr or #) Sculpture, architecture, painting, and topography in developing centers of Hellenistic culture in the eastern Mediterranean, and in Etruscan and Roman towns from 400 B.C. to the beginnings of the Roman Empire.

ARTH 5108. Greek Architecture. (3 cr; Stdtnt Opt. =CNES 5108, Prereg-Arth/Clas 3008, jr or sr or grad, or #) Geometric through classical examples of religious and secular architecture and their setting at archaeological sites in Greece, Asia Minor, and Italy.

ARTH 5111. Prehistoric Art and Archaeology of Greece. (3 cr; Stdtnt Opt. =CNES 5111, Prereg-Jr or sr or grad student, Greek art/ archaeology course or #) Artistic and architectural forms of Neolithic period in Aegean area and Cycladic, Minoan, and Mycenaean cultures. Aims and methods of modern field archaeology; the record of human habitation in the Aegean area. Archaeological evidence as a basis for historical reconstruction.

ARTH 5112. Archaic and Classical Greek Art. (3 cr; Stdtnt Opt. Prereg-Jr, Clas/ArtH 5111) Sculpture, painting, architecture and minor arts in Greek lands from the 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques. Emphasis on Periklean Athens.

ARTH 5112. Archaic and Classical Greek Art. (3 cr; Stdtnt Opt. Prereg-jr or sr or grad or #) Sculpture, painting, architecture, and minor arts in Greek lands from the 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques.

ARTH 5120. Field Research in Archaeology. (3-6 cr [max 6 cr]; Stdtnt Opt. =CLCV 5120, CNES 5120, Prereg-#) Field excavation, survey, and research at archaeological sites in the Mediterranean area. Techniques of excavation and exploration; interpretation of archaeological materials.

ARTH 5172. House, Villa, Tomb: Roman Art in the Private Sphere. (3 cr; Stdtnt Opt. =CNES 5172. Prereg-One intro art history course or #) The architecture, painting, and sculpture of urban houses, country estates, and tombs in the Roman World. Relationships between public and private spheres, and literary and physical evidence; usefulness of physical evidence in illuminating gender roles.

ARTH 5182. Art and the State: Public Art in the Roman Empire. (3 cr; Stdtnt Opt. =CNES 5182. Prereg-One intro art history course or #) Origins of Roman public art; use in maintaining community; exploitation by the first Emperor, Augustus; development and diffusion through the later Empire; varying capabilities to adjust to the demands of a Christian Empire.
ARTH 5234. Gothic Sculpture. (3 cr; Stdnt Opt. Prereq-3464 or # or 3 or grad or #) The origin, character, and development of Gothic sculpture in France, the German empire, and the Netherlands, 1150-1400. Emphasis on French sculpture of the cathedral age and the emergence of a court style in Paris and elsewhere in Europe (e.g. London, Prague).

ARTH 5252. History of Early Christian Art in Context. (4 cr; Stdnt Opt. +CNES 5252. Prereq-Opt. ARTH course or #) The role played by art in the formation of early Christian and Byzantine communities, and in establishing their relationships with the Pagan world and early Islam.


ARTH 5302. Print Culture in Early Modern Europe. (5 cr; A-F or Aud) Cultural history of printed images in Europe from their emergence in 15th century through about 1750. Book illustration, reproductive printmaking. History of print connoisseurship. Prints and scientific knowledge. Role of print culture in major social/political events such as Protestant Reformation.


ARTH 5340. Practicum in Archaeological Field and Computer Technologies. (3 cr; Stdnt Opt. +CLCV 3340. CNES 3340. ARTH 3340. Prereq-One course in ancient art/archaeology or #) Methods for excavation of Old/New World sites. Meets at archaeometry/computer lab for part of semester and at selected site in Minnesota for day-long sessions for 9 to 10 weeks.


ARTH 5422. Off the Wall: History of Graphic Arts in Europe and America in the Modern Age. (4 cr; Stdnt Opt) History/theory of creation of lithography, social caricature (e.g. Daumier, Gavarni), revival of etching (e.g. Goya, mid-century practitioners, Whistler), and color lithography (e.g., Toulouse-Lautrec, Vuillard, Bonnard). Media changes of 20th century. Revolutionaty nature of new media.


ARTH 5466. Contemporary Art. (3 cr; Stdnt Opt, Prereq-3644 or #) Survey of the art and important critical literature of the period after 1970. Origins and full development of postmodern and subsequent courses description.


ARTH 5535. Style, Tradition, and Social Content in American Painting: Colonial Era to 1876. (3 cr; Stdnt Opt) America's colonial, Revolutionary era, and 19th-century painters' responses to the influence of European aesthetics. Key American painting types: portraiture, rural genre, and landscape from Copley and Gilbert Stuart to the Hudson River School and the chroniclers of the Western frontier.

ARTH 5536. Topical Studies in American Art. (3 cr; Stdnt Opt) Course description varies from year to year, depending on the current research interests of the instructor and the needs and interests of advanced undergraduate and graduate students in modern and American art.

ARTH 5546. American Architecture: 1840 to 1914. (3 cr; Stdnt Opt) American architecture from 1840 to 1914, examined in relation to European precedents and American sociohistorical conditions. Critical attention to problems of style, the architectural profession, vernacular vs. “high”architecture, technology, economics, urbanism, and social reform.


ARTH 5725. Ceramics in the Far East. (3 cr; Stdnt Opt) Selective examination of representative pottery and ceramic wares produced in China, Korea, and Japan from the Neolithic era to modern times. Nearly every major ceramic type is represented.

ARTH 5766. Chinese Painting. (3 cr; Stdnt Opt) Major works from the late bronze age to the modern era that illustrate the development of Chinese landscape painting and associated literary traditions.

ARTH 5775. Formation of Indian Art: 2500 BCE to 300 CE. (3 cr; Stdnt Opt) Sculpture/architecture, from Indus Valley civilization through Kushana period.

ARTH 5777. The Diversity of Traditions: Indian Art 1200 to Present. (3 cr; Stdnt Opt) 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; Stdnt Opt) 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 5925. History of Photography as Art. (3 cr; Stdnt Opt) Origins and development of photography, with attention to technology and cultural impact. Major aesthetic achievements in photography from its beginning to present.

ARTH 5940. Topics: Art of the Film. (3 cr; Stdnt Opt) Topics in film history including individual directors (e.g., Hitchcock, Welles), genres (e.g., westerns, musicals), and other topics (e.g., American independent filmmaking, film noir).

ARTH 5950. Topics: Art History. (3 cr [max 9 cr]; Stdnt Opt) Topics specified in Class Schedule.

ARTH 5993. Directed Study. (1-4 cr; max 12 cr; A-F or Aud. Prereq-#) 1914.

ARTH 5994. Directed Research. (1-4 cr; A-F or Aud. Prereq-#) 409

AAS 3251W. Sociological Perspectives on Race, Class, and Gender. (3 cr; A-F only. Prereq-Social majors/minors must register A-F) 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.

AAS 3270. Service Learning in the Asian Community. (2 cr [max 8 cr]; Stdnt Opt. Prereq #) Students engage in service learning among members of local Asian communities. Readings, mentoring, English language instruction. Other activities as deemed appropriate by instructor and sponsoring agency.

AAS 3409W. Asian American Women's Cultural Production. (3 cr; Stdnt Opt) Diversity of cultures designated "Asian American." Understanding women's lives in historical, cultural, economic, and racial contexts.

AAS 3501. Asian America Through Arts and Culture. (3 cr; Stdnt Opt) Interdisciplinary questions of Asian American experience, identity, and community. Literature, dance, music, photography, film, theater, other cultural forms. Students work with local Asian American arts groups/organizations. Students express their own cultural contradictions through writing and other forms of artistic expression and attend local arts events.

AAS 3575W. Comparative Race and Ethnicity in U.S. History. (3-4 cr [max 4 cr]; A-F or Aud) America through its cultural diversity. Changing notions of American national identity/citizenship in the 20th century to present. Historical experiences of Native Americans, African Americans, Hispanic Americans, European immigrants, and Asian Americans: How these groups were defined in relation to each other and in relation to the nation.


AAS 3920. Topics in Asian American Studies. (2-4 cr [max 8 cr]; Stdnt Opt. Prereq-Jr or sr) Topics specified in Class Schedule.


AAS 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr; Stdnt Opt. CHIC 4231, AMIN 4231, AFRO 4231) 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 4311. Asian American Literature and Drama. (3 cr; A-F or Aud) 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 4920. Topics in Asian American Studies. (2-4 cr [max 8 cr]; Stdnt Opt) Topics specified in Class Schedule.

AAS 5920. Topics in Asian American Studies. (1-4 cr [max 12 cr]; Stdnt Opt) Topics specified in Class Schedule.

AAS 5996. Graduate Proseminar. (1 cr [max 4 cr]; S-N only) 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/diasporic studies.

Asian Languages and Literatures (ALL)

Department of Asian Languages and Literatures

College of Liberal Arts


ALL 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Freshman) Topics specified in Class Schedule and Course Guide.

ALL 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Freshman) Topics specified in Class Schedule and Course Guide.

ALL 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Freshman) Topics specified in Class Schedule and Course Guide.

ALL 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud, Prereq-Freshman) Topics specified in Class Schedule and Course Guide.

ALL 3200. Study Abroad Topics in Asian Culture. (1-4 cr [max 12 cr]; A-F or Aud) Part of University of Minnesota sponsored study abroad experience.


ALL 3261W. Writing (in) East Asian Cultures: From Oracle Bones to Tattoos. (3 cr; Stdnt Opt. Prereq-One year or current enrollment in [Chinese or Japanese or Korean] language or similar exposure to East Asian writing systems) History, materiality, practice of writing Chinese characters (hanzi/kanji/hanja) 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.

ALL 3265W. The Fantastic in East Asia: Ghosts, Foxes, and the Alien. (3 cr; Stdnt Opt. Prereq-Some coursework in East Asia recommended) How the strange/alien is constructed in premodern Chinese/Japanese literature. East Asian theories of the strange and their role in the classical tale, through the works of Pu Songling, Ueda Akinari, and others. Role of Buddhist cosmology/salvation in other works (e.g., Journey to the West, drama).

ALL 3370. Service Learning in the Asian Community. (2 cr [max 4 cr]; Stdnt Opt. Prereq #) Students engage in service learning among members of local Asian communities. Readings,
mentoring, English language instruction. Other activities as deemed appropriate by instructor and sponsoring agency.

ALL 3376. Hmong History Across the Globe. (3 cr; Stdnt Opt)
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 3300. Topics in Chinese Literature. (1-3 cr [max 9 cr]; Stdnt Opt)
Selected topics in Chinese literature. Topics specified in the Class Schedule.

ALL 3320. Topics in Chinese Culture. (1-3 cr [max 9 cr]; Stdnt Opt)
Selected topics in Chinese culture. Topics specified in the Class Schedule.

ALL 3336. Revolution and Modernity in Chinese Literature and Culture. (3 cr; A-F only)
Introduction to modern Chinese literature, visual culture, and critical thought from beginning of 20th century to end of Mao era. Examples of literature/culture, parallel readings of Chinese critical essays. Readings are in English translation.

ALL 3377. Chinese Literature and Popular Culture Today. (3 cr; A-F only)
Introductory survey of contemporary Chinese literature and popular culture from end of Mao era in 1979 to present. Creative results of Chinas "opening and reform." Recent commercialization, globalization of cultural Literature. Literature, visual culture, popular music.

ALL 3356W. Chinese Film. (3 cr; Stdnt Opt)
Survey of Chinese cinema from China (PRC), Taiwan, and Hong Kong. Emphasizes discussion/comparison of global, social, economic, sexual, gender, psychological, and other themes as represented through film.

ALL 3361W. Maps, Pictures, and Writing in the Representation of Taiwan. (3 cr; Stdnt Opt)
How visual (maps, pictures, and photographs) and written (travelogues, stories, and essays) media are used to contribute to formation of identity in representing people, place, and history of Taiwan, in historical/contemporary contexts.

ALL 3363. Imagined Worlds in Ming Qing China. (3 cr; Stdnt Opt)
Imaginative worlds (fictional, religious, erotic) that were available to men and women in China of the Ming and Qing dynasties. Fiction, other texts, visual materials. Ways in which texts were produced/distributed.

ALL 3371. History of Chinese Cities and Urban Life. (3 cr; A-F or Aud)
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.

ALL 3372. History of Women and Family in China, 1600-2000. (3 cr; Stdnt Opt)

ALL 3373. Religion and Society in Imperial China (3 cr; Stdnt Opt. +HIST 3466, RELS 3375)
Introduction to religions of imperial China (Buddhism, Daoism, Confucianism, "popular religion"). Their role to society. Role of gender. Conceptualizing relations with the divine. Ritual and its goals. Position of religious specialists such as monks and Daoist priests. Primary/secondary readings.

ALL 3377. A Thousand Years of Buddhism in China: Beliefs, Practices, and Culture. (3 cr; Stdnt Opt)
Buddhism in China, 4th-15th centuries. Introduction of Buddhism to China. Relevance of Buddhist teaching to indigenous thought (e.g., Taoism, Confucianism). Major "schools": Tiantai, Huayan, Chan/Zen, etc., Cultural activities of monks, nuns, and lay believers.

ALL 3400. Topics in Japanese Literature. (3 cr [max 9 cr]; Stdnt Opt)
Selected topics in Japanese literature. Topics specified in the Class Schedule.

ALL 3433W. Traditional Japanese Literature in Translation. (3 cr; Stdnt Opt. Prereq-No knowledge of Japanese necessary)
Survey of texts in different genres, from 8th to early 19th centuries, with attention to issues such as "national" identity, gender/sexuality, authorship, and popular culture.

Survey of ideas/styles of recent Japanese literature. Writers include Dazai Osamu, Ibusuki Masaji, Osamu Dazai, Yosimoto Banana. All readings in English translation.

ALL 3437. Early 20th Century Japanese Literature in Translation. (3 cr; Stdnt Opt)
Survey of the principal authors and genres of the period spanning Japan's opening to the West (1860s) to World War II. Writers include Natsume Soseki, Shiga Naoya, Kawai Yasumasa, and Taniyama Junichiro.

ALL 3441W. Japanese Theater. (3 cr; Stdnt Opt)
Japanese performance traditions. Emphasizes noh, kabuki, and bunraku in their literary/cultural contexts. Relationship between these pre-modern traditions and modern theatrical forms (e.g., Takarazuka Revue).

ALL 3456. Japanese Film. (3 cr; Stdnt Opt)
Themes, stylistics, and genres of Japanese cinema through work of classic directors (Kurosawa, Mizoguchi, and Ozu) and more recent filmmakers (Itami, Morita). Focuses on representation of femininity/masculinity.

ALL 3457. War and Peace in Japan Through Popular Culture. (4 cr; A-F or Aud. Prereq-Some knowledge of modern Japanese history or #)
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.

ALL 3500. Topics in Korean Literature. (1-3 cr [max 9 cr]; Stdnt Opt)
Selected topics in Korean literature. Topics specified in the Class Schedule.

ALL 3532. Readings in Indian Epic Traditions: Islamic Epic and Romance. (3 cr; A-F only)
Literary traditions of epic/romance that arose in Islamic societies of Central/Southern Asia. How genres of love/war interacted with political, religious, and cultural authorities over centuries. Virtue, constructions of fantasy/understandings of reality in tales of heroes, beautiful princesses, evil kings, fairies, Jinnis, magicians, and tricky secret agents.

ALL 3537W. Modern South Asian Literature. (3 cr; A-F or Aud)
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 3538. Islam and Tradition in Modern South Asia. (3 cr; A-F only)

ALL 3571. Hinduism. (3 cr; Stdnt Opt. +RELS 5371, ALL 5672)
Survey of Indian/Buddhist tradition. Topics specified in the Class Schedule.

ALL 3638. Islam and Tradition in Modern South Asia. (3 cr; A-F only)

ALL 3671. Culture and Society of India. (3 cr; Stdnt Opt. +GLOS 3961, ANTH 3923)
Contemporary society/culture in South Asia from anthropological perspective with reference to nationalism; post-colonial identities; media and public culture; gender, kinship, and politics; religion; ethnicity; and Indian diaspora.

ALL 3679. Religion and Society in Modern South Asia. (3 cr; A-F only)

ALL 3720. Topics in Hmong Culture. (1-3 cr [max 9 cr]; Stdnt Opt)
Selected topics in Hmong culture. Topics specified in the Class Schedule.

For a guide to course numbers, symbols, and abbreviations, see page 376.
ALL 5381. Persian Poetry in Translation. (3 cr; Stdnt Opt. *ALL 5831, MELC 5602, MELC 5602) Major poetic works of Iran in translation dealing with life at the medieval courts, Sufic poetry, and “new” poetry. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

ALL 5383. Persian Fiction in Translation. (3 cr; Stdnt Opt. *ALL 5831, MELC 5601, MELC 5601) Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Af-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

ALL 3900. Topics in Asian Literature. (3 cr [max 9 cr]; Stdnt Opt) Topics specified in Class Schedule.

ALL 3920. Topics in Asian Culture. (3 cr [max 9 cr]; Stdnt Opt) Topics specified in Class Schedule.

ALL 3990. Directed Study. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-*, @, @) Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses.

ALL 4900W. Major Project. (3 cr; A-F or Aud. Prereq-ALL major, sr) Directed research/writing on topic selected according to individual interest, in consultation with faculty adviser.

ALL 5220. Pedagogy of Asian Languages and Literatures. (1-3 cr [max 9 cr]; A-F only. Prereq-Grad student) Second language acquisition theory, methods, testing, and technology applicable to teaching of modern Asian languages/literatures.


ALL 5376. Liberalism and Its Critics: Global Perspectives. (3 cr; A-F only) 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 5333. Poetry and Power in Early China: Book of Songs and Songs of the South. (3 cr; A-F only, Prereq-Upper div undergrad or grad student) How to read/analyze poems from early anthologies in terms of their display/invoation of different types of cultural power. Power that poems have held over Chinese literary tradition in subsequent millennia, their literary influence/position in intellectual/political lives of Chinese readers. Studies that relate to the poetry and social/material culture.

ALL 5334. Voices From Early China: Book of Songs and Songs of the South. (3 cr; Stdnt Opt. Prereq-Undergraduate major in ALL or grad student or @) Students read/analyze poems from Book of Songs and Songs of the South (ca. 1000-300 B.C.E.). Literary influence, position the poems have held in intellectual, emotional, and political lives of Chinese readers. Historical, cultural, and theoretical studies that relate to the poetry and the voices in it.


ALL 5356. Gender and Sexuality in Chinese Film. (3 cr; Stdnt Opt. Prereq-Upper div undergrad or grad student) How gender/sexuality have been depicted, constructed, and subverted in Chinese cinemas (including mainland China, Hong Kong, Taiwan) from 1930s to present. Weekly film screenings, readings on Chinese film, key works of feminist film theory.

ALL 5357. Chinese Cinematic Realisms. (3 cr; Stdnt Opt) Various styles of realism in Chinese cinemas (mainland, Taiwan) from silent era to present. Theories of realism, conceptions of “the Real” applied in close readings of major films, placed in historical context. China’s negotiation of modernity during 20th century.


ALL 5359. Early Shanghai Film Culture. (3 cr; Stdnt Opt) 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 5366. The Nation in Modern Chinese Film and Literature. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student) Chinese nationhood as represented/negotiated in film/literature from early 20th Century to present. How China was re-imagined as a modern nation in culture, from Republican era to Mao era to the reform era. How alternative national visions of nationhood arose in Hong Kong and Taiwan.

ALL 5374. Representing the Past: Chinese Myth, Legend, and Ideology. (3 cr; Stdnt Opt) Analysis of texts that contain early Chinese myths, legends, and historical narratives in their construction of an “understandable” world. How such materials have been incorporated into different cultural formations from the periods, including contemporary popular culture. How they have figured into the construction of “China” and “Chineseness” in 20th Century.

ALL 5433. Women’s Writing in Premodern Japan in Translation. (3 cr; A-F or Aud) Genji monogatari (lengthy narrative), Makura no soshi (collection of vignettes), poetry. Gendered writing systems/authors, narrative techniques. Sexuality/figure of author. Strategies of fictionality.

ALL 5436. Literature by 20th-Century Japanese Women in Translation. (3 cr; Stdnt Opt) Literary and historical exploration of selected works by Japanese women writers in a variety of genres. All literary texts read in English.


ALL 5636. South Asian Women Writers. (3 cr; A-F or Aud. Prereq-Grad student or advanced undergrad) Survey of South Asian women’s writing, from early years of nationalist movement to present. Contemporary writing includes works by immigrant writers. Concerns, arguments, and nuances in works of writing in South Asia and diaspora.

ALL 5672. Buddhism. (3 cr; Stdnt Opt. =RELS 3371, RELS 5371, ALL 3672) Historical account of Buddhist religion in terms of its rise, development, various schools, and common philosophical concept. Indian Buddhism compared with Hinduism; Buddhism's demise and revival on the Indian subcontinent.


ALL 5831. Persian Poetry in Translation. (3 cr; Stdnt Opt. =ALL 3831, MELC 5602, MELC 3836) Major poetic works of Iran dealing with life at the medieval courts, Sufi poetry, and “new” poetry are studied. Radaki, Khayyam, Rumi, Hafiz, Yushing, and Farrukhzad are among the poets whose works are examined.

ALL 5836. Persian Fiction in Translation. (3 cr; Stdnt Opt. =MELC 3601, MELC 5601, ALL 3836) Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behranghi are analyzed/interpreted.

ALL 5900. Topics in Asian Literature. (3 cr [max 12 cr]; Stdnt Opt) Topics specified in Class Schedule.

ALL 5920. Topics in Asian Culture. (3 cr [max 12 cr]; Stdnt Opt) Topics specified in Class Schedule.

ALL 5990. Directed Study. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-#, 80) Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses.


AST 2001. Introduction to Astrophysics. (4 cr; Stdnt Opt. Prereq-[One yr calculus, PHYS 1302 or #] Physical principles and study of solar system, stars, galaxy, and universe. How observations/conclusions are made.

AST 2990. Directed Studies. (1-5 cr [max 5 cr]; Stdnt Opt. Prereq-1 yr calculus, PHYS 1302, #) Independent, directed study in observational and theoretical astrophysics. Arranged with faculty member.


AST 4101. Computational Methods in the Physical Sciences. (4 cr; Stdnt Opt. Prereq-Upper div or grad student or #) Introduction to using computer programs to solve problems in physical sciences. Selected numerical methods, mapping problems onto computational algorithms. Arranged lab.

AST 4299H. Senior Honors Astrophysics Research Seminar. (1 cr [max 2 cr]; Stdnt Opt. Prereq-Upper div student in IT or CLA, #) Based on department's research seminar.


AST 4994W. Directed Research. (3-5 cr [max 5 cr]; Stdnt Opt. Prereq-#) Independent research in observational or theoretical astrophysics. Senior Thesis for undergraduate astrophysics majors. Arranged with faculty member.


AST 5201. Methods of Experimental Astrophysics. (4 cr; Stdnt Opt. Prereq-Upper div IT or grad or #) 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.

Biochemistry (BIOC) Department of Biochemistry, Molecular Biology, and Biophysics College of Biological Sciences

BIOC 1001. Elementary Biochemistry. (3 cr; Stdnt Opt. Prereq-High school chem or college general chem) Chemistry and biochemistry as they apply to the organization, function, and regulation of living systems, especially humans. Suitable for undergraduates who desire an introduction to biochemistry including students in health science programs such as dental hygiene or occupational therapy.


BIOC 3960. Research Topics in Biochemistry. (1 cr [max 2 cr]; S-N or Aud. Prereq-3021 or 3021 or 4331 & 4331 or #) Lectures, discussion on current research in the department.

BIOC 4025. Laboratory in Biochemistry. (2 cr; Stdnt Opt. Prereq-3021 or 4331 or equiv) Theory, principles, and use of fundamental techniques in modern biochemistry labs.

BIOC 4125. Laboratory in Molecular Biology and Biotechnology. (3 cr; A-F or Aud. =BIOL 4125, BIOC 4185, BIOL 4185, Prereq-[3021 or BIOL 3021 or BIOL 4003], [4025 or GCD 4015 or GCD 4025 or MIBC 3301]) 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.

BIOC 4185. Laboratory in Molecular Genetics. (3 cr; A-F or Aud. =BIOL 4125, BIOC 4185, BIOL 4185, Prereq-Enrollment in Life Sciences Summer Undergraduate Research Program) 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.

**BIOC 4325. Laboratory in NMR Techniques.** (1 cr; S-N only. Prereq-4331; 4521 recommended; intended for biochemistry majors) 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.

**BIOC 4325. Laboratory in Mass Spectrometry.** (1 cr; S-N only. Prereq-4332, 4521) 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.

**BIOC 4331. Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems.** (4 cr; Stdnt Opt. Prereq-[[Biol 1022 or Biol 1009 or Biol 2003 or equiv], systems. Catalysis, and Metabolism in Biological analysis in Biochemistry.)

**BIOC 4322. Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression.** (4 cr; Stdnt Opt. Prereq-4331 or #) Advanced survey of molecular biology, mechanisms of gene action, and biological regulation.

**BIOC 4521. Introduction to Physical Biochemistry.** (3 cr; Stdnt Opt. Prereq-CHEM 1022, MATH 1272, PHYS 1202; 4331 recommended) Physical chemical principles, their applications in biochemistry. Thermodynamics, kinetics, spectroscopy, and solution dynamics as applied to biochemical reactions and biopolymers.

**BIOC 479W. Directed Studies: Writing Intensive.** (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#, %) Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

**BIOC 479W. Directed Research: Writing Intensive.** (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#, %) Laboratory or field investigation of selected areas of research, including written report.

**BIOC 4950. Computer Simulation and Data Analysis in Biochemistry.** (3 cr; A-F or Aud. Prereq-4331, 4332, MATH 1272) Introduction to computer simulation and data analysis. How to use readily available computer tools to formulate quantitative models and analyze experiments with free/open source software program R.

**BIOC 4993. Directed Studies.** (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#, %) Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

**BIOC 4994. Directed Research.** (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#, %) Laboratory or field investigation of selected areas of research.

**BIOC 5001. Biochemistry, Molecular and Cellular Biology.** (5 cr; Stdnt Opt. BIOC 6001. Prereq-Undergrad course in biochemistry, #) Integrated course in biochemistry, molecular biology, cell biology, and developmental biology.

**BIOC 5225. Graduate Laboratory in NMR Techniques.** (1 cr; S-N only. Prereq-8001 or #) 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.

**BIOC 5309. Biocatalysis and Biodegradation.** (3 cr; Stdnt Opt. MICE 5309. Prereq-Chemistry through organic chemistry, knowledge of word processing, e-mail, access to World Wide Web, access to college-level science library) Assess validity of information on biocatalysis and biodegradation; learn fundamentals of microbial catabolic metabolism as it pertains to biodegradation of environmental pollutants; biocatalysis for specialty chemical synthesis; display of this information on the Web.

**BIOC 5332. Biotechnology and Bioengineering for Biochemists.** (3 cr; A-F or Aud. MICE 5332. Prereq-[[3021 or 4331 or BIOL 3021 or MICB 4111], [BIOL 3301 or MICB 3301]] or #) 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.

**BIOC 5353. Macromolecular Crystallography I: Fundamentals and Techniques.** (1 cr; S-N or Aud. Prereq-[[One organic chemistry or biochemistry course], [two calculus or college physics courses]] or instr approval) Macromolecular crystallography for protein structure determination/engineering. Determining macromolecule structure by diffraction.

**BIOC 5354. Macromolecular Crystallography II: Techniques and Applications.** (1 cr; S-N or Aud. Prereq-5531) Determining structure of macromolecule by diffraction. Using software in macromolecular crystallography.

**Bioethics, Center for (BTHX)**

**Center for Bioethics**

**Academic Health Center Shared**

**BTHX 5000. Topics in Bioethics.** (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-Grad student or #) Bioethics topics of contemporary interest. Topics specified in Class Schedule.

**BTHX 5010. Bioethics Proseminar.** (2 cr; A-F only. Prereq-Bioethics grad student or grad minor) Introduction to topics in bioethics.

**BTHX 5100. Introduction to Clinical Ethics.** (3 cr; Stdnt Opt. Prereq-Jr or sr grad student or #) 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 5210. Ethics of Human Subjects Research.** (3 cr; Stdnt Opt. Prereq-Grad student or #) Issues in ethics of human subjects research.

**BTHX 5300. Foundations of Bioethics.** (3 cr; Stdnt Opt. Prereq-Grad student or #) Overview of major contemporary frameworks, foundational issues in bioethics.
BTHX 5325. Biomedical Ethics. (3 cr; Stdt Opt. Prereq-Grad student or #) 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.

BTHX 5400. Introduction to Bioethics in Health Policy. (3 cr; Stdt Opt. Prereq-Grad student or professional student or #) Topics vary to reflect issues of current significance. Relates to law/politics as appropriate but focuses on moral analyses of policy issues.


BTHX 5453. Law, Biomedicine, and Bioethics. (3 cr; A-F only. Prereq-Grad student or #) 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.


BTHX 5620. Social Context of Health and Illness. (3 cr; Stdt Opt. Prereq-Grad student or #) Social context in which contemporary meanings of health and illness are understood by providers/patients. Ethical implications. Readings from history, social science, literature, and first-person accounts.

BTHX 5900. Independent Study in Bioethics. (1-4 cr [max 8 cr]; Stdt Opt. Prereq-#) Students propose area for study with faculty guidance, write proposal which includes outcome objectives and work plan. Faculty member directs student's work and evaluates project.

Biology (BIOL)

College of Biological Sciences


BIOL 1020. Biology Colloquium. (1 cr [max 2 cr]; S-N or Aud) 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 1041. Preparation for Graduate Programs in Science. (1 cr; S-N or Aud. Prereq-#) Necessary elements for excelling in mathematics, physical and biological sciences to prepare for graduate work in science. Required for new freshmen in the Mathematics and Science Tutorial (MST) Program.

BIOL 1093. Biology Colloquium: Directed Study. (1 cr; S-N or Aud. Prereq-1020 and #1020) Individual study or research undertaken by a student concurrently enrolled in BIOL 1020 with oversight by a faculty sponsor.

BIOL 1101W. Heredity and Human Society. (3 cr; Stdt Opt. Prereq-no cr if taken after 4003 or GCB 3022) Principles of heredity and their social and cultural implications.


BIOL 1301. Becoming a Reflective Leader. (1 cr; S-N only, Prereq-Dean's Scholar) Leadership theory/concepts. Personal views on leadership. Characteristics for effective leadership. Course uses experiential teaching methods, self-reflection.

BIOL 1805. Nature of Life: Introducing New Students to the Biological Sciences. (2 cr; S-N only, Prereq-Fr in College of Biological Sciences) 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.

BIOL 1901. Freshman Seminar for the Biological Sciences. (1-2 cr [max 2 cr]; A-F or Aud. Prereq-Freshman) Orientation to University environment. Special topics illustrate importance of biological issues.

BIOL 1903. Freshman Seminar for the Biological Sciences. (1-2 cr [max 2 cr]; A-F or Aud. Prereq-Freshman) Orientation to University environment. Special topics illustrate importance of biological issues.

BIOL 1905. Freshman Seminar for the Biological Sciences. (1-3 cr [max 6 cr]; A-F only. Prereq-Freshman) Orientation to University environment. Special topics illustrate importance of biological issues.

BIOL 1905H. Biology Freshman Seminar. (1-3 cr [max 3 cr]; A-F only. Prereq-Fr or FRFY), honors) Orientation to University environment. Special topics illustrate importance of biological topics/issues in modern society.

BIOL 1910W. Freshman Seminar for the Biological Sciences. (2 cr; A-F or Aud. Prereq-Freshman) Orientation to University environment. Special topics that illustrate the importance of biological topics/issues in modern society. Writing-intensive.

BIOL 2001. Career Planning for Biologists. (1 cr; S-N or Aud) Introduction to career planning. Students assess their strengths, interests, values, and motivations. Decision making, campus/community resources, developing an action
BIOL 2002. Foundations of Biology for Biological Sciences Majors, Part I. (3 cr; A-F only. =BIOL 2002H. Prereq- [CHEM 1021 or equiv], CBS major) or 6; calculus I or equiv recommended)

First of two foundational courses. Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving and application.

BIOL 2002H. Foundations of Biology for Biological Sciences Majors, Part I. (3 cr; A-F only. =BIOL 2002. Prereq- [CHEM 1021 or equiv], CBS major) or 6; calculus I or equiv recommended)

First of two foundational courses. Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving and application.

BIOL 2003. Foundations of Biology for Biological Sciences Majors, Part II. (3 cr; A-F only. =BIOL 2003H. Prereq-[2002 or 2002H or CBS major], concurrent enrollment in Biol 2004 (must register for 2004 before 2003), [MATH 1271 or equiv])

Second of two courses. Biological concepts, from biomolecules to ecosystems. Ecology/biochemistry concepts within context of problem solving/application.

BIOL 2003H. Foundations of Biology for Biological Sciences Majors, Part II. (3 cr; A-F only. =BIOL 2003. Prereq-[2002 or 2002H or CBS major], concurrent enrollment in Biol 2004H (must register for 2004H before 2003H), [MATH 1271 or equiv], honors)

Second of two courses. Biological concepts, from biomolecules to ecosystems. Ecology/biochemistry concepts within context of problem solving/application.

BIOL 2004. Foundations of Biology for Biological Sciences Majors, Part II Laboratory. (2 cr; A-F only. =BIOL 2004H. Prereq-[2002 or 2002H or CBS major], concurrent enrollment in Biol 2003 (must register for 2004 before 2003))

Accompanies 2003. Students design/perform research projects. Relationship between biology and other sciences. Applying quantitative skills, scientific method, and modern biological tools to real-world questions.


Accompanies 2003H. Students design/perform research projects. Relationship between biology and other sciences. Applying quantitative skills, scientific method, and modern biological tools to real-world questions.


Dissection, direct observation of representatives of major animal groups.


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.

BIOL 2022. General Botany. (3 cr; A-F or Aud. Prereq-One semester of college biology)


BIOL 2100. Brewing: The Biology, History, and Practice. (3 cr; A-F only. Prereq-1001 or 1009 or 2003 or 2004)

History of brewing, microbiology, biochemistry and biological concepts such as competition, using brewing as a model. Practical aspects of modern brewing.

BIOL 21301. Leadership And Service. (2 cr; S-N only. Prereq-[1301, CBS Dean’s Scholar] or #)

Importance of service in leadership. How personal experiences influence perspectives on social issues. Techniques for group work. Students do service project with community organization related to biological sciences.

BIOL 2812. Field Zoology. (4 cr; A-F only. Prereq-Beginning biology)

Major animal groups. Native Minnesota organisms in their natural habitat. Lecture, lab, and field experiences emphasize morphological, physiological, and developmental characteristics to define evolutionary relationships. Parasitic forms affecting human welfare. Labs require dissections, including mammals.

BIOL 2822. Evolution. (3 cr; Stdnt Opt. =BIOL 3409, BIOL 5409. Prereq-One semester of college biology)

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.

BIOL 2960H. Explorations in the Biological Sciences. (3 cr; Stdnt Opt. =BIOL 3811. Prereq-One semester of college biology)

Students explore various areas of biological research, interact with scientists and fellow students, and prepare an in-depth review paper.

BIOL 3002. Plant Biology. Function. (2 cr; Stdnt Opt. Prereq-[1002 or 1009 or 2003 or equiv], [CHEM 1011 or one semester chemistry with some organic content])


BIOL 3005W. Plant Function Laboratory. (2 cr; Stdnt Opt. Prereq-Concurrent enrollment 2002)

Various plant processes at subcellular, organ, whole plant levels. Lab, recitation.


BIOL 3009. Understanding the Evolution-Creationism Controversy. (3 cr; A-F only. Prereq-1001 or 1009 or 2002 or equiv)

Aspects of evolution-creationism controversy, including its history, legacy, relevance, and key people. Court decisions, public opinion, and related issues (e.g., racism, politics).

BIOL 3121. Animal Physiology. (3 cr; Stdnt Opt. Prereq-[1002 or 1009 or 2003 or equiv], CHEM 1021; Concurrent registration in 2005 is strongly recommended)

Compares ways different animals solve similar physiological problems.

BIOL 3302. Leadership For Change. (1 cr; S-N only. Prereq-1301, 2301, CBS dean’s scholar; 2001 recommended)

Practice of leading change. Students create vision for change initiative, develop/implement action plan, and evaluate outcomes of their work within a project focused on areas of professional interest.

BIOL 3303. Peer Leadership Practicum. (1 cr; S-N only. Prereq-1301, 2301, CBS dean’s scholar; 2001 recommended)

Assist first-year students in transition to college. How to mentor students and effectively work in diverse groups. Interpersonal communication/presentation skills. Reflection, discussion, group project.

BIOL 3407. Ecology. (3 cr; Stdnt Opt. =BIOL 5407, BIOL 3807, BIOL 3408W, EEB 3001. Prereq-One semester college biology), [(MATH 142 or MATH 1271 or MATH 1281 or equiv)]

Principles of population growth/interactions and ecosystem function applied to ecological issues. Regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, biodiversity. Lab.

BIOL 3408W. Ecology. (3 cr; Stdnt Opt. =BIOL 5407, BIOL 3807, BIOL 3408W, EEB 3001. Prereq-One semester college biology), [(MATH 142 or MATH 1271 or MATH 1281 or equiv)]

Principles of population growth/interactions and ecosystem function applied to ecological issues. Regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, biodiversity. Lab.

BIOL 3409. Evolution. (3 cr; Stdnt Opt. =BIOL 2822, BIOL 5409, Prereq-One semester college biology)

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.

BIOL 3411. Introduction to Animal Behavior. (3 cr; Stdnt Opt. =BIOL 3811. Prereq-One semester of college biology)

Biological study of animal behavior. Mechanism development, function, and evolution. Emphasizes evolution of adaptive behavior, social behavior in the natural environment. Lab.

BIOL 3503. Biology of Aging. (2 cr; Stdnt Opt. Prereq-1002 or 1009 or 2003 or equiv)

BIOL 3600. Directed Instruction. (1-2 cr [max 6 cr]; S-N or Aud. Prereq-1020, upper div, application; # up to 4 cr may apply to major) Students assist with biology colloquium.

BIOL 3610. Internship: Professional Experience in Biological Sciences. (1-6 cr [max 6 cr]; S-N only. Prereq-Acceptance into CBS Internship Program, internship workshop, @) Matches student's academic or career goals with opportunities in industry, non-profit organizations, and government agencies.

BIOL 3700. Undergraduate Seminar. (1-3 cr [max 9 cr]; Stdnt Opt) Faculty members lead students in discussions on topics of interest.

BIOL 3807. Ecology. (4 cr; A-F or Aud. +BIOL 3407, BIOL 3408W, EEB 3001. Prereq-[One semester college biology], [MATH 1142 or MATH 1271 or MATH 1281 or equiv]) Principles of population growth/interactions and ecosystem function applied to ecological issues. Regulation of human populations, dynamics/impacts of disease, invasions by exotic organisms, habitat fragmentation, biodiversity. Lab, field work.

BIOL 3811. Introduction to Animal Behavior. (4 cr; A-F or Aud. +BIOL 3411. Prereq-1002 or 1009 or 2005 or equiv or #) Biological study of animal behavior. Mechanism development, function, and evolution. Emphasizes evolution of adaptive behavior, social behavior in the natural environment. Lab, field work.

BIOL 3820. Aquatic Toxicology. (2 cr; A-F only. Prereq-Courses in [general biology, chemistry]) Principles of Aquatic Toxicology. Environmental, industrial, and natural chemicals. Fate/interactions of chemicals with organisms and the aquatic environment. Insecticides, endocrine disruptors, biomarkers/bioassays, molecular sensors, risk assessment.

BIOL 3825. Ecological Genetics. (2 cr; A-F or Aud. Prereq-General biology) Using molecular techniques to study genetic variation and population structure in nature. How to isolate DNA from tissue samples, run gels, amplify DNA using polymerase chain reaction (PCR), and analyze DNA sequence variation. Conceptual basis for interpreting genetic polymorphism and sequence variation. Organisms to be studied include Colias butterflies, Daphnia in Lake Itasca, and possibly others chosen by students.

BIOL 3960H. Honors Seminar. (1 cr [max 2 cr]; A-F only. Prereq-QBS honors) Oral reports on topics of current interest to biologists. Progress reports on lab/field research by students.

BIOL 4003. Genetics. (3 cr; Stdnt Opt. +GCD 3022. Prereq-[BIOC 3021 or BIOC 4331], [any CBS major or major in animal science or agriculture plant science or forestry or BA biology or BA microbiology or nutrition or physiology or biology/society/environment]) or #) Introduction to the nature of genetic information, its transmission from parents to offspring, its expression in cells/organisms, and its course in populations.

BIOL 4004. Cell Biology. (3 cr; Stdnt Opt. Prereq-[3021 or BIOC 3021 or BIOC 4331], [4003 or BIOC 4332]) 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.

BIOL 4035. Mississippi Metagenomics Laboratory. (3 cr; A-F only. Prereq-BIOL 2004 or equiv) Impact of human activities on the Mississippi River through metagenomics; a new science used to determine the diversity and function of all the microbes in an environmental sample. Students data will add to a database of knowledge about the microbial communities in the river and how this impacts issues of water quality.

BIOL 4185. Recombinant DNA Laboratory. (3 cr; A-F or Aud. +BIOL 4125, BIOL 4185, BIOL 42125. Prereq-biochemistry or genetics corequisite or prerequisite (intermediate level lab in biochemistry or genetics or cell biology or microbiology), enrollment in Summer Undergraduate Research Program in Life Sciences, @) Basic recombinant DNA techniques. Methods for growing, isolating, and purifying recombinant DNAs and for cloning vectors.


BIOL 4700. Cell Physiology. (3 cr; A-F only. Prereq-3231 or PHSL 3051 or PHSL 3061; CHEM 1022, MATH 1272, PHYS 1202W or equiv recommended) Principles of cellular physiology. Control mechanisms involved in maintaining homeostasis with respect to cell pH, volume, electrolyte composition, membrane potential, and calcium signaling.

BIOL 4793W. Directed Studies: Writing Intensive. (1-6 cr [max 36 cr]; S-N only. Prereq-#) Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature or literature on biology education.

BIOL 4794. Directed Research. (1-6 cr [max 36 cr]; S-N only. Prereq-#) Lab or field investigation of selected areas of research.


BIOL 5111. Teaching the Biological Sciences. (3 cr; A-F or Aud. Prereq-6 cr in the life sciences) Methods and teaching styles used by outstanding university teachers including reviews and critiques from research on teaching. Opportunities for students to practice and evaluate teaching strategies.

BIOL 5193. Biology for Teachers: Monarchs in the Classroom. (3 cr; Stdnt Opt. Prereq-[Elementary or middle school or high school or preservice] teacher or #) Two-week summer workshop. Week one focuses on monarch butterfly biology taught through fieldwork, labs, lecture, and research projects. A 2- to 3-week break follows, when students raise monarchs, conduct simple experiments. Week two focuses on designing classroom activities/projects based on monarch biology. Follow-up meetings held during academic year.

For a guide to course numbers, symbols, and abbreviations, see page 376. 417
BIOL 5950. Special Topics in Biology. (1-3 cr; max 6 cr; Stdt Opt) In-depth study of special topic in life sciences.

Biology, Society, and Environment (BSE)

Department of Geography
College of Liberal Arts


BSE 3355. Environmental Quality. (3 cr; Stdt Opt) Quality of human environment as dependent on how humans make decisions about how to act, how they act, and how they evaluate both. Disjointed incrementalism, in which governments, organizations, and individuals play distinct/important roles.

Biomedical Engineering (BMEN)

Department of Biomedical Engineering
College of Science and Engineering

BMEN 1601. Biomedical Engineering Undergraduate Seminar I. (1 cr; Stdt Opt) Introduction to biomedical engineering from academic/industrial perspectives. Survey of current/emerging areas.

BMEN 1602. Biomedical Engineering Undergraduate Seminar II. (1 cr; Stdt Opt. Prereq-2601 or %) Continuation of 2601. Emphasizes biomedical engineering design and numerical analysis.

BMEN 2101. Biomedical Thermodynamics. (3 cr; A-F only. Prereq-2501, CHEM 1022, MATH 2373, & MATH 2374) 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.


BMEN 3001. Biomechanics. (4 cr; A-F or Aud. Prereq-Math 2374, Phys 1302, [BME upper div or %]) Statics, dynamics, and deformable body mechanics applied to biological/biomedical problems. Mechanical properties of biological and commonly used biomedical engineering materials. Techniques for numerical solution of biomechanics problems. Lecture/laboratory.

BMEN 3002. Biomechanics Laboratory. (1 cr; A-F or Aud. Prereq-Math 2374, Phys 1302, [BME upper div or %]; not intended for students taking 3001) Laboratory experiments in statistics, dynamics, and deformable body mechanics applied to biological/biomedical problems.


BMEN 3012. Biomedical Transport Processes Laboratory. (1 cr; A-F or Aud. Prereq-Math 2374, Phys 1302, [BME upper div or %]; not intended for students taking 3011) Laboratory experiments in momentum, heat, and mass transfer illustrated with applications in physiological processes.

BMEN 3201. Bioelectricity and Bioinstrumentation. (4 cr; A-F or Aud. Prereq-[Math 2263 or Math 2374], Phys 1302, [BME upper div or %]) Principles of electrical phenomena, instruments relevant to biomedical applications. Lecture/laboratory.

BMEN 3202. Bioelectricity and Bioinstrumentation Laboratory. (1 cr; A-F or Aud. Prereq-Math 2263 or Math 2374, Phys 1302, [BME upper div or %]; not intended for students taking 3201) Laboratory experiments in electrical phenomena. Instruments relevant to biomedical applications.


BMEN 3701. Physiology Laboratory. (2 cr; A-F or Aud. Prereq-[Math 2263 or Math 2374], Phys 1302, [BME upper div or %]; not intended for students taking 3001) Laboratory experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

BMEN 4001W. Biomedical Engineering Design I. (3 cr; A-F or Aud. Prereq-2501, 3001, 3101, 3201, 3301, 3701) Design/analysis of biomedical devices/technologies. Students work in teams on open ended design project, present completed work at design show.

BMEN 4002W. Biomedical Engineering Design II. (5 cr; A-F or Aud. Prereq-4001W) Continuation of 4001W.

BMEN 4710. Directed Research. (1-4 cr; max 4 cr; A-F or Aud. Prereq-#, %) Independent laboratory research under faculty supervision.

BMEN 4720. Directed Study. (1-4 cr; max 4 cr; A-F or Aud. Prereq-#, %) Directed study under faculty supervision.

BMEN 4896. Industrial Assignment I: Co-op Program. (2 cr; A-F only. Prereq-BMEN upper div, completion of required courses in BMEN prog through spring sem of 3rd yr, registered in co-op prog) Industrial assignment in co-op program. Formal written report on assignment.

BMEN 4910. Special Topics in Biomedical Engineering. (1-4 cr; max 4 cr; A-F or Aud. Prereq-#) New or experimental special topics.

BMEN 5001. Advanced Biomechanics. (3 cr; A-F or Aud. Prereq-3301 or Math 3101 or grad student or #) 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.

BMEN 5041. Tissue Engineering. (3 cr; Stdt Opt. Prereq-IT upper div or grad student or med student or #) 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.

BMEN 5101. Advanced Bioelectricity and Instrumentation. (3 cr; Stdt Opt. Prereq-IT upper div, grad student) or # 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.
BMEN 5102. Bioelectric Measurements and Therapeutic Devices II. (3 cr; Stdnt Opt. Prereq-5101 or #) Theoretical applications of electrical stimulation in areas of therapeutic/functional neuromuscular stimulation and pain control, cardiac pacing, defibrillation, tissue healing, and electrotherapy. Safety of electric fields. Electrical tissue impedance measurements.

BMEN 5111. Biomedical Ultrasound. (3 cr; Stdnt Opt. Prereq-[3401 or equiv], [MATH 2373 or equiv], [ITH upper div or grad student] or #) Introduction to biomedical ultrasound, including physics of ultrasound, transducer technology, medical ultrasound imaging, photoacoustic imaging, applications of non-linear acoustics, and high-intensity ultrasound.

BMEN 5151. Introduction to BioMEMS and Medical Microdevices. (2 cr; A-F or Aud. Prereq-IT sr or grad student or medical student) Design/microfabrication of sensors, actuators, drug delivery systems, microfluidic devices, and DNA/antibody microarrays. Packaging, biocompatibility, ISO 10993 standards. Applications in medicine, research, and homeland security.


BMEN 5212. Tissue Mechanics. (2 cr; A-F or Aud. Prereq-5201 or AEM 5501) Fundamental principles of continuum mechanics applied to physiological systems. Systematic consideration of individual tissues and organs. Relationships among histology, anatomy, physiology, and mechanical function in these tissues. Changes in mechanical properties related to pathology. Emphasizes tissues in the cardiovascular system.


BMEN 5351. Cell Engineering. (3 cr; Stdnt Opt. Prereq-[2501 or 5501], CSCI 1107, [MATH 2243 or Math 2373], [IT upper div or grad student] or #) Engineering approaches to cell-related phenomena important to cell/tissue engineering. Receptor/ligand binding. Trafficking/signaling processes. Applications to cell proliferation, adhesion, and motility. Cell-matrix interactions.

BMEN 5371. Biomedical Applications of Heat Transfer in Humans. (3-4 cr [max 4 cr]; Stdnt Opt. Prereq-Phsl 3061, Phsl 3071, Phsl 5061) Overview of physiology underlying thermoregulation in humans, clinical applications of heat transfer in humans, framework for design project.

BMEN 5401. Advanced Biomedical Imaging. (3 cr; A-F or Aud. Prereq-IT upper div or grad student or #) Functional biomedical imaging modalities. Principles/applications of technologies that offer high spatial/temporal resolution. Bioelectromagnetic and magnetic resonance imaging. Other modalities.


BMEN 5421. Introduction to Biomedical Optics. (3 cr; A-F only. Prereq-IT sr or grad student) 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.

BMEN 5444. Muscles. (5 cr; Stdnt Opt) Muscle structure/function: molecular mechanism by which force is generated.


BMEN 5502. Pathobiology of Medical Devices. (3 cr; A-F or Aud. Prereq-IT upper division or grad student) Biological response to biomaterials presented in context of fundamental principles of cell injury, adaptation, repair, or death. Diversity of medical uses of biomaterials, by organ system. Unique features of specific biological systems in which medical devices are used.

BMEN 5920. Special Topics in Biomedical Engineering. (2-3 cr [max 6 cr]; Stdnt Opt)

Bioproducts and Biosystems Engineering (BBE)

College of Food, Agricultural and Natural Resource Sciences; College of Science and Engineering

BEB 1001. Bioproducts and Biosystems Engineering Orientation. (1 cr; S-N or Aud) Academic programs/carers related to bioproducts and biosystems engineering. Required field trip.

BEB 1002. Wood and Fiber Science. (3 cr; A-F or Aud. BBE 5202) Wood as a bio-material. Wood’s anatomical/cellular structure compared with other plant-derived materials. Wood’s physical properties/characteristics in various applications. Non-wood fiber, bio-product characteristics.


BEB 1011. Bioproducts and Agricultural Engineering Orientation. (1 cr; S-N or Aud) Introduction to biosystems and agricultural engineering profession through readings and discussions by faculty, practicing engineers, and students; curriculum and intern, undergraduate research, and honors opportunities. Ethics, safety, environmental issues.


BEB 1901. Freshman Seminar. (3 cr [max 6 cr]; Stdnt Opt. Prereq-Freshman) Issues/topics related to natural resources and the environment. Topics vary each semester.

BEB 1906W. Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Fr) Issues/topics related to natural resources and the environment. Topics vary each semester.


BEB 3001. Mechanics and Structural Design. (4 cr; A-F or Aud. Prereq-[MATH 1272 or MATH 1372], [PHYS 1011 or PHYS 1301]) 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.

BEB 3002. Introduction to Engineering Design. (3 cr; A-F only. Prereq-[MATH 1271 or MATH 1371, CHEM 1021, BBE lower div (soph) or upper div (jr)] Freshman writing req or #) 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.

For a guide to course numbers, symbols, and abbreviations, see page 376.
BBE 3013. Engineering Principles of Molecular and Cellular Processes. (3 cr; A-F or Aud. Prereq BIOL 1009, Chem 1022 or CHEM 1370. MATH 1272.)
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.

BBE 3023. Biological Engineering Principles. (3 cr; Stdnt Opt. Prereq BIOL 1009, CHEM 3502 or & CE 3502 or #)

BBE 3023. Material and Energy Balances in Biological Systems. (3 cr; A-F or Aud. Prereq CHEM 1022, MATH 1272, PHYS 1302)
Basic principles of materials and energy balances, their applications in biological systems.

BBE 3043. Biological and Environmental Thermodynamics. (3 cr; A-F or Aud. Prereq CHEM 1022, MATH 1272, PHYS 1302)

BBE 3053. Directed Studies. (1-5 cr [max 5 cr]; Stdnt Opt. Prereq #)
Independent study of topic(s) involving physical principles as applied to agricultural production and land resources.

BBE 3101. Introductory Statics and Structures for Construction Management. (3 cr; A-F or Aud. Prereq Working knowledge of trigonometry, geometry, algebra)
Statics, engineering load 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.

BBE 3102. Residential Indoor Air Quality. (3 cr; A-F or Aud. BBE 3101. Prereq [Jr or sr or #])
Indoor air pollution issues found in residential structures, especially in north central region of the United States. Pollutant descriptions, including measurement techniques and typical ranges of concentrations. Health effects 3) Pathways and transport mechanisms. Control strategies, including mitigation and prevention.

BBE 3392. Directed Study. (1-3 cr [max 12 cr]; Stdnt Opt. Prereq-#)
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.

BBE 3396. Industrial Internship (Industrial Assignment). (1 cr; A-F or Aud. Prereq-BBE cooperative ed student)
Industrial work assignment in forest products cooperative education program. Evaluation based on formal report.


BBE 3412. Introduction to Residential Building Materials Estimating. (1 cr; A-F or Aud)

BBE 3480. Special Topics. (2-4 cr [max 12 cr]; Stdnt Opt. Prereq BBE 5480)
Topics specified in Class Schedule.

BBE 3503. Marketing of Bio-based Products. (4 cr; A-F or Aud. BBE 5503)
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.

BBE 4001. Chemistry of Plant Materials. (4 cr; A-F or Aud. BBE 5001)
Chemical principles underlying structure, properties, processing, and performance of plant materials.

BBE 4013. Transport in Biological Systems. (3 cr; A-F or Aud. Prereq BBE 3503 or SCCE 3701. CHEM 3502, ME 3331 or CHEM 4201. upper div IT)
Application of thermodynamics, fluid flow, heat/mass transfer to design problems involving biological processes and materials at cell, organism, and system level. Agricultural, environmental, food, and bioprocess applications. Solution of equations involving computer programming assignments. Hands-on instruction in Visual Basic.

BBE 4023W. Process Control and Instrumentation. (3 cr; A-F or Aud. BBE 5023. Prereq-Upper div IT or grad student)
Measurement of motion, force, pressure, flow, temperature, size, shape, color, texture, rheology, moisture, water mobility, fat, and pH. Linking physical and biological control systems.

BBE 4114W. Capstone Design Project. (4 cr; A-F or Aud. BBE 4113. upper div IT or sr or #)
Design concepts, design process. Case studies involving engineering design. Health, safety, and ethical issues facing engineers. Proposal for capstone design team project, including oral presentation of written proposal. Comprehensive design project, including written report, poster, and oral presentation of final design.

BBE 4200H. Honors Seminar. (1 cr; A-F or Aud. Prereq-BP upper div honors. #)
Current topics presented by faculty/students. Lecture/discussion.

BBE 4301. Surface and Colloid Science in Bio-based Products Manufacturing. (3 cr; Stdnt Opt. BBE 5301. Prereq-Chem 3501, [jr or sr or #])
Principles of surface/colloid science, their application to understanding manufacturing/performance of bio-based products.

BBE 4302. Organisms Impacting Bio-based Products. (3 cr; Stdnt Opt. BBE 5302. Prereq-1002 or WPS 1301 or #)
Organisms of importance to bio-based products. Deterioration, control, bioprocesses for benefit.

BBE 4303. Introduction to Bio-based Materials Science. (3 cr; A-F or Aud. BBE 5303. Prereq-2001)
Principles of materials science, their application to bio-based materials.

BBE 4305. Pulp and Paper Technology. (3 cr; Stdnt Opt. Prereq-Jr or #)

BBE 4312. Pulp and Paper Unit Operations. (4 cr; Stdnt Opt. Prereq-4305 or #)
Application of principles of momentum, heat, and mass transfer to unit operations in pulp/paper industry. Fluid transport, filtration, sheet formation, sedimentation, drainage, pressing, heat exchange, evaporation, washing, bleaching, humidification/drying, chemical/energy recovery. Computer simulation of multiple-stage systems. Online course.

BBE 4313. Design of Machine Systems. (3 cr; A-F or Aud. Prereq-AEM 2021, AEM 3031, CHEM 3502 or &CE 3502, upper div IT)

BBE 4314. Papermaking Processes and Process Engineering Laboratory. (3 cr; Stdnt Opt. Prereq-#)

Presented through the Internet. Basic concepts and most frequently used methods in statistical process control, analysis of variances, experiment design, and regression analysis. Online course.

BBE 4333. Machinery Elements. (3 cr; Stdnt Opt. Prereq-AEM 2021, AEM 3031, CHEM 3502 or &CE 3502, upper div IT)
Building blocks for machines used in crop production and food processing. Power from diesel engines, electric/hydraulic motors. Performance characteristics, efficiency.
Machine-control systems modeling (electro-hydraulic), machinery/hydraulic circuit design, safety.


**BEE 4355. Design of Wood Structures.** (3 cr; Stdnt Opt. Prereq-3001 or WPS 4301 or CE student or #) Design of wood structures using Allowable Stress Design. Wood properties/characteristics important to structural design. Heavy/light frame wood construction.

**BEE 4362. Pulping and Bleaching.** (4 cr; Stdnt Opt. Prereq-**BP 4305 or WPS 4305**). Chemistry/technologies in producing papermaking raw material. Focuses on wood pulping/bleaching, including non-wood fibers and recycled fiber materials. Online course.

**BEE 4401. Bioproducts Engineering.** (3 cr; A-F or Aud. Prereq-**[3001, 4303, 4414 or WPS 4334]**) Lab exercises in bio-based products engineering.

**BEE 4402. Bio-based Products Engineering Lab I.** (1 cr; A-F or Aud. **BEE 5402. Prereq-CHEM 2301, [jr or sr or #])** Lab exercises in bio-based products engineering.

**BEE 4403. Bio-based Products Engineering Lab II.** (1 cr; A-F or Aud. **BEE 5403. Prereq-CHEM 2301, [jr or sr or #])** Lab exercises in bio-based products engineering.

**BEE 4404. Bio-based Composites Engineering.** (3 cr; A-F or Aud. **BEE 5404. Prereq 3001, Chem 3501, [jr or sr or #])** Properties of bio-based composites.

**BEE 4406. Understanding Wood.** (2 cr; Stdnt Opt. Prereq-**UC only**) For woodworking professionals and serious craftspersons. Cellular structure of wood, identification of hardwoods and softwoods, interaction of water and wood. No prior technical training in wood properties is needed, although general experience with woodworking is helpful.


**BEE 4411. Application and Performance of Wood-based Composites in Services.** (2 cr; A-F or Aud. Prereq-**[1002 or WPS 1501 or 4406 or WPS 4406 or UC or CEE])** Physical/mechanical properties of composites. Composite applications/installations.


**BEE 4414. Advanced Residential Building Science.** (3 cr; Stdnt Opt. **BEE 5414. Prereq-3001 or WPS 4301**. Theory, advanced applications for residential buildings. Focuses on heat/mass transfer.

**BEE 4415. Advanced Residential Building Science Lab.** (1 cr; A-F or Aud. **BEE 5415. Prereq-**[**CHEM 5001, 4302, 4413W** or #] or **[**WPS 4301, 4303, 4331 or #]**, **[**4414 or WPS 4334**]**) Experiences on advanced applications of heat/mass transfer to predict performance of residential buildings.


**BEE 4491. Senior Topics: Independent Study.** (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#) Independent study in student’s area of interest.

**BEE 4501. Process and Product Design I.** (2 cr; Stdnt Opt. **BEE 4501, 4303, 4403. [4401 or 4403, 4403 or A-F or Aud. Prereq-**[**CHEM 3501, 4403 or #]**]** fr writing req. [jr or sr or #]) Students develop, formulate, and complete an open-ended, engineering process-design project at conceptual level.

**BEE 4502W. BBE Capstone Design.** (4 cr; A-F or Aud. **BEE 4502W. Prereq-**[**[1101 or 4501, sr)**]** or #) Students develop, select, formulate, and complete an open-ended, comprehensive engineering process/product design project.

**BEE 4504W. Bio-based Products Development and Management.** (3 cr; A-F or Aud. Prereq-#) Concepts of new product development and product management, their application to bio-based products.

**BEE 4523. Ecological Engineering Design.** (3 cr; A-F or Aud. **BEE 5523. Prereq-CHEM 1022, [BIOL 3407 or BIOL 3807 or EEB 4068 or LA 3204], CE 3502, upper div [IT or #])** Application ecological engineering to design of remediation systems. Artificial ecosystems, ecosystem/wetland restoration, constructed wetlands, biological engineering for slope stability, waste treatment using biological systems. Restoring ecological service of watersheds.

**BEE 4533. Agricultural Waste Management Engineering.** (3 cr; A-F or Aud. **BEE 5333. Prereq-3003, upper div [IT or #])** Sources and characteristics of agricultural wastes, including livestock, food processing, and domestic wastes. Physical, biological, chemical, rheological, and microbiological properties. Effects on environment. Collection, storage, treatment (aerobic and anaerobic), and use/disposal. Land application.

**BEE 4535. Assessment and Diagnosis of Impaired Water.** (3 cr; A-F only. **BEE 5535. Prereq-Upper division IT or CFANS or CBS student or #)** Assessing 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.


**BEE 4723. Food Process Engineering.** (3 cr; A-F or Aud. **BEE 5723. Prereq-**[**[4013 or &4013, upper div [IT or #]**]** Material/energy balance, fluid dynamics, heat/mass transfer in refrigeration, freezing, psychrometrics, dehydration, evaporation, non-thermal processing, and separation. Development/ control for production of food products.

**BEE 4733. Renewable Energy Technologies.** (3 cr; A-F or Aud. **BEE 5733. Prereq-Upper div IT or grad student or #)** Current/emerging technologies for renewable energy. Solar thermal, solar photovoltaics, biomass, wind, hydroelectricity, tidal, geothermal. Energy security. Environmental, economic, and societal considerations.

**BEE 4744. Engineering Principles for Biological Scientists.** (4 cr; A-F or Aud. **FSCN 4331. Prereq-[Math 1142 or Math 1271]**. Phys 1101; intended for non engineering students) Material/energy balances applied to processing systems. Principles of fluid flow, thermodynamics, heat, mass transfer applied to food and bioprocess unit operations such as pumping, heat exchange, refrigeration/freezing, drying, evaporation, and separation.

**BEE 4801H. Honors Research.** (2 cr; A-F or Aud. **BEE 4801H. Prereq-upper div honors)** First semester of independent research project supervised by faculty member.


**BEE 4900. Intern Reports.** (2 cr [max 4 cr]; S-N or Aud. Prereq-IT or COAFES student in BAE, #) Reports on intern work assignments reviewed by faculty and industry advisers.

**BEE 5001. Chemistry of Plant Materials.** (4 cr; A-F or Aud. **BEE 5001. Prereq-Grad student or #)** Chemical principles underlying structure, properties, processing, and performance of plant materials.
BBe 5023. Process Control and Instrumentation. (3 cr; Stdnt Opt. +BBe 4023W. Prereq-Grad student or #) Fundamental principles in system dynamics/control. Emphasizes process systems and problems faced by process engineers.

BBe 5095. Special Problems. (1-5 cr [max 5 cr]; Stdnt Opt. Prereq-#) Advanced individual-study project. Application of engineering principles to specific problem.

BBe 5102. Residential Indoor Air Quality. (3 cr; A-F or Aud. +BBe 3102. Prereq-Grad student or #) Indoor air pollution issues found in residential structures, especially in the north central region of the United States. Pollutant descriptions, including measurement techniques and typical ranges of concentrations. Health effects. Pathways, transport mechanisms. Control strategies including mitigation and prevention.

BBe 5202. Wood and Fiber Science. (3 cr; A-F or Aud. +BBe 1002) Wood as a bio-material. Wood’s anatomical/ cellular structure compared with other plant-derived materials. Wood’s physical properties/characteristics in various applications. Non-wood fiber, bio-product characteristics.

BBe 5203. Environmental Impacts of Food Production. (3 cr; A-F or Aud. Prereq-intended for non-engineering students; Credit will not be granted if credit has been received for AGET 5203) Crop production intensity, animal raising issues, food processing waste alternatives, pest control.

BBe 5212. Safety and Environmental Health Issues in Plant and Animal Production and Processing. (3 cr; A-F or Aud. Prereq-grad student or sr or #; Credit will not be granted if credit has been received for AGET 5212) Safety/health issues in food production, processing and horticultural work environments using public health, injury control, and health promotion frameworks: regulation, engineering, education. Traumatic injury, occupational illness, ergonomics, pesticide health effects, biotechnology, air contaminants.

BBe 5301. Surface and Colloid Science in Bio-based Products Manufacturing. (3 cr; Stdnt Opt. +BBe 4301. Prereq-Grad student or #) Principles of surface and colloid science, their application to manufacturing/processing of bio-based products.

BBe 5302. Organisms Impacting Bio-based Products. (3 cr; Stdnt Opt. +BBe 4302. Prereq-Grad student or #) Organisms and their importance to bio-based products: deterioration, control, bioprocesses for benefit.

BBe 5303. Introduction to Bio-based Materials Science. (3 cr; Stdnt Opt. +BBe 4303. Prereq-Grad student or #) Principles of materials science, their application to bio-based materials. Project required.


BBe 5333. Off-road Vehicle Design. (4 cr; A-F only. +BBe 4333. Prereq-[[3001, 4303] or [AEM 2021, AEM 3031], [CE 3502 or &CE 3502], upper div IT] or #) Mechanics involved in designing/testing off-road vehicle. Vehicle mechanics, traction, and performance. Complexity/modeling of vehicle interaction with soil, muskeg, and snow. Students conduct case study or literature review and develop paper for publication.

BBe 5362. Pulping and Bleaching. (4 cr; Stdnt Opt. Prereq-Grad student or #) Chemistry/technologies in producing papermaking raw material. Focuses on wood pulping/bleaching, including non-wood fibers and recycled fiber materials. Online course.

BBe 5401. Bioproducts Engineering. (3 cr; A-F or Aud. Prereq-Grad student or #) Unit operations of bioproducts engineering/management. Project required.

BBe 5402. Bio-based Products Engineering Lab I. (1 cr; A-F or Aud. +BBe 4402. Prereq-Grad student or #) Laboratory exercises in bio-based products engineering.

BBe 5403. Bio-based Products Engineering Lab II. (1 cr; A-F or Aud. +BBe 4403. Prereq-Grad student or #) Laboratory exercises in bio-based products engineering.

BBe 5404. Bio-based Composites Engineering. (3 cr; A-F or Aud. +BBe 4404. Prereq-Grad student or #) Properties of bio-based composites.


BBe 5412. Manufacturing and Applications of Bio-based Products. (4 cr; Stdnt Opt. +BBe 4412W. Prereq-Grad student or #) Manufacturing processes, end-use applications of bio-based products.


BBe 5415. Advanced Residential Building Science Lab. (1 cr; A-F or Aud. +BBe 4415. Prereq-Grad student or #) Concurrent with 4414. Exercises on advanced applications of heat/mass transfer to predict performance of residential buildings.


BBe 5480. Special Topics. (3-4 cr [max 12 cr]; Stdnt Opt. +BBe 3480. Prereq-Sr or grad student) Topics specified in Class Schedule.

BBe 5503. Marketing of Bio-based Products. (4 cr; A-F or Aud. +BBe 3503. Prereq-Grad student or #) 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.


BBe 5513. Watershed Engineering. (3 cr; A-F or Aud. Prereq-3023, upper div IT) 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.


BIE 5535. Assessment and Diagnosis of Impaired Waters. (3 cr; A-F only. =BBE 4535. Prereq-Grad student or #) Assessing 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.

BIE 5713. Biological Process Engineering. (3 cr; A-F only. =BBE 4713. Prereq.-[3033, [4013 or 4603], [upper div IT or grad student]) or #) Material/energy balances. Homogeneous reactions of bioprocess engineering and biological systems. Fermentation engineering, reactor design fundamentals. Filtration, centrifugation, separation, absorption, extraction, chromatography, Biofining. Conversion of biomass into bioenergy, biochemicals, and biomaterials.

BIE 5723. Food Process Engineering. (3 cr; A-F only. =BBE 4723. Prereq.-[3033, [4013 or 4603], [upper div IT or grad student]) or #) 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.

BIE 5733. Renewable Energy Technologies. (3 cr; A-F only. =BBE 4733. Prereq-Upper div IT or grad student or #) Solar thermal energy, solar photovoltaics, biomass energy, wind energy, hydroelectricity, tidal power, and geothermal energy. Sustainable development: energy security, environmental, economic, and societal considerations.

Business Administration (BA)

Curtis L. Carlson School of Management

BA 999. Immersion Core. (12 cr; A-F only. Prereq.-ACCT 2050, OMS 2550, Carlson School [soph or jr]) Includes FINA 2401, MKTG 3001, OMS 3001, and MGMT 3004. Students enroll as a cohort during spring term, completing the four courses with same group of students.

BA 1905. Freshman Seminar. (2-3 cr; A-F only. Prereq-Fr) Topics vary.

BA 1910W. Freshman Seminar, WI. (2-3 cr [max 9 cr]; A-F only. Prereq-QFreshman) Topics vary. See Class Schedule.

BA 3000. Career Skills. (1 cr; S-N only. Prereq-COMM soph or upper div major) Career planning. Use of Carlson School of Management’s Business Career Center. Students gain awareness, knowledge, skills associated with career/job search process.

BA 3100. Global Seminar. (3 cr [max 9 cr]; Stdnt Opt. Prereq-Approved application) Three-week, faculty-led program. Students spend May session or January session examining international business topics first-hand. Topics/locations vary. For current offerings, contact Learning Abroad Center.

BA 3900. Topics. (1-4 cr [max 12 cr]; A-F only) Topics in business vary.

BA 3990H. Honors Topics. (2-4 cr [max 8 cr]; A-F or Aud. Prereq-Honors) Topics vary.

BA 3998. Independent Study. (1-6 cr [max 16 cr]; Stdnt Opt. Prereq-COMM upper div upper, #) Student-initiated project or independent study.

BA 3999. Internship Seminar. (1 cr; S-N only. Prereq-Approved internship, #) Taken in conjunction with internship. Readings/papers on topics related student’s internship experiences. Final paper, meeting with instructor.

BA 4501. Carlson Funds Enterprise: Growth. (3 cr [max 6 cr]; Prereq- &MBA 6501, CSOM [jr or sr], approved application) Lectures, assignments, modules. Hands-on real-money experience through Golden Gopher Growth Fund.

BA 4502. Carlson Funds Enterprise: Fixed Income. (3 cr [max 6 cr]; Prereq- &MBA 6502, CSOM [jr or sr], approved application) Lectures, assignments, modules. Hands-on real-money experience through Golden Gopher Fixed Income Fund.

BA 4503. Carlson Ventures Enterprise. (2 cr [max 6 cr]; Prereq- &MBA 6503, CSOM [jr or sr], approved application) 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 nonUniversity-based start-up companies seeking initial equity capital.

BA 4504. Carlson Consulting Enterprise. (3 cr [max 6 cr]; Prereq- &MBA 6504, CSOM [jr or sr], approved application) 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.

BA 4505. Brands Enterprise. (3 cr [max 6 cr]; Prereq- &MBA 6505, CSOM [jr or sr], approved application) 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.

BA 4990H. Honors Thesis Seminar I. (2 cr; A-F only. Prereq-CSOM honors, 2nd sem jr) Conducting rigorous academic research. How to develop honors thesis from initial question of interest. Honors thesis proposal, research question, review of literature, study design.

BA 4991H. Honors Thesis Seminar II. (2 cr; A-F only. Prereq-4990H, CSOM honors, sr) Students refine research methodology, develop results, and derive preliminary conclusions. Draft of honors thesis, with preliminary results and clear agenda for final analysis.

BA 4994. Directed Research. (1-4 cr [max 4 cr]; A-F only. Prereq-Honors) Honors directed research.

Business and Industry Education (BIE)

Department of Educational Policy and Administration

College of Education and Human Development

BIE 326. Supervised Career and Technical Education Teaching. (4 cr; S-N or Aud. Prereq-@) Supervised teaching for beginning teachers, or teaching activities for preservice teachers.

BIE 3001. Teaching Marketing Promotion. (3 cr; A-F or Aud) Materials, methods, and approaches to teaching marketing promotion. Advertising, promotion, public relations, direct selling, visual merchandising, and direct marketing.

BIE 3061. Professional Sales Management. (3 cr; A-F or Aud) Examination of the sales manager’s role in training and mentoring sales representatives in strategic selling, customer-oriented service, and problem-solving tactics. Includes recruitment, hiring, training, and retention of a sales force.

BIE 3111. Exploring Technology Systems. (3 cr; Stdnt Opt) Communication, information, construction, manufacturing, design, technical drawing, biotechnology, energy, power, and transportation technologies. Students develop problem solving and manipulative skills as well as an understanding of the principles and processes through hands-on activities in a multiple activity laboratory.

BIE 3312. Technical Drawing and Production Technologies. (3 cr; A-F or Aud. =AFEE 3112) Instruction and laboratory experiences in technical drawing and design technologies; production technologies related to construction and manufacturing. Students will develop manipulative skills and techniques, and an understanding of the principles and processes of the technologies through hands-on work and lab activities.

BIE 3314. Construction Technology. (3 cr; Stdnt Opt. Prereq- Concurrent enrollment 3111) Introduction to principles, concepts, and techniques involved in civil, commercial, and
residential construction. Laboratory experiences in planning, designing, organizing, producing, and testing structures.

**BIE 3122. Communication and Information Technology.** (3 cr; A-F or Aud. Prereq: Concurrent enrollment 3121)

Information/communication systems, electronic publishing, printing technology, broadcast/recording technologies, telephone/online communication, photography, multimedia, and computer technology. Lab.

**BIE 3123. Energy, Power, and Transportation Technology.** (3 cr; A-F or Aud. Prereq: Concurrent enrollment 3121)

Mechanical, fluid, and electrical power/technologies associated with transportation of people/materials. Lecture, lab.

**BIE 3151. Technical Development: Advanced.** (1-2 credit max 32 cr; Stdnt Opt)

Work experience in business/industry.

**BIE 3624. Sales Training.** (3 cr; A-F or Aud)

Strategies and techniques for developing effective sales people.

**BIE 3993. Directed Study: BIE.** (1-4 cr [max 4 cr]; Stdnt Opt)

Self-directed study preceded by classroom instruction in basic research procedures.

**BIE 4626. Customer Service Training.** (3 cr; A-F or Aud)

Customer service strategies used by successful organizations. Training practices used to develop customer-oriented personnel.

**BIE 5001. Teaching Marketing Promotion.** (3 cr; A-F or Aud)

Materials, methods, and approaches to teaching marketing promotion. Covers the basic elements of the marketing mix: advertising, promotion, public relations, direct selling, visual merchandising, and direct marketing.

**BIE 5080. Special Topics in Business and Industry Education.** (1-4 cr [max 4 cr]; Stdnt Opt)

Content varies by offering.

**BIE 5101. Technological Problem Solving.** (3 cr; A-F or Aud. Prereq: 3111, 3112, 3121, 3122)

Capstone technology education course in which students research problems relative to various technological systems and develop solution(s) to the identified problems.

**BIE 5151. Technical Development: Specialized.** (1-12 cr [max 12 cr]; A-F or Aud. Prereq: #)

Students select/study technical processes/principles based on subjects they plan to teach, integrate specialized technical instruction in advanced/emerging areas.

**BIE 5325. Foundations of Industrial Education.** (3 cr; Stdnt Opt)

Social, economic, psychological, philosophical, legislative, and pedagogical foundations of industrial education in the United States. Comparison with selected foreign countries.

Analysis of contemporary trends against backdrop of early foundations.

**BIE 5344. Facilities Management in Business and Industry.** (3 cr; A-F or Aud. Prereq: 3121)

Planning, evaluating, and managing industrial education shop and lab facilities.

**BIE 5365. Curriculum Development in Technology Education.** (3 cr; Stdnt Opt)

Conceptualization and derivation of content for the K-12 technology curriculum. Comparison of U.S. approaches to technology curriculum with selected countries.

**BIE 5440. Business and Industry Observation and Seminar.** (1-3 cr [max 6 cr]; Stdnt Opt)

Current operating practices and career opportunities in business and industry. Planned experiences in work environments and related seminars.

**BIE 5457. Methods of Teaching Business Employment and Marketing Employment.** (3 cr; A-F or Aud)

Recent research/developments in teaching for business employment. Administrative support positions, accounting/information processing, marketing, sales, computer operations, other occupations using desktop computing.

**BIE 5475. Curriculum Development for Business and Marketing Education.** (3 cr; A-F or Aud)

Introduction to conceptual models for design/delivery of business/marketing education programs in secondary/postsecondary schools, in adult education settings, and in business/industry. Preparing programs of instruction for secondary/postsecondary level. Making decisions regarding course content.

**BIE 5596. Occupational Experience in Business and Industry.** (1-10 cr [max 10 cr]; S-N or Aud. Prereq: #)

Observation/employment in business/industry to develop technical/occupational competencies. Includes 100 clock hours of supervised work experience per credit.

**BIE 5597. Internship: Business and Industry Education.** (1-4 cr [max 4 cr]; S-N only. Prereq-3061, [HRD 5624 or HRD 5626], #, BME undergrad major, 90 cr)

Practical experience in business or industry. Focuses on marketing or sales. Requires integrative paper.

**BIE 5605. Critical Issues in Business and Industry.** (3 cr; Stdnt Opt)

Identification and analysis of major current issues in business and industry education.

**BIE 5796. Field Based Projects in Business and Industry.** (1-4 cr [max 4 cr]; S-N or Aud)

Curricular, instructional, developmental, or evaluative problems and projects applicable to local school or business and industry situations.

**BIE 5801. The Business of Tourism.** (3 cr; A-F or Aud)

Introduction to major theories, concepts, skills, and techniques influencing tourism business/industry.

**BIE 5803. Tourism Studies Capstone Seminar.** (3 cr; S-N or Aud. Prereq-Tourism studies major)

Students present, critique, and discuss implications of supporting programs for tourism.

**BIE 5856. Research Data, Experience of Self that is Part of Health Science Education.**

Students become aware of their responsibility/journey as part of health science education. Introduction to individual transformational journey as part of health science education. Students become aware of responsibility/resources to facilitate development of the self. Research data, experience of self that is part

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**Business Law (BLAW)**

**Department of Accounting**

**Curtis L. Carlson School of Management**

**BLAW 3058. The Law of Contracts and Agency.** (4 cr; A-F or Aud. Prereq-40 or more credits)

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.

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**Center for Spirituality and Healing (CSPH)**

**Academic Health Center Shared**

**CSPH 101. Self, Society, and Environment: An Integral Systems Approach to Personal Wellbeing and Engagement.** (3 cr; Stdnt Opt)

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.

**CSPH 3201. Introduction to Mindfulness-Based Stress Reduction.** (2 cr; Stdnt Opt)

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 5000. Explorations in Complementary Therapies and Healing Practices.** (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Research/practice on therapies, delivery of complementary therapies, regulatory issues.

**CSPH 5101. Introduction to Complementary Healing Practices.** (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Cultural contexts of healing traditions. Complementary therapies presented by practitioners, including traditional Chinese medicine, meditation, mind-body healing, spiritual practices, energy healing, naturopathy, herbalism, movement therapies, homeopathy, manual therapies, and nutrition.

**CSPH 5102. Art of Healing: Self as Healer.** (1 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Introduction to individual transformational journey as part of health science education. Students become aware of 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.

CSPH 5111. Ways of Thinking about Health. (2 cr (max 4 cr); S-N only. Prereq-Jr or sr or grad student or #; instructor permission required for second enrollment in course)


CSPH 5115. Cultural Knowledge, Health, and Contemporary Cultural Communities. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

How personal cultural experience affects one's view of health, illness, and healing and one's professional practice. Wisdom of cultural communities. Cultural construct underpinning the medical system. Role of culture in interaction between practitioner and patient. Reconnecting to cultural heritage in healing.

CSPH 5201. Spirituality and Resilience. (2 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Links between resilience and spirituality. Applications of resilience/health realization model to students' personal/professional lives. Review of literature, theory, and research.

CSPH 5211. Peacemaking and Spirituality: A Journey Toward Healing and Strength. (2-3 cr [max 5 cr]; A-F or Aud. Prereq-Jr or sr or grad student or #)

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.

CSPH 5215. Forgiveness and Healing: A Journey Toward Wholeness. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Impact of forgiveness on process of inter-/intrapersonal healing. Forgiveness/healing in health care and social work settings from multiple spiritual/secular traditions.

CSPH 5221. Significant Spiritual Texts of the 20th Century. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Diverse "spiritual classics" (i.e., elements of western canon that have proven over time to be resources of values). Resources of meaning for inner-life healers. How to establish a personal library for life-long journey of spiritual development.

CSPH 5225. Meditation: Integrating Body and Mind. (2 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

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.

CSPH 5301. Cultures, Faith Traditions, and Health Care. (2 cr; A-F or Aud. Prereq-Jr or sr or grad student or #)

Culturally/spiritually based health care practices of selected native/immigrant populations in Minnesota. Clinical implications. Personal/professional conflicts for delivery of competent care to culturally diverse groups by those trained in Western health care.

CSPH 5311. Introduction to Traditional Chinese Medicine. (2 cr; A-F or Aud. Prereq-Jr or sr or grad student or #)

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.

CSPH 5315. Traditional Tibetan Medicine: Ethics, Spirituality, and Healing. (2 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Ethics, spirituality, and healing from perspective of traditional Tibetan medicine. Belief 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.

CSPH 5318. Tibetan Medicine, Ayurveda, and Yoga in India. (4 cr; Prereq-[5315, 5317] or #)

Studies student 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.

CSPH 5321. Public Health Priorities in the Developing World. (2 cr; Stdnt Opt. +INMD 7567, Prereq-Jr or sr or grad student or #)

Primary public health problems, priorities, and interventions in developing countries. Issues related to culture/indigenous health systems and of concern to health care providers who work abroad or with refugee communities in countries of resettlement.

CSPH 5325. Latinos: Culture and Health. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

How Latino world view (cosmovision) affects health and compares with U.S. perspective. Differences in perception of time, family involvement, community “belonging,” gender roles, and communication styles. Folkloric beliefs. Specific issues such as AIDS, pregnancy, women’s issues, pharmacy, and nutrition. Health issues of workers. Cultural competency.

CSPH 5331. Foundations of Shamanism and Shamanic Healing. (2 cr; S-N or Aud. Prereq-Jr or sr or grad student or #)

3 ø-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.

CSPH 5401. People, Plants, and Drugs: Introduction to Ethnopharmacology. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Biologically active substances used in traditional cultures. Ethnopharmacology’s past, current, and potential contributions to human knowledge. Concrete examples.

CSPH 5405. Plants in Human Affairs. (4 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Twelve-day, intensive course. Introduction to ethnobotany/ethnopharmacology. Lectures, field trips, presentations by local experts.

CSPH 5421. Botanical Medicines in Complementary Healthcare. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #)

Widely-used botanical medicines from biomedical perspective. Alternative therapeutic systems presented according to bodily systems/processes. Evidence for therapeutic use. Biological characteristics, traditional uses, chemical properties, dosage, hazards/safety issues, quality control.

CSPH 5501. Clinical Aromatherapy: Therapeutic Use of Plant Essential Oils. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #; intended for students in health sciences or practicing health professionals; basic science, health science knowledge, computer skills, internet skills recommended)


CSPH 5505. Foundations of Homeopathic Practice. (1 cr; S-N only. Prereq-Jr or sr or grad student; designed for students in health sciences or practicing health professionals) Homeopathic philosophy, core principles, homeopathic materia medica. Review of research on utilization/efficacy of homeopathy. How to use common homeopathic remedies in acute situations. When/how to refer patients for homeopathic treatment. Issues of co-management with allopathic health care providers.

CSPH 5511. Interdisciplinary Palliative Care: An Experiential Course in a Community Setting. (2 cr; Stdnt Opt. Prereq-#)

Multidisciplinary student teams partner with interdisciplinary community hospice teams in delivery of care to patients in a variety of settings. Series of seminars employs self-analysis/case studies.

CSPH 5521. Therapeutic Landscapes. (5 cr; Stdnt Opt. Prereq-Jr or sr or grad student in [health sciences or therapeutic recreation or Horticulture or landscape architecture] or health professional or #)

Principles of therapeutic design for specific population requirements. Therapeutic landscape design. Incorporates interdisciplinary interaction between horticulture, landscape architecture, and health science departments.
CSPH 5522. Therapeutic Horticulture. (3 cr; Stdnt Opt. Prereq-5101 or Hort 5072 or #) Central elements of therapeutic horticulture in context of multiple health care settings. Evidence-based history, principles, precepts, and practical application of therapeutic horticulture. Various plant/plant-related modalities from current research findings are related to populations, using therapeutic horticulture as a treatment intervention.

CSPH 5533. Introduction to Energy Healing. (2 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #) 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.

CSPH 5535. Reiki Healing. (1 cr; S-N only. Prereq-Jr or sr or grad student or #) 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.

CSPH 5536. Advanced Reiki Healing: Level II. (1 cr; S-N only, Prereq-5535, #) 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.

CSPH 5541. Emotional Healing and Happiness: Eastern and Western Approaches to Transforming the Mind. (2 cr; Stdnt Opt. Prereq-Sr or grad student or #) 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.

CSPH 5545. Mind-Body Healing Therapies. (2 cr; A-F or Aud. Prereq-Grad student or jr or sr or #) Philosophies/paradigms. Four modalities commonly used in allopathic nursing, medicine and other health professions (biofeedback, hypnosis, imagery/visualization, meditation). Experiential and group discussion format.

CSPH 5561. Overview of the Creative Arts in Health and Healing. (2 cr; Stdnt Opt. Prereq-Jr or sr or grad student) 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.


CSPH 5611. Healthy Humor. (1 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #) Use of humor to enhance communication, treatment, and relationships with patients. How to create a positive work environment and outlook. Physiologic effects/benefits of humor/laughter. Humor and spirituality. Connection between positive outlook and health.


CSPH 5705. Health Coaching Professional Internship. (2 cr; S-N only. Prereq-5701, 5702, 5703, admitted to postbaccalaureate certificate in complementary Therapies/healing practices health coaching track; [5101, 5102, 5704 recommended]) 120 hours of health coaching practice. Students work with individual clients in acute/longitudinal encounters, provide wellness teaching, and design a career plan.

CSPH 5711. Optimal Healing Environments. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #) 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.
CHEN 3045. Chemical Engineering Industrial Internship. (1 cr; max 2 cr; A-F only. Prereq: Plan approved by [supervisor, faculty internship co-op coordinator], report signed by industrial supervisor describing engineering work completed) Industrial internship, three to eight months.

CHEN 3101. Chemical Engineering Thermodynamics. (4 cr; A-F only. Prereq-Plan approved by [supervisor, %]) Applications of concepts of thermodynamics and chemical equilibrium to problems in chemical engineering.

CHEN 3102. Reaction Kinetics and Reactor Engineering. (4 cr; A-F only. Prereq-[2001 or 4001], [3101 or 4101], [upper div CHEn major or %]) Chemical equilibrium and chemical kinetics applied to chemical engineering systems. Behavior/design of chemical reactors, interaction between chemical and physical rate processes. Mathematical modeling, design of reactors.

CHEN 3201. Numerical methods in ChEn applications. (3 cr; A-F only. Prereq-[2001 or 4001], [3005 or 4005], [3006 or 4006 or 3102 or 4102] (3 cr; A-F only. 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 %) Principles/techniques of efficient design, structure, measurement, planning, analysis, and presentation of experiments and experimental results. Problems in energy balances, fluid flow, heat transfer, and mass transfer. Design of new systems using experimental data obtained in lab. Oral/written presentations.

CHEN 4400W. Chemical Engineering Lab II. (3 cr; Stdnt Opt. Prereq-4006, 4101, 4401W, upper div CHEn major) Principles/techniques of efficient design, structure, measurement, planning, analysis, and presentation of experiments and experimental results. Experimental problems in energy balances, fluid flow, heat transfer, and mass transfer. Design of new systems using data obtained in lab. Oral/written presentations.


CHEN 3701. Introduction to Biomolecular Engineering. (3 cr; A-F or Aud. Prereq-[4001 or equiv], [Chem 2302 or &Chem 2302], [Math 2373 or equiv]; high school biology recommended) 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.

CHEN 4041. Industrial Assignment II. (2 cr; A-F only. +MATS 4041. Prereq-3041, completion of required courses in ChEn prog through fall sem of 4th year, GPA of at least 2.80, registration in co-op prog) Industrial assignment in engineering co-op program. Application of chemical engineering principles to engineering design problems in an industrial work environment. Formal written report.

CHEN 4214. Polymers. (3 cr; A-F or Aud. Prereq-[MATS 301, [3101 or 4101 or MATS 4001, [upper div MATS or ChEn]]) or %) 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.

For a guide to course numbers, symbols, and abbreviations, see page 376. 427

CHEM 5595. Special Topics. (1-4 cr [max 12 cr]; A-F only. Prereq-ChEn major upper div) New or experimental special topics.

CHEM 8572. Biochemical Engineering. (3 cr; A-F or Aud. +CHEM 2505, &3000 or 4000, &3102 or 4102) 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.


Chemistry (CHEM)
Department of Chemistry
College of Science and Engineering
CHEM 1011. Introductory Chemistry: Lecture. (5 cr; Stdtnt Opt. Prereq-[High school chemistry or equiv], two yrs high school math, not passed chem placement exam; high school physics recommended) Elementary organic chemistry. 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 containing halogens, nitrogen, or oxygen. Emphasizes problem solving.

CHEM 1015. Introductory Chemistry: Lecture. (5 cr; Stdtnt Opt. Prereq-[High school chemistry or equiv], two yrs high school math, not passed chem placement exam, Internet access; high school physics recommended) Lectures online, exams on campus. 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.

CHEM 1017. Introductory Chemistry: Laboratory. (1 cr; A-F only. Prereq-[1015 or &1015], %) Organic chemistry. 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 containing halogens, nitrogen, or oxygen. Problem solving.


CHEM 1032H. Honors Chemistry II. (4 cr; A-F or Aud. =CHEM 1022. Prereq-[1031H or &1031H] or honors student and permission of University Honors Program) Advanced introduction. Chemical kinetics/reaction mechanisms, chemical/physical equilibria, acids/bases, entropy/second law of thermodynamics, electrochemistry/corrosion; descriptive chemistry of the elements; coordination chemistry; biochemistry; applications of chemical principles to environmental problems. Lab emphasizes writing for scientific journals.

CHEM 1600W. Freshman Seminar: Writing Intensive. (1-3 cr [max 4 cr]; A-F or Aud. Prereq-Freshman) Topics vary. See freshman seminar topics.

CHEM 2094. Directed Research. (1-3 cr [max 3 cr]; Stdtnt Opt. Prereq-#) Learning experience in areas not covered by regular courses. Individually arranged with faculty member.

CHEM 2101. Introductory Analytical Chemistry Lecture. (3 cr; Stdtnt Opt. Prereq-2012 or &2012) Primarily for chemistry majors. Methods/concepts of measurement by chemical/instrumental analysis, including titrimetry, quantitative spectrophotometric analysis, chromatographic separations, equilibrium/rate methods.

CHEM 2111. Introductory Analytical Chemistry Lab. (2 cr; Stdtnt Opt. Prereq-2101 or &2101) 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.

CHEM 2121. Process Analytical Chemistry. (3 cr; A-F or Aud. Prereq-[2302 or &2302], [3501 or &3501]; IT student) Strategies/techniques for analysis. Use of modern instruments, including spectrophotometry, chromatography, and electrochemistry.

CHEM 2301. Organic Chemistry I. (3 cr; Stdtnt Opt. Prereq-Grade of at least C- in [1022 or 1032H or &1032H] or [grade of at least B in 1031H, &1031H]) Important classes of organic compounds, their constitutions, configurations, conformations, and reactions. Relationships between molecular structure and chemical reactivity/properties. Spectroscopic characterization of organic molecules.

CHEM 2302. Organic Chemistry II. (3 cr; Stdtnt Opt. Prereq-Grade of at least C- in 2301) 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.

CHEM 2311. Organic Lab. (4 cr; Stdtnt Opt. Prereq-Grade of at least C- in 2302 or &2302) Lab techniques in synthesis, purification, and characterization of typical organic compounds.

CHEM 2312H. Honors Organic Lab. (5 cr; A-F or Aud. Prereq-[2301 or &2301], [Chem or ChemE or BioC] major, #) Honors organic chemistry lab.

CHEM 2910. Special Topics in Chemistry. (1 cr [max 6 cr]; S-N or Aud. Prereq-1 sem 1xxx chemistry or #) Topics in chemistry. Opportunities and current research.

CHEM 2910H. Special Topics in Chemistry. (1 cr [max 6 cr]; S-N or Aud. Prereq-One sem 1xxx chemistry or #) Topics in chemistry. Opportunities, current research.
CHEM 2920. Special Topics in Chemistry. (1 cr; max 6 cr; S-N or Aud. Prereq-1 sem 1xxx chemistry or #)
Topics in chemistry. Opportunities and current research.

CHEM 2920H. Special Topics in Chemistry. (1 cr; max 6 cr; S-N or Aud)
Topics in chemistry. Opportunities, current research.

CHEM 3001. Chemical Literature and Information Retrieval. (1 cr; S-N or Aud. Prereq-2302 or 2302 or #)
Information retrieval.

CHEM 3501. Introduction to Thermodynamics, Kinetics, and Statistical Mechanics. (3 cr; Stdnt Opt. Prereq-[1022 or 1032H], [MATH 2263 or &MATH 2265 or MATH 2374 or &MATH 2374], [PHYS 1302 or PHYS 1402V])

CHEM 3502. Introduction to Quantum Mechanics and Spectroscopy. (3 cr; Stdnt Opt. Prereq-[1022 or 1032H], [MATH 2263 or &MATH 2265 or MATH 2374 or &MATH 2374 or MATH 2243 or &MATH 2243 or MATH 2373 or &MATH 2373], [PHYS 1302 or PHYS 1402V])

CHEM 4001. Chemistry of Plant Materials. (4 cr; A-F or Aud. Prereq-2302, [jr or sr or #])
Chemical principles underlying structure, properties, processing, and performance of plant materials.

CHEM 4011. Mechanisms of Chemical Reactions. (3 cr; Stdnt Opt. Prereq-[2302, 3501] or equiv)

CHEM 4021. Computational Chemistry. (3 cr; Stdnt Opt. Prereq-[3502 or equiv])
CHEM 4701. Inorganic Chemistry. (3 cr; Stdnt Opt. Prereq-[2311 or &2311], [3501 or &3501 or 3502 or &3502]) 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.

CHEM 4711W. Advanced Inorganic Chemistry Lab. (2 cr; A-F or Aud. Prereq-4701, chem major) Lab experiments in inorganic/organometallic chemistry illustrating synthetic/spectroscopic techniques.

CHEM 4715. Physical Inorganic Chemistry. (3 cr; Stdnt Opt. Prereq-4701 or equiv, chem major or #) 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.

CHEM 4725. Organometallic Chemistry. (3 cr; Stdnt Opt. Prereq-4701 or equiv, chem major or #) Synthesis, reactions, structures, and other properties of main group and transition metal organometallic compounds; electronic and structural theory, emphasizing their use as stoichiometric and homogeneous catalytic reagents in organic and inorganic systems.

CHEM 4735. Bioinorganic Chemistry. (3 cr; Stdnt Opt. Prereq-4701 or equiv, chem grad or #) Role of metal ions in biology. Emphasizes structure, function, and spectroscopy of metalloproteins and their synthetic analogs.

CHEM 4745. Advanced Inorganic Chemistry. (3 cr; Stdnt Opt. Prereq-4701, chem major, #) Topics in main group and transition metal chemistry. Emphasizes synthesis, structure, physical properties, and chemical reactivity.

CHEM 5210. Materials Characterization. (4 cr; Stdnt Opt. Prereq-grad student or #) Modern tools/techniques for both bulk- and thin-film characterization. Topics may include ion-solid 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.

CHEM 5245. Introduction to Drug Design. (3 cr; A-F or Aud. &MEDC 5245, PHAR 6245. Prereq-2502 or equiv) Concepts that govern design/discovery of drugs. Physical, biogenic, medicinal chemical principles applied to explain rational design and mechanism of action drugs.

CHEM 5501. Introduction to Thermodynamics, Kinetics, and Statistical Mechanics. (3 cr; A-F or Aud. Prereq-[1022 or 1032H], [MATH 2263 or &MATH 2263 or MATH 2374 or &MATH 2374], [PHYS 1502 or PHYS 1402V]) Physical chemistry as it relates to macroscopic descriptions of chemical systems. Chemical thermodynamics, phase equilibria, chemical equilibria. Statistical mechanics.

CHEM 5502. Introduction to Quantum Mechanics and Spectroscopy. (3 cr; A-F or Aud. Prereq-[1022 or 1032H], [MATH 2263 or &MATH 2263 or MATH 2374 or &MATH 2374 or MATH 2243 or &MATH 2243 or MATH 2373 or &MATH 2373], [PHYS 1502 or PHYS 1402V]) Microscopic descriptions of chemical systems. Quantum theory. Applications to atomic/molecular structure. Molecular spectroscopy. Quantum statistical mechanics. Discussion of solutions to several differential equations.


CHEM 5755. X-Ray Crystallography. (4 cr; A-F or Aud. Prereq-Chem grad student or #) 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.

Chicano Studies (CHIC)

Department of Chicano Studies

College of Liberal Arts

CHIC 1102. Latinos in the United States: Culture and Citizenship. (3 cr; Stdnt Opt) Historical/cultural knowledge on the complex/multi-layered relationship that Latinos have to the U.S., their country of origin. Influence of social, cultural, and political dynamics on Latino identity, politics, and sense of belonging in the U.S. Cultural citizenship.

CHIC 1102H. Latinos in the United States: Culture and Citizenship. (3 cr; A-F only) Historical/cultural knowledge on the complex/multi-layered relationship that Latinos have to the U.S., their country of origin. Influence of social, cultural, and political dynamics on Latino identity, politics, and sense of belonging in the U.S. Cultural citizenship.

CHIC 1112. Introduction to Chicano/o Studies: Critical Paradigms. (3 cr; Stdnt Opt) Prevailing paradigms of analysis, methodologies of research, and guiding theoretical concepts that have shaped Chicano Studies. Chicano/o history, culture, and meanings, including (im)migration, repatriation, community formation, Chicano movement. Contemporary trends in art and culture.


CHIC 1275. Service Learning in the Chicano/ Latino Community. (3 cr; Stdnt Opt. +CHIC 1275) Hands-on, minds-on engagement in service learning. Integration of community service and related academic study. Students work as tutors/mentors in a Chicano-Latino based K-12 educational setting (school or after school program).


CHIC 1901. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

CHIC 1902. Freshman Seminar. (3 cr; Stdnt Opt) Freshman seminar.

CHIC 1907W. Freshman Seminar. (3 cr; A-F only, Prereq Fr) Topis specified in Class Schedule.

CHIC 1908W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topis specified in Class Schedule.


CHIC 3213. Chicano Music and Art. (3 cr; A-F or Aud) 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 3221. Introduction to Chicana/o Cultural Studies: Barrio Culture and the Aesthetics of Everyday Life. (3 cr; Stdnt Opt) 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. (3 cr; Stdnt Opt) 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. (3 cr; Stdnt Opt. +CHIC 1275) Hands-on, minds-on engagement in practice/theory of service learning. Integration of

CHIC 3375. Folklore of Greater Mexico. (3 cr; Stdnt Opt) Scholarly survey and exploration of the sociocultural function of various types of folklore in Greater Mexico. Students analyze the ways in which folklore constructs and maintains community, as well as resists and engages cultural shifts.


CHIC 3446. Chicana/o History II: WWII, El Movimiento, and the New Millennium. (3 cr; Stdnt Opt) 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/Indigenous Studies: History, Culture, and Politics. (3 cr; Stdnt Opt) Historical, cultural, and political processes that have impacted Chicanas/os and their understanding of being indigenous to North American continent and Southwestern U.S. History as dynamic process intimately related to present/future constructions of Mexican American identities and sociopolitical perspectives.

CHIC 3507W. Introduction to Chicana/o Literature. (3 cr; Stdnt Opt) Cultural, intellectual, and sociopolitical traditions of Mexican Americans as they are represented in creative literature. Genres/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. (3 cr; Stdnt Opt) Lived experience of Chicana/os in Midwest. Art, music, and spoken word as media for how Chicana/os convey that experience. How/why groups, affiliations, and organizations form in alignment/competition. How living in Midwest impacts those relationships.

CHIC 3712. Chicanas/os: Psychological Perspectives. (3 cr; Stdnt Opt) Textual analysis of Chicana/Latina writings with special emphasis on the psychological motivations of the subjects pertaining to race, class, and gender relationships.

CHIC 3752. Chicanas and Chicanos in Contemporary Society. (3 cr; Stdnt Opt) 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; Stdnt Opt) 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. (3 cr; Stdnt Opt + POL 3752) Foundations/contradictions of contemporary Chicano politics. Policy issues that concern Latinos, successes/failures of Latino empowerment strategies, electoral impact of Latino votes. Question of whether there is a Latino political/community.

CHIC 3900. Topics in Chicano Studies. (3 cr [max 6 cr]) Topics vary by section of course.

CHIC 3993. Directed Studies. (1-6 cr [max 16 cr]; Stdnt Opt, Prereq-#) Guided individual reading, research, and study. Students often do preliminary readings and research in conjunction with plans for education abroad programs.

CHIC 4231. The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States. (3 cr; Stdnt Opt + AAS 4231, AMIN 4231, AFRO 4231) Examination of the structural or institutional motivations of people of color in public policy. Critical evaluation of sociological theories in addressing the problem of contemporary communities of color in the United States.

**CAPY 5660. ADHD Throughout the Life Span: Perspectives on Diagnosis, Assessment, and Developmental Course.** (1 cr; Stdtnt Opt. =CAPY 5620, CAPY 5669. Prereq-Upper div) 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.


**CAPY 5670. Preventing Violence and Antisocial Behavior in Children and Adolescents: Interventions, Practices.** (1 cr; Stdtnt Opt. =CAPY 5662. Prereq-Community and school-based intervention programs aimed at the prevention of antisocial behavior are reviewed and evaluated) Community-school-based intervention programs aimed at preventing antisocial behavior.

**CAPY 5671. Suicide Prevention: Examining What Interventions May Alter Suicide Risk.** (1 cr; Stdtnt Opt) Suicide is examined from a range of perspectives by understanding differences across sex, development, and culture. Suicide prevention techniques are discussed and controversies in the field will be highlighted. Group participation is encouraged.

**CAPY 5672. Children’s Exposure to Domestic Violence: Effects on Child Functioning. Treatment Implications.** (1 cr; Stdtnt Opt) 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 5673. Prevention Programming: Learning the Skills to Implement a Preventive Intervention.** (1 cr; Stdtnt Opt) Early intervention to reduce antisocial and risk taking behaviors (e.g., suicide, unsafe sex) in teenagers. “Early Risks Skills for Success” program as model for teaching techniques of early prevention. Social-emotional skill training, academic enrichment, monitoring/mentoring, behavioral management techniques group settings, techniques to support/educate parents of a risk children.

**CAPY 5674. Serious Emotional Disturbance in Children and Adolescents.** (1 cr; Stdtnt Opt) Anxiety, mood, behavioral and trauma disorders. Case examples. Cognitive behavioral therapy, play therapy, behavior modification, parent-child interaction therapy, family Therapy. Discussion, exercises, session videotapes.


**CAPY 3308. Introduction to Research Methods in Child Psychology.** (4 cr; A-F or Aud. Prereq-2301, Psy 1001) Techniques used in the study of child development; emphasis on collection, organization, and analysis of data.

**CAPY 3360. Child Psychology Honors Seminar.** (2 cr; A-F or Aud. Prereq-CPSY honors student) 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.

**CAPY 4302. Infant Development.** (4 cr; A-F or Aud. Prereq-2301 or 3301) 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.

**CAPY 4303. Adolescent Psychology.** (4 cr; A-F or Aud. Prereq-Psy 1001) Overview of development in the second decade of life. Interactions of adolescents with family, school, and society.


**CAPY 4311. Behavioral and Emotional Problems of Children.** (4 cr; A-F or Aud. Prereq-2301 or #) Behavioral and emotional problems of children and adolescents: psychopathology contrasted to normal development; symptoms, causes, course, and prevention of common disorders, excluding physical and sensory handicaps.


**CAPY 4329. Biological Foundations of Development.** (4 cr; A-F or Aud. Prereq-2301 or equiv) Evolutionary theory and behavioral genetics applied to understanding of development of human behavior; formation of species-typical adaptive behavior and individual differences in infancy, childhood, and adolescence. This course is only offered Fall semesters.

**CAPY 4331. Social and Personality Development.** (4 cr; A-F or Aud. Prereq-2301, Psy 1001) 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.
CPSY 4334W. Children, Youth in Society. (4 cr; A-F or Aud. Prereq-2301) 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).

CPSY 4336W. Development and Interpersonal Relations. (4 cr; A-F or Aud. Prereq-2301 or equiv, 4331) Processes and functions of interactions with parents and peers; analysis of theory and research on developmental changes and influences.


CPSY 4345. Language Development and Communication. (3 cr; A-F or Aud. Prereq-2301) Structure and function of language; factors influencing development; methodological problems, language scales, theories.

CPSY 4347W. Senior Project. (2 cr; A-F or Aud. Prereq-CPsy sr) Current literature on self-selected developmental topic. Students write a literature review.

CPSY 4993. Directed Instruction in Child Psychology. (1-4 cr; max 8 cr; S-N or Aud. Prereq-ECSE or MEd student) Students serve as teaching assistants or peer advisors.

CPSY 4994. Directed Research in Child Psychology. (1-4 cr; max 8 cr; Stdnt Opt. Prereq-4 cr in CPSy, #, %) Individual empirical investigation. Students help plan/implement scientific studies, gain experience/expertise in methodology of research.

CPSY 4994V. Directed Research in Child Psychology (Honors Thesis). (1-6 cr; max 6 cr; Stdnt Opt. Prereq-4 cr in CPSy, CPsy honors, #, %) Individual empirical investigation. Students help plan/implement scientific studies while gaining experience/expertise in research methodology.

CPSY 4996. Field Study in Child Psychology. (1-4 cr; max 8 cr; S-N or Aud. Prereq-4 cr CPsy, #) Independent reading. Varies depending on student's specific area of interest. Students receive credit while interning in metropolitan area.

CPSY 5251. Social and Philosophical Foundations of Early Childhood Education. (3 cr; A-F only. Prereq-[MEd student in ECE or ECSE] or #) Surveys imagery, history, philosophy, and psychology of early childhood education. Analyzing/interpreting trends in early education, including diversity, special needs, legislation, public policy, and educationally appropriate practice.

CPSY 5252. Facilitating Social and Physical Learning in Early Childhood Education. (3 cr; A-F only. Prereq-Student in early childhood ed or early childhood special ed) Current theoretical/empirical literature and developmental knowledge as basis for planning, implementing, and evaluating social/physical growth/development of young children. For students obtaining ECE/ECSE licensure.

CPSY 5253. Facilitating Cognitive and Creative Learning in Early Childhood Education. (3 cr; A-F only. Prereq-MEd student in early childhood ed or early childhood special ed, or #) Overview of cognitive, creative, and language characteristics of children ages 0-8 years and how teachers can plan/implement scientific studies while gaining children's development in these areas.

CPSY 5281. Student Teaching in Early Childhood Education. (3 cr; A-F only. Prereq-MEd student in early childhood ed or early childhood special ed) Application of theory/research relating to teaching preschool children. For individuals obtaining ECE licensure.

CPSY 5413. Early Childhood and Public Policy. (3 cr; Stdnt Opt.) 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; max 3 cr; Stdnt Opt. Prereq- Early Childhood Policy Certificate student, #) 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.

CPSY 5501. Foundations in Infant and Early Childhood Mental Health I. (3 cr; A-F only. Prereq-[Baccalaureate degree in early-childhood-related field from accredited U.S. institution or documented equiv], [experience in early childhood research or practice]) Focuses on early childhood mental health; issues pertinent to facilitate children's development in these areas.

CPSY 5502. Infant Observation Seminar II. (1 cr Prereq-5501) 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 5503. Foundations in Infant and Early Childhood Mental Health II. (3 cr; A-F only. Prereq-5501) 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 III. (1 cr Prereq-5508) 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 5511. Infant Observation Seminar IV. (1 cr Prereq-5510) 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. Assessment in Infant and Early Childhood Mental Health: DC 0-3R. (2 cr; Stdnt Opt. Prereq-[Baccalaureate degree in early-childhood-related field from accredited U.S. institution or documented equiv], [experience in early childhood research or practice]) Achieving reliability in two observational measures of parent-child interaction: (1) nursing child assessment feeding (2) teaching Scales. Discussion, lecture, videotapes, listening/observation tasks.

CPSY 5515. Assessment in Infant and Early Childhood Mental Health: NCAST. (2 cr; S-N only. Prereq-[Baccalaureate degree in early-childhood-related field from accredited U.S. institution or documented equiv], [experience in early childhood research or practice]) Achieving reliability in two observational measures of parent-child interaction: (1) nursing child assessment feeding (2) teaching Scales. Discussion, lecture, videotapes, listening/observation tasks.

CPSY 5518. Prevention and Intervention in Infant and Early Childhood Mental Health I. (3 cr; A-F only. Prereq-5501, 5503, 5506, 5508) Students design prevention/intervention programs and apply evidence-based strategies in workplace/practicum settings. Readings, in-class reflective practice groups.

CPSY 5521. Prevention and Intervention in Infant and Early Childhood Mental Health II. (3 cr; A-F only. Prereq-5518) 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. Prereq-5518 or 5521) 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. Prereq-5518 or 5521) Principles and strategies of reflective supervision/consultation. Discussion, final assignment designated by instructor.
Chinese (CHN)
Department of Asian Languages and Literatures
College of Liberal Arts


CHN 1012. Beginning Modern Chinese. (6 cr; Stdnt Opt. +CHN 4002. Prereq-1011 or equiv or #) Speaking and reading modern standard Chinese through structured practice.

CHN 1015. Accelerated Beginning Modern Chinese. (5 cr; Stdnt Opt. Prereq-1012 or 1015; oral/aural skills or speaker of other Chinese dialect recommended) Continuation of CHN 1015. 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.

CHN 3021. Intermediate Modern Chinese. (5 cr; Stdnt Opt. +CHN 4003. Prereq-1012 or 1015 or equiv or #) Modern standard Chinese skills developed further through conversations, writing, and reading.


CHN 3031. Advanced Modern Chinese. (4 cr; Stdnt Opt. Prereq-3022 or equiv or #) Reading and analysis of 20th-century texts.

CHN 3032. Advanced Modern Chinese. (4 cr; Stdnt Opt. Prereq-3031 or equiv or #) Reading and analysis of 20th-century texts.


CHN 3290. Chinese Language Teaching Tutorial. (1 cr [max 2 cr]; S-N only. Prereq-Grade of A in 3032) Students tutor beginning students of Chinese and are part of department’s Chinese language team.


CHN 4006. Accelerated Intermediate Modern Chinese. (3 cr; Stdnt Opt. Prereq-1012 or 1015, grad student) #; oral/aural skills or other Chinese dialect recommended) Continuation of 1015. Mandarin Chinese. Reading, writing, standard pronunciation.


CHN 4292. Directed Reading. (1-5 cr [max 5 cr]; Stdnt Opt. Prereq-# or #, @) Guided individual reading or study.

CHN 5011. Research Methods. (4 cr; Stdnt Opt. Prereq-3032 or 3112) Introductory to the sources and approaches of research in language and literature.

CHN 5101. Chinese Survival Skills. (1 cr; S-N or Aud. Prereq-Enrolled in U of M law school) For students about to depart for China who have had no formal Chinese language instruction.


CHN 5120. Topics in Chinese Linguistics. (4 cr [max 8 cr]; Stdnt Opt. Prereq-q4121 or 4125) Studies of the structure and change in the Chinese language.

CHN 5212. Introductory Classical Chinese. (3 cr; Stdnt Opt. Prereq-3111 or 5211 or #) Reading/analysis of representative texts.

CHN 5393. Directed Study. (1-5 cr [max 18 cr]; Stdnt Opt. Prereq-# or #, @) Guided individual reading or study.

Civil Engineering (CE)
Department of Civil Engineering
College of Science and Engineering

CE 5. Refresher Course for Civil Engineers. (0 cr; S-N or Aud. Prereq-BCE or equivalent degree or completion of Parts I and II of the State Board Examination) Review of civil engineering fundamentals required to pass the Minnesota Professional Engineering Examination in civil engineering.

CE 1101. Civil Engineering Orientation. (1 cr; S-N or Aud. Prereq-Lower div) Introduction to Department of Civil Engineering and civil engineering practice. Presented by faculty members and professional engineers.


CE 3102. Uncertainty and Decision Analysis in Civil Engineering. (3 cr; A-F or Aud. Prereq-MATH 1371, MATH 1372 or equiv) Stochastic models, their usefulness in reasoning about uncertainty in civil engineering. Techniques for identifying, fitting, and validating models using data samples. Testing hypotheses about, and bounding uncertainty attached to, engineering parameters. Applications to branches of civil engineering.

CE 3111. CADD for Civil Engineers. (2 cr; S-N only. Prereq-3201) Introduction to AutoCAD and land development desktop software. Students complete all tasks to design two-lane roadway using civil engineering design software, including topography, plan/profile, contours, cross sections, and quantity calculations.

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CE 3202. Surveying and Mapping. (2 cr; A-F or Aud. Prereq-[MATH 1271, MATH 1272IT] or consent of instructor) 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.


CE 3401. Linear Structural Analysis. (3 cr; A-F or Aud. Prereq-Grade of at least C- in AEM 3031, IT) Analysis of determinate/determinate trusses and frames and of deformation by virtual work. Application of energy, slope-deflection, and moment distribution methods to indeterminate structures. Influence lines. Design.

CE 3402W. Civil Engineering Materials. (3 cr; A-F or Aud. Prereq-Grade of at least C- in [AEM 3031 or BBE 3001], IT) Concepts of behavior mechanisms for civil engineering materials such as concrete, metals, asphalt, plastics, and wood. Standard specifications for material properties. Techniques for testing.

CE 3406. Construction Materials for Managers. (3-4 cr; A-F or Aud. Prereq-[AEM 3011 or WPS 4301], construction management major) Basic concepts of physical properties and behavior mechanisms for construction materials such as concrete, steel, aluminum, and wood. Standard specifications for material properties. Laboratory techniques for evaluation of each material.


CE 4000H. Honors Research Seminar. (1 cr [max 2 cr]; A-F only. *GEOE 4000H. Prereq-Upper div CE) Research seminars in civil and geological engineering given by faculty members and visiting scholars.

CE 4011. Special Topics. (1-4 cr [max 12 cr]; A-F only. Prereq:Upper div CE) Topics/credits vary.

CE 4092H. Honors Selected Reading. (1 cr [max 2 cr]; A-F only. *GEOE 4092H. Prereq-Upper div CE) Selected readings, student presentations.


CE 4102W. Cost Estimating Design. (4 cr; A-F or Aud. Prereq:4301, 4401, 4501, 4502) 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.


CE 4170. Independent Study I. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#) Special studies in planning, designing, or analyzing civil engineering systems. Lab problems, literature studies, or reports supervised by staff.

CE 4180. Independent Study II. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#) Special studies in the planning, design, or analysis of civil engineering systems. Individual lab research problems, literature studies, reports. Supervised by staff.

CE 4190. Engineering Co-op Assignment. (2-6 cr [max 6 cr]; S-N or Aud. Prereq-Upper div CE, approval of department co-op director) Formal written report of work during six-month professional assignment.


CE 4201. Highway Design. (3 cr; A-F or Aud. Prereq:Upper div Geo or grad, 3202, 3201 or #) Vertical and horizontal alignment, earthwork computations, highway capacity, forecast of traffic volume demand, impact of vehicle type on geometric design, intersection design.


CE 4341. Engineering Geostaticis. (3 cr; A-F or Aud. *GEOE 4341. Prereq-CE, GEOE or upper div Geo or grad, Stat 3201 or #) Problem solving and decision making in civil and geological engineering using applied statistics. Emphasizes spatially correlated data, e.g., geologic site characterization, spatial sampling design.


CE 4401. Steel and Reinforced Concrete Design. (4 cr; A-F or Aud. Prereq-Grade of at least C- in 3401, 3402, [upper div IT or grad student]) Limit-states design. Steel: tension, compression, flexure, combined compression/flexure, connections. Concrete: beams in flexure/shear, one-way slabs, T-beams, development length, serviceability.

CE 4441. Matrix Structural Analysis. (3 cr; A-F or Aud. Prereq-[Grade of at least C- in [3101, 3401] or in a CSCI programming course], [upper div IT or grad student]) or #) Analysis of linear structural systems by matrix methods, stiffness, and flexibility methods.
CE 4412. Reinforced Concrete Design II. (3 cr; A-F or Aud. Prereq-[Grade of at least C- in 4401, [upper div IT or grad student] or #; 4411 recommended)
Advanced design of reinforced concrete structures: footings, retaining walls, columns with slenderness effects and biaxial loading, torsion, continuous systems, two-way floor systems.

CE 4413. Steel Design II. (3 cr; A-F or Aud. Prereq-[Grade of at least C- in 4401, [upper div IT or grad student] or #; 4411 recommended)
Design of steel and composite steel/concrete structures, including multistory frames and plated girders. Beam-columns, torsion, connections, frames.

CE 4501. Hydrologic Design. (4 cr; A-F or Aud. Prereq-3502)

CE 4502. Water and Wastewater Treatment. (3 cr; A-F or Aud. Prereq-3501 or CHEN 2001)

CE 4511. Hydraulic Structures. (3 cr; A-F or Aud. Prereq-4501)
Hydraulic design procedures for culverts, dams, spillways, outlet works, and river control works. Drop structures, water intakes, bridge crossings. Off-channel structures.

CE 4512. Open Channel Hydraulics. (4 cr; A-F or Aud. Prereq-IT or grad, 3502 or #)
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 moveable bed mechanics.

CE 4531. Environmental Process Engineering. (3 cr; A-F or Aud. Prereq-3501, & 4511)
Physical principles that influence behavior of engineered and natural environmental systems. Flow behavior through reactors, mass transfer, interfacial effects, stability, kinetics.

CE 4562. Environmental Remediation Technology. (3 cr; A-F or Aud. Prereq-3501, 4501 or #)
Technologies designed for removal of pollutants from groundwater and soils. Advances in technological design. Emerging technologies such as in situ bioremediation, phytoremediation. Role of environmental biotechnology in pollution abatement.

CE 5094. Civil Engineering Research. (1-4 cr [max 4 cr]; Stdt Opt. Prereq-#)
Research or independent study in concrete, structural steel, soils, hydraulics, hydrology/ municipal, environmental, or transportation problems. Investigations, reports, tests, designs.

CE 5180. Special Topics. (1-4 cr [max 4 cr]; A-F or Aud. Prereq-#)
Topics vary depending on faculty and student interests.

CE 5211. Traffic Engineering. (3 cr; Stdt Opt. Prereq-3201, Stat 3021 or equiv)
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.

CE 5212. Transportation Policy, Planning, and Deployment. (4 cr; Stdt Opt. Prereq-3201 or equiv)

CE 5214. Transportation Systems Analysis. (4 cr; Stdt Opt. Prereq-3201)
Systems approach, its application to transportation engineering/ planning. Prediction of flows and level of service. Production functions, cost optimization, utility theory, demand modeling, transportation network analysis, equilibrium assignment, decision analysis, multidimensional evaluation of transportation projects.

CE 5253. Asphalt and Portland Cement Concrete Materials. (4 cr; Stdt Opt. Prereq-[3402, upper div IT or grad student or #)

CE 5311. Geomechanics. (3 cr; A-F or Aud. +GOE 5311, Prereq:Upper div IT or grad, 4301, GeoE 4301 or #)

CE 5321. Geomechanics. (3 cr; A-F or Aud. +GOE 5321, Prereq:Upper div IT or grad, 4301 or GeoE 4301)

CE 5331. Geomechanics Modeling. (3 cr; A-F or Aud. +GOE 5331, Prereq:Upper div IT or grad, 4301 or #)
Soil and rock response in triaxial testing; drained and undrained behavior; elastic and plastic properties. Modeling stresses, strains, and failure in geomechanics problems.

CE 5341. Wave Methods for Nondestructive Testing. (4 cr; A-F or Aud. Prereq-[AE 2021, AEM 3031 or #)
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, lab.

CE 5351. Advanced Mathematics for Civil Engineers. (3 cr; A-F or Aud. Prereq-[(Math 2263 or Math 2374 or equiv), JR or grad student] in civil engineering) or #)
Emphasizes skills relevant for civil engineers. Mathematical principles explained in an engineering setting. Applications from various areas in civil engineering.

CE 5414. Prestressed Concrete Design. (3 cr; A-F or Aud. Prereq-[Grade of at least C- in 4401, [upper div IT or grad student] or #; 4412 recommended)
Design of prestressed concrete structures. Time dependent effects, behavior, flexure, shear, torsion, deflections, continuous systems.

CE 5415. Masonry Structures. (3 cr; A-F or Aud. Prereq-[Grade of at least C- in 5401, [upper div IT or grad student] or #; 4412 recommended)

CE 5511. Urban Hydrology and Land Development. (4 cr; A-F only. Prereq-CE 4501)
Urban hydrology for small watersheds and the management of storm water quality and quantity.

CE 5541. Environmental Water Chemistry. (3 cr; A-F only. A-F or Aud. Prereq-3501, Chem 1021, Chem 1022)
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.

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.

CE 5551. Environmental Microbiology. (3 cr; A-F or Aud. Prereq-[Upper div or grad] student)
Role of microorganisms in environmental bioremediation, pollution control, water wastewater treatment, biogeochemistry, and human health. Lecture.

CE 5552. Environmental Microbiology Laboratory. (1 cr; A-F only. Prereq-5551 or & 5551)
Basic microbiological techniques: isolation, identification/enumeration of bacteria, BOD, biodegradable kinetics, disinfection. Lab.

CE 5581. Water Resources: Individuals and Institutions. (3 cr; A-F or Aud. Prereq-#)
Control of water resources by natural system functions, user actions. Influence of social, economic, and political institutions. Water resource policy in the United States. Case studies (e.g., flood/drought management).
CE 5591. Environmental Law for Engineers. (3 cr; A-F or Aud. Prereq: Upper div IT or grad or P) Environmental regulatory law relevant to civil and environmental engineering; specific provisions of federal statutory and regulatory laws such as NEPA, CWA, RCRA, CAA, and CERCLA.

Classical and Near Eastern Studies (CNES)

Department of Classical and Near Eastern Studies
College of Liberal Arts

CNES 1002. World of Greece. (3 cr; Stdnt Opt) Ancient Greek civilization, from second millennium BCE to Roman period. Art/ archaeology, philosophy, science, literature, social/political institutions. Focuses on connections with contemporary cultures corresponding to Ancient Near East.

CNES 1003. World of Rome. (3 cr; Stdnt Opt) 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 1042H. Honors Course: Greek and Roman Mythology. (4 cr; Stdnt Opt. Prereq = CNES 1042. Prereq- Honors or P) Introduction to stories/study of Greek/Roman mythology.

CNES 1043. Introduction to Greek and Roman Archaeology. (4 cr; Stdnt Opt) Role that material culture, including art/architecture, plays in forming our picture of Classical past. Relationship between archaeology and other disciplines dealing with past. Selected sites, motives/methods of research. How results are used by archaeologists and general public.

CNES 1044. Introduction to Near Eastern Archaeology. (3 cr; Stdnt Opt) Near Eastern peoples before Greco-Roman times, how archaeology discovered them. Cultural history going back 10,000+ years, including rise of farming, domestic life, states, and empires. Art, ideas, and architecture of Egypt, Babylonia, Persia, and other civilizations.

CNES 1046. Technical Terminology for the Health Professions. (3 cr; Stdnt Opt. Prereq = CLAS 1148) Greek and Latin prefixes, suffixes, and roots basic to the vocabulary of health professions; taught through computer-assisted instruction.


CNES 1905. Freshman Seminar. (3 cr; Stdnt Opt) Topics specified in Class Schedule.

CNES 1909W. Freshman Seminar. (3 cr; Stdnt Opt) Topics specified in Class Schedule.

CNES 1910W. Freshman Seminar. (3 cr; Stdnt Opt, Prereq-For or up to 30 cr) Topics specified in Class Schedule.


CNES 3035. Classical Myth in Western Art. (4 cr; Stdnt Opt. Prereq = ARTH 3035) Role of myth in visual arts. Major figures/stories that became popular in ancient world and have fascinated artists/audiences ever since.

CNES 3070. Topics in Ancient Religion. (3 cr; Stdnt Opt. Prereq = RELS 3070) 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. (3 cr; Stdnt Opt. Prereq = CNES 5071) Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities, ritual performance, prayer/sacrifice, temple architecture, death and the afterlife, mystery cults, philosophical religion, Near Eastern salvation religions.


CNES 3076. Apostle Paul: Life, Letters, and Legacy. (3 cr; Stdnt Opt. Prereq = CNES 5076) How/what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/enemies.


CNES 3083W. Ancient Comedy. (3 cr; Stdnt Opt) Greek/Roman comic drama (e.g., Aristophanes, Menander, Plautus, Terence).

CNES 3101. Ancient Greece: Poet and Hero in the Age of Homer. (3 cr; Stdnt Opt) Homer and his epic poetry. Trojan war. Greek lyric poets (Sappho, Pindar). Early Greek philosophy.


CNES 3104. Ancient Rome: Kings and Consuls. (3 cr; Stdnt Opt) Roman Republic, from its origins to Caesar’s death.


CNES 3109. The Age of Justinian and Muhammad (c.500-c.700 A.D.). (3 cr; Stdnt Opt) Uses sources written between 500 and 700 A.D. to consider history, art, religion, and architecture of Golden Age of Byzantium, its superpower relations with Persian Empire. Way that Arab invasions from mid-7th century altered configuration of Mediterranean world and Near East.

CNES 3142. Art of Egypt. (4 cr; Stdnt Opt. = ARTH 3142) Arts and architecture of Egypt, from prehistoric times to emergence of modern Egypt. Emphasizes elements of continuity and of change that have shaped Egyptian culture.

CNES 3152. Art and Archaeology of Ancient Greece. (4 cr; Stdnt Opt. = ARTH 3152) Civilization of ancient Greece as revealed through art and material culture. Case studies of selected monuments/sites.

CNES 3162. Roman Art and Archaeology. (4 cr; Stdnt Opt. = ARTH 3162. Prereq-: CLAS 3162) Introduction to art and material culture of Roman world: origin, change, continuity. “Progress” or “decay” in the later Empire, its legacy to modern world.


CNES 3340. Practicum in Archaeological Field and Computer Techniques. (3 cr; Stdnt Opt. = CLCV 3340, ARTH 5340, CNES 5340, ARTH 3340. Prereq-CLCV major or # or 1 course in ancient art and archaeology) Methods used for excavation of Old and New World sites. Meets at archaeometry/computer lab for part of the semester and at a selected site in Minnesota for day-long sessions for 9 to 10 weeks.

CNES 3502. Ancient Israel: From Conquest to Exile. (3 cr; Stdnt Opt. = HIST 3502, CNES 5502. Prereq-Knowledge of Hebrew not required, 3500 recommended) 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.


CNES 3535. Death and the Afterlife in the Ancient World. (3 cr; Stdnt Opt. = CNES 5535) 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. (3 cr; Stdnt Opt. = CNES 5601) 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 3951W. Major Project. (4 cr; Stdnt Opt. Prereq-These 3xxx ANE courses, [major in ANE or CNEA or RELS]) Research project pertaining to ancient world, using documents or primary sources along with secondary sources. Students select project in consultation with faculty member.

CNES 3993. Directed Studies. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-#) Guided individual reading or study.

CNES 4051. Ancient Near East and Egypt: Neolithic to 1500 BCE. (3 cr; A-F or Aud. +HIST 4051. Prereq-: Previous coursework in ancient history recommended) Lands of Western Asia and Northeast Africa from Neolithic through Middle Bronze Age. Interdependent technological/political developments such as agriculture, state formation, writing. Use of literature/art as vehicles for articulating concepts. Changing relationships among cultures/polities of ancient Near East and regions beyond.

CNES 5013. Introduction to Roman Law. (3 cr; Stdnt Opt) Survey of Roman law from social and historical perspectives. Basic concepts of Roman private law and legal procedure.


CNES 5071. Greek and Hellenistic Religions. (3 cr; Stdnt Opt. = CNES 3071, Prereq-#) Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities; ritual performance; prayer and sacrifice; temple architecture; death and the afterlife; mystery cults; philosophical religion; Near Eastern salvation religions. Meets with 3071.


CNES 5076. Apostle Paul: Life, Letters, and Legacy. (3 cr; Stdnt Opt. = CNES 3076) How/what we can know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.

CNES 5077. Religious Violence in the Early Roman Empire: Jews, Christians, and Pagans. (3 cr; Stdnt Opt. = RELS 3077, CNES 3077, RELA 3077, RELS 5077, RELA 5077) Methods for understanding discourses of violence. Ways religious traditions shaped...
ethic identity/practices and views of sacrifice, martyrdom, spectacles of violence, apocalyptic ideologies of violence, state persecution, texts and terror, and holy war.

CNE5 5080. New Testament Proseminar. (3 cr [max 18 cr]; Stdnt Opt. Prereq-1082 or 3072 or equiv)
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.

CNE5 5081W. Classical Epic in Translation. (3 cr; Stdnt Opt. «CLCV 3081W, CNE5 3081W, Prereq-Grad student or #)

CNE5 5082W. Greek Tragedy in Translation. (3 cr; Stdnt Opt)
Origins of tragedy. Selected plays of Aeschylus, Sophocles, and Euripides.

CNE5 5083. Ancient Comedy. (3 cr; Stdnt Opt)
Greek/Roman comic drama (e.g., Aristophanes, Menander, Plautus, Terence).

CNE5 5088. Greek Architecture. (3 cr; Stdnt Opt. «ARTH 5088. Prereq-Jr, ClAS/ArTH 3008 or #)
Geometric through classical examples of religious and secular architecture and their setting at archaeological sites in Greece, Asia Minor and Italy.

CNE5 5111. Prehistoric Art and Archaeology of Greece. (3 cr; Stdnt Opt. «ARTH 5111. Prereq-Jr. Greek art or archaeology course or #)
Artistic and architectural forms of Neolithic period in Aegean area and Cycladic, Minoan, and Mycenaean cultures. Aims and methods of modern field archaeology; the record of human habitation in the Aegean area. Archaeological evidence as a basis for historical reconstruction.

CNE5 5112. Archaic and Classical Greek Art. (3 cr; Stdnt Opt. Prereq-Jr, ClAS/ArTH 5111)
Sculpture, painting, architecture and minor arts in Greek lands from the 9th through 5th centuries B.C. Examination of material remains of Greek culture; archaeological problems such as identifying and dating buildings; analysis of methods and techniques. Emphasis on Periclean Athens.

CNE5 5120. Field Research in Archaeology. (3-6 cr [max 6 cr]; Stdnt Opt. «ARTH 5120, CLCV 5120. Prereq-#)
Field excavation, survey, and research at archaeological sites in the Mediterranean area. Techniques of excavation and exploration; interpretation of archaeological materials.

CNE5 5172. House, Villa, Tomb: Roman Art in the Private Sphere. (3 cr; Stdnt Opt. «ARTH 5172. Prereq-Intro art history course or #)
Architecture, painting, and sculpture of urban houses, country estates, and tombs in Roman world. Relationships between public/private spheres and literary/physical evidence. Usefulness of physical evidence in illuminating gender roles.

CNE5 5182. Art and the State: Public Art in the Roman Empire. (3 cr; Stdnt Opt. «ARTH 5182. Prereq-Intro art history course or #)

CNE5 5251. Archaeology of Herodian Israel. (3 cr; A-F or Aud. «REL5 5251, RELA 5251. Prereq-One course in (archaeology or ancient history) or grad student)
Archaeological sites in Israel dating to era of Herod the Great (37-4 BC). Palaces and religious edifices. Remains from Jewish/gentile settlements throughout the kingdom. Course readings consist of contemporary literary sources and excavation reports.

CNE5 5252. History of Early Christian Art in Context. (4 cr; Stdnt Opt. «ARTH 5252. Prereq-3xxx art history course or #)
Role played by art in formation of early Christian/Byzantine communities and in establishing their relationships with Pagan world and early Islam.

CNE5 5340. Practicum in Archaeological Field and Computer Techniques. (3 cr; Stdnt Opt. «CLCV 5340. ARTH 5340. ARTH 3340. CNE5 3340. Prereq-CICV major or ancient art and archaeology course or #)
Methods used for excavation of Old and New World sites. Meets at archaeometry/computer lab for part of the semester and at a selected site in Minnesota for day-long sessions for 9 to 10 weeks. Meets with 3340.

CNE5 5502. Ancient Israel: From Conquest to Exile. (3 cr; Stdnt Opt. «HIST 5502. CNE5 3502. Prereq-Knowledge of Hebrew not required; 5501 recommended)
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.


CNE5 6061. Sexuality and Gender in Ancient Greece and Rome. (3 cr; Stdnt Opt. «CNE5 6061. SWhat we know (or think we know) about ancient Greek/Roman ideas about sexuality and gender roles. Nature of evidence/methodologies by which it is analyzed.

CNE5 701. Alphabetic Epigraphy of the Ancient Near East. (3 cr; Stdnt Opt)

CNE5 717. Introduction to Ugaritic. (3 cr; Stdnt Opt. Prereq-Adv study of biblical texts or #)
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.

CNE5 7956. Classical Texts : Approaches and Methods. (3 cr; Stdnt Opt. Prereq-CNE5 grad student or #)
Methods/approaches, from antiquity to present, for reading/interpreting Greek/Latin literary texts.

CNE5 5940. Topics in Classical Literature. (3 cr [max 9 cr]; Stdnt Opt. Prereq-Two literature courses or #)
Additional work for graduate credit. Topics specified in Class Schedule. Meets with 3940.

CNE5 5992. Directed Research. (1-12 cr; Stdnt Opt. Prereq-#; @)
Guided individual reading or study.

CNE5 5994. Directed Instruction. (1-12 cr; Stdnt Opt. Prereq-#; @)
Guided individual research.

Classical Civilization (CLCV)

Department of Classical and Near Eastern Studies

College of Liberal Arts

CLCV 1301. The Olympic Games. (3 cr; Stdnt Opt. «CLCV 3301, ARTH 3201)
Surveys the Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

CLCV 3501W. Classical Epic in Translation. (3 cr; Stdnt Opt. «CLCV 5081W, CNE5 3081W. Prereq-Classical Civilization major or #)

CLCV 3501. The Olympic Games. (3 cr; Stdnt Opt. «ARTH 3201, CLCV 1301)
The Olympic Games (776 B.C. to A.D. 338) and other ancient athletic festivals, including those for women participants. Greek art and literature serve as basic sources. Comparisons are made with modern athletic events.

CLCV 3340. Practicum in Archaeological Field and Computer Techniques. (3 cr; Stdnt Opt. «ARTH 5340, CNE5 5340, ARTH 3340. CNE5 3340. Prereq-CICV major or # or one course in ancient art and archaeology)
Methods used for excavation of Old and New World sites. Meets at archaeometry/computer lab for part of the semester and at a selected site in Minnesota for day-long sessions for 9 to 10 weeks.

CLCV 3502. Scandinavian Myths. (3 cr; Stdnt Opt)
Literary/cultural investigation of popular myths, myths, and religion of medieval Scandinavians. Interaction of paganism and Christianity. Reflection of myths in Old Scandinavian literature/art. All readings in English.
Clinical Laboratory Sciences Program (CLSP)

Allied Medical Technology

Academic Health Center Shared

CLSP 1010. Orientation in Clinical Laboratory Sciences. (1 cr; S-N or Aud. Prereq-%) Orientation to medical technology (clinical laboratory science) profession.

CLSP 4092. Honors Program: Laboratory Methods. (3 cr; Stdnt Opt. Prereq-%) Individual assignment to special projects or research in one of the clinical areas of chemistry, hematology, immunohematology, or microbiology.

CLSP 4101. Virology, Mycology, and Parasitology for Clinical Laboratory Scientists. (2 cr; A-F or Aud. Prereq-One microbiology course with lab, one biochem course, enrolled CLSP student, #) Basic aspects of lab diagnosis of viral, fungal, and parasitic infections. Lecture.

CLSP 4102. Principles of Diagnostic Microbiology. (2 cr; A-F or Aud. Prereq-One microbiology course with lab, one biochem course, enrolled CLSP student, #) Techniques used in laboratory diagnosis of infectious diseases. Isolating/identifying bacteria/yeast. Antibacterial susceptibility testing. Lecture.

CLSP 4103. Diagnostic Microbiology: Laboratory. (2 cr; A-F or Aud. Prereq-One microbiology course with lab, one biochem course, enrolled CLSP student, #) Techniques used in lab diagnosis of infectious disease. Isolating/identifying bacteria/yeasts. Antimicrobial susceptibility testing. Lab.

CLSP 4201. Hematology I. (3 cr; A-F or Aud. Prereq-Enrolled CLSP, #) Theory/application of basic principles in clinical hematology. Lecture, lab.

CLSP 4202. Hematology II. (2 cr; A-F or Aud. Prereq-[4201 or 5201], enrolled CLSP student, #) Fundamentals of examining blood/bone marrow. Emphasizes identification of normal, immature, and abnormal cells. Correlation of clinical/lab findings. Lecture, lab.

CLSP 4203. Hemostasis. (1 cr; A-F or Aud. Prereq-[4201 or 5201], enrolled CLSP student, #) Theory/application of concepts/techniques in hemostasis/coagulation. Lecture, Lab. Online course.

CLSP 4265. Comparative Hemostasis. (1 cr; A-F or Aud) Theory and application of specific concepts and techniques in hemostasis and coagulation.

CLSP 4301. Urinalysis. (1 cr; A-F only. Prereq-CLSP student) Procedures for the physical, chemical, and microscopic examination of urine. Lecture, lab.

CLSP 4302. Clinical Chemistry I: Lecture and Lab. (3 cr; A-F or Aud. Prereq: Two organic chem courses with lab, one biochem course, #) Assessing renal/metabolic disease/dysfunction, electrolyte, and acid-base balance. Principles/processes for quality assurance in clinical lab. Lecture online only, lab.

CLSP 4304. Clinical Chemistry II: Lecture. (2 cr; A-F or Aud. Prereq-[4302 or 5302], two organic chem courses with lab, one biochem course, #) Principles/application of clinical chemistry. Correlation of clinical/lab findings.

CLSP 4305. Clinical Chemistry II: Laboratory. (2 cr; A-F or Aud. Prereq-[4302 or 5302], two organic chem courses with lab, one biochem course) Principles/application of lab procedures in clinical chemistry.

CLSP 4401. Immunology. (1 cr [max 2 cr]; A-F or Aud. Prereq-BIOC 3021, #) Basic principles of human immune function, clinical applications, technical techniques (including flow cytometry).

CLSP 4402. Molecular Diagnostics. (2 cr [max 4 cr]; A-F only) Theory/application of molecular diagnostics in clinical lab. Lecture, lab.

CLSP 4501. Introduction to Transfusion Medicine. (2 cr; A-F or Aud) Principles of blood grouping, antibody identification, compatibility testing, donor testing for transfusion medicine.

CLSP 4502. Introduction to Transfusion Medicine: Laboratory. (2 cr; A-F or Aud. Prereq-[4401 or 5401]) Exercises illustrating basic techniques in blood grouping, antibody identification, compatibility testing, and donor testing for transfusion medicine.

CLSP 4601W. Management and Professional Issues. (2 cr [max 4 cr]; A-F only. Prereq-4602, CLSP student) Basic concepts in professional issues and management as applied to clinical lab.

CLSP 4602. Basic Concepts in Education and Research as Applied to the Clinical Laboratory. (1 cr; A-F or Aud. Prereq-#)

CLSP 4701. Applied Diagnostic Microbiology. (2 cr; S-N or Aud. Prereq-[4701, 4101, enrolled CLSP student, #) Isolation, identification, and antimicrobial susceptibility testing of clinically significant microbes from patient specimens.

CLSP 4702. Applied Clinical Hematology/Hemostasis. (2 cr; S-N or Aud. Prereq-[4701, 4201, 4202, 4302, 4304, 4305, enrolled CLSP student, #) Application of basic methods/techniques in clinical hematology, cellular morphology, and hemostasis.

CLSP 4703. Applied Clinical Chemistry and Urinalysis. (2 cr; S-N or Aud. Prereq-[4703, 4302, 4304, 4305, enrolled CLSP student, #) Application of basic methods/techniques in clinical chemistry lab.

CLSP 4704. Applied Transfusion Medicine. (2 cr; S-N or Aud. Prereq-[4704, 4501, 4502, enrolled CLSP student, #) Application of basic methods/techniques in transfusion medicine lab.

CLSP 4705. Specialty Rotation. (1 cr; S-N or Aud. Prereq-Enrollment in CLS program) A one week rotation in specialty lab such as cytogenetics, flow cytometry, microbiology lab at MN Dept of Health, and other choices.

CLSP 4901. Special Laboratory Methods. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-CLSP student, #) Individual assignment to special project in research lab or clinical lab.

Collaborative Arts Interdisciplinary Program (COLA)

Department of Theatre Arts and Dance

College of Liberal Arts

COLA 1001. Art of Collaboration. (3 cr; A-F only) Characteristics/challenges of collaboration, through three representative approaches from the visual arts, music, and theater. Concrete problematic situations arising from a collaborative/multimedia-enhanced project.
COLA 1521. Collaboratory I: Collaborative Research Laboratory. (1 cr [max 2 cr]; S-N only)
Students and IPCA faculty share works-in-progress, discuss work processes, develop new collaborations, and wrestle with the art of critique.

COLA 3001. Art of Collaboration 2. (5 cr; A-F only)
Characteristics/challenges of collaboration, through three representative approaches from the movement/dance, music, and theater. Concrete problematic situations arising from a collaborative/multimedia-enhanced project.

COLA 3011. Move to Question: A Lab for Creative Practice. (3 cr; Stdnt Opt)

COLA 3012. Crossing Boundaries to Imagine New Worlds. (3 cr; Stdnt Opt)
Boundaries/intersections where multiple art forms/practices converge. Students collaborate to co-author/create works for in-class/public performance.

COLA 3014. Making Beatz: Cutting Time, Hiding Time, Revealing Time. (5 cr; Stdnt Opt)

COLA 3215. Towards a Theory of Collaboration. (3 cr; A-F only)
Eleven topics for student symposia. Flow psychology, jazz, action painting, human-computer interaction, Bacon's graphs, dance/music, gestures in music, French diagrammatics, collaboratories, Raifael Project, Rubato software for music.

COLA 3416. The Documentary. (4 cr; Stdnt Opt)

COLA 3521. Collaboratory II: Collaborative Research Laboratory. (1 cr [max 2 cr]; S-N only)
Students and IPCA faculty share works-in-progress, discuss work processes, develop new collaborations, and wrestle with the art of critique.

COLA 3950. Topics in Collaborative Arts. (1-4 cr [max 32 cr]; Stdnt Opt. Prereq-#)
Focuses on a single topic, listed in Class Schedule.

COLA 4321. Flow and Gesture in the Art of Collaboration. (3 cr; Stdnt Opt)
Three basic layers of art collaboration: flow, gesture, collaboration. Psychology, jazz, action painting, human-computer interaction.

COLA 5215. Towards a Theory of Collaboration. (3 cr; A-F only)
Eleven topics for student symposia. Flow psychology, jazz, action painting, human-computer interaction, Bacon’s graphs, dance/music, gestures in music, French diagrammatics, collaboratories, Raifael Project, Rubato software for music.

COLA 5950. Topics in Collaborative Arts. (1-4 cr [max 32 cr]; Stdnt Opt. Prereq-#)
Focuses on a single topic, listed in Class Schedule.

COLA 5993. Directed Studies. (1-3 cr [max 15 cr]; A-F only. Prereq-#; @)
Guided independent study.

**College of Food, Agricultural and Natural Resource Sciences (CFAN)**

CFAN 1201. Discovering Majors and Careers. (1 cr; A-F only)
Five stages in the career discovery process: self-assessment, exploration, decision making, experimenting, and implementing. Determining next steps in academic/career process.

CFAN 1501. Biotechnology, People, and the Environment. (3 cr; A-F or Aud)
Basic concepts in genetic engineering as a foundation for studying the impact of biotechnology on agriculture, medicine, industry, and the environment. Continental aspects of biotechnology related to public policy issues are discussed.

CFAN 1901. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1902. Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1903. Freshman Seminar. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1904. Freshman Seminar. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1905. Freshman Seminar. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1906W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1910W. Freshman Seminar: Topics. (1-3 cr [max 3 cr]; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 3000. Directed Studies in International Agriculture. (2-4 cr [max 8 cr]; A-F or Aud. Prereq-#)
Oral presentations, discussion of students' research papers. Literature review of selected topics. Discussions with students/staff about their experiences in international agriculture.

CFAN 3000H. Honors Topics in CFANS. (2-4 cr [max 6 cr]; A-F or Aud. Prereq-Honors)
Oral presentations, discussion of students' research papers. Literature review of selected topics. Discussions with students/staff about their experiences in international agriculture.

CFAN 3001. Pests and Crop Protection. (3 cr; A-F or Aud. Prereq-BIOL 1009 or equiv or #)
Introduction to biology/identification of insects, weeds, and diseases that affect agricultural crops. Management of these organisms based on principles of integrated pest management.

CFAN 3100H. Honors Experience. (2-3 cr [max 6 cr]; A-F or Aud. Prereq-#)
Developed by student and CFANS faculty mentor. May include foreign study-travel, research, position or policy paper, or any experience demonstrating advanced study/service/understanding.

CFAN 3201. Strategic Career Planning. (1 cr; A-F only. Prereq-Soph or jr or sr or grad student)
Self exploration, networking, industry research, job/internship search, resumes, cover letters, interviewing, salary negotiation, goal setting.

CFAN 3480. Topics in CFANS. (1-4 cr [max 8 cr]; Stdnt Opt)
Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

CFAN 3500. International Field Studies Seminar. (1-3 cr [max 6 cr]; A-F or Aud. Prereq-#)
Interface of agriculture with various natural resources, environmental, economic, food safety, public policy, ethical issues transcending national borders. Seminars take place in other countries or regions of world, providing global perspective. Active learning, lectures, discussion tutorials, field trips, reports, exams.

CFAN 3900. Topics in International Agriculture. (2-4 cr [max 25 cr]; A-F or Aud. Prereq-#)
International, on-site, classroom, and field-study of agricultural systems. Sites vary. Can include language study.

CFAN 4409W. Undergraduate Senior Thesis: Science in Agriculture. (1-6 cr [max 12 cr]; A-F or Aud. Prereq-3rd or sr or major in ScAg. #)
Usually one full year. Research/thesis experience under supervision of CFANS faculty member. Written bound thesis, oral presentation of research results.

CFAN 5500. Special topics for K-12 Educators: Agricultural, Food, and Environmental Sciences and Technologies. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-#)
Students engage in instruction and applications that lead to new understandings, techniques,
and materials for teaching about the science, technology and utilization of plants, animals, food, and natural resources, and the environment for the benefit of society and our ecosystems.

**College of Liberal Arts (CLA)**

**CLA 1001. Introduction to CLA Student Life.** (1 cr; S-N or Aud)

**CLA 1003. Introduction to Student-Athlete Life.** (2 cr; S-N only. Prereq-first-year student-athlete)

**CLA 1005. Introduction to Liberal Arts Learning.** (3 cr; A-F only. Prereq-CLA ATS fr)
History of liberal arts, higher education, U of M, and CLA. Contexts/values that define a college-educated person. Key skills for academic success. Students participate in campus engagement opportunities.

**CLA 1050. Faculty Mentor Freshman Seminar.** (2 cr; A-F or Aud. Prereq-Freshman, Faculty Mentor Program)
Discussions led by faculty mentors on liberal education, nature of University life, major exploration, study skills appropriate to various disciplines.

**CLA 1051. CLA Freshman Research.** (2 cr; No grade. Prereq-Available only to CLA freshmen receiving a CLA Research Opportunity)
Freshman research or creative opportunity with faculty.

**CLA 1052. CLA Freshman Research.** (1-2 cr [max 2 cr]; Stdnt Opt. Prereq-Only available to CLA freshmen receiving a CLA Research Opportunity)
Freshman research or creative opportunity with faculty.

**CLA 1200. Topics.** (1-3 cr [max 3 cr]; Stdnt Opt)
See Course Guide for specific topic titles.

**CLA 1301. SEAM First Year Seminar.** (2 cr; A-F or Aud. Prereq-SEAM)
Exploration of issues related to students’ academic/career interests. Multicultural, other skills. Small-group discussions.

**CLA 1302. SEAM First-Year Colloquium.** (2 cr; A-F or Aud. Prereq-SEAM)
Introduction to resources that enhance academic/professional interests. Focus on multiculturalism. Small group discussions led by professional staff, guest speakers.

**CLA 1303. SEAM Seminar.** (5 cr; A-F or Aud. Prereq-SEAM student)
Exploration of issues related to students’ academic/career interests. Instructor lectures, interactive small-group discussions, student-led conversations based on weekly topics.

**CLA 1401. Leadership, Citizenship, and the University.** (3 cr; A-F only)
Local civic history. Leadership. Technological/academic skill development. Sense of agency/ownership as citizens within the University community.

**CLA 1901. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1902. Topics: Freshman Seminar.** (3 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1903. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1904. Topics: Freshman Seminar.** (1-3 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1905. Topics: Freshman Seminar.** (3 cr; A-F or Aud. Prereq-Freshman)
Freshman seminar. Topics specified in Class Schedule.

**CLA 1906W. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1907W. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1908W. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1909W. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 1910W. Topics: Freshman Seminar.** (1-4 cr; A-F only. Prereq-Freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

**CLA 2005. Introduction to Liberal Education and Responsible Citizenship.** (3 cr; A-F only. Prereq-1005)

**CLA 3001. Success Strategies for Transfer Students.** (1 cr; S-N or Aud)
Effective learning/academic skills, academic/career goals, use of advanced technology in University learning. Academic/career options available at the University. Students develop comprehensive educational plan, identify their long-range educational goals, and learn how to evaluate/select courses to meet goals.

**CLA 3500. Topics.** (2-4 cr [max 8 cr]; Stdnt Opt)
Topics specified in Class Schedule.

**CLA 5300. Topics by Visiting Winton Chair.** (1-5 cr [max 10 cr])
Topics specified in Course Guide.

**CLA 5500. Topics.** (3-5 cr [max 10 cr]; Stdnt Opt)
Topics specified in Course Catalog.

**Communication Studies (COMM)**

**Department of Communication Studies**

**College of Liberal Arts**

**COMM 1101. Introduction to Public Speaking.** (3 cr; Stdnt Opt. +COMM 1101H)
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.** (3 cr; Stdnt Opt. +COMM 1101. Prereq-honors)

**COMM 1102H. Honors: Introduction to Communication.** (3 cr; Stdnt Opt. Prereq-honors)
Strategies for analyzing, evaluating, generating arguments. Problems in listening/responding to argument.

**COMM 1681W. Rhetorical Fictions and 20th Century Conflicts.** (4 cr; Stdnt Opt)

**COMM 1902. Freshman Seminar.** (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Freshman seminar. Topics specified in Class Schedule.

**COMM 1904. Freshman Seminar.** (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

**COMM 1905W. Freshman Seminar.** (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.
COMM 3110. Topics in Speech-Communication. (3 cr; Stdnt Opt) Cases illustrating speech-communication theory, underlying issues.

COMM 3190H. Honors Course: Research Seminar in Communication. (3 cr; max 6 cr; A-F or Aud. Prereq-Honors candidate in comm, #, %) Students conduct original research in rhetoric, communication theory, or media for honors thesis. Theory, methods, research writing.

COMM 3201. Introduction to Electronic Media Production. (3-4 cr; max 4 cr; A-F or Aud) Production/criticism of messages for electronic media. Theory/practice in planning, scripting, production, and criticism in various electronic media. Student productions in lab.


COMM 3204. Advanced Electronic Media Production. (4 cr; A-F or Aud, Prereq-3201 or #) 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.


COMM 3231. Reality TV: History, Culture, and Economics. (3 cr; Stdnt Opt) Social, visual, cultural, economic, historical, and ethical dimensions of reality television.


COMM 3401. Introduction to Communication Theory. (3 cr; Stdnt Opt) Social scientific theory in communication. Communication history. Logic of scientific/communication theories in interpersonal, small group, organizational, intercultural, and electronically mediated communication.

COMM 3402. Introduction to Interpersonal Communication. (3 cr; Stdnt Opt) Nature and function of communication between individuals in formal and informal relationships. Communicative interactions from theoretical and practical viewpoints.

COMM 3405. Language and Gender. (3 cr; Stdnt Opt. Prereq-One women's studies course) Gender/communication. Interdisciplinary theory. Role of communication in creating, maintaining, fostering, appraisal, and employment gender relations in society.

COMM 3409. Nonverbal Communication. (3 cr; Stdnt Opt) Nonverbal communication in interpersonal communication process. Nonverbal codes (touch, space, smell, eye contact) and their communicative functions (impression management, flattering, persuading, lying) in relational contexts (intimate relationships, friendships, work relationships). Theories, practices.

COMM 3411. Introduction to Small Group Communication. (3 cr; Stdnt Opt) 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 Aud) Application of communication concepts in information interview. Planning, conducting, and evaluating informational, journalistic/elite, information interview. Class training, field experience.


COMM 3441. Introduction to Organizational Communication. (3 cr; Stdnt Opt) Functions of communication in work groups, in organizational hierarchies, and between organizations.

COMM 3451W. Intercultural Communication: Theory and Practice. (3 cr; Stdnt Opt. Prereq-Planning an intercultural experience) Theories of and factors influencing intercultural communication. Development of effective intercultural communication skills.

COMM 3452W. Communication and the Intercultural Reentry. (3 cr; Stdnt Opt, Prereq-Return from an intercultural experience) Intercultural experience explored through stories and story telling, participant observation, and social scientific theory. Constructs include identity, learning styles, cultural adaptation, values, ethics.

COMM 3601. Introduction to Rhetorical Theory. (3 cr; Stdnt Opt) Theoretical systems to explain/direct creation of public discourse. Traditional rhetoric to contemporary perspectives. Using theory to explain practice of public discourse.


COMM 3625. Communication Ethics. (3 cr; A-F or Aud) Applying concepts/theories from philosophy and social science to ethical issues in interpersonal, group, organizational, intercultural, and media communication.

COMM 3631. Freedom of Speech. (3 cr; Stdnt Opt) 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. (3 cr; A-F only) Speeches that became famous because of the occasion, issue, or speaker. Students analyze texts, research the issues, the historical trajectory, 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. (3 cr; A-F only) 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 3676W. Communicating Terrorism. (3 cr; Stdnt Opt) Terrorism as an ethical and international problem. Different cultures' historical trajectories for terrorism. Contrasts between Algerian, Irish, and Arab terrorism.

COMM 3682W. Communicating War. (3 cr; Stdnt Opt) 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]; Stdnt Opt. Prereq-One Comm course, #, %, @) Guided individual reading or study.

COMM 3980. Directed Instruction. (3 cr [max 6 cr]; S-N or Aud. Prereq-#) Supervised planning/teaching of undergraduate courses.

COMM 3990. Research Practicum. (1-3 cr [max 6 cr; Stdnt Opt] How communication research is designed, implemented, and published. Focus is on working with senior faculty on their current research projects.
COMM 3995W. Major Project. (1-3 cr [max 3 cr]; S-N or Aud. Prereq-Comm major, #) Individualized instruction leading to completion of senior project.

COMM 4204. Producing for Television: Theory and Practice. (4 cr; Stdnt Opt. Prereq-3201, 3204) 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 planning. Each student completes a television program, including writing a script, preproduction, and considering crew and talent needs. Media producer responsibilities.


COMM 4231. Comparing Electronic Media Systems. (3 cr; Stdnt Opt. Prereq-3211 or #) Historical, political, and sociological aspects of electronic media systems throughout the world, including United States, Canada, Great Britain, France, Germany, and Russia. Regulation and impact on political, social, and economic development.

COMM 4235. Electronic Media and Ethnic Minorities--A World View. (3 cr; Stdnt Opt) Representation and involvement of various ethnic groups (e.g., African-Americans, Native Americans in United States and Canada) in media industry. Turks in Europe, radio, TV, cable, Internet. Roles of government, industry, public organizations, and minority groups in regulating, managing, and financing ethnic media activities.

COMM 4263. Feminist Media Studies. (3 cr; A-F only. Prereq-3211 or #) Issues and perspectives 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.

COMM 4291. New Telecommunication Media. (3 cr; A-F or Aud. Prereq-3211 or #) Development and current status of new telecommunication media such as cable TV, radio, DBS, MDS, and video disk/cassettes. Technology, historical development, regulation, and programming of these media and their influence on individuals, organizations, and society.

COMM 4407. Communication and Conflict. (3 cr; A-F or Aud. Prereq-3401 or #) Aspects of conflict common across types of relationships. Theories as alternative lenses to illuminate aspects of conflict. Communication strategies to manage or resolve conflict.

COMM 4452W. Intercultural Interaction: Theory and Application. (3 cr; Stdnt Opt) Small group interaction across cultures for both international and U.S. students. Discussion, simulations, readings.

COMM 4471. Communication in Marriage and Family. (3 cr; Stdnt Opt. Prereq-3401 or 3402 or #) Contemporary theories of marriage/family communication using life-cycle approach. Role/function of communication in changing relational contexts. Ways of improving marriage/family relationships.

COMM 4602W. Contemporary Political Persuasion. (3 cr; Stdnt Opt. Prereq-4201, 4341 or #) Contemporary political speech. Ideologies in political persuasion.

COMM 4621W. Rhetoric of Feminism. (3 cr; Stdnt Opt) History/criticism of rhetoric of feminism from 19th century to present.

COMM 5110. Special Topics in Communication Theory. (3 cr [max 9 cr]; Stdnt Opt) Advanced theoretical problems. See department office for current offering.


COMM 5211. Critical Studies in Communication Theory and Methods. (3 cr; A-F only. Prereq-Grad student or #) Survey of theories, research methods, and scholars dominating critical media studies since late 1920s.


COMM 5233W. Electronic Media and National Development. (3 cr; Stdnt Opt) Use of electronic media to change social, political, economic, and cultural life. Use by developing nations to improve agricultural practices, hygienic standards, literacy, and awareness of civic responsibility.

COMM 5271. Media Historiography. (3 cr; A-F only. Prereq-3211, [jr or sr]) Critical media studies perspective (political economy, cultural, and technological) on history of mass media in the U.S., 1800s to present. Conceptual approaches to writing of media history. Skills/techniques for doing historical research in media studies.

COMM 5401. Advanced Theories of Communication. (3 cr; Stdnt Opt. Prereq-3401 or grad) Survey of major theoretical approaches to communication including, positivism, constructivism, and systems.

Comparative Literature (CL)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts

CL 5331. Discourse of the Novel. (3 cr; Stdnt Opt. *CSCL 5331)
Comparative study of the novel (eighteenth century to present). Its relation to ordinary language practices, emergent reading publics, technologies of cultural dissemination, problems of subjectivity; its role in articulating international cultural relations.

CL 5555. Introduction to Semiotics. (3 cr; Stdnt Opt. *CSCL 5555)
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).

Cinema as object of theoretical/historical analysis. Emphasizes concepts that have transformed scope/aim of film analysis since 1960s. Readings of filmic/theoretical texts.

CL 5992. Directed Reading in Comparative Literature. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-#)
Guided individual reading and study.

Comparative Studies in Discourse and Society (CSDS)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts

CSDS 5301. Society, Ideology, and the Production of Art. (3 cr; Stdnt Opt. *CSCL 5301)
Recent critical theories of relation of arts to social/ideological forces. Selected artifices from Western culture (e.g., Renaissance to 20th century; high, popular, mass culture). Music, visual art, literature.

CSDS 5555. Introduction to Semiotics. (3 cr; Stdnt Opt.)
Problems of the sign. Sign function/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).

Cinema as object of theoretical/historical analysis. Emphasizes concepts that have transformed scope/aim of film analysis since 1960s. Readings of filmic/theoretical texts.

CSDS 5993. Directed Study. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-#)
Guided individual reading and study.

Computer Science (CSCI)

Department of Computer Science and Engineering

College of Science and Engineering

CSCI 1001. Overview of Computer Science. (4 cr; Stdnt Opt. Prereq-None)

CSCI 1103. Introduction to Computer Programming in Java. (4 cr; Stdnt Opt.)
Programming and problem solving fundamentals. Significant portions of Java programming language. Students design/write Java programs relating to various subjects. Substantial programming projects, integral weekly lab.

CSCI 1107. Introduction to FORTRAN Programming for Scientists and Engineers. (3 cr; Stdnt Opt. Prereq-Math 1271 or Math 1371 or #)
Algorithm development and principles of computer programmingusing FORTRAN. Emphasizes numerical methods for science and engineering applications.

CSCI 1109, C# Programming. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-Transfer student)
Not taught. Credit for transfer students who have taken a freshman- or sophomore-level C# class.

CSCI 1113. Introduction to C/C++ Programming for Scientists and Engineers. (4 cr; Stdnt Opt. Prereq-Math 1271 or Math 1371)
Programming for scientists/engineers. C/ C++ programming constructs, object-oriented programming, software development, fundamental numerical techniques. Exercises/examples from various scientific fields.

CSCI 1211. Introduction to the Internet 1. (4 cr; A-F or Aud)
Concepts of the internet, analog vs digital communication, networking, packet switching, software protocols. E-mail, search engines, file transfer (ftp), remote login (Telnet). Creating Web pages using HTML and Cascading Style Sheets. Advanced programming concepts such as Java, Perl, and CGI.

CSCI 1901. Structure of Computer Programming I. (4 cr; Stdnt Opt. Prereq-MATH 1271 or equiv or #)
Recursion as algorithm development technique. Use of abstractions to hide program details. Use of modularity to manage complexity. Objects, data structures. Programming language Scheme as implementation vehicle. Introduction to Python as transition to other programming languages.

CSCI 1902. Structure of Computer Programming II. (4 cr; Stdnt Opt. Prereq-1901 or #)
Object-oriented programming using language such as C++ or Java. Builds on 1901, presenting additional data structures/algorithm. Object-oriented approach to implement data structures/operations as abstract data types.

CSCI 1905. Freshman Seminar. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-Fr)
Topics vary. See Class Schedule.

Introduction to numerical computing for CSCI, mathematics, and science/engineering students. Uses Mathematica or Matlab to cover numerical error, root finding, systems of equations, interpolation, numerical differentiation and integration, least squares, and differential equations.

CSCI 2033. Elementary Computational Linear Algebra. (4 cr; Stdnt Opt. Prereq-MATH 1271 or MATH 1371 or #)

CSCI 2980. Special Topics in Computer Science. (1-4 cr [max 8 cr]; A-F or Aud. Prereq-#)
Special topics. Lectures, informal discussions.

CSCI 3003. Introduction to Computing in Biology. (3 cr; Stdnt Opt. Prereq-1002H or Biol 1002 or 1009H or Biol 1009 or equiv or #)

CSCI 3081W. Program Design and Development. (4 cr; Stdnt Opt. *CSCI 4089, CSCI 4089W. Prereq-[1902, 2021] or #)
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, and coding standards.

For a guide to course numbers, symbols, and abbreviations, see page 376. 445
CSCI 3921W. Social, Legal, and Ethical Issues in Computing. (3 cr; Stdnt Opt. Prereq-At least soph or #) Impacts of computers on society. Computer science perspective of ethical, legal, social, philosophical, political, and economic aspects of computing.

CSCI 3970. Industrial Student Co-op Assignment. (2 cr [max 4 cr]; S-N or Aud. Prereq-CSci, in co-op program, #) Industrial work assignment in a co-op program involving advanced computer technology. Reviewed by a faculty member. Grade based on final written report.

CSCI 3980. Undergraduate Colloquium. (1 cr [max 2 cr]; Stdnt Opt. Prereq-Upper div CSCI; can be repeated for cr) Current computing trends and hot topics; industrial and career related topics; research topics; research projects and undergraduate research opportunities; graduate school options.


CSCI 4061. Introduction to Operating Systems. (4 cr; Stdnt Opt. Prereq-2041 or EE 2361; no cr for CSCI) Processes/threads, process coordination, interprocess communication, asynchronous events, memory management/file systems. Systems programming projects using operating system interfaces and program development tools.

CSCI 4107. Introduction to Computer Graphics Programming. (3 cr; Stdnt Opt. Prereq-1907 or CSCI 2041 or #; cannot be taken for grad CSCI cr) Theory/practice of computer graphics programming using C/C++ and OpenGL. Practical concepts in computer graphics modeling, rendering, and animation. Emphasizes effective use of graphics toolkits.


CSCI 4203. Computer Architecture. (4 cr; Stdnt Opt. EE 5361, EE 4363. Prereq-2021 or #) 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.

CSCI 4211. Introduction to Computer Networks. (3 cr; Stdnt Opt. Prereq-5211. Prereq-4201 or #; basic knowledge of [computer architecture, operating systems] recommended, cannot be taken for grad CSCI cr) 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.


CSCI 4707. Practice of Database Systems. (3 cr; Stdnt Opt. Prereq-1NET 4707, CSCI 5707. Prereq-4041 or #) Concepts, conceptual data models, case studies, common data manipulation languages, logical data models, database design, facilities for database security/ integrity, applications.

CSCI 4921. History of Computing. (3 cr; Stdnt Opt. Prereq-4321) 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. Prereq-Upper div CSCI, #) 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.


CSCI 4980. Special Topics in Computer Science for Undergraduates. (1-3 cr [max 9 cr]; A-F or Aud. Prereq-Undergrad, #; no cr for grad in [CSCI or CompE]) Lectures and informal discussions on current topics in computer science.

CSCI 4994H. Honors Thesis. (1-3 cr [max 6 cr]; A-F only. Prereq-Honors student, #) Research work for an honors thesis arranged with a CS faculty member who is the adviser or co-adviser.

CSCI 5023. Operating Systems. (3 cr; Stdnt Opt. Prereq-4061 or #) Conceptual foundation of operating system designs and implementations. Relationships between operating system structures and machine architectures. UNIX implementation mechanisms as examples.

CSCI 5041. System Modeling and Performance Evaluation. (5 cr; Stdnt Opt. Prereq-5103 or #) Techniques for modeling computer systems for performance evaluation through analytical/simulation techniques. How to model computing systems and communications protocols to evaluate their performance under different operating conditions.


CSCI 5060. Programming Languages. (3 cr; Stdnt Opt. Prereq-4011 or #) 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.


CSCI 5090. Visualization. (3 cr; Stdnt Opt. Prereq-1902, 4041 or equiv or #) Fundamental theory/practice in data visualization. Emphasizes programming applications. Volume visualization, vector field visualization, information visualization, multivariate visualization, visualization of large datasets, visualization in immersive virtual environments, and perceptual issues in effective data representation. Projects are implemented in C++ using VTK or similar visualization API.

CSCI 5115. User Interface Design, Implementation and Evaluation. (3 cr; Stdnt Opt. Prereq-4501 or #) 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.
CSCI 5116. GUI Toolkits and Their Implementation. (3 cr; Stdnt Opt. Prereq-5115 or 5107 or #) Structure and design of user interface toolkits and frameworks. Aspects of GUI toolkits (e.g., window system protocols, event processing, geometry management, resource management, data management, constraints). Course is built around implementation assignments and case studies of toolkits.

CSCI 5125. Collaborative and Social Computing. (3 cr; Stdnt Opt. Prereq-5115 or #) Introduction to computer-supported cooperative work, social computing. Technology, research methods, theory, case studies of group computing systems. Readings, hands-on experience.

CSCI 5129. e-Public Health: Online Intervention Design. (3 cr; Stdnt Opt) Planning, design, implementation, and evaluation of Internet-based public health interventions. Students work on interdisciplinary team projects. Instructors and students draw from computer science, public health, and communications disciplines.

CSCI 5131. Advanced Internet Programming. (3 cr; Stdnt Opt. +CSCI 4131. Prereq-5106 or 5211 or #; [[4081 or 5801], 5707, grad student) recommended) Issues in Internet programming: Java programming, concurrent programming, workflow, distributed databases, security, collaborative computing, object-oriented architecture/design, network publishing, messaging architecture, distributed object computing, internets.

CSCI 5143. Real-Time and Embedded Systems. (3 cr; A-F only. Prereq-4061 or #, experience with C language) 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.

CSCI 5161. Introduction to Compilers. (3 cr; Stdnt Opt. Prereq-[2011, 5106] or #) Techniques for translating modern programming languages to intermediate forms or machine-executable instructions, and their organization into compiler. Lexical analysis, syntax analysis, semantic analysis, data flow analysis, code generation. Compiler project for prototypical language.


CSCI 5210. Data Communications and Computer Networks. (3 cr; Stdnt Opt. +CSCI 4211. Prereq-[4061 or #), basic knowledge of [computer architecture, operating systems, probability], grad student) 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.


CSCI 5231. Wireless and Sensor Networks. (3 cr; Stdnt Opt. Prereq-4211 or 5211 or equiv) Enabling technologies, including hardware, embedded operating systems, programming environment, communication, networking, and middleware services. Hands-on experience in programming tiny communication devices.

CSCI 5271. Introduction to Computer Security. (3 cr; Stdnt Opt. Prereq-4061 or equiv or #) Concepts of computer, network, and information security. Risk analysis, authentication, access control, security services, audit trails, cryptography, network/database/application security, viruses, firewalls.


CSCI 5403. Computational Complexity. (3 cr; Stdnt Opt. Prereq-4041 or #) Computational models, complexity measures in each model, and related complexity classes.


CSCI 5471. Modern Cryptography. (3 cr; Stdnt Opt. Prereq-[2011, 4041, [familiarity with number theory or finite fields]] or #) 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.


CSCI 5523. Introduction to Data Mining. (3 cr; Stdnt Opt. Prereq-[2031 or 2033] or STAT 3021 or #) 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.

CSCI 5525. Machine Learning. (3 cr; Stdnt Opt. Prereq-Grad student or #)
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.

CSCI 5541. Natural Language Processing. (3 cr; Stdnt Opt. Prereq-4041 or #)

CSCI 5551. Introduction to Intelligent Robotic Systems. (3 cr; Stdnt Opt. Prereq-2033 or 3033 or #)
Transformations, kinematics/inverse kinematics, dynamics, control. Sensing (robot vision, force control, tactile sensing), applications of sensor-based robot control, robot programming, mobile robotics, microrobotics.

CSCI 5552. Sensing and Estimation in Robotics. (3 cr; Stdnt Opt. Prereq-[5551, Stat 5021] or #)

CSCI 5561. Computer Vision. (3 cr; Stdnt Opt. Prereq-5511 or #)
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.

CSCI 5707. Principles of Database Systems. (3 cr; Stdnt Opt. +INET 4707, CSCI 4707. Prereq-[4041 or #], grad student)
Concepts, database architecture, alternative conceptual data models, foundations of data manipulation/analysis, logical data models, database designs, models of database security/integrity, current trends.

CSCI 5708. Architecture and Implementation of Database Management Systems. (3 cr; Stdnt Opt. Prereq-4707 or 5707 or #)

Advanced introduction to software engineering. Software life cycle, development models, software requirements analysis, software design, coding, maintenance.

CSCI 5802. Software Engineering II. (3 cr; Stdnt Opt. Prereq-5801 or #)
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.

CSCI 5980. Special Topics in Computer Science. (1-3 cr; max 9 cr; Stdnt Opt. Prereq-#; may be repeated for cr)
Lectures and informal discussions on current topics in computer science.

CSCI 5991. Independent Study. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-#; may be repeated for cr)
Independent study arranged with CS faculty member.

CSCI 5994. Directed Research. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-#; may be repeated for cr)
Directed research arranged with faculty member.

CSCI 5996. Curricular Practical Training. (1 cr [max 3 cr]; S-N or Aud. Prereq-[CSCI or CompE] major, #)
Industrial work assignment involving advanced computer technology. Reviewed by faculty member. Grade based on final report covering work assignment.

Construction Management (CMGT)

College of Continuing Education

CMGT 2019. AutoCAD for Construction Managers. (2 cr; S-N or Aud. Prereq-30 sem cr)
AutoCAD software skills. Techniques of computer-aided design and drafting (CAD) at job entry level. Lecture, lab.

CMGT 3001. Introduction to Construction. (3 cr; Stdnt Opt)

CMGT 3011. Construction Plan Reading. (2 cr; Stdnt Opt)
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 project manuals, including notes, symbols, and plan layout.

CMGT 4011. Construction Documents and Contracts. (3 cr; Stdnt Opt. Prereq-3001, 45 sem cr)
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.

CMGT 4012. Risk Management, Bonds, and Insurance. (2 cr; Stdnt Opt. Prereq-3001, 45 sem cr)

CMGT 4013. Legal and Ethical Issues in Construction. (3 cr; Stdnt Opt. Prereq-4011 or equiv or #)
Role of construction management professional in society. Principles of conduct for construction management professional, goals in professional performance/behavior, reviews of mandatory requirements.

CMGT 4018. E-Business in Construction. (2 cr; A-F or Aud)
Selection/implementation of Web-based project management tools. Software such as Bidcom, E-BUILDER, Bricmanet, Construction Web, Frametech. Hands-on work with live building sites. Digital technologies in construction industry. Wire/wireless communication, online plan/bid rooms, mobile computing, video conferencing.

CMGT 4021. Construction Planning and Scheduling. (3 cr; Stdnt Opt. Prereq-3001, [3011 or CE 4101], 45 sem cr)

CMGT 4022. Construction Estimating. (3 cr; Stdnt Opt. Prereq-3001, [3011 or CE 4101], 45 sem cr)

CMGT 4031. Construction Safety and Loss Control. (3 cr; Stdnt Opt. Prereq-3001, 45 sem cr)

CMGT 4041. Specifications and Technical Writing for Construction Professionals. (3 cr; Stdnt Opt. Prereq-4011 or #)
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.
Cultural Studies and Comparative Literature (CSCL)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts

CSCL 1991. Introduction to Film Study. (4 cr; Stdnt Opt. =ARTH 1921W)
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.

CSCL 2910H. Topics in Cultural Studies and Comparative Literature. (3 cr [max 6 cr]; A-F only. Prereq-Honors)
Topics specified in Class Schedule.

CSCL 3115. Cinema and Ideology. (4 cr; Stdnt Opt)
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 3172. Music as Discourse. (3 cr; Stdnt Opt)
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 3173W. The Rhetoric of Everyday Life. (3 cr; Stdnt Opt)
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.

CSCL 3174. Poetry as Cultural Critique. (3 cr; Stdnt Opt)
Examines the status of “poetry” in several cultures of the Americas bringing together techniques of close reading and broad cultural inquiry.

CSCL 3176. Oppositional Cinemas. (4 cr; Stdnt Opt)
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 3177. On Television. (4 cr; Stdnt Opt)
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 3178W. Documentary Cinema: History and Politics. (4 cr; Stdnt Opt)
Documentary cinema from its emergence in 1920s to present. Complex power relations between filmmakers and their subjects. Political appropriations of the genre.

CSCL 3179. Reading Literary Movements. (3 cr; Stdnt Opt)
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 3321W. Theories of Culture. (3 cr; Stdnt Opt)
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 3331. Science and Culture. (3 cr; Stdnt Opt)
Battle of sciences/humanities over truth/reality as technology recasts knowledge/work. Questions of texts as-truth. Ongoing religious attacks on science.

CSCL 3361. Visions of Nature: The Natural World and Political Thought. (4 cr; Stdnt Opt +EEB 3361)
Theories about organization of nature, human nature, and their significance for development of ethics, religion, political/economic philosophy, civics, and environmentalism in Western/other civilizations. Lecture/discussion, film assignments.

CSCL 3412W. Psychoanalysis and Literature Part I: The Essential Freud. (3 cr; Stdnt Opt) 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 3413W. Psychoanalysis and Literature Part II: Post Freudian Criticism. (3 cr; Stdnt Opt)

CSCL 3421. Culture and the Production of Modern Identity I: 1600-1750. (3 cr; Stdnt Opt)
History of cultural, perceptual and/or conceptual changes in Western societies, 1600 to 1750, concerning new and conflicting understandings of the human imagination, subjectivity, identity, and the body; addressed through philosophy, literature, visual arts, music, pedagogical and medical treatises, and manners.

CSCL 3422. Culture and the Production of Modern Identity II: 1750-1900. (3 cr; Stdnt Opt)
History of cultural, perceptual and/or conceptual changes in Western societies, 1750 to 1900, concerning new and conflicting understandings of the human imagination, subjectivity, identity, and the body; addressed through philosophy, literature, visual arts, music, pedagogical and medical treatises, and manners.

CSCL 3456W. Sexuality and Culture. (3 cr; Stdnt Opt)

CSCL 3458W. The Body and the Politics of Representation. (3 cr; Stdnt Opt)
Western representation of the human body, 1500 to present. Body's appearance as a site and sign for production of social and cultural difference (race, ethnicity, class, gender). Visual arts, literature, music, medical treatises, courtesy literature, erotica.

CSCL 3461. Monsters, Robots, Cyborgs. (3 cr; Stdnt Opt)
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.

CSCL 3465. Aliens. (3 cr; Stdnt Opt)
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 3472. Gay Men and Homophobia in American Culture. (3 cr; Stdnt Opt)
The historical appearance as a sexual minority in American society since 1700, studied in a broad context of cultural history and discourse, including literature and the arts, journalism, science and medicine, religion, and law.

CSCL 3557W. Close Reading. (3 cr; Stdnt Opt)
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 3621W. Colonial and Postcolonial Literatures and Theory: 1700 to the Present. (3 cr; Stdnt Opt)
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 3771. Basic Concepts of Literary Study. (3 cr; Stdnt Opt)
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 3910. Topics in Cultural Studies and Comparative Literature. (3 cr [max 24 cr]; Stdnt Opt)
Topics specified in Class Schedule.

CSCL 3910H. Topics in Cultural Studies and Comparative Literature: Honors. (3 cr [max 12 cr]; Stdnt Opt)
Topics specified in Class Schedule.

CSCL 3920. Topics in Cinema and Media Culture. (4 cr [max 8 cr]; Stdnt Opt)
Topics specified in Class Schedule.

CSCL 3979. Issues in Cultural Pluralism. (3 cr; Stdnt Opt)
Critical/comparative basis for study of racial, ethnic, and cultural communities, primarily in the U.S. Perspectives on identity, citizenship, democracy, and power.

CSCL 3993. Directed Study. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-#, %, @)
Guided individual reading or study.

CSCL 4910. Topics in Cultural Studies and Comparative Literature. (2 cr; Stdnt Opt)
Topics specified in Class Schedule.

CSCL 4944H. Honors Thesis. (3 cr; Stdnt Opt. Prereq-Candidate for summa honors in CSCL, consent of CSCL honors adviser, @)
Summa honors thesis.

CSCL 4993. Directed Study. (1-3 cr [max 6 cr]; A-F or Aud)
Guided individual study.

CSCL 5154W. Theoretical Constructions of Space. (3 cr; Stdnt Opt)
Inquiry into theories of space drawn from various disciplines including anthropology, architecture, geography, history, landscape design, philosophy, planning, and sociology. Focus on sociopolitical interests that are served and sustained; emphasis on opportunities and implications for personal identity.

CSCL 5256W. Suburbia. (3 cr; Stdnt Opt)
Suburbia from origins in 18th-century England to the present. Historical changes and present challenges, especially in America. Ideology, mythology, planning, development, geography, transportation, the family. Specific sites and designs; representations in film, television, popular literature, and music.

CSCL 5301. Society, Ideology, and the Production of Art. (3 cr; Stdnt Opt +CSDS 5302)
Recent critical theories on the relation of the arts to social and ideological forces; selected artifacts from Western culture (Renaissance to 20th century; high, popular, and mass culture). Music, visual art, literature.

CSCL 5302. Aesthetics and the Valuation of Art. (3 cr; Stdnt Opt +CL 5331)
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 5311. Avant-Garde Cinema. (4 cr; A-F or Aud. Prereq-1921 or ARTH 1921W or equiv)
History/theory of avant-garde cinema, from classical period (1920s) to post-WWII.

CSCL 5413. Cinema and Society in the Arab World. (4 cr; A-F only. Prereq-1921 or ARTH 1921W or equiv)
Focuses on Egypt, Algeria, and Syria, against background of European colonialism, loss of Palestine, Arab-Israeli wars, rise of Arab nationalism, and Algerian War.

CSCL 5555. Introduction to Semiotics. (3 cr; Stdnt Opt +CL 5555)
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 semantics to various signifying practices (literature, cinema, daily life).

CSCL 5711. Sociocriticism. (3 cr; Stdnt Opt) Sustained consideration of the modern tradition of sociological reflection on literature. Early and late Birmingham School. Frankfurt School, Bakhtin circle, and the various French initiatives associated with both Les Temps Modernes and Tel Quel.


CSCL 5993. Directed Study. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq—#, @) Guided individual reading or study.

Curriculum and Instruction (CI)

Department of Curriculum and Instruction

College of Education and Human Development

CI 1001. Introduction to the Elementary School. (3 cr; A-F or Aud) 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 1911. Ethics, Wealth, and Education in a Democracy. (3 cr; A-F or Aud) Relationship between democratic citizenship and education. Role of economics/ethics in defining character of education. Relationship between school/university programs and citizenship. Relevance of education in contemporary society.

CI 2311W. Introduction to Technology and Ethics in Society. (3 cr; Stdnt Opt. CI 4311W) 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. CI 4312) Immersive exploration/critique of dangers/risks associated with the pervasive use of the Internet. Dangers and strategies to combat them. The Internet’s potential for teaching/learning.

CI 3001. Survey of Art Activities. (2 cr; A-F or Aud) Introduction to pictorial expression, design, and the function of art in the social environment.

CI 3002. Introduction to Secondary Schools. (3 cr; A-F only) Culture of teaching, student learning, community contexts for learning, and societal influences on teaching/schools. Students visit different types of schools and volunteer in area schools or educational organizations.

CI 3150. Special Topics: Education and Society. (1-6 cr; max 6 cr; Stdnt Opt) Special topics, current trends regarding education and society.

CI 3211. Introduction to Elementary Teaching. (3 cr; A-F only. Prereq—[Elementary education foundations or early childhood education foundations] major) Field-based practicum. Students apply learning from their University course to elementary school setting, connecting theory, research, and practice.

CI 3212. Practicum: Elementary Teaching. (2 cr; S-N only. Prereq—&EDPSY 561, &EDPSY 5616, elementary education foundations or early childhood foundations) Field-based practicum. Students apply learning from their University course in elementary school setting, linking theory, research, and practice.

CI 3283. Practicum: Special Education K-6. (2-2 cr, S-N only. Prereq—&EDPSY 561, &EDPSY 5616, elementary education foundations or early childhood foundations) Field-based practicum. Students apply learning from their University course in elementary school setting, linking theory, research, and practice.

CI 3401. Diversity in Children’s Literature. (3 cr; A-F or Aud. Prereq—&or # or #) 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 4311W. Technology and Ethics in Society. (3 cr; Stdnt Opt. CI 2311W) 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. CI 4312) Immersive exploration/critique of dangers/risks associated with society’s pervasive use of the Internet. Dangers and strategies to combat them. The Internet’s potential for teaching/learning.

CI 4413. Practicum: Working With Developing Readers. (2 cr, S-N only. Prereq—&EDPSY 5616, elementary education foundations major) Field-based practicum. Students apply learning from their University course to working with developing readers. Instructor provides specific assignment.

CI 5183. Applying Instructional Methods in the Elementary Classroom. (1-2 cr [max 8 cr]; S-N or Aud. Prereq—Foundations of ed major or elem ed initial licensure only) Supervised experience in elementary classrooms.

Dakota (DAKO)

Department of American Indian Studies

College of Liberal Arts


DAKO 4121. Beginning Dakota I. (3 cr; Stdnt Opt. DAKO 4121. Prereq—1121, 11004 in another language or passing score on LPE or grad student) Language acquisition skills, oral drills. In-class participation focused on questions/answers.

DAKO 4122. Beginning Dakota II. (3 cr; Stdnt Opt. DAKO 4122. Prereq—1121, 11004 in another language) or passing score on LPE or grad student Language acquisition skills. Oral drills. In-class participation focuses on questions/answers.


DAKO 4126. Advanced Dakota Language I. (3 cr; A-F or Aud) Focuses on immersion method.

DAKO 4127. Advanced Dakota Language II. (3 cr; A-F or Aud) Focuses on immersion method.
DANCE 1001. Modern Dance Technique 1. (1 cr; Stdnt Opt) Expressive body movement: alignment, proprioceptiveness, body mechanics, weight, momentum, line, and intent.

DANCE 1002. Modern Dance Technique 2. (1 cr; Stdnt Opt. Prereq-1001 or audition or #) Continuation of 1001. Expressive body movement. Alignment, proprioceptiveness, body mechanics, weight, momentum, line, intent.


DANCE 1050. Men's Modern Dance Technique. (1 cr [max 3 cr]; Stdnt Opt) Identity of male dancer. Gender-specific movement through technical training. Human movements attributable to specific genders: feminine, masculine, transgender? If so, how does this impact teaching of dance technique or performance, and how observer views dance?

DANCE 1040. Modern Dance Partnering Technique. (1 cr [max 2 cr]; A-F only. Prereq-Dance major or #) Technical demands, approaches, and skills needed for partnering in modern dance.

DANCE 1101. Ballet Technique 1. (1 cr; Stdnt Opt) Principles, basic technique, and vocabulary of ballet; barre, center, and allegro.

DANCE 1102. Ballet Technique 2. (1 cr; Stdnt Opt. Prereq-1101 or audition or #) Continuation of 1101. Principles, basic technique, and vocabulary of ballet. Barre, center, allegro.


DANCE 1201. Jazz Technique 1. (1 cr; Stdnt Opt) Jazz dance technique and its origins. Warm-up, center-floor work, and across-the-floor combinations.

DANCE 1202. Jazz Technique 2. (1 cr; Stdnt Opt. Prereq-1201 or audition or #) Continuation of 1201. Jazz dance technique, its origins. Warm-up, center-floor work, across-the-floor combinations.


DANCE 1301. Tap Technique 1. (1 cr; Stdnt Opt) Learning fundamental terms, basic rhythm structures, stock steps, and standard time steps.

DANCE 1302. Tap Technique 2. (1 cr; Stdnt Opt. Prereq-1301 or #) Fundamental terms, basic rhythms and syncopation, stock steps, and standard time steps; clarity of sound and rhythm.

DANCE 1313. African Based Movement. (1 cr; Stdnt Opt) 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.


DANCE 1345. Alexander Technique for Movement Artists. (1 cr) How body/mind are interrelated, how physical changes affect those patterns. Somatic theories/approaches originating in various regions of world.


DANCE 1354. Contact Improvisation. (1 cr; Stdnt Opt) Technical aspects. Philosophical ideas. How body/mind are interrelated, how physical changes affect those patterns. Somatic theories/approaches originating in various regions of world.


DANCE 1356. Bodyworks: Introduction to Somatic Studies. (2 cr; Stdnt Opt) How body/mind are interrelated, how physical changes affect those patterns. Somatic theories/approaches originating in various regions of world.


DANCE 1358. Skinner Releasing Technique. (1 cr; Stdnt Opt) Technical aspects. Philosophical ideas. How body/mind are interrelated, how physical changes affect those patterns. Somatic theories/approaches originating in various regions of world.

DANCE 1359. Hip Hop Movement. (1 cr) Technical aspects. Philosophical ideas. How body/mind are interrelated, how physical changes affect those patterns. Somatic theories/approaches originating in various regions of world.

DANCE 1361. Alexander Technique for Movement Artists. (1 cr) How body/mind are interrelated, how physical changes affect those patterns. Somatic theories/approaches originating in various regions of world.

DANCE 1362. African Diasporic Movement 2. (1 cr Prereq-1351 or audition or #) Second of six-course sequence. Builds on level 1 by further developing in complexity the technique movement, poly-rhythm, levels, undulation, combinations, and dynamics, while also exploring the relationship between the dance and the drum and energy expressing.

DANCE 1363. African Diasporic Movement 3. (1 cr Prereq-1352 or audition or #) Third of six-course sequence. Afro-Brazilian dance, including jumps, turns, floor work, and rhythm. Developmental focus on developing flexibility, strength, and vocabulary in polycyclic movement, moving toward body-bound harmony, illuminating dynamics of coordination, relaxation, breathing, undulation.
DANCE 1354. African Diasporic Movement 4. (1 cr; Prereq-1353 or audition or #) Fourth of six-course sequence. Builds on level 3 by exploring movement from mythology of Afro-Brazilian belief systems orixá and Candomblé. How corporal knowledge and technique fluency through the course sequence support different dance techniques.


DANCE 1402. Dance History. (3 cr; Stdnt Opt. Prereq-1401) “Ways of knowing” in dance history by reading the works of critics, historians, and philosophers who address questions concerning the nature of dance.

DANCE 1601. Dance Improvisation. (1 cr; A-F or Aud. Prereq- Concurrent registration in a modern dance technique course) 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.

DANCE 1626. Music for Dance. (5 cr; Stdnt Opt. Prereq-%) 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.

DANCE 3010. Modern Dance Technique 5. (2 cr [max 4 cr]; Stdnt Opt. Prereq-%, audition) Application of principles of space, time, energy. Alignment, power from pelvic center, rotation/turnout, muscular tonality, joint articulation, clarity of intent, stretch, strength, stamina.


DANCE 3210. Jazz Technique 5. (1 cr [max 2 cr]; Stdnt Opt. Prereq-%, audition) Continuation of jazz technique. Rhythm structures, longer phrases, greater physical speed, attack/control.


DANCE 3301. Tap Technique 1. (1 cr; Stdnt Opt. Prereq-1302 or #) Tap techniques and creative development through improvisational studies.

DANCE 3302. Tap Technique 4. (1 cr, Stdnt Opt. Prereq-3301 or #) Tap techniques and rhythm structures.

DANCE 3303. Tap Technique 5. (1 cr, Stdnt Opt. Prereq-3302 or #) Fifth of six-part sequence. Sophisticated musicality, complex rhythm structures, shading, and grace moves to music of different periods. Improvisation exercises explore phrasing, context, and theme toward developing choreography. Tap history/culture.

DANCE 3304. Tap Technique 6. (1 cr, Stdnt Opt. Prereq-3303 or #) Sixth of six-part sequence. Sophisticated musicality, complex rhythm structures, shading, and grace moves to music of different periods. Improvisation exercises explore phrasing, context, and theme toward developing choreography. Tap history/culture.

DANCE 3311. Contemporary Indian Dance 1. (1 cr Prereq-%) 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.

DANCE 3312. Contemporary Indian Dance 2. (1 cr Prereq-3311 or #) 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.

DANCE 3333. Laban Movement Analysis. (2 cr; Stdnt Opt) Concepts of LMA, which is used to describe, understand, and perform all forms of movement/dance. Movement experiences, lectures, discussion, observation.


DANCE 3337. Body Mind Centering. (2 cr; Stdnt Opt) 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.


DANCE 3433. Articulate Body. (3 cr; Stdnt Opt. Prereq-Dnce major, %) Lectures and movement sessions in biodynamic considerations for optimal dance performance and metabolic demands of dance.


DANCE 3495. Dance and Global Tourism. (3 cr Prereq-Jr or sr) 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.

DANCE 3500. Topics in Dance. (1-3 cr [max 10 cr]; Stdnt Opt) Topics specified in Class Schedule.

DANCE 3601. Dance Composition 1. (3 cr; Stdnt Opt. Prereq-1020, 1601, concurrent regis in a modern dance technique course, %) Movement, vocabulary in relation to theme, space, time, energy, and body parts; solo, duet, and trio forms.

DANCE 3602. Dance Composition 2. (3 cr; Stdnt Opt. Prereq-3601, %, concurrent regis in a modern dance technique course) Movement, vocabulary in relation to theme, space, time, energy, and body parts; solo, duet, and trio forms.

DANCE 3621. Dance Production I. (2 cr; A-F or Aud. Prereq-Dance major, %) Technical/administrative aspects of dance production. Lighting, costumes, sound, marketing, stage management, fundraising, publicity. Emphasizes practical project management and personal management skills.

DANCE 3622. Dance Production II. (2 cr; A-F or Aud. Prereq-3621, dance major, %) Continuation of 3621. Students produce the spring Student Dance Concert.
DNCE 3700. Performance. (1 cr [max 4 cr]; Stdnt Opt. Prereq: Concurrent enrollment in a technical course, audition, %)
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.

DNCE 3701. Summer Dance Intensive. (1-3 cr [max 6 cr])
Real-world experience with a professional dance company. Students participate in daily technique and repertoire classes culminating in an informal performance. Artists are arranged year-by-year.

DNCE 3901. Survival Strategies in Dance. (3 cr; A-F or Aud. Prereq: Dance major, %)

DNCE 4443. Theorizing Dancing Bodies. (3 cr; Stdnt Opt. =DNCE 5443. Prereq: 3402W or #)
Major developments in Western philosophical thought on dance and dance theory, from its beginnings to present.

DNCE 4454W. (Re)Writing the Dancing Body. (3 cr; Stdnt Opt. =DNCE 5454. Prereq: Jr or sr)

DNCE 4601. Dance Composition 3. (3 cr; Stdnt Opt. Prereq: 3602, concurrent regis in a modern dance technique course, %)
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.

DNCE 4602. Dance Composition 4. (3 cr; Stdnt Opt. Prereq: 4601, *modern dance technique course, %)

DNCE 4901. Senior Seminar. (2 cr; S-N or Aud. =TH 4901. Prereq-Sr. [Dnce or Th major])
Development of senior project, alone or in groups, under guidance of faculty members.

DNCE 5010. Modern Dance Technique 7. (2 cr [max 4 cr]; Stdnt Opt. Prereq: %, audition)
Continuation of technical development. Performance range/style. Students study with various guest artists.


DNCE 5110. Ballet Technique 7. (1 cr [max 2 cr]; Stdnt Opt. Prereq: %, audition)
Continuation of ballet technique. Musicality, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet.


DNCE 5210. Jazz Technique 7. (1 cr [max 2 cr]; Stdnt Opt. Prereq: #, audition)
Continuation of jazz technique. Syncopation, performance projection. Specific styles: swing, bebop, lyrical, funk, latin.


DNCE 5333. Laban Movement Analysis. (2 cr; Stdnt Opt. Prereq: %)
Concepts of LMA, which is used to describe, understand, and perform all forms of movement/dance. Movement experiences, lectures, discussion, observation.

DNCE 5334. Introduction to Dance/Movement Therapy. (2 cr; Stdnt Opt. Prereq: %)

DNCE 5337. Body-Mind Centering 2. (2 cr [max 4 cr]; Stdnt Opt. Prereq: 3337 or equiv)
Embodied consciousness. How knowledge is created. How mind/body are indissolubly linked. How body gives rise to states of consciousness that influence and often unconsciously control opinions, feelings, thoughts, and actions.

DNCE 5443. Theorizing Dancing Bodies. (3 cr; Stdnt Opt. =DNCE 4443. Prereq: %)
Major developments in Western philosophical thought on dance and dance theory, from its beginnings to present.

DNCE 5454. (Re)Writing the Dancing Body. (3 cr; Stdnt Opt. =DNCE 4454W. Prereq: Grad student)

DNCE 5493. Corporealities, Movement, and Social Justice: Staging “Equitable” Choreographies. (3 cr; A-F only. Prereq-Jr or sr: 4443 recommended)

DNCE 5495. Dance and Global Tourism. (3 cr; Prereq:Grad student)

DNCE 5500. Topics in Dance. (1-3 cr [max 10 cr]; Stdnt Opt.)
Topics specified in Class Schedule.

DNCE 5601. Dance Composition 5. (1 cr; Stdnt Opt. Prereq: 4601, 4602, %)

DNCE 5700. Performance. (1 cr [max 4 cr]; Stdnt Opt. Prereq: =technical course, %)
Technique, improvisation, choreography, music, design, and technical production as they relate to dance performance.

DNCE 5858. Teaching Dance. (4 cr; Stdnt Opt. Prereq: 1020, %, #)
Methods, principles, and techniques of teaching dance.

DNCE 5993. Directed Studies. (1-4 cr [max 10 cr]; Stdnt Opt. Prereq: %, @)
Guided individual study.

Danish (DAN)
Department of German, Scandinavian, and Dutch

College of Liberal Arts

DAN 1001. Beginning Danish. (5 cr; Stdnt Opt. =DAN 4001)
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.).

DAN 1002. Beginning Danish. (5 cr; Stdnt Opt. =DAN 4002. Prereq:1001)
Continues the presentation of all four language modalities (listening, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and the Danish culture.

DAN 1003. Intermediate Danish. (5 cr; Stdnt Opt. =DAN 4003. Prereq:1002)
Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

DAN 1004. Intermediate Danish. (5 cr; Stdnt Opt. =DAN 4004. Prereq:1003)
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.

DAN 4001. Beginning Danish. (2 cr; Stdnt Opt. =DAN 1001. Prereq:1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001. See 1001 for course description.

DAN 4002. Beginning Danish. (2 cr; Stdnt Opt. =DAN 1002. Prereq:1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.
Dental Hygiene (DH)

Department of Preventive Sciences

School of Dentistry

DH 1191. Dental Hygiene Care Process. (6 cr; A-F or Aud. Prereq-DH student)
Assessment principles related to medical and oral health status, dental hygiene clinical procedures, and development of instrumentation and hypertension screening skills.

DH 2111. Dental Anatomy. (2 cr; A-F only. Prereq-DH student)
All deciduous/permanent teeth, including tooth form, function, and relationship to oral health. Calcification, eruption, exfoliation patterns. Ideal static occlusion, dental terminology, tooth annotation systems. Lab includes identification/annotation of teeth.

DH 2121. The Dental Hygiene Care Process Clinical Application I. (5 cr; A-F or Aud. Prereq-DH student)
Dental hygiene care process, assessment principles related to medical and oral health status, dental hygiene clinical procedures, and development of instrumentation skills.

DH 2122. Dental Hygiene Care Process Clinical Application II. (3 cr; A-F or Aud. Prereq-DH student)

DH 2221. Cariology and Applied Nutrition in Dental Hygiene Care. (3 cr; A-F or Aud. Prereq-DH student)

DH 3120. General and Oral Pathology. (2 cr; A-F or Aud. Prereq-DH student)

DH 3121. Local Anesthesia and Pain Management. (2 cr; A-F only)

DH 3123. The Dental Hygiene Care Process Clinical Application III. (4 cr; A-F only. Prereq-DH student)
Dental hygiene treatment planning, alternative instruments, and advanced skills related to implementation of dental hygiene care. Clinical experience.

DH 3126. Oral and Maxillofacial Radiology Clinic I. (0 cr; A-F or Aud. Prereq-DH student)
Radiographic Technique. Exposing radiographs on skulls, interpretation, panoramic/extraroral technique, quality assurance procedures.

DH 3133. Pharmacology. (2 cr; A-F or Aud. Prereq-DH student)
Principles of pharmacology, physical/chemical properties of drugs, modes of administration, therapeutic/adverse effects, drug actions/interactions.

DH 3134. Pediatric Dentistry. (1.2 cr; A-F or Aud. Prereq-DH student)
Knowledge, skills, and attitudes required for providing dental hygiene care for pediatric patients.

DH 3151. Oral and Maxillofacial Radiology. (2 cr; A-F or Aud. Prereq-DH student)
General principles of radiology, radiation physics, dosimetry, biology, radiation protection, regulations, recent concepts of imaging.

DH 3191. Independent Study. (0 cr; Stdnt Opt. Prereq-DH student)
Individually arranged study, instruction, or research with faculty to meet student needs/interests.

For a guide to course numbers, symbols, and abbreviations, see page 376. 455
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DH 4359. Dental Public Health and Academic Service Learning II. (2 cr; A-F only. Prereq-DH student) Academic service-learning in various community health care settings. Assessment, planning, implementation, and evaluation of a community oral health program.

DH 4419. Independent Study. (0-6 cr [max 6 cr]; Stdnt Opt. Prereq-DH student) Individually arranged study, instruction, or research with faculty to meet student needs/interests.

DH 4211. Principles of Restorative Techniques II. (3 cr; S-N only) Restorative Techniques. Clinical experiences.


DH 4241. Extraplantal Clinical Dental Hygiene. (0-6 cr [max 6 cr]; A-F or Aud. Prereq-DH) Students participate in educational/clinical experiences with diverse patient populations in community outreach clinics.

DH 4250. Dental Hygiene Community Outreach Elective. (0-8 cr [max 8 cr]; S-N or Aud. Prereq-DH student) Individually arranged dental hygiene clinical experience in community outreach clinics.


DH 4302. Dental Hygiene Care: Special Needs Patients. (2 cr; A-F only. Prereq-DH student) Knowledge, skills, and attitudes required for dental hygiene care for geriatric and special needs patients.

DH 4303. Information Literacy. (3 cr; S-N only) Use of library tools/resources to find/use quality, scholarly sources. Knowledge/skill in five components of information literacy: need, access, evaluation, use, issues.

DH 5201. Management Internship. (5 cr; S-N only. Prereq-Dental hygiene grad student) Supervised experience in oral health care industry. Experience in corporations, health care management organizations, long-term care facilities, publishing firms, or professional organizations.

DH 5203. Capstone Project. (5 cr; S-N only. Prereq-Dental hygiene grad student) Formulation of extensive business plan/project related to area of interest based on coursework taken or internship experience.

DH 5401. Research Methods in Health Sciences. (3 cr; A-F only. Prereq-Dental hygiene grad student) Developing skills in scientific method. Analyzing research findings. Types of research, problem selection, hypothesis writing, research planning/design, data collection/measuring techniques, analysis/interpretation of data. Ethics.

DH 5403. The Discipline of Dental Hygiene. (2 cr; A-F only. Prereq-Dental hygiene grad student) Dental hygiene practice grounded in science and guided by research evidence. Etiology, prevention, and treatment of dental caries, periodontal diseases, oral cancer, and other conditions. Advances in technology.


DH 5415. Dental Hygiene Supervised Didactic Course Student Teaching. (1-3 cr [max 6 cr]; A-F only. Prereq-Dental hygiene grad student) Observation/participation in supervised teaching experience in dental hygiene education under faculty mentorship.

DH 5420. Master of Dental Hygiene Independent Study. (0-5 cr [max 10 cr]; S-N or Aud. Prereq-Enrolled master of dental hygiene student) Directed study with dental hygiene faculty member on selected topic.

Dental Therapy (DT)

School of Dentistry


DT 3210. Head and Neck Anatomy. (1 cr; A-F only. Prereq-Accepted into undergraduate dental therapy program) Anatomical nomenclature in head/neck anatomy as they relate to dental therapy treatment.


DT 3230. Oral and Maxillofacial Radiology. (2 cr; A-F only. Prereq-Accepted into dental therapy program)
Production/utilization of radiographs in accordance with good professional judgement, as well as state/federal radiation regulations. Processing radiographs in darkroom. Processing a digital image.

DT 3231. Oral and Maxillofacial Radiology II. (1 cr; A-F only. Prereq-2d yr dental therapy student)
Utilization of X-rays in accordance with state/federal radiation regulations. Radiographic assessment of developmental and acquired anomalies of teeth, osseous structures, and maxillary sinus.

DT 3232. Oral and Maxillofacial Radiology Preclinical Laboratory. (1 cr; A-F only. Prereq-2d yr dental therapy student)
Preclinical demonstration-participation phases using mounted human skulls.

DT 3250. Oral Histology and Embryology. (2 cr; A-F only. Prereq-Enrolled in dental therapy program)

DT 3251. General and Oral Pathology. (1.6 cr; A-F only)
Etiology, progression, recognition, and treatment of selected general/oral pathological conditions. Relationship general pathology to oral cavity. Head/neck lesions, importance of early detection. Diagnostic process, normal clinical findings.

DT 3330. Clinical Application I. (3 cr; A-F only. Prereq-Undergrad dental therapy program)
Assessment principles related to medical/oral health status. Dental therapy clinical procedures, instrumentation skills. Health assessment, parts of periodontium, dental deposits, toothwear, dental disease/prevention, plaque control.

DT 3331. Provider Patient Relationships. (2 cr; A-F only. Prereq-Enrolled in dental therapy program)

DT 3332. Cariology and Applied Nutrition in Dental Therapy Care. (3 cr; A-F only. Prereq-Enrolled in dental therapy program)
Dental caries etiology, pathology/prevention. Applying principles of diet/nutrition to dental therapy patient care/counseling.

DT 3333. Dental Public Health and Academic Service Learning I. (2 cr; A-F only. Prereq-2d year dental therapist student)
Dental therapist as engaged with diverse communities and as professionally responsible and ethical. Public health approach to disease. Ways in which U.S. oral health care is delivered. Factors impacting supply/demand. Outreach experiences, service learning.

DT 3334 W. Dental Therapy Care Process: Clinical Application II. (2 cr; A-F only. Prereq-2d yr dental therapist student)
Providing dental care for gerodontic patients and patients with disabilities.

DT 3335. Management and Supervision of a Dental Practice. (1 cr; A-F only. Prereq-2d yr dental therapy student)
Inter-professional course. Organizational, managerial, and financial systems that affect successful dental practice.

DT 3336. Ethics and Jurisprudence for the Dental Therapist. (1 cr; A-F only)

DT 3337. Dental Public Health and Service Learning II. (2 cr; A-F only. Prereq-2d yr dental therapy student)
How to assess, plan, implement, obtain funding for, and evaluate a public health program.

DT 3338 W. Research Methods in Dental Therapy. (3 cr; A-F only. Prereq-2d yr dental therapy student)
Types of research. Problem selection, hypothesis writing, research planning/design. Data collection, measuring techniques. Analysis/interpretation of data. Ethics in research. Writing the research proposal.

DT 3410. Applied Dental Biomaterials. (1 cr; A-F only. Prereq-2d yr dental therapy student)
Application of scientific principles to selection/utilization of dental biomaterials.

DT 3429. Introduction to Psychomotor Skill Development. (1 cr; S-N only. Prereq-Dental therapy student)
Reality based training for psychomotor skills required in prosthodontic/operative courses. Eye-hand/mirror skills, ergonomics used while preparing teeth for restoration.

DT 3430. Oral Anatomy. (2 cr; A-F only. Prereq-Accepted into dental therapy program)
Morphological characteristics of human dentition and associated contiguous structures. Foundational knowledge applying to most situations encountered in general dental clinical practice.

DT 3431. Oral Anatomy Laboratory. (2 cr; A-F only. Prereq-Accepted in dental therapy program)
Manual dexterity skills, anatomy of human dentition.

DT 3432. Operative Dentistry I. (2 cr; A-F only. Prereq-2d yr dental therapy student)

DT 3433. Operative Dentistry I Pre-Clinic Laboratory. (2 cr; A-F only. Prereq-2d yr dental therapy student)

DT 3434. Operative Dentistry II for the Dental Therapist, Lecture and Lab. (3 cr; A-F only)
How to surgically manage more advanced caries lesions. Transition from pre-clinic lab to clinic setting.

DT 3436. Operative Dentistry III. (1 cr; A-F only)
Facilitates transition of students from the pre-clinic laboratory to the clinic setting. Students are expected to demonstrate competency in the surgical treatment of dental caries prior to being certified ready for patient care.

DT 3521. Foundations of Interprofessional Professionalism, Communication and Collaboration. (1 cr; S-N only)
Professionalism, communication/collaboration across health professions. Online independent/group work followed by facilitated interprofessional small group discussions of case narratives.

DT 4140. Preventive Pediatric Dentistry Clinic. (1 cr; No grade)
Students participate in oral health promotion of pediatric patients. Brushing techniques, fluoride application, dietary analysis/counseling. Students talk with parents of pediatric patients. At least 10 clinic sessions.

DT 4141. Pediatric Dentistry Clinic Rotation. (1 cr [max 3 cr]; A-F only)

DT 4142. Clinical Pediatric Dentistry II. (1 cr; A-F only. Prereq-Foundation competence in clinical dentistry)
Early childhood development, care for children.

DT 4143. Clinical Pediatric Dentistry III. (1 cr; A-F only. Prereq-Foundation competence in clinical dentistry)
Early childhood development, care for children.

DT 4140. Oral Radiology Clinic. (1 cr [max 3 cr]; A-F only)
Clinical instruction in oral radiography. Intraoral/extraradicular radiographic procedures, quality evaluations.

DT 4141. Oral Radiology Clinic II. (1 cr; A-F only)
Clinical instruction in oral radiography. Intraoral/extraradicular radiographic procedures, evaluations.

DT 4142. Oral Radiology Clinic III. (1 cr; A-F only)
Clinical instruction in oral radiography. Intraoral/extraradicular radiographic procedures, evaluations.

DT 4240. Comprehensive Care Clinic. (1 cr; A-F only. Prereq-3d yr dental therapy student)
Assessment, treatment, and management of patients. Conducts/principles of evidence-based dentistry as applied to clinical practice.

DT 4241. Dental Auxiliary Utilization. (1 cr; A-F only. Prereq-2d yr dental therapy student)
Clinic rotation. Advanced diagnostic/treatment technologies. Techniques of four-handed dentistry.
DT 4323. Comprehensive Care Clinic II. (1 cr; A-F only)
Mission of School of Dentistry. Application of principles to the comprehensive assessment, treatment, and management of patients.
Evidence-based dentistry.

DT 4324. Comprehensive Care Clinic III. (1 cr; A-F only)
Application of principles to comprehensive assessment, treatment, and management of patients. Evidence-based Dentistry.

DT 4339. Team Building Within the Oral Health Care Setting. (1 cr; S-N only)
Elements of oral health care team. Role that provider/others play. How to address issues/suggestions/conflicts in a way that supports the best interest of the patient.

DT 4360. Outreach Experiences in Dental Therapy. (2 cr [max 4 cr]; A-F only)
Students complete six-eight weeks of outreach service at a combination of the following community based clinics: Hibbing Community College Dental Clinic; Mobile Dental Unit; NorthPoint Health and Wellness Center; Prairie Winds Dental Clinic; Rice Regional Dental Clinic or Walker Dental Clinic.

DT 4361. Outreach Experiences II. (2 cr; A-F only)
Experiences that reinforce principles of delivering dental health care/services to a variety of patients, including underserved patient populations, in contemporary off-site clinical settings.

DT 4440. Operative Dentistry Clinic. (2 cr [max 6 cr]; A-F only)
Placing restorations. Student clinicians place single tooth restorations on patients, with direction/oversight of instructor.

DT 4441. Operative Clinic II. (0 cr; A-F only)
How to place restorations. Students place single-tooth restorations on patients.

DT 4442. Operative Clinic III. (2 cr; A-F only)
How to place restorations. Student places single-tooth restorations on patients.

DT 4460. Essentials of Clinical Care for the Dental Therapist. (5-10 cr [max 20 cr]; S-N only)
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 5110. Periodontology I. (1 cr; A-F only. Prereq-2nd yr dental therapy masters student)

DT 5130. Preclinical Pediatric Dentistry. (2 cr; A-F only. Prereq-DT grad program)

DT 5210. Head and Neck Anatomy. (1 cr; A-F only. Prereq-Accepted into master’s dental therapy program)
Anatomical nomenclature in head/neck anatomy as they relate to dental therapy treatment.

DT 5211. Applied Pharmacology for the Dental Therapist. (2 cr; A-F only)
Principles of pharmacological drugs used in dentistry, modes of drug administration, therapeutic/adverse effects of drugs. Preparation for pharmacology of local anesthetics. Nitrous oxide sedation—prescription writing.

DT 5212. Local Anesthesia and Pain Management. (2 cr; A-F or Aud. Prereq-DT grad program)

DT 5230. Oral and Maxillofacial Radiology. (2 cr; A-F only. Prereq-DT grad program)
Production/utilization of radiographs in accordance with good professional judgement, as well as state/federal radiation regulations. Processing radiographs in darkroom. Processing a digital image.

DT 5250. Oral Histology and Embryology. (2 cr; A-F only. Prereq-Enrolled in master’s dental therapy program)

DT 5330. Clinical Application I. (3 cr; A-F only. Prereq-Accepted into master’s dental therapy program)
Assessment principles related to medical/oral health status. Dental therapy clinical procedures, instrumentation skills. Health assessment, parts of periodontium, dental deposits, toothwear, dental disease/prevention, plaque control.

DT 5331. Provider Patient Relationships. (2 cr; A-F only)

DT 5332. Cariology and Applied Nutrition in Dental Therapy Care. (0 cr; A-F only. Prereq-2nd yr dental therapy masters student)
Dental caries etiology, pathology/prevention. Applying principles of diet/nutrition to dental therapy patient care/counseling.

DT 5429. Introduction to Psychomotor Skill Development. (1 cr; S-N only. Prereq-In dental therapy program)
Virtual reality based training for psychomotor skills required in prosthodontic/operative courses. Eye-hand/mirror skills, ergonomics used while preparing teeth for restoration.

DT 5430. Oral Anatomy. (2 cr; A-F only. Prereq-Accepted into dental therapy masters program)
Morphological characteristics of human dentition, associated contiguous structures. Foundational knowledge applied to situations encountered in general dental clinical practice.

DT 5431. Oral Anatomy Laboratory. (2 cr; A-F only. Prereq-Accepted into masters in dental therapy program)
Manual dexterity skills, anatomy of human dentition.

DT 5432. Operative Dentistry I. (2 cr; A-F only)
How to treat dental caries. Therapeutic treatment of early caries lesion.

DT 5433. Operative Dentistry I Pre-Clinic Laboratory. (2 cr; A-F only. Prereq-2nd yr masters in dental therapy student)

DT 5434. Operative Dentistry II and III. (3 cr; A-F only. Prereq-Enrolled in masters in dental therapy program)
How to surgically manage more advanced caries lesions. Transition from pre-clinic lab to clinic setting.

DT 5521. Foundations of Interprofessional Professionalism, Communication, and Collaboration. (1 cr; S-N only)
Professionalism, communication/collaboration across health professions. Online independent/group work followed by facilitated interprofessional small group discussions of case narratives.

Design (DES)

College of Design

DES 1101V. Honors: Introduction to Design Thinking. (4 cr; A-F only. Prereq-Honors student)
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 1102W. Introduction to Design Thinking. (4 cr; A-F or Aud)
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)
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. Prereq-Honors)
Development of creative capability applicable to all fields of study. Problem solving techniques. Theory of creativity/innovation.

DES 1160. Topics in Design. (1-4 cr [max 24 cr]; A-F only)
In-depth investigation of specific topic, announced in advance.

DES 1201. SEAM Seminar. (2 cr; A-F only)
Topics in design.
DES 1904. Freshman Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-Fr) Topics specified in Class Schedule.

DES 1905. Freshman Seminar. (2-3 cr [max 3 cr]; A-F or Aud. Prereq-Fr) Topics in design.

DES 1907W. Freshman Seminar. (2-3 cr [max 3 cr]; A-F only. Prereq-Fr) Topics in design.

DES 1910W. Freshman Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-Fr) Topics in design.


DES 2150H. Honors Seminar: Lower Division. (2-3 cr [max 3 cr]; A-F only. Prereq-Honors program) Honors topics in design.

DES 3160. Topics in Design. (1-4 cr [max 24 cr]; A-F only)

DES 3170. Topics in Design. (1-4 cr [max 32 cr]; A-F or Aud) In-depth investigation of specific topic.

DES 3196. Field Study: National or International. (1-10 cr [max 10 cr]; A-F or Aud) Faculty-directed field study in national or international setting.

DES 3201. Strategic Career Planning for Design. (1 cr; A-F only. Prereq-soph, jr, sr, [Graphic design or interior design or clothing design or environmental design or architecture] major) Students research career opportunities/organizations related to their industry, set career goals based on skills/interests, and identify job search skills to secure internships and implement transition from college to employment.

DES 3311. Travels in Typography. (3 cr; A-F or Aud. +DES1 3010) 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 typesetting, calligraphy, and letterpress printing.

DES 3321. Introduction to Furniture Design. (3 cr; A-F or Aud. +DES1 3040) Furniture design as discipline, not as method. Material, sensual, and aesthetic, both sublime and mundane. Objects that mediate our environment. History, design criteria, technology, craft. Group case study, research presentation, individual making/presentation of a concept-prototype.

DES 3331. Street Life Urban Design Seminar. (3 cr; A-F only. +DES1 3050) 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, satellite 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 3341. (un)Wrapping It Up: New Materials for Design. Design for New Materials. (3 cr; A-F or Aud) New high-tech fabrics, foils, electrotexiles, and intelligent textiles that respond to environmental stimuli. Hands-on materials research, testing of prototypes. Cross-disciplinary student teams explore appropriate-use modeling/applications. Several one-week projects lead to larger/integrated project.

DES 3351. Phenomenon of Everyday Design. (3 cr; A-F or Aud) 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 3361. History of Modern Design. (3 cr; A-F or Aud) Interplay between the products of design and mass consumption in an innovative manner. Major focus on the late 19th and the 20th centuries. Lectures, exams, and projects integrate material from product, interior, industrial, merchandising, graphic, textile, and clothing design.

DES 4150H. Honors Seminar: Upper Division. (2-3 cr [max 3 cr]; A-F only. Prereq-Honors. [jr or sr]) Topics in design.

DES 4160. Topics in Design. (1-4 cr [max 24 cr]; A-F only)

DES 4165. Design and Globalization. (3 cr; A-F or Aud. +DES 5165. Prereq-Jr or sr) Movement of people, products, and ideas. Challenges brought by differences among us.

DES 4193. Directed Study in Design. (1-6 cr [max 36 cr]; A-F only. Prereq-%)

DES 4301. Design Minor Seminar. (3 cr; A-F or Aud. Prereq-Design minor) Students share ideas/conclusions with one another and create a summary statement (e.g., document, multimedia display, designed object).

DES 5185. Human Factors in Design. (3 cr; A-F or Aud) Theory/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.

DES 5193. Directed Study in Design. (1-6 cr [max 36 cr]; A-F only. Prereq-%)

DES 5196. Field Study: National or International. (1-10 cr [max 10 cr]; A-F or Aud. +DES 5196, APST 5196, HSG 5196, IDES 5196) Faculty-directed field study in a national or international setting.

Dutch (DTCH)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

DTCH 1001. Beginning Dutch. (5 cr; Stdnt Opt. +DTCH 1002, Prereq-1001) 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.).

DTCH 1002. Beginning Dutch. (5 cr; Stdnt Opt. +DTCH 4002. Prereq-1001) 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.

DTCH 1003. Intermediate Dutch. (5 cr; Stdnt Opt. +DTCH 4003. Prereq-1002) Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

DTCH 1004. Intermediate Dutch. (5 cr; Stdnt Opt. +DTCH 4004. Prereq-1003) 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.


DTCH 3012. Conversation and Composition. (3 cr; Stdnt Opt. Prereq-3012) Further practice and refinement of spoken and written Dutch beyond the intermediate level; development of compositional skills and vocabulary based on the reading, viewing, and discussion of relevant Dutch and Flemish media reports. Grammar review and development of critical corrective grammatical skills.

DTCH 3310. Studies in Dutch Literature. (3 cr [max 9 cr]; Stdnt Opt. Prereq-Reading knowledge of Dutch) In-depth study of authors or topics from various periods in Dutch literature (e.g., 19th-century Dutch novels, colonial novels, literature of Golden Age). All primary literature is read in the original.
**DTCH 3510. Topics in Dutch Culture. (3 cr [max 9 cr]; Stdnt Opt. Prereq-No knowledge of Dutch required)**
A single topic or theme of Dutch or Flemish culture explored in depth. Past topics have included Dutch national character, origin of the Batavian myth, and images of Dutchness.

**DTCH 3610. Dutch Literature in Translation. (3 cr [max 9 cr]; Stdnt Opt. Prereq-No knowledge of Dutch required)**
In-depth study of authors or topics from various periods in Dutch literature. All primary/secondary literature is read in English translation.

**DTCH 3993. Directed Studies. (1-5 cr [max 12 cr]; Stdnt Opt. Prereq- #, @)**
Guided reading in or study of Dutch literature, culture, or advanced language skills.

**DTCH 4001. Beginning Dutch. (2 cr; Stdnt Opt. +DTCH 1001. Prereq-1004 in another language or passing score on LPE or grad student)**
Meets concurrently with 1001. See Dtch 1001 for description.

**DTCH 4002. Beginning Dutch. (2 cr; Stdnt Opt. +DTCH 1002. Prereq-1004 in another language or passing score on LPE or grad student)**
Meets concurrently with 1002. See 1002 for description.

**DTCH 4003. Intermediate Dutch. (2 cr; Stdnt Opt. +DTCH 1003, Prereq-1004 in another language or passing score on LPE or grad student)**
Meets concurrently with 1003. See 1003 for description.

**DTCH 4004. Intermediate Dutch. (2 cr; Stdnt Opt. +DTCH 1004. Prereq-1004 in another language or passing score on LPE or grad student)**
Meets concurrently with 1004. See 1004 for description.

**DTCH 5993. Directed Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq- #, @)**
Guided individual reading or study.

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### East Asian Studies (EAS)

#### Institute for Global Studies

**College of Liberal Arts**

**EAS 1462. Introduction to East Asia in Modern Times: 1600-2000. (4 cr; Stdnt Opt)**

**EAS 3013. Introduction to East Asian Art. (3 cr; Stdnt Opt. +ARTH 3013)**
A selective examination of representative 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.

**EAS 3461. Introduction to East Asia I: The Imperial Age. (3-4 cr [max 4 cr]; Stdnt Opt. +HIST 3461)**
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. (3-4 cr [max 4 cr]; Stdnt Opt. +HIST 3462)**
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.

**EAS 3464. China in the Song, Yuan, and Ming Dynasties. (3 cr; Stdnt Opt. +HIST 5464, HIST 5464a)**
China during the Song (976-1279), Yuan (1279-1368) and Ming (1368-1644) dynasties, political institutions and social structures. Attention to primary sources and how historians ask and answer questions about the past.

**EAS 3465W. China in the Ming and Qing Dynasties. (3 cr; Stdnt Opt. +HIST 5465W, HIST 5465)**
The political and social history of China from about 1600 until the end of the Qing dynasty in 1911. Topics include ethnicity, daily life, legal structures, city life, and peasantry.

**EAS 3468. Social Change in Modern China. (3 cr; Stdnt Opt. +HIST 3468, HIST 5468)**
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.

**EAS 3471. Modern Japan, Meiji to the Present (1868-2000). (3 cr; Stdnt Opt)**
World War I, Japan’s emergence as an industrial society, world power in the 1920s. Rise of militarism, World War II in the Pacific. Political reform, economic resurgence, cultural change in postwar era.

**EAS 3472. Early Modern Japan. (3 cr; Stdnt Opt. +HIST 3472)**

**EAS 3474. The Rise of Modern Japan: 1850s to 1900s. (3 cr; A-F or Aud. +HIST 3474)**
The Meiji Revolution from Commodore Perry to the eve of World War I; origins of constitutional monarchy, industrial economy, Western influences, and modern cultural change.

**EAS 3940. Topics in Asian History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Jr or sr or #)**
Selected topics in Asian history not covered in regular courses.

**EAS 3970. Supplemental Discussion in East Asian Studies. (1 cr [max 3 cr]; Stdnt Opt. Prereq-3xxx course)**
Extra discussion section with T.A.

**EAS 4473. Chinese Politics. (3 cr; Stdnt Opt. +POL 4473W)**
Focuses on fundamental conflicts in Chinese society; the democratic 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.

**EAS 4462. Comparative East Asian Development: A New Model for Growth and Prosperity? (3 cr; A-F or Aud. Prereq-3661 or Soc 3661 or related Asian or sociology courses or East Asian experience or #)**
Social and cultural reasons for the rapid growth and relative equity of Japan, South Korea, Taiwan, Hong Kong, Singapore and more recently, China. Relation of these examples to more general theories of development.

**EAS 5940. Topics in Asian History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Grad or intr consent)**
Selected topics such as cultural, economic, intellectual, political, and social history.

### Ecology, Evolution, and Behavior (EEB)

#### Department of Ecology, Evolution, and Behavior

#### College of Biological Sciences

**EEB 3002. Sex, Evolution, and Behavior: Examining Human Evolutionary Biology. (4 cr; A-F or Aud)**
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.

**EEB 3361. Visions of Nature: The Natural World and Political Thought. (4 cr; Stdnt Opt. +CSSL 3361. Prereq-Soph or jr or sr; biological sciences students may not apply these credits toward major)**
Theories about the organization of nature, human nature, and their significance for the development of ethics, religion, political and economic philosophy, civics, and environmentalism in Western and other civilizations.

**EEB 3603. Science, Protection, and Management of Aquatic Environments. (3 cr; Stdnt Opt. Prereq-One semester college biology)**
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.

Hands-on modeling experiences in context of biological applications. Reviews calculus concepts. Students carry out modeling steps, from developing the model, to analytical analysis, to developing computer code, to running the models.
EEB 4016W. Ecol. Biogeography. (3 cr; Stdnt Opt. Prereq-BIOL 3407)
Biological regions of the world in general and Northern Minnesota in detail. Ecological principles of distribution, interpretations of regional/temporal patterns in distribution of vegetation, taxonomic groups of plants/animals. Includes one weekend field trip.

EEB 4068. Plant Physiological Ecology. (3 cr +EEB 5068. Prereq-Biol 2022 or BIOL 3002 or BIOL 3407 or BIOL 3408W or #) 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 Aud. +FW 4129. Prereq-BIOL 1001 or BIOL 2012) Evolutionary and biogeographic history of mammalia. 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.


EEB 4607. Plankton Ecology. (4 cr; A-F or Aud. Prereq-4601 or Geo 4601) Planktonic bacteria, algae, and animals in lakes, reservoirs, and oceans with special attention to processes that cause variations of abundance.

EEB 4609W. Ecosystem Ecology. (3 cr; Stdnt Opt. Prereq-BIOL 3407 or #) 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.

EEB 4611. Biogeochemical Processes. (3 cr; Stdnt Opt. Prereq-[CHEM 2301, PHYS 1201] or #) 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).

EEB 4631. Global Ecology. (4 cr; A-F or Aud. Prereq-[college level ecology course, 2 semesters of [chemistry, high-school physics]] or #) Interactions between biosphere/lithosphere, atmosphere/oceans throughout Earth history. How climate is influenced on long time scales (evolution of photosynthesis) and on decadal time scales (forest clearance). Earth as an interacting ecosystem. Evaluating future effects of accumulating greenhouse gases.

EEB 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N or Aud. Prereq.-#) Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

EEB 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N or Aud. Prereq.-#) Laboratory or field investigation of selected areas of research, including written report.

EEB 4801. Field Limnology. (4 cr; A-F only. Prereq.[Chem 1022, [3001 or Biol 3407]] or #) Description/analysis of lakes, streams, and other aquatic environments. Lake origins, physics, chemistry, and biology. Focuses on how different forcings, including human ones, affect biological dynamics and interactions. Field work emphasizes comparative approach to differences in northern Minnesotan lakes, bogs, and streams.


EEB 4814. Plant Community Ecology. (4 cr; A-F or Aud. Prereq-Ecology course) Communities represented in Itasca Park and vicinity with emphasis on vegetation, patterns of distributions of communities, their interaction with environment and dynamic relationships, methods of community, and description and analysis.

EEB 4825. Telemetry and Animal Behavior. (2 cr; A-F only. Prereq-General Biology) Using latest techniques in radio telemetry to study animal behavior, especially animal movements and home ranges. Methods of attaching radio transmitters, locating radio-tagged animals, determining accuracy of positional data, calculating positions. Software for home range calculations/placement of data on a GIS base system.

EEB 4839. Field Studies in Mammalogy. (4 cr; A-F or Aud. Prereq-College-level biology course that includes study of animals or #) Techniques for studying small mammals. Lectures and field projects emphasize identification, distributions, community interactions, ecophysiology, and population ecology.

EEB 4842. Arctic Field Ecology. (4 cr; A-F or Aud. Prereq-Basic courses in ecology, organismal biology, approved application) Arctic natural history/ecology explored via a four-week trip to Northwest Territories of Canada. Students travel by van, air, and inflatable canoes; design their own research projects; help with ongoing studies in landscape/riparian ecology; learn field skills/techniques associated with ecological studies in Arctic regions; and work directly with local Inuit people about traditional ecological knowledge.

EEB 4844. Field Ornithology. (4 cr; A-F or Aud. Prereq-One semester college biology or #) Introduction to biology of breeding birds through use of field techniques at Itasca Biological Station and Laboratories. Daily fieldwork emphasizes identification, behavioral observations, netting/censusing.

EEB 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N or Aud. Prereq.-#) Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

EEB 4994. Directed Research. (1-6 cr [max 42 cr]; S-N only. Prereq.-#) Laboratory or field investigation of selected areas of research.

EEB 5001. Spatiotemporal Dynamics of Plant Communities. (3 cr; Stdnt Opt. Prereq-[Biol 3407, 4014] or #) Dynamic nature of plant communities in times of environmental changes. Emphasizes species invasion as key for structure/dynamics of plant assemblages. Observational, theoretical, and experimental studies on spatiotemporal dynamics of plant communities under various changes in biological/environmental conditions, including human-induced Global Warming.


EEB 5011. Pollen Morphology. (2 cr; Stdnt Opt. Prereq-Biol 3407, PBio 4321 or #) Morphology and nomenclature of pollen grains and pteridophyte spores, survey of pollen and spores of major plant families, lab techniques.

EEB 5033. Population and Quantitative Genetics. (4 cr; A-F or Aud. Prereq-[Biol 4003 or GCD 3022], intro statistics or #) 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.

EEB 5042. Quantitative Genetics. (5 cr; A-F only. Prereq-[Biol 4003 or GCD 3022] or #; a course in statistics is recommended) 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.

For a guide to course numbers, symbols, and abbreviations, see page 376. 461

Ecology, Evolution, and Behavior (EEB)
ECON 1101. Principles of Macroeconomics. (4 cr; Stdt Opt. = APEC 1102H, ECON 1105, ECON 1102H, APEC 1102. Prereq-1101 or equiv.) Knowledge of plane geometry and advanced algebra


ECON 1105. Principles of Microeconomics. (4 cr; Stdt Opt. = APEC 1102, ECON 1102H, APEC 1102, ECON 1102. Prereq-1104 or equiv), Math 1271)

ECON 1902. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

ECON 1903. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

ECON 1904. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

ECON 1905. Freshman Seminar. (3 cr; A-F only. Prereq-Freshman)
Topics specified in Class Schedule.

ECON 1910W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

ECON 2021. Survey of Economic Ideas. (3 cr; Stdt Opt. = ECON 4022. Prereq-1101, 1102 or equiv; not open to Econ majors)
A historical and analytical treatment of how important economic ideas developed over time, and their relationship to prevailing economic conditions and politics. Economic ideas from Adam Smith to the present.

ECON 2033. Current Economics Issues. (3 cr [max 6 cr]; Stdt Opt. = ECON 4033. Prereq-1101, 1102 or equiv; not open to Econ majors)
Current controversies over economic policies used to deal with some economic problems. Students focus in part on a specific issue of their choice. Different economic issues are discussed each time the course is offered (every three years).
ECON 3101. Intermediate Microeconomics. (4 cr; Stdnt Opt. =ECON 3101H, APEC 3001, ECON 3105, Prereq-1101, 1102 or equiv. Math 1271 or equiv) Behavior of households, firms, and industries under competitive and monopolistic conditions; factors influencing production, price, and other decisions of the firm; applications of the theory. Economic efficiency and distribution of well-being.

ECON 3101H. Honors Course: Intermediate Microeconomics. (4 cr; Stdnt Opt. =ECON 3101, APEC 3001, ECON 3105, Prereq-1101, 1102 or equiv, Math 1271 or equiv, honors) Behavior of households, firms, and industries under competitive and monopolistic conditions; factors influencing production, price, and other decisions of the firm; applications of the theory. Economic efficiency and distribution of well-being.

ECON 3102H. Honors Course: Intermediate Macroeconomics. (4 cr; Stdnt Opt. =APEC 3006, ECON 3102, Prereq-3101 or equiv, honors) Determinants of national income, employment, and price level; effects of monetary and fiscal policies; emphasis on a general equilibrium approach. Applications of economic efficiency and distribution of well-being.

ECON 3501. Labor Economics. (3 cr; Stdnt Opt. =ECON 4531, Prereq-1101, 1102 or equiv; not open to Econ majors) Role of labor in economy; labor as factor of production, population, and labor force; economics of labor markets; labor market institutions; theories of wages and employment; unions and collective bargaining; public policy.

ECON 3611. Environmental Economics. (3 cr; Stdnt Opt. Prereq-1101, 1102, or equiv; not open to Econ majors) Dependence of the economy on the environment; alternative visions of the future and issues on which actual outcome will depend; particular attention to global warming; future generations and sustainability; economic incentives for environmental protection and degradation; economic aspects of environmental policies.

ECON 3701. Money and Banking. (3 cr; Stdnt Opt. =ECON 4721, ECON 4721H, Prereq-1101, 1102 or equiv; not open to Econ majors) Historical development, present characteristics, and economic role of financial institutions. Commercial banking, the Federal Reserve System, and monetary policy.


ECON 3951. Major Project Seminar. (2 cr; A-F only. Prereq-[3101 or 3102 or equiv], fr writing requirement satisfied) 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.

ECON 3960. Topics in Economics. (3 cr [max 6 cr]; Stdnt Opt. Prereq-1101, 1102 or equiv) Topics specified in Class Schedule.

ECON 3991. Independent Study. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-1101, 1102, #) Students confirm topic of study with faculty supervisor or with director of undergraduate studies before beginning (otherwise no credit).

ECON 3993. Directed Studies. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-1101, 1102 or equiv, #) Guided individual reading or study in areas not available in regular course offerings.


ECON 4041. The Prospective World Economy. (3 cr; Stdnt Opt. =ECON 5041. Prereq-3102 or equiv) Considers what the economic future holds, what can be done now to deal with global issues, and how to improve economic prospects of countries.

ECON 409H. Honors Course: Game Theory and Applications. (4 cr; Stdnt Opt. Prereq-3101, 3102 or equiv, Math 1271-1272 or equiv) Games; normal form and extensive form; wars of attrition; games of timing; bargaining applications in industrial organization, macroeconomics, and international economics.

ECON 4112. Introduction to Mathematical Economics. (4 cr; Stdnt Opt. Prereq-3101, 3102 or equiv, Math 1271-1272-2243 or equiv) Development of selected models of economic behavior in mathematical terms. Topics selected to illustrate the advantages of a mathematical formulation.

ECON 4161. Microeconomic Analysis. (2 cr; Stdnt Opt. Prereq-[3101 or 5151 or equiv], Math 2243, Math 2263, #) 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.

ECON 4164. Microeconomic Analysis. (2 cr; Stdnt Opt. Prereq-4163, #) 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.


ECON 4171. History of Economic Thought. (3 cr; Stdnt Opt. Prereq-3101, 3102 or equiv) Primarily a critical reading course. Topics include Smith, Ricardo, Malthus, and Marx; neoclassicists, Keynes, the mercantilist and physiocratic doctrines; and modern theory.


ECON 4261. Introduction to Econometrics. (4 cr; A-F or Aud. Prereq-[3101 or equiv]), [[Math 1271, Math 1272] or equiv], Math 2243, Math 2263, [[Stat 4101, Stat 4102] or Stat 5101, Stat 5102]; Math 4242 strongly recommended) Review of basic linear regression model, its variants. Time series/simultaneous equation
ECON 4262. Econometric Analysis. (2 cr; Stdnt Opt. Prereq-4260)
Review of basic linear regression model, its variants. Time series/simultaneous equation models. Material may include panel data, censored/truncated regressions, discrete choice models.

ECON 4307. Comparative Economic Systems. (3 cr; Stdnt Opt. Prereq-4307. Prereq-3101, 3102 or equiv; not open to Econ majors)
Functions of economic systems; market economy vs. centrally planned economy. Post socialistic transitions in Eastern Europe, Russia, and China and reforms undertaken. Initial conditions and strategies for reforms; results of reforms in terms of key economic indicators.

ECON 4311. Economy of Latin America. (3 cr; Stdnt Opt. Prereq-4311, 3102 or equiv)
Economic evolution in Latin America since 1950. Trade liberalization, poverty, inflation, development strategies in selected Latin American countries. Theory/applications of important issues.

ECON 4313. The Russian Economy. (3 cr; Stdnt Opt. Prereq-4313, 3102 or equiv)

ECON 4315. The Japanese Economy. (3 cr; Stdnt Opt. Prereq-4315, 3102 or equiv)
Economic development following contact with western civilization. Issues covered include trade, development and growth, population growth, capital formation, international economic relations, agricultural and industrial policies; role of the government in the economy, and current issues of interest.

ECON 4317W. Economic Development. (3 cr; Stdnt Opt. Prereq-4317. Prereq-3101, 3102 or equiv)

ECON 4337. Comparative Economic Systems. (3 cr; Stdnt Opt. Prereq-4337. Prereq-3101, 3102 or equiv)
Functions of economic systems; market economy versus centrally planned economy. Comparison of different economic systems. Post socialist transitions in Eastern Europe, Russia, and China. Initial conditions and strategies for reforms; results of reforms in terms of key economic indicators.

ECON 4401. International Economics. (3 cr; Stdnt Opt. Prereq-[3101, 3102 or equiv], not open to econ majors)

ECON 4421W. Economic Integration of the Americas. (3 cr; Stdnt Opt. Prereq-3101, 3102 or equiv or #)
Analysis of economic relationships among countries in the Western Hemisphere. Modeling the impact of NAFTA and similar regional trade accords. Prospects for further integration. Comparison with European integration.

ECON 4421Y. Honors Course: International Trade. (4 cr; Stdnt Opt. Prereq-[3101, 3102 or equiv], Math 1271)

ECON 4432W. International Finance. (3 cr; Stdnt Opt. Prereq-3101, 3102 or equiv; 4431 or 4439 or equiv recommended)
Balance of payments; international financial markets; exchange rate determination; international monetary system; international investment and capital flows; financial management of the multinational firm; open economy macroeconomic policy.

ECON 4531. Labor Economics. (3 cr; Stdnt Opt. Prereq-4531, 3102 or equiv)
Labor markets and their operations; population and labor force; labor market institutions; wage and employment theories; unions and collective bargaining; public policy.

ECON 4560. Economics of Discrimination. (3 cr; Stdnt Opt. Prereq-[3101, 3102 or equiv; [Stat 3011, Stat 3022] recommended)
Theory and empirical evidence of labor/ consumer markets discrimination. Race/gender differentials. Effects of anti-discrimination policies such as affirmative action. Use of economic models, formal statistical analysis.

ECON 4621H. Honors Course: Urban Economics. (4 cr; Stdnt Opt. Prereq-3101 or equiv)

ECON 4623. Housing Markets and Public Policy. (3 cr; Stdnt Opt. Prereq-1101, 1102 or equiv)

ECON 4631H. Honors Course: Industrial Organization and Antitrust Policy. (4 cr; Stdnt Opt. Prereq-4631, 46301. Prereq-3101 or equiv)

ECON 4721. Money and Banking. (3 cr; Stdnt Opt. Prereq-3701, ECON 4721H. Prereq-3101 or equiv)
Theories of money demand and money supply. Financial intermediation and banking, banking practices and regulation, role of the Federal Reserve system. Monetary policy.

ECON 4721H. Honors Course: Money and Banking. (4 cr; Stdnt Opt. Prereq-4721, ECON 3701. Prereq-[3101 or equiv; Math 1271)
Theories of money demand and money supply. Financial intermediation, banking, nonbank financial institutions, banking practices, bank regulation, international banking, role of the Federal Reserve System. Monetary policy.

ECON 4731. Macroeconomic Policy. (3 cr; Stdnt Opt. Prereq-3101, 3102 or equiv)
Monetary vs. fiscal policy debate in the context of the underlying macroeconomic theory controversy. Comparison of Keynesian, Monetarist, and Classical theories; rational expectations; policy ineffectiveness; time inconsistency; rules vs. discretion; budget deficits; unemployment and inflation.

ECON 4731H. Honors Course: Macroeconomic Policy. (4 cr; Stdnt Opt. Prereq-[3101, 3102 or equiv], Math 1271, honors)

ECON 4741. Quantitative Analysis of the Macroeconomy. (3 cr; Stdnt Opt. Prereq-[3101, 3102 or equiv], [Stat 3011 or equiv])

ECON 4751. Financial Economics. (3 cr; Stdnt Opt. Prereq-4751H. Prereq-3101 or equiv, Math 1271 or equiv, 1.6 sem statistics)

ECON 4751H. Honors Course: Financial Economics. (4 cr; Stdnt Opt. Prereq-4751. Prereq-3101, [3102 or equiv], [Math 1271 or equiv], [Stat 3011 or equiv])
Efficiency of financial markets. Theoretical concepts, empirical evidence.
ECON 4821. Public Economics. (3 cr; Stdnt Opt. = ECON 3801. Prereq=ECON 3801; prereq 3101, 3102 or equiv)
Competing views on the proper role of government in the economy. Effects of tax and spending policies, taking into account private agents' response to government actions and the ways government officials may use their powers; political policies. Applications primarily to U.S. government.

ECON 4831. Cost-Benefit Analysis. (3 cr; Stdnt Opt. = ECON 461H. Prereq 3101 or equiv)
Principles for evaluation of benefits/costs of public projects or programs. Issues connected with definition/measurement of benefits/costs. Rate of return, rate of discount. Market imperfections, risk, and uncertainty. Case studies of applications of theory.

ECON 4960. Topics in Economics. (3 cr [max 6 cr]; A-F only. Prereq [3101 or 3102 or equiv], MATH 1271; may change based on topic)
Topics specified in Class Schedule.

Guided individual reading or study in areas not available in regular course offerings.

ECON 5109H. Game Theory for Engineers. (4 cr; A-F or Aud. Prereq [[[Math 2283, Math 2373, Math 2374, Math 3283] or Math 4606], M.S./Ph.D. student in [engineer or comp sci or info tech or operations mgmt]] or #; for econ [undergrads or PhD students])

ECON 5151. Elements of Economic Analysis: Firm and Household. (2 cr; Stdnt Opt. Prereq 3101, 3102, or equiv, MATH 1271 or equiv, Math 2243 or equiv, grad or #)
Decision-making by households and firms under conditions of perfect competition, monopoly, and monopolistic competition.

ECON 5152. Elements of Economic Analysis: Income and Employment. (2 cr; Stdnt Opt. Prereq 3101, 3102 or equiv, MATH 1271 or equiv, Math 2243 or equiv, grad or #)
Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding.

ECON 5312. Growth, Technology, and Development. (3 cr; Stdnt Opt. Prereq 3101, 3102 or equiv or #)
Economics of research and development; technical change and productivity growth; impact of technology on institutions; science and technology policy.

Education and Human Development (EDHD)
College of Education and Human Development

EDHD 1920. CEHD Special Topics. (1-3 cr [max 6 cr]; Stdnt Opt)
For topics, see Class Schedule.

EDHD 3001. Exploring the Teaching Profession I. (2 cr; A-F only. Prereq= DirecTrack to Teaching program or @)
Introduction to K-12 teaching profession. Culture of teaching: roles of teachers, student learning, multicultural/diverse students/ contexts, societal influences. Volunteer experiences in Twin Cities.

EDHD 3002. Exploring the Teaching Profession II. (2 cr; A-F only. Prereq=3001, admission to DirecTrack to Teaching)
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.

EDHD 3100. International Topics for Undergraduates. (1-7 cr [max 15 cr]; Stdnt Opt)
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.

EDHD 5001. Learning, Cognition, and Assessment. (3 cr; Stdnt Opt. = EPSY 3119. Prereq=MED/initial licensure student or CLA music ed or preteaching major or #; psych course recommended)

EDHD 5003. Developmental and Individual Differences in Educational Contexts. (2 cr; A-F or Aud. Prereq= Fr or sr or post-bac or MED/initial licensure or CLA music ed or preteaching major or FOE or agriculture or kinesiology or #)
Overview of developmental/individual differences of children/adolescents in educational contexts. Emphasizes behavioral biology, dynamic systems, and ecological perception.

EDHD 5004. Teaching Students With Special Needs in Inclusive Settings. (2 cr; A-F or Aud. Prereq-Teacher preparation program in [CEHD or music education or agriculture education or DirecTrack] or #; licensure students must take this course for a grade) Exceptionalities in educational settings as defined in federal/state rules/regulations. Historical perspectives, definitions, etiology, needs, characteristics. Service delivery systems for each exceptionality.

EDHD 5005. School and Society. (2 cr; A-F or Aud. Prereq=Fr or sr or MED/initial licensure student or CLA music ed major or preteaching major or #)
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.

EDHD 5007. Technology for Teaching and Learning. (1.5 cr; A-F or Aud. Prereq=MED/initial licensure or CLA music ed major or preteaching major or #; basic computer skills) 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.

EDHD 5009. Human Relations: Applied Skills for School and Society. (1 cr; A-F or Aud. Prereq=MED/initial lic or CLA music ed or preteaching or #)
Issues of prejudice/discrimination in terms of history, power, social perception. Knowledge/skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, leadership, judgment/decision making, prejudice reduction, conflict resolution, teaching in diverse educational settings.

EDHD 5100. International Topics for Graduate Students. (1-7 cr [max 15 cr]; Stdnt Opt)
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.

Educational Policy and Administration (EDPA)
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EDPA 1080. Special Topics in Leadership. (1-3 cr [max 6 cr]; A-F or Aud)
For topic, see Class Schedule.

EDPA 1301W. Personal Leadership in the University. (3 cr; A-F only. = PA 1961W)
Introduction to personal leadership. Students examine their own views on leadership. Differences between personal/positional leadership, characteristics of leaders within University, importance of personal development.

EDPA 1905. Freshman Seminar. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq=Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

EDPA 1909W. Freshman Seminar: International Perspectives and Writing Intensive (IP, WI). (1-3 cr [max 6 cr]; Stdnt Opt. Prereq=Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

EDPA 1942. Freshman Seminar: Technology and Society. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq=Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

EDPA 2124. Intercultural Communication and Service Learning: Interdisciplinary Approaches to Public Engagement. (3 cr; A-F only)
Cross-cultural competence. Social/economic issues in the United States and abroad. Major
courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu. University of Minnesota Twin Cities 2010-12 Undergraduate Catalog theories, concepts, and models in intercultural/multicultural education. Classroom, research, and service learning activities.

EDPA 3010. Special Topics for Undergraduates. (1-3 cr [max 9 cr]; Stdnt Opt) Inquiry into educational policy and administration problems and issues.

EDPA 3021. Introduction to Historical Foundations of Modern Education. (3 cr; Stdnt Opt. = EDPA 5021, HUM 3021, HUM 4021) Analysis/interpretation of important elements in modern education derived from pre-classical sources: Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, Industrial Revolution.

EDPA 3036. Religion, Ethics, and Educational Policy. (3 cr; Stdnt Opt) American religious pluralism in relationship to ethics and educational policy. History of religious influence/expression in K-12 and higher education. Students interact with community leaders. Legal issues, religion/science, sexuality, religious alternatives, policy topics.


EDPA 3102. Maximizing Study Abroad Through Culture and Language Strategies: Pre-Departure Preparation. (1 cr; Stdnt Opt. Prereq: #) Preparation for overseas sojourn: understanding culture, ways cultures differ in values, seeing oneself as a member of a culture or cultures.

EDPA 3104. Maximizing Study Abroad Through Culture and Language Strategies: Re-Entry. (1 cr; Stdnt Opt, Prereq: 3103 or #) Reflect upon personal study abroad experience through traditional activities to ease transition back into the United States and to maximize learning from study abroad experience.

EDPA 3303. Introduction to Women in Leadership. (3 cr; Stdnt Opt) Sex discrimination, female career patterns, women leaders, inclusive conceptualizations of managerial/administrative theory.

EDPA 3305. Learning About Leadership Through Film and Literature. (3 cr; Stdnt Opt) 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.

EDPA 3701. History of U.S. Higher Education. (5 cr; A-F or Aud) U.S. higher education, from ancient roots to present. Equality of opportunity, faculty autonomy, curriculum, institutional governance. Students use multidisciplinary tools to study and derive meaning from past.

EDPA 4303W. Leadership for Global Citizenship. (3 cr; A-F only. = PA 4961W. Prereq: [3402 or PA 3971]) Leadership theory, community building, social change, interdisciplinary approaches to complex global issues. Students finalize portfolios, submit scholarly products to demonstrate understanding of personal/positional leadership in changing global context. Capstone course.


EDPA 5001. Leading Organizational Change: Theory and Practice. (3 cr; Stdnt Opt) 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.

EDPA 5021. Historical Foundations of Modern Education. (3 cr; Stdnt Opt. = HUM 3021, EDPA 3021, HUM 4021) Analysis and interpretation of important elements in modern education derived from pre-classical sources: Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution.

EDPA 5023. History of Western Educational Thought. (3 cr; Stdnt Opt. = EDPA 3023, HUM 4023, HUM 3023) Great educational classics of Western civilization: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, and others.


EDPA 5028. Education Imagery in Europe and America. (3 cr; Stdnt Opt) Images and ideas of education expressed in the visual arts of Western civilization (antiquity to 20th century) in relation to concurrent educational thought and practice; symbolism, myth, propaganda, didacticism, genre, caricature.

EDPA 5032. Comparative Philosophies of Education. (3 cr; Stdnt Opt) Exploration of the principal philosophies in educational thought today, e.g., realism, idealism, pragmatism, and postmodernism. Practice in philosophical critique.

EDPA 5041. Sociology of Education. (3 cr; Stdnt Opt. = SOC 5455) Structures and processes within educational institutions; linkages between educational organizations and their social contexts, particularly related to educational change.

EDPA 5044. Introduction to the Economics of Education. (3 cr; Stdnt Opt) Costs and economic benefits of education, with a focus on K-12; educational markets, prices, and production relationships; investment and cost-benefit analysis.


EDPA 5061. Ethnographic Research Methods. (5 cr; Stdnt Opt) 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.

EDPA 5080. Special Topics: Educational Policy and Administration. (1-3 cr [max 24 cr]; Stdnt Opt) Topical issues in educational policy/administration.

EDPA 5087. Seminar: Educational Policy and Administration. (1-3 cr [max 24 cr]; Stdnt Opt) Shared responsibility of students/instructor in presentation of topics.

EDPA 5095. Problems: Educational Policy and Administration. (1-3 cr [max 24 cr]; Stdnt Opt) Course or independent study on specific topic within department program emphasis.

EDPA 5096. Internship: Educational Policy and Administration. (1-9 cr [max 24 cr]; Stdnt Opt) Internship in elementary, secondary, general, or postsecondary administration, or other approved field setting.

EDPA 5101. International Education and Development. (3 cr; Stdnt Opt) Introduction to comparative and international development education, contemporary theories regarding the role of education in the economic, political, and sociocultural development of nations; examination of central topics and critical issues in the field.

EDPA 5102. Knowledge Constructions and Applications in International Development Contexts. (3 cr; Stdnt Opt) Interrelationships of knowledge capital (noetic symbolic resources) and culture through intrinsic, cross-multicultural perspectives. Distinguishing knowledge from information/data. National/international developments occurring along basic/applied knowledge paths.
EDPA 5103. Comparative Education. (3 cr; Stdnt Opt.) 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.

EDPA 5104. Strategies for International Development of Education Systems. (3 cr; A-F or Aud. Prereq-Grad student) 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.

EDPA 5121. Educational Reform in International Context. (3 cr; Stdnt Opt) 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.

EDPA 5124. Critical Issues in International Education and Educational Exchange. (3 cr; Stdnt Opt) 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.

EDPA 5128. Anthropology of Education. (3 cr; Stdnt Opt. +ANTH 5128) Insights from educational anthropology for educators to address issues of culture, ethnicity, and power in schools.

EDPA 5132. Intercultural Education and Training: Theory and Application. (3 cr; Stdnt Opt) Examination of intercultural education; formal and nonformal education programs intended to teach about cultural diversity, promote intercultural development and communication and interaction skills, and teach students from diverse background more effectively.

EDPA 5142. Youth Futures in International and Global Contexts. (3 cr; A-F only. Prereq-CIDE student or #) Strategic trends in global youth development. Implications. Reconciling trends with normative scenarios with respect to presence, absence, and projected likelihood of suitable policies, workable collaborations, and funding.

EDPA 5144. Cultural Models, Simulations, and Games. (3 cr; Stdnt Opt. Prereq-Upper div or grad student) Use of dynamic educational models, simulations, and games in international education/development courses. Storytelling, simulated intercultural encounters, imagination, knowledge construction/applications, time, ethics, computer simulations, games, systems.

EDPA 5301. Contexts of Learning: Historical, Contemporary, and Projected. (3 cr; A-F or Aud) Contextual understanding of education as a social institution. Education is studied as an institution among the several that constitute its dynamic context.

EDPA 5303. Managing the Learning Organization. (3 cr; A-F or Aud) Examines schools, colleges, and other human service organizations centered on learning. Focuses on perspectives and skills needed to manage organizations effectively.

EDPA 5306. Staff Technology Development and Support. (1 cr; Stdnt Opt. +CI 5346. Prereq-Broadband Internet access, a newer computer) How to lead an organization in designing, implementing, evaluating, improving, and sharing approaches to staff development. Technology-related development. Facilitating staff development through use of technology.

EDPA 5307. School Management and Technology. (1 cr; Stdnt Opt. Prereq-Broadband Internet access, a newer computer) Various organizational/management issues impacted by information technology. Focuses on hardware, software, and database technologies designed to facilitate management/operations of school organizations.

EDPA 5308. Emerging Issues and School Technology. (1 cr; Stdnt Opt. Prereq-Broadband Internet access, a newer computer) Needs of schools/administrators to remain on forefront of information technologies. Focuses on anticipated technological trends years/decades ahead.

EDPA 5309. Data-Driven Decision Making I. (1 cr; Stdnt Opt. Prereq-Broadband Internet access, a newer computer) Data-driven decision making for schools/administrators. Focuses on data collection/analysis needs of educational organizations and on use of appropriate software/databases to collect, manage, analyze, and report school information.

EDPA 5311. Data-driven Decision Making II. (1 cr; Stdnt Opt. Prereq-5310. broadband Internet access, newer computer) Continuation of 5310. Data-driven decision making for schools/administrators. Hands-on training in students’ own organizations in using technology to analyze data to make educational decisions.

EDPA 5312. School Technology Policy Issues. (1 cr; Stdnt Opt. Prereq-Broadband Internet access, a newer computer) Various state/national policy issues related to educational technology. Focuses on “digital divide” in schools/communities, federal educational technology policy initiatives, and state/federal educational technology legislation.

EDPA 5313. Legal and Ethical Issues in School Technology. (1 cr; Stdnt Opt. Prereq-Broadband Internet access, a newer computer) Social, legal, and ethical issues related to school technology. How to model responsible decision-making related to these issues.


EDPA 5316. School Technology Leadership Multimedia Project. (1 cr; Stdnt Opt. Prereq-[[Mac or PC] with 256 MB RAM, [Windows NT 2000 or XP or Mac OS 9 or 10], Pentium [2 or faster], internet connection, [Netscape or Internet Explorer], virus protection software, School Technology Leadership or #) Students focus on individualized school technology leadership topic of choice, deliver a multimedia presentation of project results. Regular consultation with faculty, peer mentors, and outside mentors.

EDPA 5321. Leaders in the Superintendent and Central Office. (3 cr; Stdnt Opt) 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.

EDPA 5322. Leaders in the Superintendent and Central Office. (3 cr; Stdnt Opt) 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.


For a guide to course numbers, symbols, and abbreviations, see page 376. 467

EDPA 5328. Introduction to Educational Planning. (3 cr; Stdnt Opt) Principles, tools, comparative practices, and emerging issues in K-12 and higher education setting, decision making models, strategic and project planning, barriers to effectiveness, and change management processes.

EDPA 5332. Leadership Development Seminar. (3 cr; Stdnt Opt) Assessment and development of skills required of the educator in planning, decision making, and human relations. Introduction to contemporary issues in educational administration.

EDPA 5341. The American Middle School. (3 cr; Stdnt Opt) Focus on the uniqueness of the early adolescent and appropriate learning situations. For educators working with middle-level students.


EDPA 5346. Politics of Education. (3 cr; A-F or Aud. Prereq-postbac, MED, or grad student) 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.

EDPA 5348. Leaders of Human Resources Administration. (2 cr; Stdnt Opt. Prereq- Designed for students working on licensure for dir of community educ or superintendent or K-12 principal or dir of spec educ) Skills required for effective administrator/leader. Human resources administration. Employee recruitment, selection, orientation/support, supervision, performance appraisal of school district personnel.

EDPA 5356. Disability Policy and Services. (3 cr; Stdnt Opt) 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.

EDPA 5361. Project in Teacher Leadership. (3 cr [max 6 cr]; S-N or Aud. = C1 5778. Prereq-MEd student in Teacher Leadership Program) 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.

EDPA 5364. Context and Practice of Educational Leadership. (3 cr; A-F or Aud) 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.

EDPA 5368. Leadership for Special Education Services. (3 cr; Stdnt Opt. Prereq-Administrator or supervisor or professional responsible for managing general or special or alternative education program) Legislative, procedural, executive, and judicial actions that affect services, families, and children with special needs at federal, state, and local levels.

EDPA 5372. Youth in Modern Society. (3 cr; Stdnt Opt) Youth in advanced societies and as a social entity; functions and roles in industrial society, family, education, politics and government, economy and work, welfare and religion; organizations, social movements, and subcultures; empirical research and cross-cultural perspectives.


EDPA 5381. The Search for Children and Youth Policy in the U.S. (3 cr; Stdnt Opt) Review of contemporary policy issues affecting children and youth in the U.S. and South Africa; identify national standards, norms and principles of youth development; conflicting expectations facing policy-makers; and search for the critical content of youth policy.

EDPA 5385. Licensure Seminar: Program Policies and Inclusionary Leadership. (1 cr; S-N or Aud) Preparation for licensure program. Program overview, preassessment, reflective practice, APA writing, exit panel review, administrative employment interview.

EDPA 5386. Leadership Portfolio Seminar. (1 cr; S-N or Aud. Prereq-5385 or 5385 or 5385) 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.


EDPA 5389. Community Education Leadership. (3 cr; Stdnt Opt) Competencies of leadership, community relations, communication, community assessment, program development, program evaluation. Philosophy/administration of community/alternative education programs.

EDPA 5391. Special Education Law for Leaders. (1 cr; Stdnt Opt. Prereq-Designed for students working on licensure in PK-12 administration) Competencies of leadership, policy, and political influence. Legal/regulatory applications focusing on special education law.

EDPA 5392. Special Education Finance: Program Models, Policy, and Law. (2 cr; Stdnt Opt. Prereq-Knowledge of special education; [5324 or 5324] recommended) How special education revenue is a resource used to accomplish student-related objectives. Special education revenue sources, compliance, budget monitoring. Key special education policy, case law, program models from perspective of director of special education.

EDPA 5393. Leading School Finance Elections. (1 cr; S-N or Aud) Comprehensive planning model for conducting school finance elections. Emphasizes systems, strategies, and campaign tactics.

EDPA 5394. Leadership in Community Education Finance and Law. (1 cr; S-N or Aud. Prereq-5324 recommended) Interplay between finance and laws directly applicable to community education. MN Statute 124D, revenues/expenditures, and UFARS approached from frame of resource development.

EDPA 5396. Field Experience in PK-12 Administration: Authentic Practice in Leadership. (3 cr [max 12 cr]; S-N or Aud. Prereq- Field experience or internship arranged for students seeking licensure as PK-12 principal/superintendent. Content/credit depend on licensure requirements specified in individual field experience agreement.

EDPA 5501. Principles and Methods of Evaluation. (3 cr; Stdnt Opt. = EPSY 5243) Introduction to program evaluation. Planning an evaluation study, collecting and analyzing information, reporting results; evaluation strategies; overview of the field of program evaluation.


EDPA 5524. Evaluation Colloquium. (1 cr [max 24 cr]; S-N or Aud. = EPSY 5246. Prereq-5501 or EPSY 5243) Informal seminar of faculty and advanced students. Issues/problems of program evaluation.

EDPA 5528. Focus Group Interviewing Research Methods. (3 cr; Stdnt Opt) Skills needed to conduct focus group interviews. Students conduct focus group study and report results at final class session.

EDPA 5701. U.S. Higher Education. (3 cr; Stdnt Opt) U.S. higher/postsecondary education in historical/contemporary perspective. Emphasizes structure, history, and purposes of system as a whole.

EDPA 5721. Race and Ethnicity in Higher Education. (3 cr; Stdnt Opt) Reviews research. Theoretical frameworks, methodological perspectives, and research strategies used to study students, staff, and faculty. Historical perspectives.

EDPA 5724. Leadership and Administration of Student Affairs. (2-3 cr [max 3 cr]; Stdnt Opt. =EPSY 5421) Scope, administration, coordination, and evaluation of programs in college and university student affairs.


EDPA 5732. The Law and Postsecondary Institutions. (3 cr; Stdnt Opt) Analysis of court opinions and federal regulations affecting postsecondary educational institutions.

EDPA 5734. Institutional Research in Postsecondary Education. (2-3 cr [max 3 cr]; =EDPA 5721, 5264, 5744) Scope, role, administration, research strategies, and evaluation of institutional research in postsecondary institutions. Overview of research methodologies, disciplinary foundations of institutional research. Use of institutional, state, and national databases in addressing full range of institutional missions/functions.

EDPA 5735. Developmental Psychology. (3 cr; Stdnt Opt) History, current work. Future promise of educational psychology. Major topics in educational psychology. Focuses on interplay between theory, empirical research, and practical applications.

EDPSY 3300. Educational Psychology. (3 cr; Stdnt Opt) Preparation for professional practice in educational psychology. Emphasis on educational psychology research and educational application.

EDPSY 4300. Special Topics in Educational Psychology. (1-3 cr [max 3 cr]; Stdnt Opt) Current issues in educational psychology or related coursework in areas not normally available through regular curriculum offerings.

EDPSY 5101. Intelligence and Creativity. (3 cr; A-F or Aud) Contemporary theories of intelligence and intellectual development and contemporary theories of creativity and their implications for educational practices and psychological research.

EDPSY 5112. Knowing, Learning, and Thinking. (4 cr; A-F or Aud) Principles of human information processing, memory, and thought; mental operations in comprehension and problem solving; developing expertise and automaticity; emphasis on applied settings.

EDPSY 5113. Psychology of Instruction and Technology. (3 cr; Stdnt Opt) 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.

EDPSY 5114. Psychology of Student Learning. (3 cr; A-F or Aud) Principles of educational psychology: how learning occurs, why it fails, and implications for instruction. Topics include models of learning, development, creativity, problem-solving, intelligence, character education, motivation, diversity, special populations.

EDPSY 5115. Psychology of Adult Learning and Instruction. (3 cr; Stdnt Opt) Survey of adult learning/instruction. Emphasizes instructional design, learning theories, experience, individual differences, evaluation, tests/measurement, technology. Implications for curricular/instructional design in higher education, continuing education, professional/business related training.

EDPSY 5118. Language: Psycholinguistic Research and Educational Application. (3 cr; A-F or Aud) Psycholinguistic study of language. Psychological processes involved in language use, mechanisms that guide these processes. Failures of these mechanisms. How language operates.

EDPSY 5135. Human Relations Workshop. (4 cr; Stdnt Opt) Experimental 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.

EDPSY 5141. Aggression in Schools. (3 cr; A-F or Aud. Prereq-5xxx course in [developmental or educational psychology]) Development of aggression in schools. Aggression defined, compared to cooperative/prosocial behavior. Theories, methods, gender/individual differences.

For a guide to course numbers, symbols, and abbreviations, see page 376. 469
EPSY 5142. Play in Development and Education. (3 cr; A-F only. Prereq: Course in child or developmental psychology) Development/functions of play in humans with comparisons made to other species, especially non-human primates. Play as it relates to evelopmentally appropriate practice.

EPSY 5151. Cooperative Learning. (3 cr; Stdnt Opt) 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 5153. Social Development in PreK to Secondary Schools. (3 cr; A-F only. Prereq: Course in psychology) Social development in educational settings, from preschool through high school.

EPSY 5191. Education of the Gifted and Talented. (3 cr; A-F or Aud) Theories of giftedness, talent development, instructional strategies, diversity and technological issues, implications for educational practices and psychological inquiry, and inter-cultural considerations.

EPSY 5200. Special Topics: Psychological Foundations. (1-4 cr [max 30 cr]; Stdnt Opt) 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 Aud. Prereq: EPSY 5261 or intro statistics course) Designing/conducting a research study. Reviewing literature, formulating research problem, using different approaches to gather data, managing/analyzing data, reporting results.

EPSY 5221. Principles of Educational and Psychological Measurement. (4 cr; Stdnt Opt. Prereq: EPSY 5261 or equiv) 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 5231. Introductory Statistics and Measurement in Education. (4 cr; Stdnt Opt. EPSY 5261, EPSY 3264) Students develop an understanding of basic statistics and measurement concepts and tools and apply them to the collection, analysis, and interpretation of data.

EPSY 5243. Principles and Methods of Evaluation. (3 cr; Stdnt Opt. +EDPA 5501) 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. (5 cr; Stdnt Opt. Prereq: [EPSY 5221 or 5231 or 5261 or equiv], [CEHD grad student or MED student]) 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.


EPSY 5246. Evaluation Colloquium: Psychological Foundations. (1 cr [max 8 cr]; S-N or Aud. +EPSY 5252, Prereq: EPSY 5243 or EDPA 5501) Informal seminar of faculty and advanced students interested in the issues and problems of program evaluation.

EPSY 5247. Qualitative Methods in Educational Psychology. (3 cr; Stdnt Opt. Prereq: Grad student) 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.


EPSY 5272. Statistics Teaching Internship. (1-3 cr; max 3 cr; S-N only. Prereq: Grad student, #) Supervised teaching experience.

EPSY 5281. Introduction to Computer Operations and Data Analysis in Education and Related Fields. (3 cr; Stdnt Opt. Prereq: Statistics course) How to use the computer to access/analyze information. National, state, local, and specialty Web sites that contain data of interest to social scientists. Using EXCEL, SPSS, SAS, and R for data analysis.

EPSY 5300. Special Topics in Educational Psychology. (1-9 cr [max 9 cr]; Stdnt Opt) Current issues in educational psychology or related areas not normally available through regular curriculum offerings.

EPSY 5400. Special Topics in Counseling Psychology. (1-4 cr [max 8 cr]; Stdnt Opt) Theory, research, and practice in counseling and student personnel psychology. Topics vary.

EPSY 5401. Counseling Procedures. (3 cr; Stdnt Opt. Prereq: Upper div student) Emphasis on the counseling relationship and principles of interviewing. Case studies, role playing, and demonstration. For individuals whose professional work includes counseling and interviewing.

EPSY 5412. Introduction to Developmental Counseling and Guidance. (3 cr; Stdnt Opt. Prereq: #) Contemporary models of counselors as advocates for all students. Emphasizes prevention and systems intervention with counselors involved in the developmental guidance curriculum, school change, staff and community collaboration, individual student planning, and learning success with diverse populations.

EPSY 5421. Leadership and Administration of Student Affairs. (3 cr; Stdnt Opt. +EDPA 5724) Theoretical approaches, administrative structure, and evaluation methods used in college/university student affairs.

EPSY 5432. Foundations of Individual/Organizational Career Development. (5 cr; Stdnt Opt) 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.

EPSY 5434. Counseling Adults in Transition. (3 cr; Stdnt Opt. Prereq: Advanced undergrad or grad student in the helping professions) Psychological, physical, and social dimensions of adult transitions (e.g., family and personal relationships, career). Adult development theories, stress and coping, and helping skills and strategies as they relate to adult transition.

EPSY 5451. College Students Today. (3 cr; Stdnt Opt. +EDPA 5704) Issues involving diverse populations of students in colleges/universities. Student development
theory, students’ expectations/interests, how college affects student outcomes. Role of curricular/extracurricular activities and of student-faculty interactions.

**EPSY 5604.** Transition From School to Work and Community Living for Persons With Special Needs. (3 cr; Stdnt Opt)

Use of strategies/models for improving transition of youth from school to work and community living. Course content that specifically addresses all phases of student assessment, individualized transition planning, Parent, family, and student involvement in designing post school options. Community-based services (employment, residential living, social and recreational services, etc). Comprehensive interagency approaches.

**EPSY 5609.** Family-centered Services. (2 cr; A-F or Aud)


**EPSY 5612.** Understanding of Academic Disabilities. (3 cr; A-F or Aud)

Introduction to issues related to the education of students with academic disabilities (learning disabilities, mild mental intellectual disabilities, and emotional/behavioral disabilities) including history, definition, assessment, classification, legislation, and intervention approaches.

**EPSY 5613.** Foundations of Special Education I. (3 cr; A-F or Aud. Prereq-Child development course, 5601 or equiv)

Emphasis on the organization of educational programs and services for people with disabilities. Second course for students seeking to become licensed teachers in special education.

**EPSY 5614.** Foundations of Special Education II. (3 cr; A-F or Aud. Prereq-5613)

Emphasis on assessment, planning, and implementing educational programs for people with disabilities. Second course for students seeking to become licensed teachers in special education.

**EPSY 5615.** Advanced Academic Interventions. (3 cr; A-F or Aud. Prereq-5612)

Designing, implementing, and evaluating individual educational plans (IEPs) for special education students with learning disabilities, emotional/behavioral disorders, and mild mental/ intellectual disabilities.

**EPSY 5616.** Behavior Analysis and Classroom Management. (3 cr; Stdnt Opt)

Introduction to assumptions, principles, and procedures of behavioral approach to analyzing behavior and programs for classroom management. Emphasis on specifying problems, conducting observations, intervening, and evaluating behavioral change.

**EPSY 5618.** Specialized Interventions for Students With Disabilities in Reading and Written Language. (3 cr; A-F or Aud. Prereq-Enrollment in [EBD or LD or DD or D/ HH or #])

Historical/contemporary perspectives, empirical evidence relating to reading/written language instruction/assessment designed to improve outcomes of students with disabilities. Field work in tutoring.

**EPSY 5621.** Functional/Basic Academic Interventions in Mental Retardation. (3 cr; A-F or Aud. Prereq-5613, 5614)

Methods and materials course emphasizing functional approaches to promoting academic learning in students with mild to moderate mental retardation and moderate to severe mental retardation.

**EPSY 5622.** Programs and Curricula for Learners with Severe Disabilities. (3 cr; Stdnt Opt. Prereq-5616)

Emphasis on developing programs and curricula for students with moderate, severe, and profound developmental delays, as well as severe multihandicapping conditions. Special consideration given to preparing children and youth for integrated community environments.

**EPSY 5624.** Biomedical and Physical Aspects of Developmental Disabilities. (2 cr [max 3 cr]; A-F or Aud)


**EPSY 5625.** Education of Infants, Toddlers, and Preschool Children with Disabilities: Introduction. (2 cr; A-F or Aud)

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; Stdnt Opt. Prereq-[5621, 5622] or #)

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.

**EPSY 5636.** Sensory Impairments of Learners With Intellectual Disabilities. (2 cr; Stdnt Opt. Prereq-5613, 5614)

Characteristics of learners with visual and auditory impairments; design of instructional programs to remediate or circumvent disabilities, including use of prosthetic devices; related areas of performance affected by sensory impairments.

**EPSY 5641.** Foundations of Education for Individuals Who Are Deaf/Hard of Hearing. (3 cr; Stdnt Opt)

Historical and current issues related to education of individuals who are deaf or hard of hearing. Implications of causes of hearing loss, social and cultural relationships, philosophies of education, characteristics and legislative guidelines and their applicability to education of individuals who are deaf or hard of hearing.

**EPSY 5642.** Early Childhood Intervention for Infants, Toddlers, and Preschoolers Who Are Deaf/Hard of Hearing. (3 cr; Stdnt Opt. Prereq-Preservice teacher in deaf education licensing program or #)


**EPSY 5644.** Language Development and Programming for Deaf/Hard of Hearing Children. (3 cr; Stdnt Opt)


**EPSY 5646.** Reading and Writing Practices with Deaf/Hard of Hearing Children. (3 cr; Stdnt Opt. Prereq-5644 or general education methods in tchg reading and writing skills, or #)

Gain knowledge and skills to assess, plan, and implement instruction for children and youth with hearing loss. Emphasis is placed on research, theoretical, and programmatic issues in developing reading and writing skills, curricular adaptations, and effective instructional approaches.

**EPSY 5647.** Aural and Speech Programming for Persons Who Are Deaf/Hard of Hearing. (3 cr; Stdnt Opt)

Study of the speech and hearing mechanisms, causes of hearing loss, and rehabilitation. Emphasis on instructional practices, aural rehabilitation in the educational setting, adaptive technology, and adaptations to optimize functional skills with individuals who are deaf or hard of hearing.

**EPSY 5648.** Communication Systems for Children with Disabilities. (2 cr; Stdnt Opt)


**EPSY 5649.** Models of Instructional Programming With Deaf and Hard of Hearing Students. (3 cr; Stdnt Opt. Prereq-[5641, 5644] or #)

Design of development of portfolios for various models of educational service delivery systems for individuals with hearing loss. Emphasizes consultation skills, curriculum management/modifications, material/technology applications, and support service adaptations.

**EPSY 5656.** Social and Interpersonal Characteristics of Students With Disabilities. (3 cr; A-F or Aud)

Emphasis on children and youth of school age and on the ways in which their emotional, social, and behavioral disorders affect their functioning in school and on ways in which their behaviors disturb others.

**EPSY 5657.** Interventions for Social and Emotional Disabilities. (3 cr; A-F or Aud. Prereq-5616, 5656)

Developing comprehensive behavioral programs for students with social and emotional disabilities. Instructing students with social and emotional disabilities.

**EPSY 5661.** Introduction to Autism Spectrum Disorder. (3 cr; A-F only)

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 5681. Education of Preschool Children With Disabilities: Methods and Materials. (3 cr; A-F only, Prereq-[5616, 5625] or #) 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.

EPSY 5701. Practicum: Field Experience in Special Education. (1-6 cr [max 12 cr]; A-F or Aud. Prereq-[5614, [FOE or SpEd grad or licence student]) or #) Observations and supervised support of teaching practice in schools or agencies serving children with disabilities in integrated programs.

EPSY 5702. Practicum in Autism Spectrum Disorder. (3 cr; A-F only, Prereq-5616, 5661, 5609, one of [5622 or 5644 or SLHS 5606], enrolled in Autism Spectrum Disorder certificate program., #) Four hundred hours of supervised work in settings where individuals with Autism Spectrum Disorder are served. On-site supervision is provided by qualified professionals. A University supervisor conducts on-site observations. Bi-weekly seminars.

EPSY 5703. Practicum in Applied Behavior Analysis. (3 cr; A-F only. Prereq-5616, 5657, Psy 4011, Applied Behavior Analysis Certificate student, #) Four hundred hours of supervised experience in applied behavior analytic intervention with individuals with significant challenging behavior and learning difficulties. On-site supervision is provided by qualified professionals. A University supervisor conducts on-site observations. Bi-weekly seminars.

EPSY 5720. Special Topics: Special Education. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#) Lab and fieldwork approach, often assuming a product orientation, e.g., generation of action plan, creating set of observation field notes, collecting data in some form. Provides opportunities for educational personnel to study specific problems and possibilities related to special education.

EPSY 5751. Student Teaching: Defect and Hard of Hearing. (1-6 cr [max 10 cr]; Stdnt Opt. Prereq-#) 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 Aud. Prereq-#) Supervised experience in teaching or related work in schools or other agencies serving children and adolescents with learning disabilities.

EPSY 5753. Student Teaching: Early Childhood Special Education. (1-6 cr [max 8 cr]; S-N or Aud. Prereq-#) completion of all course requirements for license in ECSE. Supervised experience in teaching or related work in schools, agencies, or home settings with infants, toddlers, and preschoolers with disabilities and their families.

EPSY 5754. Student Teaching: Social and Emotional Disabilities. (1-6 cr [max 8 cr] A-F or Aud. Prereq-Completion of licensure coursework, #) Teach students with social and emotional disorders at public schools and other appropriate sites. Attend a weekly seminar on student teaching competencies.

EPSY 5755. Student Teaching: Developmental Disabilities, Mild/Moderate. (1-6 cr [max 6 cr]; A-F or Aud. Prereq-Completion of all licensure coursework, #) 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.

EPSY 5756. Student Teaching: Developmental Disabilities, Moderate/Severe. (1-6 cr [max 6 cr]; A-F or Aud. Prereq-Completion of all licensure coursework, #) 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.

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, Prereq-Licensure candidate in Early Childhood/Early Childhood Licensure Program, completion of all other licensure requirements for ECSE, #) completion of Birth-3 student teaching should be completed after age 3-5 student teaching when possible. 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.

EPSY 5762. Student Teaching in Early Childhood Special Education for Children Aged Birth to Three Years. (3 cr [max 6 cr]; S-N only, Prereq-Licensure candidate in Early Childhood/Early Childhood Licensure Program, completion of all other licensure requirements for ECSE, #) completion of Birth-3 student teaching should be completed after age 3-5 student teaching when possible. Student teachers work closely with cooperating teacher and University supervisor to design/implement programming for families with children aged birth-three in their homes. Course includes seminar with discussion, cooperative learning experiences, and some lectures.

EPSY 5800. Special Topics in School Psychology. (1-9 cr [max 9 cr]; Stdnt Opt) 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 Aud) 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 5851. Collaborative Family-School Relationships. (2-3 cr [max 3 cr]; Stdnt Opt. Prereq-Honors senior or grad student) Theoretical and empirical bases for creating collaborative family-school relationships for students’ development and educational success in school. Emphasis on model programs for K-12 and practical strategies for educational personnel to address National Educational goal 8.

EPSY 5852. Prevention and Early Intervention. (3 cr; Stdnt Opt) Theory/research base for school-based primary/secondary programs to promote academic/social competence of children/youth (birth to grade 12).

EPSY 5871. Interdisciplinary Practice and Interagency Coordination in Education and Human Services. (3 cr; Stdnt Opt) Prepracticum and procedures of interdisciplinary practice and interagency coordination. Examine the relative strengths of interdisciplinary approaches, develop skills for collaborating with others, and examine different approaches to interagency coordination.

Electrical and Computer Engineering (EE)

Department of Electrical and Computer Engineering

College of Science and Engineering

EE 1. Refresher Course for Electrical Engineers. (0 cr; A-F or Aud. Prereq-[BSEE or BEEE], pass EIT exam, four yrs elec eng experience) 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.

EE 1001. Introduction to Electrical and Computer Engineering. (1 cr; S-N or Aud. Prereq-lower div IT or #) Introduction to engineering in general and to computer engineering in particular. Exploration of techniques and technologies developed by electrical and computer engineers.


Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.
Binary arithmetic, data representation. Data types/structures. Assembly language, C programming, Control flow, iteration, recursion. Integral lab.

EE 170W. Energy, Environment, and Society. (3 cr; Stdnt Opt) Energy supply and demand; generation of electricity; environmental impact of energy usage; energy conservation methods; utility deregulation; role of communication and computers. Demos, computer simulation, teamwork, and projects.


EE 2006. Introductory Circuits Laboratory. (1.5 cr; Stdnt Opt) Meets concurrently with an arranged 2002 section.


EE 2103. Introduction to Electronics II. (1 cr; Stdnt Opt. Prereq-2001 or 2101) Active and passive analog filters, high frequency diode and transistor models, amplifier frequency response, multistage amplifiers. Covers electronics content of 2011 in half a semester.

EE 2301. Introduction to Digital System Design. (4 cr; Stdnt Opt. Prereq-MATH 1272 or MATH 1372 or MATH 1572) Boolean algebra, logic gates, combinational logic, logic simplification, sequential logic, design of synchronous sequential logic, VHDL modeling, design of logic circuits. Integral lab.

EE 2361. Introduction to Microcontrollers. (4 cr; Stdnt Opt. Prereq-2301, [1301 or CSCI 1113 or CSCI 1901]) Computer organization, assembly language programming, arithmetic/logical operations, parallel/serial input/output. Exception handling, interrupts, using special-purpose features such as A/D converters, fuzzy logic, DSP operations. Integral lab.


EE 3006. Fundamentals of Electrical Engineering Laboratory. (1 cr; Stdnt Opt. Prereq-Concurrent enrollment in 3005 is allowed but not required) Lab to accompany 3005.


EE 3041. Industrial Assignment I. (2 cr; A-F only. Prereq-[EE or CompE upper div] &3115, IT] or %) Experiments in circuits/electronics. Team design project.

EE 3042. Industrial Assignment II. (2 cr; A-F only. Prereq-3041) Experiments in circuits/electronics.

EE 3101. Circuits and Electronics Laboratory I. (2 cr; Stdnt Opt. Prereq-[2002, IT], IT] or %) Experiments in circuits/electronics.

EE 3102. Circuits and Electronics Laboratory II. (2 cr; Stdnt Opt. Prereq-[3101 or IT] or %, attendance first day of class) Experiments in circuits/electronics. Team design project.

EE 3105. Circuits Electronics Transition Laboratory. (75 cr; A-F or Aud. Prereq-3015) Together with 3400, completes the 3101 requirement.


EE 3161. Semiconductors Devices. (3 cr; Stdnt Opt. Prereq-Upper div IT, 2011, Phys 1402, IT] or %) Elementary semiconductor physics; physical description of pn junction diodes, bipolar junction transistors, field-effect transistors.


EE 3940. Special Topics in Electrical and Computer Engineering. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-#) Topics that are not available in regular courses. Topics vary.

EE 3990. Curricular Practical Training. (1 cr; max 2 cr; S-N only. Prereq-#, undergrad EE or CompE major) Industrial work assignment involving advanced electrical engineering technology. Reviewed by faculty member. Final report covering work assignment.

EE 4042W. Industrial Assignment II. (4 cr; A-F only. Prereq-3041) 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.

EE 4044. Industrial Assignment III. (2 cr; A-F only. Prereq-4042W) Industrial work assignment in engineering co-op program. Evaluation based on student’s formal written report covering semester work assignment.

EE 4111. Advanced Analog Electronics Design. (4 cr; Stdnt Opt. Prereq-3015, 3115) 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.

EE 4231. Linear Control Systems: Designed by Input/Output Methods. (3 cr; Stdnt Opt. Prereq-3015, upper div IT or grad student in IT major) or %) 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.


EE 4235. Linear Control Systems Laboratory. (1 cr; Stdnt Opt. Prereq-4231 or &4231) Lab to accompany 4231.

EE 4237. State Space Control Laboratory. (1 cr; Stdnt Opt. Prereq-4233 or &4233; no cr for [EE or CompE] grad students) Lab to accompany 4233.
Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.


EE 4363. Computer Architecture and Machine Organization. (4 cr; Stdnt Opt. =EE 5361, CSCI 4205, Prereq-2561) 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.


EE 4505. Communications Systems Laboratory. (1 cr; Stdnt Opt. Prereq-4501 or &4501) Experiments in design of wired/wireless communication systems. Lab to accompany 4501.


EE 4607. Wireless Hardware System Design. (3 cr; Stdnt Opt. Prereq-[3015, 3115, 3601, IT student] or %) Random processes, noise, modulation, error probabilities. Antenna operation, power transfer between antennas, rf propagation phenomena, transmitters/receivers, transmission lines, effect of antenna performance on system performance, rf/microwave device technologies, small-signal amplifiers, mixers, power amplifiers, rf oscillators.

EE 4609. Digital Signal Integrity. (3 cr; Stdnt Opt. =EE 5609, Prereq-2101, Phys 1301, 1302, [or EE or CompE major]) Introduction to high speed interconnect design. Transmission line theory, coupled line theory, elements of microwave circuit theory, parasitic calculations/measurement, techniques for good interconnect design.

EE 4701. Electric Drives. (3 cr; Stdnt Opt. Prereq-3015) 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.

EE 4703. Electric Drives Laboratory. (1 cr; Stdnt Opt. Prereq-4701 or &4701) Laboratory to accompany 4701. Simulink-based simulations of electric machines/drives in applications such as energy conservation and motion control in robotics.


EE 4722. Power System Analysis Laboratory. (1 cr; Stdnt Opt. Prereq-4721 or &4721) Lab analysis of AC power systems, power system networks, power flow, short circuit, transient stability.


EE 4743. Switch-Mode Power Electronics Laboratory. (1 cr; Stdnt Opt. Prereq-4741 or &4741) Laboratory to accompany 4743. PSpice-based 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.

EE 4930. Special Topics in Electrical and Computer Engineering Laboratory. (1-2 cr [max 6 cr]; A-F only. Prereq-IT 1 sr or grad student or %) Lab work not available in regular courses. Topics vary.

EE 4940. Special Topics in Electrical and Computer Engineering. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-IT or #) Topics that are not available in regular courses. Topics vary.


EE 5325. Robust Control System Design. (3 cr; Stdnt Opt. Prereq-[IT grad, 3015, 5231 or %) Development of control system design ideas; frequency response techniques in design of single-input/single-output (and MI/MO) systems. Robust control concepts. CAD tools.


EE 5334. VLSI Design II. (3 cr; Stdnt Opt. Prereq-[5343, IT grad student] or %) CMOS arithmetic logic units, high-speed carry chains, fast CMOS multipliers. High-speed performance parallel shifters. CMOS memory cells, array structures, read/write circuits. Design for testability, including scan design and built-in self test. VLSI case studies.

EE 5327. VLSI Design Laboratory. (3 cr; Stdnt Opt. Prereq-[4301, 5323 or &5323], IT grad student] or %) Complete design of an integrated circuit. Designs evaluated by computer simulation.


EE 5333. Analog Integrated Circuit Design. (3 cr; Stdnt Opt. Prereq-[3115, IT grad student] or %) 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 amplifier or comparator or analog sampled-data circuit filter).

EE 5364. Advanced Computer Architecture. (3 cr; Stdnt Opt. Prereq-[4363 or CSCI 4203], IT grad student] or %) Instruction set architecture, processor microarchitecture. Memory and I/O systems. Interactions between computer software and hardware. Methodologies of computer design.

EE 5371. Computer Systems Performance Measurement and Evaluation. (3 cr; Stdnt Opt. + EE 5463 or [CS 4203 or Stat 5201], IT grad student] or %) Tools/techniques for analyzing computer hardware, software, and system performance. Benchmark programs, measurement tools, performance metrics. Deterministic/probabilistic simulation techniques, random number generation/testing. Bottleneck analysis.

EE 5381. Telecommunications Networks. (3 cr; Stdnt Opt. Prereq-[4501, 5351, IT grad student] or %) 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.


EE 5581. Information Theory and Coding. (3 cr; Stdtnt Opt. Prereq-[5531, IT grad student] or %) Source/channel models, codes for sources/ channels. Entropy, mutual information, capacity, rate distortion functions. Coding theorems.

EE 5583. Error Control Coding. (3 cr; Stdtnt Opt. Prereq-[5325, Math 2373] or equiv), [IT grad student or %]) Error-correcting codes. Concepts, properties, polynomial representation. BCH, Golay, Reed-Muller/Reed-Solomon codes. Convolutional codes. Iterative codes.


EE 5562. RF/Microwave Circuit Design. (3 cr; Stdtnt Opt. Prereq-[5601 or 5601 equiv]), [IT grad student or %]) 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).

EE 5561. Plasma-Aided Manufacturing. (4 cr; A-F or Aud. +ME 5361. Prereq. +[ME 3321, 3322 or equiv], [upper div IT or grad student]) or %) Manufacturing using plasma processes. Plasma properties as a processing medium. Plasma spraying, welding and microelectronics processing. Process control and system design. Industrial speakers. Cross-disciplinary experience between heat transfer design issues and manufacturing technology.

EE 5613. RF/Microwave Circuit Design Laboratory. (2 cr; Stdtnt Opt. Prereq-[5601 or 5601], IT grad student or %) Scattering parameters, planar lumped circuits, transmission lines, RF/microwave substrate materials, matching networks/tuning elements, resonators, filters, combiners/dividers, couplers. Integral lab.

EE 5616. Antenna Theory and Design. (3 cr; Stdtnt Opt. Prereq-[5601 or 5601], IT grad student or %) Antenna performance parameters, vector potential/radiation integral, wire antenna structures, broad band antenna structures, microstrips/aperture theory, antenna measurements.

EE 5621. Physical Optics. (3 cr; Stdtnt Opt. Prereq-[3015, IT grad student]) or %) Physical optics principles, including Fourier analysis of optical systems/images, scalar diffraction theory, interferometry, and coherence theory. Diffraactive optical elements, holography, astronomical imaging, optical information processing, microoptics.


EE 5624. Optical Electronics. (4 cr; Stdtnt Opt. Prereq-[3601 or Phys 3002], IT grad student or %) 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.


EE 5628. Fiber Optics Laboratory. (1 cr; Stdtnt Opt. Prereq-[5627 or 5627], IT grad student or %) Experiments in fiber optics. Dielectric waveguides, modes in optical fibers, fiber dispersion/attenuation, loss sources/detectors, optical communication systems.


EE 5655. Magnetic Recording. (3 cr; Stdtnt Opt. Prereq-IT grad student or %) Magnetic fundamentals, recording materials, idealized models of magnetic recording/reproduction, analytic models of magnetic record heads, sinusoidal magnetic recording, digital magnetic recording, magnetic recording heads/media, digital recording systems.

EE 5657W. Physical Principles of Thin Film Technology. (4 cr; Stdtnt Opt. Prereq-IT grad student or %) Fabrication, characterization, and application of thin film and nanostructured materials/devices. Focuses on vacuum deposition. Materials science. Hands-on, team-based labs.


EE 5707. Electric Drives in Sustainable Energy Systems Laboratory. (3 cr; Stdtnt Opt. Prereq-5705 or CSE 5705) Lab to accompany 5705.

EE 5721. Power Generation Operation and Control. (3 cr; Stdtnt Opt. Prereq-[4721, IT grad student]) or %) 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.


EE 5821. Biological System Modeling and Analysis. (3 cr; Stdtnt Opt. Prereq-IT grad student or life science grad student or %) Purpose of biological system modeling. Advantages, limitations, special problems. Models of nerve excitation and propagation. Biological control systems. Respiratory/cardiopulmonary systems. Sensory organs, theories of perception andbody/motion.
measured data to compare computer systems or to judge how much a new architectural feature improves systems performance.

EE 5940. Special Topics in Electrical Engineering I. (1-4 cr; max 12 cr; Stdnt Opt) Special topics in electrical and computer engineering. Topics vary.

EE 5950. Special Topics in Electrical Engineering II. (1-4 cr; max 12 cr; Stdnt Opt) Special topics in electrical and computer engineering. Topics vary.

EE 5960. Special Topics in Electrical Engineering III. (1-4 cr; max 12 cr; Stdnt Opt) Special topics in electrical and computer engineering. Topics vary.

EE 5970. Special Topics in Electrical Engineering IV. (0-4 cr; max 12 cr; Stdnt Opt. Prereq: EE or CompE grad student or 6; only available for Rochester Campus) Special topics in electrical and computer engineering. Topics vary.

EE 5999. Practicum. (1-3 cr; max 9 cr; A-F or Aud. Prereq-EHS) Project in student’s employing organization or project in organization providing internship or integration of projects from previous coursework or development of program-related project.

EHS 5031. Basic principles of research in emergency health services. (3 cr; A-F or Aud)

Basic principles of research in emergency health services.

English as a Second Language (ESL)

College of Continuing Education

EHS 3112. First Responder for Coaches and Athletic Trainers. (3 cr; A-F or Aud. Prereq: Jr or sr)


EHS 3312. Emergency Medical Technician. (6 cr; A-F or Aud. Prereq: Jr or sr)


EHS 4011. Concepts of Emergency Health Service. (3 cr; A-F or Aud)

Emergency medical system (EMS). Its impact on all aspects of U.S. culture. Basic practices generalized across systems. Comprehensive review of components required for effective EMS. Historical perspective, medical-legal concerns, medical oversight, accountability, scope of practice, communications/transportation, rural vs. urban issues, disaster management.

EHS 4021. EMS Planning and Fiscal Management. (3 cr; A-F or Aud)

Fundamentals of planning, fiscal, and process management as related to emergency medical systems (EMS). Regulatory requirements, EMS delivery models, contract negotiations, budgeting, scenario planning.

EHS 4999. Practicum. (1-3 cr; max 9 cr; A-F or Aud. Prereq-EHS) Project in student’s employing organization or project in organization providing internship or integration of projects from previous coursework or development of program-related project.

EHS 5031. Basic principles of research in emergency health services. (3 cr; A-F or Aud)

Basic principles of research in emergency health services.

ESL 220. Intermediate Reading and Composition. (0 cr; S-N or Aud. Prereq: Non-native English speaker)

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.

ESL 225. SIEP, Intermediate Oral Skills. (0 cr; S-N only. Prereq: Non-native speaker of English)

English spoken language skills, community contact.

ESL 230. Intermediate Oral Skills. (0 cr; S-N or Aud. Prereq: Non-native English speaker)


ESL 305. SIEP, Advanced Grammar. (0 cr; S-N or Aud. Prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override)

English grammar skills.

ESL 310. Advanced Grammar. (0 cr; S-N or Aud. Prereq: Non-native speaker of English)

Difficult areas of grammar, resources to work on them. Meaning, use, form. Complex sentence patterns.

ESL 315. SIEP, Advanced Reading and Composition. (0 cr; S-N or Aud. Prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override)

English reading/composition skills.

ESL 320. Advanced Reading and Composition. (0 cr; S-N or Aud. Prereq: Non-native speaker of English)

Improving reading efficiency. Strategy development, vocabulary building. Using reading to support academic writing.

ESL 325. SIEP, Advanced Oral Skills. (0 cr; S-N only. Prereq: Non-native speaker of English)

English spoken language skills, community contact.

ESL 330. Advanced Oral Skills. (0 cr; S-N or Aud. Prereq: Non-native speaker of English)

Listening/speaking skills in academic/conversational situations. Listening to lectures, note taking, giving speeches/presentations, readings, film, discussion. Pronunciation focuses on individual need.

ESL 405. SIEP, High-Advanced Grammar. (0 cr; S-N or Aud. Prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override)

English grammar skills.

ESL 410. English Grammar for Academic Purposes. (0 cr; S-N or Aud. Prereq: Non-native speaker of English)

Production of grammatically sophisticated structures in writing. Students edit their assignments.

ESL 415. SIEP, High-Advanced Reading and Composition. (0 cr; S-N or Aud. Prereq: Non-native speaker of English; see Minnesota English as a Second Language Program for override)

English reading/composition skills.
ESL 420. High Advanced Reading/Composition. (0 cr; S-N or Aud. Prereq-Non-native speaker of English) Reading for academic purposes. Comprehension of scholarly reading selections. Improving reading efficiency. Writing process, academic-style assignments.

ESL 425. SIEP, High Advanced Oral Skills. (0 cr; S-N only. Prereq-Non-native speaker of English) English spoken language skills, community contact.

ESL 430. High Advanced Oral Skills. (0 cr; S-N or Aud. Prereq-Non-native speaker of English) 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.

ESL 611. Advanced Grammar. (0 cr; S-N or Aud. Prereq-Nonnative English speaker) Difficult areas of grammar, resources to work on them. Meaning, use, form. Complex sentence patterns.

ESL 800. Academic Skills for the American University. (0 cr; S-N or Aud. Prereq-Non-native speaker of English, permission of Minnesota English Language Program) English language needed to interact within university setting. Academic life, student/instructor roles, communicating by email, classroom interactions, discussion/panel presentation skills.


ESL 901. American Culture. (0 cr; S-N or Aud. Prereq-Non-native speaker of English) Areas of U.S. culture such as humor, religions, ethnic groups, lifestyles, and popular culture.

ESL 902. Academic Skills for the American University. (0 cr; S-N or Aud. Prereq-Non-native speaker of English) English language needed to interact within university setting. Academic life, student/instructor roles, communicating by email, classroom interactions, discussion/panel presentation skills.

ESL 903. Business English. (0 cr; S-N or Aud. Prereq-Non-native English speaker) Oral/written communication skills in business setting.

ESL 904. TOEFL Preparation. (0 cr; S-N or Aud) Preparing for Internet-based TOEFL (iBT). Listening, speaking, grammar, writing, reading. Students examine types of questions and practice strategies useful on the test.

ESL 905. Topics in ESL. (0 cr; Stdnt Opt. Prereq-Nonnative speaker of English) Varying topics in learning English as a second language.

ESL 921. Academic Writing. (0 cr; S-N or Aud. Prereq-Non-native speaker of English) Writing for academic purposes.

ESL 931. Academic Speaking. (0 cr; S-N or Aud. Prereq-Non-native speaker of English) American academic interactions. Lectures, presentations, seminar-style discussions, informal exchanges. Presenting oneself professionally/socially in collegial settings with accuracy, variety, and flexibility.

ESL 941. Research Writing for the American University. (0 cr; S-N only. Prereq-[Non-native speaker of English, [TOEFL IBT 79 or IELTS 6.5 or MNBatt 80 or equiv] or %]) 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.


ESL 3001. Integrated Skills for Academic English. (2 cr [max 4 cr]; Stdnt Opt. Prereq-Non-native speaker of English) Polishing English skills to succeed in university-level classes. Small group discussions, interactions with instructors/peers, academic writing, vocabulary building.


ESL 3201. Advanced English Reading and Composition. (5 cr [max 10 cr]; Stdnt Opt. Prereq-Non-native speaker of English, [IBT score of 53-67 or equiv] or %) Comprehension of main ideas, organization, and support in longer authentic English texts. Expanded vocabulary comprehension. Fluency, focus, and persuasiveness through drafting/revision. Focuses on accuracy/variety of expression.

ESL 3202. Academic Reading and Composition. (5 cr [max 10 cr]; Stdnt Opt. Prereq-3201, Non-native speaker of English, [IBT score of at least 68 or equiv], %) 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.

ESL 3402. Research Writing for the American University. (4 cr [max 8 cr]; Stdnt Opt. Prereq-3202, non-native speaker of English, [C-TOEFL score of at least 190 or equiv], %) 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.

ESL 3501. Advanced English Listening and Speaking. (4 cr [max 8 cr]; Stdnt Opt. Prereq-[Non-native speaker of English, [TOEFL IBT 79 or IELTS 6.5 or MNBatt 80 or equiv] or %]) 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.

ESL 3502. Advanced English Listening and Speaking. (5 cr [max 10 cr]; Stdnt Opt. Prereq-3501, non-native speaker of English, [IBT score of at least 68 or equiv], %) 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/understanding.


Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.
ENGL 1181V. Honors: Introduction to Shakespeare. (4 cr; A-F or Aud. +ENGL 1181W. Prereq-Honors or #) Survey of Shakespeare's work, treating approximately 10 plays. Lecture.


ENGL 1201V. Honors: Contemporary American Literature. (4 cr; A-F or Aud. +ENGL 1201W. Prereq-Honors or #) Chronologically/Thematically based readings from American literature. Approaches to literary analysis/criticism. Social/historical contexts of authorship/reading, literary artistry/conventions. Discussion, writing.

ENGL 1201W. Contemporary American Literature. (4 cr; Stdnt Opt. +ENGL 1201V) Literature of 1960s to today. Ways American authors from various ethnic, gender, religious, sexual, economic orientations and genres explore politics, aesthetics, sociocultural taboos, and extra-literary concerns.

ENGL 1301V. Honors: Introduction to Multicultural Literatures of the United States. (4 cr; A-F or Aud. +ENGL 1301W. Prereq-Honors or #) Representative works by African American, American Indian, Asian American, and Chicano/Chicana writers, chiefly from 19th century. Social/cultural factors in America's literary past/present.


ENGL 1401V. Honors: Introduction to “Third World” Literatures in English. (4 cr; A-F or Aud. +ENGL 1401W. Prereq-Honors or #) Diverse works produced in English outside the United States and Britain. Works represent different cultures, but treats concerns derived from a common post-colonial legacy.

ENGL 1401W. Introduction to “Third World” Literatures in English. (4 cr; Stdnt Opt. +ENGL 1401V) Diverse works produced in English outside the United States and Britain. Works represent different cultures, but treats concerns derived from common post-colonial legacy.

ENGL 1501W. Literature of Public Life. (4 cr; A-F only) Meaning/practice of citizenship. Historical themes, contemporary issues in American public life: access of citizenship, tensions between social duties and individual freedoms, role of moral values in public life. Diverse literary materials.

ENGL 1601W. English Language and Society. (4 cr; Stdnt Opt) Nontechnical understanding of systematic, dynamic, creative nature of human language. Emphasizes English language.

ENGL 1701H. Modern Fiction. (3 cr; Stdnt Opt. +ENGL 1701W) Basic techniques for analyzing/understanding fiction. Readings from novels and short stories written in English-speaking countries and elsewhere (in translation). Introduction to fictional techniques such as point of view, fictional conventions, and some forms of experimentation.

ENGL 1701W. Topics: Modern Fiction. (4 cr; Stdnt Opt. +ENGL 1701V. Prereq-Honors or #) Basic techniques for analyzing/understanding fiction. Readings from novels and short stories written in English-speaking countries and elsewhere (in translation). Point of view, fictional conventions, forms of experimentation.

ENGL 1703E. Honors: Modern Fiction. (4 cr; Stdnt Opt. +ENGL 1703F. Prereq-Honors or #) Basic techniques for analyzing/understanding fiction. Readings from novels and short stories written in English-speaking countries and elsewhere (in translation). Point of view, fictional conventions, forms of experimentation.

ENGL 1905. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

ENGL 1907W. Topics: Freshman Seminar. (3 cr; A-F or Aud) Topics specified in Class Schedule.

ENGL 3001V. Honors: Textual Analysis. Methods. (4 cr; A-F only. +ENGL 3001W. Prereq-Honors, [English major or minor approved BIS or IDIM program with English area]) Training/practice in analyzing various literary forms. Emphasizes poetry, argument, evidence, and documentation in literary papers. Introduction to major developments in contemporary criticism.

ENGL 3001W. Textual Analysis: Methods. (4 cr; A-F only. +ENGL 3001V. Prereq-English major or minor or premajor or BIS/IDIM program with English area) Close/critical reading, placing literature in history/culture. Idea of multiple approaches to literary works. Analysis of various literary forms, including poetry.


ENGL 3002H. Honors: Modern Literary Criticism and Theory. (3 cr; Stdnt Opt. +ENGL 3002. Prereq-Honors or #) Problems of interpretation/criticism. Questions of meaning, form, authority, literary history, social significance.

ENGL 3003W. Historical Survey of British Literatures I. (4 cr; Stdnt Opt) An introductory historical survey of British literature and culture from the Anglo-Saxon invasions through the end of the 18th century.

ENGL 3004W. Historical Survey of British Literatures II. (4 cr; Stdnt Opt) An introductory historical survey of British literature and culture in the 19th and 20th centuries. Includes Romantic, Victorian, and Modernist authors, such as Wordsworth, Keats, Tennyson, the Brontes, Austen, Dickens, Wilde, Yeats, Woolf, and Thomas.
ENGL 3005Y. Honors: Survey of American Literature I. (4 cr; Stdt Opt. Prereq-Honors or #) Readings in American literature, from first European contact, through colonial times, to mid-19th century. Texts in several genres by diverse authors. Classics, less familiar works. Historical, social, and aesthetic contexts.

ENGL 3005W. Survey of American Literatures and Cultures I. (4 cr; Stdt Opt) Readings in American literature from first European contact, through colonial times, to mid-19th century. Texts in several genres by diverse authors. Classics, less familiar works. Historical, social, and aesthetic contexts.

ENGL 3006Y. Survey of American Literatures and Cultures II. (4 cr; Stdt Opt) Readings from the mid-19th to the mid-20th century, including the realists’ and regionalists’ response to the growth of industrial capitalism, Modernism in the 1920s, and the issues which united and divided the country throughout the 20th century.

ENGL 3007. Shakespeare. (3 cr; A-F or Aud. +ENGL 3007H) Plays from all of Shakespeare’s periods, including at least A Midsummer Night’s Dream, Hamlet, the history plays, King Lear, Macbeth, The Tempest, Twelfth Night, Antony and Cleopatra, Othello, and The Winter’s Tale.

ENGL 3007H. Honors: Shakespeare. (3 cr; A-F or Aud. +ENGL 3007, Prereq-Honors or #) Plays from all of Shakespeare’s periods, including at least A Midsummer Night’s Dream, Hamlet, the history plays, King Lear, Macbeth, The Tempest, Twelfth Night, Antony and Cleopatra, Othello, and The Winter’s Tale.

ENGL 3008. Research in English: In and Out of the Archives. (3 cr; A-F only. Prereq-English major or minor or BIS/IDIM English or # or %) Social/textual relationships. How to craft revealing questions and assess information. Modes of inquiry. Collections/communities. Written assignments, discussion. Archival materials in print, oral, digital, and visual forms.

ENGL 3008H. Research in English: In and Out of the Archives. (3 cr; A-F only. Prereq-[CLA honors, English major or English minor or BIS/IDIM English]] or #) Social/textual relationships. How to craft revealing questions and assess information. Modes of inquiry. Collections/communities. Written assignments, discussion. Archival materials in print, oral, digital, and visual forms.

ENGL 3010. Studies In Poetry. (3 cr [max 9 cr]; Stdt Opt. +ENGL 3010H) Special topics related to reading poetry in various interpretive contexts.

ENGL 3010H. Honors: Studies in Poetry. (3 cr; Stdt Opt. +ENGL 3010, Prereq-Honors or #) Special topics related to reading poetry in various interpretive contexts.

ENGL 3011. Diaspora Poetics. (3 cr; Stdt Opt) Verbal art, historic or recent, produced by displaced persons as basis for engagement with idea of creative, survivalist displacement of language itself.


ENGL 3021. Captivity in Literature and Film: From the Barbary Coast to Guantanamo Bay. (3 cr; Stdt Opt. +ENGL 5021) Whether there is a captivity genre in English/Global literature, from early modern period to 21st century. Texts/films from numerous civilizations/histories.


ENGL 3029W. Professional Writing. (3 cr; Stdt Opt. +WRIT 3029W) How to write for various professional purposes/audiences, using differing styles, tones, and organizational elements. Potential genres include grant proposals, feasibility studies, job search portfolios, progress reports, annotated bibliographies. Broader issues of professional literacy.

ENGL 3030. Studies in Drama. (3 cr [max 9 cr]; Stdt Opt. +ENGL 5030, ENGL 3030H) Topics may include English Renaissance tragedy, English/Renaissance and 18th century, or American drama by writers of color. Single-author courses focus on writers such as Tennessee Williams and Eugene O’Neill, or issues/topics such as gender/performance.

ENGL 3030H. Honors: Studies in Drama. (3 cr [max 9 cr]; A-F only. +ENGL 5030, ENGL 3030H, Prereq-Honors or #) Topics may include English Renaissance tragedy, English/Renaissance and 18th century American drama by writers of color. Single-author courses focus on writers such as Tennessee Williams and Eugene O’Neill, or issues/topics such as gender, and performance.

ENGL 3032. Shakespeare in London. (3 cr; Stdt Opt) How are different interpretations of Shakespearean works embodied in the theater? How are they transformed by location/context? Students attend/discuss theatrical productions.

ENGL 3040. Studies in Film. (3 cr; Stdt Opt. +ENGL 3040H) Topics regarding film in a variety of interpretive contexts, from the range and historic development of American, English and Anglophone film. Recent examples: “American Film Genres,” “Film Noir,” “Chaplin and Hitchcock.” Topics and viewing times announced in Class Schedule.

ENGL 3040H. Honors: Studies in Film. (3 cr; Stdt Opt. +ENGL 3040, Prereq-Honors or #) Topics regarding film in various interpretive contexts. Range and historic development of American, English, and Anglophone film. Examples: “American Film Genres,” “Film Noir,” “Chaplin and Hitchcock.” For topics, see Class Schedule.


ENGL 3060. Studies in Literature and the Other Arts. (3 cr [max 9 cr]; Stdt Opt) Examine literature’s role in conjunction with other arts including music, the visual arts, dance, etc. Topics specified in Class Schedule.

ENGL 307b. Studies in Literary and Cultural Modes. (3 cr [max 9 cr]; A-F or Aud) Modes of literary expression/representation that transcend conventional demarcations of genre and historical periods. Topics may include horror, romance, mystery, comedy, and satire.


ENGL 3109H. Honors: General Topics. (3 cr [max 9 cr]; A-F only. Prereq-honors student) Topics specified in Class Schedule.

ENGL 3110. Survey of Medieval English Literature. (3 cr; A-F or Aud) 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 Aud) 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 [max 9 cr]; Stdt Opt. +ENGL 5110) Major and representative works of the Middle Ages. Topics specified in the Class Schedule.

ENGL 3115. Medieval and Renaissance Drama. (3 cr; A-F or Aud) Medieval/Renaissance drama in terms of performance. Performance history, enactments of scenes from cycle/morality plays, informal production of a morality play.

ENGL 3122. Shakespeare II: The Major Themes. (3 cr; Stdt Opt. Prereq-3007 or #) Shakespeare’s intellectual community, its language/values. In-class readings from at least six plays. Quizzes on dramatic speeches. Written assignments.

ENGL 3132. The King James Bible as Literature. (3 cr; Stdt Opt) 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 3134. Milton and the Century of Revolution. (3 cr; A-F or Aud. =ENGL 3134H) 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 3134H. Honors: Milton and the Century of Revolution. (3 cr; A-F or Aud. =ENGL 3134. Prereq-Honors or #) 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. (3 cr; A-F or Aud. =ENGL 3141) The literature of the British Victorian period (1832-1901) in relation to its cultural and historical contexts. Typical authors: Dryden, Behn, Swift, Pope, Fielding, Burney.

ENGL 3151H. Honors: Romantic Literatures and Cultures. (3 cr; A-F only) 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; Stdnt Opt. =ENGL 3161H) 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; Stdnt Opt. =ENGL 3161. Prereq-Honors or #) Literature of the British Victorian period (1832-1901) in relation to its cultural/historical contexts. Typical authors: Tennyson, the Brownings, Dickens, Arnold, Hopkins, the Brontes.

ENGL 3171. Modern British Literature and Cultures. (3 cr; Stdnt Opt) 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 3180. Contemporary Literatures and Cultures. (3 cr [max 9 cr]; Stdnt Opt. =ENGL 5180, ENGL 5180H) Examine issues related to the reading and understanding of British, American, and Anglophone fiction and poetry in a variety of interpretive contexts.

ENGL 3180H. Honors: Contemporary Literatures and Cultures. (3 cr; A-F or Aud. =ENGL 3180, ENGL 5180. Prereq-Honors or #) Issues related to reading/understanding British, American, and Anglophone fiction/poetry in various interpretive contexts.

ENGL 3211. American Poetry to 1900. (3 cr; Stdnt Opt) Poets from the Puritans to the end of the 19th century. The course attends to the intellectual and cultural background of the poets, poetic theory, and form.

ENGL 3212. American Poetry from 1900. (3 cr; Stdnt Opt) 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; Stdnt Opt) 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; Stdnt Opt. =ENGL 3222H) Novels from early 1900's realism through the Modernists (e.g., Faulkner, Hemingway, Fitzgerald) to more recent writers (e.g., Ellison, Bellow, Erdrich, Pynchon). Stylistic experiments, emergence of voices from formerly under-represented groups, and novelists’ responses to a technologically changing society.

ENGL 3222H. Honors: American Novel from 1900. (3 cr; Stdnt Opt. =ENGL 3222. Prereq-Honors or #) Novels from early 1900s realism through Modernists (e.g., Faulkner, Hemingway, Fitzgerald) to recent writers (e.g., Ellison, Bellow, Erdrich, Pynchon). Stylistic experiments, emergence of voices from under-represented groups. Novelists’ responses to a technologically changing society.

ENGL 3231. American Drama. (3 cr; Stdnt Opt. =ENGL 3231H) Representative dramas from the 18th through 20th centuries. Topics include the staging of national identities, the aesthetics of modern and contemporary drama, and the production concerns of mainstream, regional, and community theaters.

ENGL 3231H. Honors: American Drama. (3 cr; Stdnt Opt. =ENGL 3231. Prereq-honors student) Representative dramas, from 18th through 20th centuries. Staging of national identities, aesthetics of modern/contemporary drama. Production concerns of mainstream, regional, and community theaters.

ENGL 3300. Multicultural American Literatures and Cultures. (3 cr; Stdnt Opt. =ENGL 3300, ENGL 3300H) Writings of specific ethnic groups. Emphasizes historical or cultural context. Topics may include American minority drama, Harlem Renaissance, Asian-American literature/film, African-American women writers. Topics specified in Class Schedule.

ENGL 3300H. Honors: Multicultural American Literatures and Cultures. (3 cr; Stdnt Opt. =ENGL 3300, ENGL 3300H) Writings of specific ethnic groups. Emphasizes historical or cultural context. Topics may include American minority drama, Harlem Renaissance, Asian-American literature/film, African-American women writers. Topics specified in Class Schedule.

ENGL 3330. Gay, Lesbian, Bisexual, and Transgendered Literature. (3 cr [max 9 cr]; Stdnt Opt) Literature/culture produced by/about gay, lesbian, bisexual, and transgendered people. Emphasizes importance of materials falsified/ignored in earlier literary/cultural studies. How traditional accounts need to be revised in light of significant contributions of GLBT people.

ENGL 3350. Women Writers. (3 cr [max 9 cr]; Stdnt Opt. =ENGL 3350, ENGL 3350H) Groups of writers in the 19th and/or 20th centuries. Will focus either on writers from a single country or be comparative in nature. The course will be organized thematically according to topics of contemporary and theoretical interest.

ENGL 3350H. Honors: Women Writers. (3 cr; Stdnt Opt. =ENGL 3350, ENGL 3350H) Groups of writers in the 19th and/or 20th centuries. Either focuses on writers from a single country or is comparative. Organized thematically according to topics of contemporary/theoretical interest.

ENGL 3351W. Voices from the Gaps: Writing and Art by Women of Color. (4 cr; Stdnt Opt) Collaborative/individual research writing, and Web site production for VG (Voices from the Gaps). Focuses on visual arts, film, music, and literature by North American women writers of colour. Texts/discussions in English.

ENGL 3352. Weird Books by Women. (3 cr; Stdnt Opt) Weirdness as non-normativity that creates discomfort. Weirdness as incestuous creepiness, dissociation, hysteria, paranoia. Weirdness as identifying, but not wanting to, with a twisted “reality.” Weirdness created through experimental text, form, and narrative.

For a guide to course numbers, symbols, and abbreviations, see page 376.
ENGL 3400. Post-Colonial Literatures. (3 cr; [max 9 cr]; Stndt Opt.; ENGL 3400H, ENGL 3400W, ENGL 3400P) 
Varied topics in post-Colonial literatures. Typical novels include Chinua Achebe, Tsitsi Dangaremba, Fadia Faqir, and Salman Rushdie; filmmaker Kidlat Tahimik; and “dub” poets Mutabaruka and Jean Binta Breeze.

ENGL 3400H. Honors: Post-Colonial Literatures. (3 cr; Stndt Opt. = ENGL 3400, ENGL 3400W, ENGL 3400P) 
Varied topics in post-Colonial literatures. Typical figures include novelists Chinua Achebe, Tsitsi Dangaremba, Fadia Faqir, and Salman Rushdie; filmmaker Kidlat Tahimik; and “dub” poets Mutabaruka and Jean Binta Breeze.

ENGL 3501. Public Discourse: Coming to Terms With the Environment. (3 cr; Stndt Opt.) 
Public discourse in various geographic regions and historical periods. See Course Guide for specific course description.

ENGL 3505. Community Learning Internships I. (3 cr; A-F or Aud) 
Connections between literature/literacy, theory/practice, and community work and academic study. Students work as interns in local community-based education projects. Interns meet with faculty and community representatives to reflect on daily work and practical relevance. Students receive initial training from Career and Community Learning Center and Minnesota Literacy Council, and orientations at community sites. Four hours weekly work at community site, readings, journal writing, monthly short papers.

ENGL 3506. Learning Internships II. (4 cr; A-F or Aud. Prereq-3505 in preceding semester or #) 
Students work at a community site. In weekly meetings with faculty and community representatives, students explore relationship between their academic skills and community experiences. Social functions of literacy and liberal education in the United States. Eight hours weekly work at community site, readings in history/theory of literacy, written reflection exercises, design/execution of scholarly or educational project at community site.

ENGL 3592W. Introduction to Black Women Writers in the United States. (3 cr; Stndt Opt.) 
Literature of African American women writers explored in novels, short stories, essays, poetry, autobiographies, drama from 18th to late-20th century.

ENGL 3597W. Introduction to African American Literature and Culture I. (4 cr; Stndt Opt. = ENGL 3598W, ENGL 3598H, AFRO 3597W) 
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama from colonial era through Harlem Renaissance.

ENGL 3598. Introduction to African American Literature and Culture II. (4 cr; Stndt Opt. = ENGL 3598W, AFRO 3599W, ENGL 3597W) 
African American oral tradition, autobiography, poetry, essay, fiction, oratory, and drama from after Harlem Renaissance to the end of 20th century.

ENGL 3598W. Introduction to African American Literature and Culture II. (4 cr; Stndt Opt. = ENGL 3598W, AFRO 3599W, ENGL 3597W) 
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

ENGL 3601. Analysis of the English Language. (4 cr; Stndt Opt.) 

ENGL 3711. Literary Magazine Production Lab I. (4 cr; A-F only) 
First of two courses. Students produce undergraduate art/literary magazine Ivory Tower. Students decide upon identity, tone, and direction of the issue. They take on managing staff responsibilities, call for submissions, make selections, edit/design, set budget, and begin fund-raising.

ENGL 3712. Literary Magazine Production Lab II. (4 cr; A-F only) 
Second of two courses. Students produce undergraduate art/literary magazine Ivory Tower. Students produce final issue, design/layout, select printer, distribute, and market journal. Reading/writing assignments on history of literary magazines.

ENGL 3713. Editing for Publication. (4 cr; Stndt Opt. Prereq-Soph or jr or 1st sem sr) 
Practice professional editing of various kinds of texts (e.g., scientific/technical writing). Introduction to editing levels, from substantive revision to copyediting. Computer-mediated editorial practices.

ENGL 3741. Literary and American Cultural Diversity. (4 cr; Stndt Opt.) 

ENGL 3870. Figures in English and North American Literature. (5 cr; [max 9 cr]; Stndt Opt.) 
Topics specified in the Class Schedule.

ENGL 3881. London Seminar. (3 cr; Stndt Opt. Prereq-Completion of 3xxx composition requirement, %) 
Topics specified in the Class Schedule.

ENGL 3883V. Honors Thesis. (1-4 cr; max 4 cr; A-F or Aud. Prereq-Honors candidacy in English, consent of English honors advisor) 
See guidelines available from English honors advisor.

ENGL 3960W. Senior Seminar. (4 cr; A-F or Aud. Prereq-English major, [jr or sr], major adviser approval, %) 
Rigorous/intensive seminar. Students write extended scholarly essay. Topics specified in Class Schedule.

ENGL 3980. Directed Instruction. (1-6 cr; max 6 cr; Stndt Opt. Prereq-#, %, @) 
Directed study arranged between student and advising faculty member.

ENGL 3993. Directed Study. (1-4 cr; max 8 cr; A-F only. Prereq-One 3xxx, [English major or minor or [BIS or IDIM or ICP] with English concentration], [jr or sr], %, @) 
Guided individual reading or study.

ENGL 4003. History of Literary Theory. (3 cr; A-F or Aud) 
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 4041. Old Age in Film and Literature. (3 cr; A-F or Aud) 
How/why subject of old age is focus of a selection of primarily modern verbal/visual texts (fiction, non-fiction). Philosophical, sociological, and psychological perspectives. Ways in which varied experiences of old age have as much to do with culture as with biology.

ENGL 4090. General Topics. (1-4 cr; max 12 cr; Stndt Opt.) 
Topics specified in Class Schedule.

ENGL 4152. Nineteenth Century British Novel. (3 cr; A-F or Aud) 
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 4153. Nineteenth-Century British Poetry. (3 cr; A-F or Aud) 
Poetry written in Britain during 19th century. Possible authors include Wordsworth, Byron, Hemans, Tennson, Robert and Elizabeth Browning, D. G. and Christina Rossetti, Swinburne, and Hopkins.

ENGL 4232. American Drama by Writers of Color. (3 cr; A-F or Aud) 
Selected works by Asian American, African American, American Indian, Latino, and Chicano playwrights. How racial/ethnic differences are integral to different visions of American drama. History of minority/ethnic theaters, politics of casting, mainstreaming of the minority playwright.

ENGL 4233. Modern and Contemporary Drama. (3 cr; A-F or Aud) 
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, absurdist) 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. (3 cr; A-F or Aud) 
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 4593. The African-American Novel. (3 cr; Stdnt Opt. = AFRO 4593)
Contextual readings of 19th-20th-century black novelists, including Chesnutt, Hurston, Wright, Baldwin, Petry, Morrison, and Reed.

ENGL 4602W. Gender and the English Language. (4 cr; Stdnt Opt)
Connections between gender and other social factors that influence history/future of English language. Race, ethnicity, class, regional/national variation, religion, technology. Gender theories as they relate to social issues, texts, and discourse practices.

ENGL 4603W. World Englishes. (4 cr; Stdnt Opt)
Historical background, psychosocial significance, and linguistic characteristics of diverging varieties of English spoken around the world, especially in postcolonial contexts (Caribbean, Africa, Asia). Development of local standards/vernaculars. Sociolinguistic methods of analysis.

ENGL 4605. Social Variation in American English. (4 cr; Stdnt Opt)
Description/analysis of English language variation in the United States and the Caribbean. Social history of migrations (voluntary/enforced) leading to development of regional/rural dialects, pidgins, creoles, and urban varieties.

ENGL 4612. Old English I. (3 cr; Stdnt Opt. = ENGL 3612, ENGL 5612)
Introduction to the language through 1150 A.D. Culture of Anglo-Saxons. Selected readings in prose/poetry.

ENGL 4613. Old English II. (3 cr; Stdnt Opt. = ENGL 4613)
Critical reading of texts. Introduction to versification. Readings of portions of Beowulf.

ENGL 4721. Electronic Text. (3 cr; Stdnt Opt)
Status/function of text, related questions as framed by electronic text.

ENGL 4722. Alphabet to Internet: History of Writing Technologies. (4 cr; Stdnt Opt)

ENGL 5001. Introduction to Methods in Literary Studies. (3 cr; Stdnt Opt)
Ends/methods of literary research, including professional literary criticism, analytical bibliography, and textual criticism.

ENGL 5002. Introduction to Literary and Cultural Theory. (3 cr; Stdnt Opt. = ENGL 5002)
Approaches to practical/theoretical problems of literary history/genre.

ENGL 5020. Readings in Narrative. (3 cr; Stdnt Opt. = ENGL 3020, Prereq-Grad student or #)
Issues related to reading/understanding narrative in various interpretive contexts. Topics may include “The 19th-century English (American, Anglophone) Novel,” “Introduction to Narrative,” or “Techniques of the Novel.”

ENGL 5021. Captivity in Literature and Film: From the Barbary Coast to Guantanamo Bay. (3 cr; Stdnt Opt. = ENGL 3021, Prereq-Grad student or #)
Whether there is a captivity genre in English/GLOBAL literature, from early modern period to 21st century. Texts/films from numerous civilizations/histories.

ENGL 5030. Readings in Drama. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3030H, ENGL 3030. Prereq-Grad student or #)
Wide reading in literature of a given period or subject. Prepares students for work in other courses/seminars. Relevant scholarship/criticism. Topics specified in Class Schedule.

ENGL 5040. Theories of Film. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3040, Prereq-Grad student or #)
Advanced topics related to film in a variety of interpretive contexts, from the range and develop historical perspective of American, English, and Anglophone film (e.g., “Fascism and Film,” “Queer Cinemas”). Topics and viewing times announced in Class Schedule.

ENGL 5090. Readings in Special Subjects. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 5090, Prereq-Grad student or #)
General background and 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. Readings in Middle English Literature and Culture. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3110, Prereq-Grad student or #)
Wide reading in literature of period. Relevant scholarship/criticism. Topics vary. See Class Schedule.

ENGL 5121. Readings in Early Modern Literature and Culture. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3121, Prereq-Grad student or #)
Topical readings in early modern poetry, prose, fiction, and drama. Attention to relevant scholarship or criticism. Preparation for work in other courses or seminars.

ENGL 5140. Readings in 18th Century Literature and Culture. (3 cr; Stdnt Opt. = ENGL 3140, Prereq-Grad student or #)
Literature written in English, 1660-1798. Topics may include British Literatur in Reformation and 18th century, 18th-century American literature, a genre (e.g., 18th-century novel).

ENGL 5150. Readings in 19th-Century Literature and Culture. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3150, Prereq-Grad student or #)
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]; Stdnt Opt. = ENGL 3170, Prereq-Grad student or #)
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 5175. 20th-Century British Literatures and Cultures I. (3 cr; Stdnt Opt. = ENGL 3175. Prereq-Grad student or #)
Principal writers, intellectual currents, conventions, genres, and themes in Britain/Ireland, 1900-45. Fiction/nonfiction by Conrad, Richardson, Forster, Joyce, Mansfield, Rhye, Woolf, Lawrence and Huxley, Poetry by Hardy, Hopkins, Loy, H.D., Yeats, Pound and Eliot. Drama by Sygne and Shaw.

ENGL 5176. 20th-Century British Literatures and Cultures II. (3 cr; Stdnt Opt. = ENGL 3176, Prereq-Grad student or #)

ENGL 5180. Readings in Contemporary Literature and Culture. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3180, ENGL 3180H, Prereq-Grad student or #)

ENGL 5200. Readings in American Literature. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3200, ENGL 3200H, Prereq-Grad student or #)
General background/preparation for advanced graduate study. Readings cover either a wide historical range (e.g., 19th century), a genre (e.g., the novel), or a major literary movement (e.g., modernism).

ENGL 5300. Readings in American Minority Literature. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3300, ENGL 3300H, Prereq-Grad student or #)
Contextual readings of 19th-20th-century American minority writers. Topics specified in Class Schedule.

ENGL 5400. Readings in Post-Colonial Literature. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3400, ENGL 3400H, Prereq-Grad student or #)
Selected readings in post-colonial literature. Topics specified in Class Schedule.

ENGL 5510. Readings in Criticism and Theory. (3 cr [max 9 cr]; Stdnt Opt. = ENGL 3510, ENGL 3510H, Prereq-Grad student or #)

ENGL 5597. Harlem Renaissance. (3 cr; Stdnt Opt. = AFRO 5597, Prereq-Grad student or #)
Multidisciplinary review of Jazz Age’s Harlem Renaissance: literature, popular culture, visual arts, political journalism, major black/white figures.

ENGL 5630. Theories of Writing and Writing Instruction. (3 cr; Stdnt Opt. = ENGL 3630, Prereq-Grad student or #)
Introduction to major theories that inform teaching of writing in college and upper-level high school curriculums. Topics specified in Class Schedule.
ENGL 5711. Introduction to Editing. (4 cr; Stdnt Opt)
Editor-writer relationship, manuscript reading, author querying, rewriting, style. Some discussion of copy editing. Students develop editing skills by working on varied writing samples.

ENGL 5712. Advanced Editing. (4 cr; Stdnt Opt. Prereq-5711 or grad student in Eng)
Editing long text. Fiction, children's literature, translations, indexes. Workshop/seminar.

ENGL 5743. History of Rhetoric and Writing. (3 cr; Stdnt Opt. Prereq-Grad student or #)
Assumptions of classical/contemporary rhetorical theory, especially as they influence interdisciplinary field of composition studies.

ENGL 5790. Topics in Rhetoric, Composition, and Language. (3 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #)
Topics specified in Class Schedule.

ENGL 5800. Practicum in the Teaching of English. (1-2 cr [max 2 cr]; Stdnt Opt. Prereq-Grad student or #)
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.

ENGL 5805. Writing for Publication. (3 cr; Stdnt Opt. Prereq-Grad student or #)

ENGL 5992. Directed Readings, Study, or Research. (1-3 cr [max 45 cr]; Stdnt Opt. Prereq-Grad student or #)

English: Creative Writing (ENGW)
Department of English Language and Literature

College of Liberal Arts

ENGW 1101W. Introduction to Creative Writing. (4 cr; Stdnt Opt)
Writing poetry and prose. Small group workshops and lecture presentations by visiting writers. For those who want to try creative writing, improve reading skills, and learn more about the creative process.

ENGW 1102. Introduction to Fiction Writing. (3 cr; Stdnt Opt)
Beginning instruction in the art of fiction: characterization, plot, dialogue, and style. Writing exercises to help students generate ideas. Students read and discuss published fiction as well as their own writing.

ENGW 1103. Introduction to Poetry Writing. (3 cr; Stdnt Opt)
Beginning instruction in the art of poetry. Discussion of student poems and contemporary poetry, ideas for generating material, and writing exercises both in and out of class.

ENGW 1104. Introduction to Literary Nonfiction Writing. (3 cr; Stdnt Opt)
Beginning instruction in the art of literary nonfiction, including the memoir. Discussion of student work and contemporary creative nonfiction, ideas for generating material, and writing exercises.

ENGW 3102. Intermediate Fiction Writing. (5 cr; Stdnt Opt. Prereq-1101 or 1102 or %)
Exercises, experiments, assigned readings, discussion of student work.

ENGW 3104. Intermediate Poetry Writing. (5 cr; Stdnt Opt. Prereq-1103 or 1104 or %)
Opportunity to explore new poetic possibilities and read widely in contemporary poetry/poetics. Advanced workshop.

ENGW 3107. Advanced Literary Nonfiction. (4 cr [max 8 cr]; Stdnt Opt. Prereq-3106 or %)
Advanced workshop. Writing memoir, literary essays.

ENGW 3110. Topics in Creative Writing. (3 cr [max 9 cr]; Stdnt Opt. Prereq-1101 or 1102 or 1103 or 1104 or %)
Topics specified in Class Schedule.

ENGW 3960W. Writing Workshop for Majors. (4 cr; A-F only. Prereq-Eng major, 6 cr of ENGW [including 3xxx appropriate for workshop genre], [jr or sr], major adviser approval, %)
Topics specified in Class Schedule.

ENGW 5102. Advanced Fiction Writing. (4 cr [max 8 cr]; Stdnt Opt. Prereq-%)
Advanced workshop for graduate students with considerable experience in writing fiction.

ENGW 5104. Advanced Poetry Writing. (4 cr [max 8 cr]; Stdnt Opt. Prereq-%)
Advanced workshop for graduate students with considerable experience in writing poetry. An opportunity to explore new poetic possibilities and to read widely in contemporary poetry and poems.

ENGW 5105. Advanced Poetry Writing. (4 cr [max 8 cr]; Stdnt Opt. Prereq-%)
Advanced workshop for students with considerable experience in writing poetry. An opportunity to explore new poetic possibilities and to read widely in contemporary poetry and poems.

ENGW 5110. Topics in Advanced Fiction Writing. (4 cr [max 16 cr]; Stdnt Opt. Prereq-%)
Special topics in fiction writing. Topics specified in Class Schedule.

ENGW 5130. Topics in Advanced Creative Writing. (4 cr [max 16 cr]; Stdnt Opt. Prereq-%)
Workshop. Might include work in more than one genre.

ENGW 5201. Journal and Memoir Writing. (3 cr; Stdnt Opt)
Using memory in writing, from brainstorming to drafting to revising, in several genres (poems, traditional memoir essays, fiction). How diverse cultures shape memory differently.

ENGW 5202. Journal and Memoir Writing. (3 cr; Stdnt Opt)
Using memory in writing, from brainstorming to drafting to revising, in several genres (poems, traditional memoir essays, fiction). How diverse cultures shape memory differently.

ENGW 5204. Playwriting. (4 cr [max 8 cr]; Stdnt Opt. Prereq-Jr or sr, one ENGW 3xxx course, permission number [available in creative writing office])
Advanced workshop. Contact creative writing program for specific description.

ENGW 5205. Screenwriting. (4 cr; Stdnt Opt. Prereq-Jr or sr, one ENGW 3xxx course, % [permission number available in creative writing office])
Advanced workshop. Contact creative writing program for specific description.

ENGW 5207. Screenwriting II. (4 cr; Stdnt Opt. Prereq-5205, one [Eng W or EngL or WS] 3xxx course, [jr or sr], %)
Story structure, dialogue, description. Students turn story created in 5205 into a fully realized screenplay.

ENGW 5310. Topics in Advanced Literary Nonfiction. (4 cr [max 16 cr]; Stdnt Opt. Prereq-%)
Special topics in essay writing (e.g., arts reviewing, writing about public affairs, writing in personal voice). Topics specified in Class Schedule.

ENGW 5606. Literary Aspects of Journalism. (3 cr; A-F or Aud. +JOUR 5606W)
Literary aspects of journalism as exemplified in and influenced by works of English/American writers past/present. Lectures, discussions, weekly papers.

ENGW 5993. Directed Study in Writing. (1-4 cr [max 18 cr]; Stdnt Opt. Prereq-%)
Projects in writing poetry, fiction, drama, and nonfiction, or study of ways to improve writing.

Entomology (ENT)
Department of Entomology

College of Food, Agricultural and Natural Resource Sciences

ENT 1905. Topics: Freshman Seminar. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-Fr)

ENT 3005. Insect Biology. (4 cr; Stdnt Opt)
Diverse biology of insects and their arthropod relatives. Insect behavior (including social insects), pollination, herbivory, insects as disease vectors, beneficial insects, insect population dynamics/ecology. Insects’ role in natural, agricultural, and urban, systems. Lecture/lab.

ENT 3281. Veterinary Entomology. (3 cr; A-F or Aud)
Biological management of insects, mites, ticks that affect livestock, poultry, companion animals. Emphasizes problem identification/solving. Lecture, lab.

ENT 3925. Insects, Aquatic Habitats, and Pollution. (3 cr; A-F or Aud. Prereq-[3005 or Biol 3407 or FW 3001] or #, or %)
Effects differing classes of pollutants have

ENT 4015. Ornamentals and Turf Entomology. (3 cr; Stdnt Opt. Prereq-1xxx course in biology or hort or forest resources) Diagnosis and management of insect pests in landscape plants. Emphasis on the principles of biological control, biorational pesticides, and integrated pest management.

ENT 4021. Honey Bees and Insect Societies. (3 cr; Stdnt Opt. Prereq-BIOL 1009 or #) 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.

ENT 4022. Honey Bee Management. (1 cr; Stdnt Opt. Prereq-BIOL 1009 or #; &4021 recommended) Field course for students interested in honey bee management and the conservation and maintenance of other bee pollinators. Work with live bee colonies and participate in field research problems related to honey bee behavior and management.

ENT 4096. Professional Experience Program: Internship. (1-3 cr [max 3 cr]; S-N or Aud. Prereq-COAES Jr or Sr, complete internship contract available in COAES Career Services before enrolling, UC only, #) Professional experience in entomology firms or government agencies through supervised practical experience; evaluative reports and consultations with faculty advisers and employers.


ENT 4861. Aquatic Insects. (3 cr; A-F only. Prereq-College-level general biology course or equiv) Taxonomy/natural history of aquatic insects. Their importance in aquatic ecology, water resource management, recreation, and conservation. Family-level identification of immature/adults. Field trips to local aquatic habitats. A collection is required.

ENT 5009. Pesticides in Horticulture: Their Use and Abuse. (3 cr; A-F or Aud. Prereq-[[4015 or 4251], PIPA 2001] or #) History of pesticide use. Case studies on specific pesticide issues, such as DD, atrazine, Temik, and imidacloprid. Pesticides use, application methods, environmental concerns. Training for pesticide certification license for Minnesota. Test given near campus during course.

ENT 5011. Insect Structure and Function. (4 cr; A-F or Aud. Prereq-3005 or #) Comparative study of insect structures/functions from evolutionary perspective. Introduction to physiology of digestion, respiration, other organ systems.


ENT 5041. Insect Ecology. (3 cr; Stdnt Opt. Prereq-BIOL 5041 or EBB 5122 or #) 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.


ENT 5121. Applied Experimental Design. (4 cr; Stdnt Opt. +AGRO 5121, Prereq-Stat 5021 or equiv or #) 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. Offered with AGRO 5121.


ENT 5321. Ecology of Agricultural Systems. (3 cr; A-F or Aud. +AGRO 5321. Prereq-[1xxx or above] course in [Agro or AnSc or Hort]. [1xxx or above] course in [Ent or PIPA or Soil]) or #) Ecological approach to problems in agricultural systems. Formal methodologies of systems inquiry are developed/applied.

ENT 5341. Biological Control of Insects and Weeds. (3-4 cr [max 4 cr]; A-F or Aud. Prereq-3001, Biol 1009, EEB 1001 or grad) 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.


ENT 5361. Aquatic Insects. (4 cr; A-F or Aud. Prereq-#) Taxonomy, natural history of aquatic insects including their importance in aquatic ecology, water resource management, recreation, and conservation. Emphasizes family-level identification of immature/adults. Field trips scheduled to local aquatic habitats. A collection is required.


ENT 5910. Special Problems in Entomology. (1-6 cr [max 10 cr]; Stdnt Opt. Prereq-#) Individual field, lab, or library studies in various aspects of entomology.

ENT 5920. Special Lectures in Entomology. (1-3 cr [max 9 cr]; Stdnt Opt) Lectures or labs in special fields of entomological research. Given by visiting scholar or regular staff member.

Environmental Sciences, Policy, and Management (ESPM)

College of Food, Agricultural and Natural Resource Sciences
ESPM 1002. Transfer Orientation Seminar. (1 cr; A-F or Aud) 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.
ESP 1003H. Honors Colloquium. (3 cr; max 6 cr; A-F or Aud. Prereq-Lower division honors, #) Lectures from experts, readings, discussions of current environmental topics/issues. Topics vary, see Class Schedule.


ESP 1480. Topics in Natural Resources. (1-4 cr; max 6 cr; Stdnt Opt. Prereq-Lower div) Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

ESP 1905. Freshman Seminar. (1-3 cr; max 3 cr; Stdnt Opt) Freshman seminar: topics vary.

ESP 1906W. Freshman Seminar. (3 cr; Stdnt Opt. Prereq- Fr) Issues/topics related to natural resources and the environment. Topics vary each semester.


ESP 2041. Natural Resources Consumption and Sustainability. (3 cr; Stdnt Opt) Trends in national/global population growth, economics, energy, food, water, and consumption of food, energy, minerals, wood, and other raw materials. Natural resources as raw materials for industry and for economic development. Environmental/economic trade-offs in gathering, processing, and use. Balancing consumption and environmental needs. Environmental impacts of extraction/use. Sustainability.


ESP 3000. Seminar on Current Issues for ESPM. (1 cr; max 6 cr; A-F or Aud. Prereq-Jr) 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.

ESP 3001. Treaty Rights and Natural Resources. (3 cr; A-F or Aud. + ESPM 5001) Readings, class discussion about nature of treaty rights reserved by indigenous Americans with respect to utilization of natural resources. Emphasizes Midwest issues. Web-assisted course.

ESP 3002. Colloquium: Exotic Plants and Animals. (1 cr; A-F or Aud) Current exotic plants/animals in Great Lakes region and the world. Gypsy moths, brown tree snakes, zebra mussels, Eurasian watermilfoil. Impact/control. Readings, discussions, and lectures from experts on topics such as invasion theory and real world management.

ESP 3011W. Ethics in Natural Resources. (3 cr; Stdnt Opt) Normative/professional ethics, and leadership considerations, applicable to managing natural resources and the environment. Readings, discussion.

ESP 3012. Statistical Methods for Environmental Scientists and Managers. (4 cr; A-F or Aud. + STAT 5021, STAT 5011, ANSC 3011. Prereq-Two yrs of high school math) 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.

ESP 3031. Applied Global Positioning Systems for Geographic Information Systems. (3 cr; A-F or Aud. + ESPM 5031. Prereq-Intro GIS course) GPS principles, operations, techniques to improve accuracy. Datum, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/coder 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.

ESP 3101. Conservation of Plant Biodiversity. (3 cr; A-F or Aud. + ESPM 5101. Prereq-BIOL 1001 or BIOL 1009) Introduction to principles underlying assessment/conservation of plant biodiversity at individual, population, and community levels. Case studies in management of biodiversity to restore/maintain ecosystem function. Issues such as genetics, timber harvesting, invasive species, plant reproduction.

ESP 3108. Ecology of Managed Systems. (3 cr; Stdnt Opt. + ESPM 5108. Prereq-BIOL 1001 or BIOL 1009 or HORT 1001 or #) 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.

ESP 3111. Hydrology and Water Quality Field Methods. (3 cr; A-F or Aud. + ESPM 3111, Prereq-4061 or EEB 4601 or GEO 4601 or FR 3114) 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.

ESP 3128. Seminar: Environmental Science. (1 cr; 5-N or Aud) Students analyze environmental topics presented by guest speakers. Job opportunities in environmental science. Resume writing, interviewing skills.


ESP 3202W. Environmental Conflict Management, Leadership, and Planning. (3 cr; A-F or Aud. + ESPM 5202) 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.

ESP 3207. Natural Resource-based Sustainable Development in Costa Rica. (3 cr; Stdnt Opt. + ESPM 5207, Prereq-(Fr or Sr), #) Field trips. From conventional to organic bird-friendly coffee production/marketing to sustainable management of high/low-land tropical forests and biodiversity. Lectures, seminars, labs, field work, written project.

ESP 3211. Survey, Measurement, and Modeling for Environmental Analysis. (3 cr; Stdnt Opt. + ESPM 5211, Prereq-[MATH 1031 or MATH 1051], [3012 or FW 4001 or STAT 5011], computer competency) 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.


ESP 3241W. Natural Resource and Environmental Policy: History, Creation, and Implementation. (3 cr; Stdnt Opt. + ESPM 5241) Basic concepts of political/administrative processes important to natural resource policy and program development. Case study approach to policy/legislative process, participants in policy development, and public programs. Federal/state laws/regulations, international issues.
ESPM 3245. Sustainable Land Use Planning and Policy. (3 cr; A-F or Aud. =ESPM 5245) 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. (3 cr; A-F or Aud. =ESPM 5251, LAS 3251) 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 3271. Environmental Policy, Law, and Human Behavior. (3 cr; A-F or Aud) Equity, transaction costs, social exchange, expectations, and conflict with regard to human-environment interactions. Assessment techniques.

ESPM 3425. Atmospheric Composition: From Smog to Climate Change. (3 cr; A-F only. =GEO 3425, Prereq- [CHEM 1021, CHEM 1022, PHYS 1101, MATH 1142, MATH 1271, MATH 1281] or equiv or #; ESPM 1425 recommended) Processes governing the chemical makeup of Earth’s atmosphere and their implications for air pollution, climate, and human welfare. “What is the composition of the atmosphere, and why is it changing?” Evolution of the atmosphere; atmospheric structure and transport; biogeochemical cycles of carbon, nitrogen, oxygen, mercury; the greenhouse effect; aerosols; stratospheric ozone loss; oxidizing power of the atmosphere; smog.

ESPM 3480. Topics in Natural Resources. (1-4 cr [max 6 cr]; Stdnt Opt) Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.


ESPM 3602. Regulations and Corporate Environmental Management. (3 cr; A-F only. =ESPM 5602, MGMT 5602. Prereq-APEC 101 or ECON 101) Concepts/issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels.

ESPM 3603. Environmental Life Cycle Analysis. (3 cr; A-F only. =ESPM 5603) 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. =ESPM 5604) Environmental problems such as climate change, ozone depletion, and loss of biodiversity.


ESPM 3606. Pollution Prevention: Principles, Technologies, and Practices. (3 cr; A-F only. =ESPM 5606. Prereq- CHEM 1011 or #) Implementing a pollution prevention project, e.g., cleaner production, design for the environment, life-cycle management. Ways industries can reduce their industrial emissions/costs by preventing pollution.

ESPM 3612W. Soil and Environmental Biology. (3 cr; Stdnt Opt. Prereq-BIOL 1009 or equiv; CHEM 1021 or equiv; 2125 recommended) 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.

ESPM 3703. Agroforestry in Watershed Management. (3 cr; Stdnt Opt. =ESPM 5703) 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 N Amer and from developing countries.

ESPM 4012W. Problem Solving: Environmental Review. (4 cr; Stdnt Opt. Prereq-Jr or sr) 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 EQB guidelines.

ESPM 4041W. Problem Solving for Environmental Change. (4 cr; A-F or Aud. Prereq-ESPM sr) Capstone course. Students working with a team on a real world project related to selected track, gather/analyze data relevant to clients’ 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. (3 cr; Stdnt Opt) 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]; Stdnt Opt. Prereq-#) Research, readings, and instruction.

ESPM 4094. Directed Research. (1-7 cr [max 7 cr]; Stdnt Opt. Prereq-#) Research under the direction of department faculty.

ESPM 4096. Professional Experience Program: Internship. (1-6 cr [max 6 cr]; A-F only. Prereq-DCFANS undergrad, #, completed internship contract) Students create oral/written report based on paid or volunteered work or field experience.

ESPM 4200H. Honors Seminar. (1 cr; A-F or Aud. Prereq-ENR upper div honors, #) Topics presented by faculty, students, guest speakers. Lecture/discussion.


ESPM 4242. Methods for Environmental and Natural Resource Policy Analysis. (3 cr; A-F or Aud. =ESPM 5242. Prereq-[3241 or equiv, [3261 or equiv]) 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 over use, management, and protection of resources often occur.

ESPM 4295W. GIS in Environmental Science and Management. (4 cr; A-F or Aud. Prereq: FR 313 or #) Application of spatial data inventory/analysis in complex environmental planning problems. Spatial data collection, database development methods including GPS, DLG, TIGER, NWI data, spatial analysis. Topics identified by non-University partners.

ESPM 4601. Soils and Pollution. (3 cr; Stndt Opt. Prereq: [Chem 1021 or equiv], [Phys 1042 or equiv] or #; 3416 recommended) Principles of microbiology, chemistry, physics applied to evaluation of pollution of soils. Mitigation of pollution in agricultural/urban settings, remediation of polluted sites.

ESPM 4607. Industrial Biotechnology and the Environment. (3 cr; A-F only. =ESPM 5607. Prereq: BIOL 1009, CHEM 1021) Biotechnology pertaining to bio-based products development, their environmental impact.

ESPM 4608. Bioremediation. (3 cr; A-F only. =ESPM 5608. Prereq: (BIOL 1001 or BIOL 1009), CHEM 1017) Use of organisms in remediation of waste/pollution problems related to bio-based product industries. Types, characteristics, and identification of useful microorganisms. Application of microbes to benefit industrial processes of wood/fiber.

ESPM 4609. Air Pollution Impacts, Management, and Ethical Challenges. (3 cr; A-F or Aud. =ESPM 5609. Prereq: [BIOL 1001 or BIOL 1009], [CHEM 1011 or CHEM 1015 or CHEM 1021], CHEM 1017) Air pollutants, sources, and impacts on humans, plants, animals, soil, water, atmosphere, and planet. Emission rates, measurement, control technologies, air pollution laws/regulations. Personal perspectives/ethics related to air pollution, how they impact professional/civic life.

ESPM 4801H. Honors Research. (2 cr; A-F or Aud. Prereq: ENR upper div honors, #) Independent research project supervised by faculty member.


ESPM 5001. Treaty Rights and Natural Resources. (3 cr; A-F or Aud. =ESPM 3001. Prereq-Grad student or #) Readings, class discussion about treaty rights reserved by indigenous Americans with respect to use of natural resources. Emphasizes Midwest issues. Web-assisted course.


ESPM 5031. Applied Global Positioning Systems for Geographic Information Systems. (3 cr; A-F or Aud. =ESPM 5301. Prereq-Grad student or #) GPS principles, operation, techniques to improve accuracy. Datum, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/carrer phase GPS used in exercises. GPS handheld units, MDA based ArcPad/GPS equipment. Transferring field data from desktop systems, integrating GPS data with GIS.

ESPM 5061. Water Quality and Natural Resources. (3 cr; Stndt Opt. Prereq: Grad student or #) 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 5101. Conservation of Plant Biodiversity. (3 cr; A-F or Aud. =ESPM 3101. Prereq-Grad student or #) Introduction to principles underlying assessment/conservation of plant biodiversity at individual, population, and community levels. Case studies, methods of biodiversity to restore or maintain ecosystem function. Genetics, timber harvesting, invasive species, plant reproduction.


ESPM 5131. Environmental Biophysics and Ecology. (3 cr; A-F or Aud. Prereq: [(Biol 1009 or equiv), Math 1271, Phys 1101, [upper div or grad student]) Basic concepts of environmental variables such as temperature, humidity, wind, and radiation. Mechanics of heat/mass transfer between a living organism and its surrounding environment. Set of practical examples to integrate concepts and transport processes.

ESPM 5202. Environmental Conflict Management, Leadership, and Planning. (3 cr; A-F or Aud. =ESPM 5202W. Prereq-Grad or #) 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 5211. Survey, Measurement, and Modeling for Environmental Analysis. (3 cr; Stndt Opt. =ESPM 5311. Prereq-Grad student or #) 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: History, Creation, and Implementation. (3 cr; Stndt Opt. =ESPM 3241W. Prereq-Grad student or #) Basic concepts of political/administrative processes important to natural resource policy and program development. Case study approach to policy/legislative process, participants in policy development, and public programs. Federal/state laws/regulations, international issues.

ESPM 5242. Methods for Natural Resource and Environmental Policy. (3 cr; A-F or Aud. =ESPM 4242. Prereq: [3241 or equiv], [3261 or equiv], [sr or grad student]) Methods, formal and informal, for analyzing environmental/natural resource policies. How to critically evaluate environmental/natural resources policies using economic/non-economic decision-making criteria. Application of policy analysis principles and concepts to environmental/natural resource problems. Recognizing politically-charged environment in which decisions occur over use, management, and protection of these resources often occur.

ESPM 5245. Sustainable Land Use Planning and Policy. (3 cr; A-F or Aud. =ESPM 3245. Prereq-Grad student) Planning theories, concepts, and constructs. Policies, processes, and tools for sustainable planning.
Environmental Sciences, Policy, and Management (ESPM)

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 Aud. *ESPM 3251, LAS 3251. Prereq-Grad student or #)
International perspectives on resource use in developing countries. Integration of natural resource issues with social, economic, and policy considerations. Agriculture, forestry, agroforestry, non-timber forest products, water resources, certification, development issues. Latin American case studies.

ESPM 5256. Natural Resource Law and the Management of Public Lands and Waters. (3 cr; A-F or Aud. *ESPM 4256. Prereq-3241, sr or grad student)

ESPM 5261. Economics and Natural Resources Management. (4 cr; A-F or Aud. *ESPM 3261. Prereq-Grad student or #)

ESPM 5295. GIS in Environmental Science and Management. (4 cr; A-F or Aud. Prereq-Grad student or #)
Application of spatial data inventory/analysis in complex environmental planning problems. Spatial data collection. Database development methods, including GPS, DLG, TIGER, NWI, data, and spatial analysis. Topics identified by non-University partners.

ESPM 5402. Biometeorology. (3 cr; Stdtnt Opt. Prereq-MATH 1271, PHYS 1201, STAT 3011, Grad or #)
Calculus-based introduction to atmospheric boundary layer (ABL), interface between earth’s surface and the atmosphere. ABL development/turbulence, surface energy balance, ABL clouds, air quality, microclimate, observational/modeling methods.

ESPM 5480. Topics in Natural Resources. (1-4 cr max 6 cr; Stdtnt Opt. Prereq-5 or grad student)
Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

ESPM 5482. Biosafety Science and Policy. (3 cr; Stdtnt Opt)
Science/policy for governing environmental/human safety of genetic engineering through Minnesota, national, and international cases.

ESPM 5501. Biological Collections: Curation and Management. (1 cr; Stdtnt Opt. Prereq-One [gen biology or intro to natural resources] course or #)

ESPM 5555. Wetland Soils. (3 cr; A-F or Aud. *SOIL 5555. Prereq-1125 or 2125 or equiv or #; 4511 recommended)
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.

ESPM 5575. Wetlands Conservation. (3 cr; Stdtnt Opt. *ESPM 5375. Prereq-#; sr or grad student or #)

ESPM 5601. Principles of Waste Management. (3 cr; A-F or Aud. Prereq-1125 or 2125, Biol 1002/1009 or Chem 1021, Stat 3011, APEC 1101 or #)

ESPM 5602. Regulations and Corporate Environmental Management. (3 cr; A-F only. *MGMT 3602, ESPM 3602. Prereq-APEC 1101 or ECON 1101)
Concepts, major issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels.

ESPM 5603. Environmental Life Cycle Analysis. (3 cr; A-F only. Prereq-[Math 1142 or [Math 1271, Math 1282]], [Econ 1101 or APEC 1101])
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.”

ESPM 5604. Environmental Management Systems and Strategy. (3 cr; A-F only. *ESPM 3604)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

ESPM 5605. Recycling: Extending Raw Materials Supplies. (3 cr; A-F only. *ESPM 3605)

ESPM 5606. Pollution Prevention: Principles, Technologies, and Practices. (3 cr; A-F only. *ESPM 3606. Prereq-CHEM 1011 or #)
Implementing a pollution prevention project, e.g., cleaner production, design for the environment, life-cycle management. Ways industries can reduce their industrial emissions/costs by preventing pollution.

ESPM 5607. Industrial Biotechnology and the Environment. (3 cr; A-F only. *ESPM 4607. Prereq-BIOL 1009, CHEM 1021, grad student)
Biotechnology pertaining to biobased products development and their environmental impact.

ESPM 5608. Bioremediation. (3 cr; A-F only. *ESPM 4608. Prereq-[BIOL 1001 or BIOL 1009], CHEM 101)
Use of microbes or their enzymes to detoxify contaminants in the field or in containment facilities. Contaminants, sources, fate. Biological organisms, pathways, and catalysts utilized in bioremediation. Site inspection practices, bioremediation technologies, application in real-world situations.

ESPM 5609. Air Pollution Impacts, Management, and Ethical Challenges. (3 cr; A-F or Aud. *ESPM 4609. Prereq-[CHEM 1021 or CHEM 1015], [BIOL 1001 or BIOL 1009 or CHEM 1017])
Air pollutants, sources, and impacts on humans, plants, animals, soil, water, atmosphere, and planet. Emission rates, measurement, control technologies, air pollution laws/regulations. EPerspectives and personal ethics related to air pollution, how they impact professional/civic life.

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.

ESPM 5811. Environmental Interpretation. (3 cr; A-F or Aud. *ESPM 4811. Prereq-Grad student or #)

For a guide to course numbers, symbols, and abbreviations, see page 376.
Family Social Science (FSOS)

Department of Family Social Science
College of Education and Human Development

FSOS 101. Intimate Relationships. (4 cr; Stdnt Opt)
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. (4 cr; Stdnt Opt)
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 1301. Cash or Credit: You Need to Know. (1 cr; A-F or Aud. Prereq-Fr or soph or PSEO)
Money management. Responsible use of credit, specifically credit cards. Online courses: 15 Web-based lessons.

FSOS 1905. Freshman Seminar. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

FSOS 2011. Preparation for Working With Families. (2 cr; A-F or Aud)
Systematic preparation for upper division education, research/field internships, and career possibilities in Family Social Science.

FSOS 2103. Family Policy. (3 cr; Stdnt Opt. +FSOS 4103)
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 cr; Stdnt Opt. +FSOS 4105. Prereq-PSTL 1004 or STAT 1011 or OMS 2550 or ESPY 3264 or STAT 3101 or PSY 4801 or #)

FSOS 2191. Independent Study in Family Social Science. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-Soph, #)
Independent reading or writing or research under faculty supervision.

FSOS 3101. Personal and Family Finances. (3 cr; Stdnt Opt. Prereq-At least soph or #)

FSOS 3102. Family Systems and Diversity. (3 cr; Stdnt Opt. +FSOS 5101. Prereq-At least soph or #)
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.

FSOS 3104. Global and Diverse Families. (3 cr; Stdnt Opt. +FSOS 4102. Prereq-at least Soph or #)
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.

FSOS 3150. Special Topics in Family Social Science. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-Varies by topic, at least soph)
Review of research/scholarly thought. Topics specified in Class Schedule.

FSOS 3426. Alcohol and Drugs: Families and Culture. (3 cr; Stdnt Opt. +FSOS 5426)

FSOS 3429. Counseling Skills Practicum I. (3 cr; Stdnt Opt. +FSOS 5429)
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; Stdnt Opt. Prereq-At least jr or #)
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.

FSOS 4104W. Family Psychology. (3 cr; Stdnt Opt. Prereq-At least jr or #)
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 4106. Family Resource Management. (3 cr; Stdnt Opt. Prereq-APEC 1101 or APEC 1102 or ECON 1101 or ECON 1102 or ECON 1104 or #)
Analysis of how individuals/families use interpersonal, economic, natural, and community resources to make decisions, solve problems, and achieve central life purposes.

FSOS 4150. Special Topics in Family Social Science. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-Varies by topic, at least jr)
Review of research/scholarly thought. Topics specified in Class Schedule.

FSOS 4152. Gay, Lesbian, and Bisexual People in Families. (3 cr; Stdnt Opt. Prereq-At least jr or #)
Perspectives on gay, lesbian, and bisexuals (GLB) in families. Unique contributions of GLB to understanding diversity among families. Homophobia, mythologies, coming-out, identity, gender, social networks, intimacy, sexuality, children, parenting, aging, AIDS, ethnicity.

FSOS 4153. Family Financial Counseling. (3 cr; A-F or Aud. Prereq-[3101, 3102, 3429] or #)
Introduction to family financial management applications through different stages in family life cycle. Case studies.

FSOS 4154. Families and Aging. (3 cr; Stdnt Opt. Prereq-At least jr or #)
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 Aud. Prereq-At least jr or #)
History, theories, research, and contemporary practices of parent-child relationships in diverse families/cultures across the life span. Preparation for professionals in education, social work, and other human service occupations.

FSOS 4156. Legal-Economic Controversies in Families. (3 cr; Stdnt Opt. Prereq-3101 or #)
Interdisciplinary course for critical thinking about legal-economic controversies across family life span. Principles of argumentation/debate are used to analyze controversies for public decision making about controversial family issues.

FSOS 4160H. Honors Capstone Project. (2 cr [max 4 cr]; A-F only. Prereq-FSO honors)
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]; Stdnt Opt. Prereq-Sr, #)
Independent reading or writing or research under faculty supervision.

FSOS 4294. Research Internship. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-[FSOS major, at least jr] or #)
Research project with faculty. May include planning, proposal writing, literature review, data collection/coding/cleaning/analysis, and reporting.

FSOS 4296. Field Study: Working With Families. (1-12 cr [max 12 cr]; S-N or Aud. Prereq-[2101, at least jr] or #)
Directed paraprofessional work experience related to student’s area of study.

FSOS 5014. Quantitative Family Research Methods I. (3 cr; Stdnt Opt. Prereq-Grad student or #)
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.
FSOS 5015. Management Interventions. (3 cr; Stdnt Opt. Prereq-Grad student or Sr) Systemic/behavioral frameworks as they apply to diverse families. Thinking systemically about families across multiple ecological systems. How to identify and apply 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.

FSOS 5032. Family Systems Theories and Interventions. (3 cr; Stdnt Opt. Prereq-Grad student or Sr) Family theories focusing on the dynamics and processes relevant to family life. Diversity issues related to gender, ethnicity, cultural orientation, and disability. Issues related to divorce, single parenthood, and remarriage are covered. Family strengths and family problems are integrated.

FSOS 5193. Directed Study in Family Social Science. (1-6 cr; Stdnt Opt. Prereq-Grad FSOS or grad student in related field) Focuses on research and other family theories focusing on the dynamics and processes relevant to family life. Diversity issues related to gender, ethnicity, cultural orientation, and disability. Issues related to divorce, single parenthood, and remarriage are covered. Family strengths and family problems are integrated.


Fina 4221. Principles of Corporate Finance. (2 cr; A-F only. Prereq-4241, 4242, [ACCT 5100 or ACCT 5101]) Cases of corporate investment decisions. Financing decisions, payout decisions, tax effects, managerial incentives.

Fina 4229. Corporate Cases Capstone. (2 cr; A-F only. Prereq-4222, Prereq-[4221 or 4241], 4242, [ACCT 5100 or ACCT 5101]) Cases of corporate investment decisions. Making capital budgeting decisions, targeting/evaluating firm performance.


Fina 4329. Security Analysis Capstone. (2 cr; A-F only. Prereq-4322, Prereq-[4221 or 4241], 4242, [ACCT 5100 or ACCT 5101]) Valuation of equity securities. Principles. Relationship between various valuation approaches. Tools to test self-designed security selection rules.

Fina 4422. Financial Modeling. (2 cr; A-F only. Prereq-4221, [ACCT 5100 or ACCT 5101]) Projecting financial statements to identify financing needs and perform DCF analysis in decision making. APV-, FCF-, and WACC-based methods.

Fina 4522. Options in Corporate Finance. (2 cr; A-F only. Prereq-4221, CSOM [jr or sr]) Basics of options and payoff structures using applications from corporate investment and financing decisions. Put-call parity, binomial models, real options, applications/cases.

Fina 4523. Derivatives I. (2 cr; A-F only. Prereq-4522, 4523, [ACCT 5100 or ACCT 5101]) 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.

Fina 4529. Derivatives II Capstone. (2 cr; A-F only. Prereq-4523, CSOM sr) 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 and collateralized debt obligations.


Fina 4622. International Finance. (2 cr; A-F only. Prereq-4211, [4221 or 4241], [4621 or ECON 3102]) Corporate investment, risk management decision making in international context. International capital markets, cost of capital in emerging economies. Measuring/managing currency risk.

Financial Mathematics (FM) School of Mathematics

College of Science and Engineering


FM 5011. Mathematical Background for Finance I. (4 cr; Stdnt Opt. Prereq-[5001, 5002] with grade of at least B or [MFM program director approval, grad MFM major]) Mathematics needed for MFM program. Focuses on finance.


FM 5021. Mathematical Theory Applied to Financial Mathematics I. (4 cr; Stdnt Opt. Prereq-[5011 or 5012], grad MFM major, program director approval) Bridge between theory and application.

FM 5022. Mathematical Theory Applied to Financial Mathematics II. (4 cr; Stdnt Opt. Prereq-5021, 5011 or 5012, grad MFM major, program director approval) Bridge between theory and application.

FM 5031. A Practitioner’s Course in Finance I. (4 cr; Stdnt Opt. Prereq-[5021 or 5022], grad MFM major, program director approval) Practical course taught by industry professionals. Focuses on hands-on real-world problem solving.

FM 5032. A Practitioner’s Course in Finance II. (4 cr; Stdnt Opt. Prereq-5031, 5021 or 5022, grad MFM major, program director approval) Taught by industry professionals. Focuses on hands-on real-world problem solving.

Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.

**Finnish (FIN)**

**Department of German, Scandinavian, and Dutch**

**College of Liberal Arts**

**FIN 1001. Beginning Finnish. (5 cr; Stdnt Opt. +FIN 1001)**
Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include every day subjects (shopping, directions, family, food, housing, etc.).

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.

Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

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.

**FIN 3011. Advanced Finnish. (3 cr; Stdnt Opt. Prereq-1004 or 4004)**
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.

**FIN 3012. Advanced Finnish. (3 cr; Stdnt Opt. Prereq-3011)**
Discussion of novels, short stories, plays, articles. Structural, stylistic, vocabulary-building exercises.

**FIN 3670. Topics in Finnish Studies. (5 cr [max 9 cr]; Stdnt Opt)**
Interdisciplinary social science topics on Finnish people, culture, and society. In English.

**FIN 4002. Beginning Finnish. (2 cr; Stdnt Opt. +FIN 1002. Prereq-1004 in another language or passing score on LPE or grad student)**
Meets concurrently with 1002. See 1002 for description.

**FIN 4003. Intermediate Finnish. (2 cr; Stdnt Opt. +FIN 1003. Prereq-1004 in another language or passing score on LPE or grad student)**
Meets concurrently with 1003. See 1003 for description.

**FIN 4004. Intermediate Finnish. (2 cr; Stdnt Opt. +FIN 1004. Prereq-1004 in another language or passing score on LPE or grad student)**
Meets with 1004. See 1004 for description.

**FIN 5670. Topics in Finnish Studies. (3 cr [max 9 cr]; Stdnt Opt)**
Interdisciplinary social science topics on Finnish people, culture, and society. Taught in English.

**Fisheries and Wildlife (FW)**

**Department of Fisheries, Wildlife, and Conservation Biology**

**College of Food, Agricultural and Natural Resource Sciences**

Controversial issues involving specific wildlife management principles/techniques.

**FW 1901. Freshman Seminar. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-Fr with no more than 29 cr)**
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

**FW 1905. Freshman Seminar. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-Fr with no more than 29 cr)**
Issues/topics related to natural resources and the environment. Topics vary.

Fish, wildlife, and other forms of biodiversity. Single species, populations, ecosystem, and landscape approaches. Experimental/interactive course. Decision-case studies.

Introduction to extinction as a process both natural and human caused. Illustrates differences in extinction events and why we should be concerned about rate of extinction. Definitions of current jargon used to describe imperiled species due to their legal/biological connotations. Case history examples of wildlife species that are threatened or endangered.

**FW 2003. Introduction to Marine Biology. (3 cr; Stdnt Opt. Prereq: BIOL 1001 or BIOL 1009 or BIOL 2012 or GEOL 1006 or #)**

**FW 3565. Fisheries and Wildlife Ecology and Management: Field Trip. (2 cr; A-F only. Prereq-9)**
Eight-day field trip to Wyoming and points en route during spring break. Emphasizes broad range of fisheries and wildlife management, including big game, waterfowl, endangered species.

**FW 4001. Biometry. (4 cr; A-F or Aud. Prereq: Math 1031)**
Basic statistical concepts such as probability, sampling space, and frequency distributions. Descriptive statistics: sample tests, linear regression (simple and multiple), ANOVA, goodness of fit, nonparametric method and other relevant selected topics (e.g., clustering and classification).

**FW 4101. Herpetology. (4 cr; Stdnt Opt. Prereq: BIOL 1010 or BIOL 2012)**
Reptiles/amphibians, their systematics, behavior, ecology, physiology, development, and morphology. Diversity of reptiles/amphibians. Focuses on Minnesota fauna. Lab.

**FW 4102. Principles of Conservation Biology. (3 cr; Stdnt Opt. Prereq: BIOL 1009 or equiv; Biol 3407 recommended)**
Introduction to themes/concepts of diverse, dynamic, and interdisciplinary field. Biological/social underpinnings of conservation problems/solutions.

**FW 4103. Principles of Wildlife Management. (3 cr; Stdnt Opt. Prereq: Intro biology course. [jr or sr])**
Foundation for understanding discipline of wildlife management. Preparation for upper division wildlife courses.

**FW 4104. Hunting and Fishing Traditions: Field Sports Reflected in Arts, Literature, and Practice. (3 cr; Stdnt Opt)**

**FW 4105. Hunting and Fishing Traditions: Field Sports Reflected in Arts, Literature, and Practice. (2 cr; Stdnt Opt)**
Philosophical foundations, history, traditions, and current importance of field sports in North American society. Laboratory sessions introduce making/using modern sport fishing equipment. Optional experiential learning laboratory introduces safe handling/operation of firearms, leading to State of Minnesota Firearms Safety Certificate. Lectures, invited guests, readings.

**FW 4106. Important Plants in Fisheries and Wildlife Habitats. (1 cr; A-F or Aud. Prereq: [BIOL 3407 or BIOL 3408W or BIOL 3807], [jr or sr], FW major)**
Field identification of important plants in fisheries and wildlife habitats.
FW 4108. Field Methods in Research and Conservation of Vertebrate Populations. (3 cr; A-F or Aud. Prereq.-Biol 3407 or Biol 3408W or Biol 3807) Survey of major invertebrate phyla from standpoints of structure, function, development, and their environmental/evolutionary relationships. Focuses on major groups of multicelled invertebrates. Special unit dedicated to invertebrates of Minnesota.

FW 4191. Independent Study: Conservation Biology. (1-5 cr; max 5 cr) Individual field, library, and lab research in conservation biology.


FW 4292. Special Lectures: Fisheries. (1-5 cr [max 15 cr]; Stdnt Opt. +FW 5292. Prereq.- FW 5292. Prereq.#) Lectures in special fields of fisheries given by visiting scholar or regular staff member.


FW 5051. Analysis of Populations. (4 cr; Stdnt Opt. Prereq.-[BIOL 3407 or BIOL 3408W, 4001 OR STAT 3011 or ESPM 3012], sr or #) Factors involved in regulation, growth, general dynamics of populations. Data needed to describe populations, population growth, population models, regulatory mechanisms.

FW 5292. Special Lectures: Fisheries. (1-5 cr [max 15 cr]; Stdnt Opt. +FW 4292. Prereq.- Grad student or #) Lectures in special fields of fisheries given by visiting scholar or regular staff member.

FW 5392. Special Lectures: Wildlife. (1-5 cr [max 15 cr]; Stdnt Opt. +FW 4392. Prereq.- Grad student or #) Lectures given by visiting scholar or staff member.

FW 5401. Fish Physiology and Behavior. (2 cr; Stdnt Opt. Prereq.-[3156 or 5136], grad student or #) Introduction to major themes of fish physiology and behavior.

FW 5411. Aquatic Toxicology. (3 cr; Stdnt Opt. Prereq.-Intro chem, intro ecol, #) Pollution assessment approaches, biological effects, fate/fow of contaminants in aquatic systems, major types of pollutants.

FW 5455. Sustainable Aquaculture. (3 cr; Stdnt Opt. Prereq.-[Intro biology, intro chemistry] or #) How aquaculture affects the environment and human well-being in Minnesota and worldwide. Role of aquaculture as worlds fastest growing food sector and in hatcheries to support fishing and rebuild endangered species. Organic aquaculture, other innovations.

FW 5571. Avian Conservation and Management. (3 cr; Stdnt Opt. Prereq.-EEB 4134 or grad or #) Current problems in avian conservation/ management. Nongame, wetland, game birds.

FW 5600. Fisheries Population Analysis. (3 cr; A-F or Aud. Prereq.-[4001 or Stat 5021], Biol 3407, [Math 1142 or Math 1271]) Introduction to theory/methods for estimating vital statistics of fish populations. Using microcomputers/statistical software to describe, analyze, model attributes of fish populations. Case studies from literature of marine/freshwater fisheries management.

FW 5603W. Habitats and Regulation of Wildlife. (5 cr; A-F or Aud. Prereq.-BIOL 3407) Environmental interactions of wildlife at population/community levels. Environmental threats from human activities. Habitat management practices. Objectives, policies, regulations in population management.


FW 5625. Wildlife Handling and Immobilization for Research and Management. (2 cr; S-N or Aud. Prereq.-General biology, [grad student or vet med student or FW 5840]) 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 course. Uses live animals.

For a guide to course numbers, symbols, and abbreviations, see page 376. 493

**Food Science and Nutrition (FSCN)**

**Department of Food Science and Nutrition**

**College of Food, Agricultural and Natural Resource Sciences**

**FSCN 1001. Orientation to Nutrition.** (1 cr; A-F only. Prereq.-Nutrition major) Nutrition as a professional career track. Services available at the U to achieve academic success. Paths to becoming a registered dietician. Use of nutrition undergraduate major as preparation for professional schools. Work environment.

**FSCN 1012. Sports Nutrition.** (2 cr; Stdnt Opt) 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 1090. Topics.** (3 cr; A-F or Aud) Non-lab microbiology for nursing


**FSCN 1904. Topics: Freshman Seminar.** (3 cr; A-F or Aud) Interdisciplinary seminar. Topics vary.

**FSCN 2031. Introductory Microbiology.** (4 cr; A-F only) How microbes impact our world in both deadly and life-saving ways. Roles of bacteria, fungi, and viruses as agents of human diseases; in food spoilage and food borne diseases; and in food preservation and health promotion. Preventing plant diseases, food drug production, cleaning up oil spills. Genetic engineering.

**FSCN 3102. Introduction to Food Science.** (3 cr; Stdnt Opt. Prereq.-Chem 1022) Introduction to composition of and chemical/ physical properties of foods. Evaluating interaction/reaction of foods due to formulation, processing, and preparation.


FSCN 3615. Sociocultural Aspects of Food, Nutrition, and Health. (3 cr; Stdnt Opt. Prereq-1112) Sociocultural aspects of regional and cultural diversity in food preferences and food behavior, food habits, demographies, lifestyles, food consumption, and expenditures. Effect of socioeconomic status, religious beliefs, age, and cultural meaning of food on food choices.

FSCN 3662. Introduction to Dietetic Practice. (2 cr; A-F or Aud. Prereq-1112, admitted to Coordinated Program in Dietetics, #) Introduction to the practice of dietetics in medical centers, residential care centers, ambulatory care clinics, and community service agencies.

FSCN 3721. Food Service Operations Management Laboratory. (2 cr; A-F or Aud. Prereq-[3102 or &3102], [3722 or &3722]) Experience in managing a food service operation. On-/off-campus commercial/institutional restaurants used as labs. Required field trips.

FSCN 3732. Food Service Operations Management. (3 cr; A-F or Aud. Prereq-3102 & 3102) Planning, preparing, delivering, serving, managing foods served away from home.

FSCN 4096. Professional Experience Program: Internship. (1-4 cr [max 2 cr]; A-F or Aud. Prereq-3102, #; UC only) Supervised practical and professional experience in food industry firms or government agencies; evaluative reports and consultations with faculty advisors and employees. Registration information in COAFES Career Services.


FSCN 4121. Food Microbiology. (3 cr Prereq-BIOC 3021, [2021 or VBS 2032 or MICB 3301]) 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.

FSCN 4122. Food Fermentations and Biotechnology. (2 cr; Stdnt Opt. Prereq-[MICB 3301, BIOL 4003] or #) 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.

FSCN 4210. Topics in Food Science and Nutrition. (1-4 cr [max 6 cr]; Stdnt Opt. Prereq-#) In-depth investigation of a specific topic in nutrition and food science not covered by other courses. Topic announced in advance.

FSCN 4291. Independent Study. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-Undergrads, #) Individual lab or library research in an area related to food science or nutrition.


FSCN 4332. Food Processing Operations. (3 cr; A-F or Aud. Prereq-4351 or BAE 4744) Engineering principles applied to commonly used food processing operations. Blanching, pasteurization, sterilization, frying, baking, milling, extrusion. Meat processing, water treatment, waste management.


FSCN 4343. Processing of Dairy Products. (4 cr; Stdnt Opt. Prereq-FSCN 4172, FSCN 4322, 4331) Demonstration/application of basic concepts of food engineering/processing, food chemistry, and food microbiology to production of fluid, fermented, concentrated, and dehydrated dairy products.

FSCN 4345. Flavor Technology. (3 cr; Stdnt Opt. Prereq-4171, 4321, 4331) Flavor/off-flavor development in foods. Industrial production of food flavorings, their proper application to food systems.

FSCN 4349. Food Science Capstone. (1-2 cr [max 2 cr]; A-F only. Prereq-Concurrent enrollment in another [4xxx or 5xxx] FSCN course, food science major, sr) Planning of process or product development project. Defining goals, preparing/following timeline, reviewing literature, coordinating with experts, procuring supplies, writing progress reports. Determining ingredient specifications, lab/pilot plant production. Chemical, microbiological, and sensory testing. Oral/written presentations.


FSCN 4614. Community Nutrition. (3 cr; Stdnt Opt. Prereq-1112) Community-based nutrition issues are explored including nutrition risks associated with different age, sex, ethnic, and socioeconomic groups; community needs assessment; program planning and evaluation, and programs that address the needs and interests of people in different stages of the life cycle, ethnic or cultural backgrounds, and literacy levels.


FSCN 4622. Nutritional Toxicology, the basic science of diet-related toxicants. (3 cr; A-F only. Prereq-BIOC 3021; designed for students majoring in [nutrition or food science or toxicology]) Concepts of toxicology. Molecular mechanism behind dietary chemical-induced toxicities. Impact/risk of dietary chemicals for human health.

FSCN 4664. Senior Capstone: Becoming a Registered Dietitian. (1 cr; S-N or Aud. Prereq-[4665 or &4665], Nutrition/dietetics subplan of nutrition major or #) Preparation for advancement in a career as registered dietitian, including completion of dietetic internship application. Current issues in dietetics.


FSCN 4666. Medical Nutrition Therapy II. (3 cr; A-F or Aud. Prereq-4665) Pathology, management, and nutrition therapy for disorders of the cardiovascular, endocrine, urinary, and neuromuscular and skeletal systems. Nutrition intervention for inborn errors of metabolism, and eating disorders and obesity.
Forest Resources (FR)

Department of Forest Resources

College of Food, Agricultural and Natural Resource Sciences

FR 1001. Orientation and Information Systems. (1 cr; A-F or Aud) 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, GUIs, the Internet, spreadsheets, Lumina, periodical indexes.


FR 1901. Freshman Seminar. (1-3 cr [max 3 cr]; Stdt Opt. Prereq-Freshman) In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

FR 2101. Identifying Forest Plants. (1 cr; A-F or Aud. Prereq-[Biol 1001 or Biol 1009]; 1101, Biol 2022 recommended) 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.


FR 2104. Measuring Forest Resources. (1 cr; A-F or Aud) Introduction to land survey, tree/forest stand measurement (munsuration), and forest sampling techniques. Taught at Cloquet Forestry Center.

FR 3104. Forest Ecology. (4 cr; A-F or Aud. Prereq-Biol 1001 or 1009; 1 semester college chemistry recommended) Form/function of forests as ecological systems. Characteristics/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.

FR 3105. Forest Ecosystem Health and Management. (3 cr; A-F only. +FR 5105. Prereq-3104 or Biol 3407 or EEB 3001 or equiv ecology course) Agents processes affecting tree/forest health. Insects, diseases, wildlife, wildfire, windstorms, invasive species, atmospheric change, soil/water pollution, human development. Principles of forest ecosystem health/management applied to areas ranging from wilderness to urban forest and from local to global in scope.


FR 3203. Forest Fire and Disturbance Ecology. (3 cr; A-F or Aud. +FR 5203. Prereq-[3104 or equiv], course fee) Ecology, history, management, and control of fire, wind, insect infestation, browsing, and other disturbances in forests. Disturbance regimes of boreal, northern hardwood, and other major forest types of North America. Influence of disturbance on wildlife habitat, urban/wildland interfaces, forest management, and stand/landscape dynamics. Guest speakers on fire organization, training, and operations. Two-day field trip.


FR 3411. Managing Forest Ecosystems: Silviculture. (3 cr; Stdt Opt. +FR 5411. Prereq-[3104, non FR [major or minor]] or [3104, &5413, FR [major or minor]] or #) 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.

FR 3431. Timber Harvesting and Road Planning. (2 cr; Stdt Opt. +FR 5431. Prereq-3411 or #) 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
FR 3471. Forest Planning and Management. (3 cr; A-F or Aud. +FR 3471. Prereq: Intro silviculture or concurrent registration in silviculture or #) Processes/techniques for scheduling forest management activities. Goals of landowners, industry, government, and society. Predicting forest outcomes, financial analysis, forest regulation, mathematical models, linear programming, economic analysis. Landscape-level management, desired conditions, historical range of variability, wildlife management, carbon sequestration, resource monitoring, certification, adaptive management.

FR 3480. Topics in Natural Resources. (1-3 cr [max 12 cr]; Stdnt Opt. +FR 5480) Lectures in special fields of natural resources given by visiting scholar or faculty member. Topics specified in Class Schedule.

FR 3501. Arboriculture; Selection and Maintenance of Trees. (3 cr; Stdnt Opt. Prereq-[1101 or Hort 1012], Biol 2022) 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.


FR 4118. Trees; Structure and Function. (3 cr; A-F or Aud. +FR 5118. Prereq:One chemistry course, one biology course, one ecology course) Plant-water relations. Relations of biology to ecology/management. How physiological factors affect ecological processes and management decisions.

FR 4203. Directed Study. (1-5 cr [max 15 cr]; Stdnt Opt. Prereq-#) Study/project on topic of personal interest in consultation with faculty member. Initial proposal, reports of accomplishments.

FR 4301. Urban Forest Management. Managing Greenspaces for People. (3 cr; Stdnt Opt. +FR 5501. Prereq-[1101 or Hort 1012], Ent 4251, PIP 3003, [UF major or minor] or #) 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.

FR 4511. Field Silviculture. (2 cr; Stdnt Opt. Prereq-[3104 or 3411 or 3612] or #) 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.

FR 4515. Field Remote Sensing and Resource Survey. (2 cr; Stdnt Opt. Prereq-[3218, 3262] or #) Field applications of remote sensing, sampling/measurement methods to inventory/mapping of forest and other natural resources. Offered at Cloquet Forestry Center.


FR 5104. Forest Ecology. (4 cr; A-F or Aud. +FR 5104. Prereq-[ [Biol 1001 or 1009], grad student] or #; 1 semester college chemistry recommended) Form/function of forests as ecological systems. Characteristics/dynamics of species, populations, communities, landscapes, and ecosystem processes. Examples applying ecology to forest management. Weekly discussions on research topics, exercises, current issues in forest resource management. Required weekend field trip.

FR 5105. Forest Ecosystem Health and Management. (3 cr; A-F only. +FR 3105. Prereq-[3104 or Biol 3407 or EEB 3001 or equiv) Principles of forest ecosystem health and its management applied to areas ranging from wilderness to urban forest, and from local to global.


FR 5118. Trees; Structure and Function. (3 cr; A-F or Aud. +FR 5118. Prereq-Grad student or #) Plant-water relations. Relations of biology to ecology and management. How physiological factors affect ecological processes and management decisions.

FR 5131. Geographical Information Systems (GIS) for Natural Resources. (4 cr; A-F only. +FR 3131. Prereq-Grad student or #) 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.

FR 5142. Tropical Forest Ecology. (3 cr; Stdnt Opt. Prereq-3xxx ecology course) Ecological principles related to form, function, and development of wet/dry tropical forests at organismal, community, and ecosystem scales. Ecophysiology, succession, productivity, biodiversity, sustainability, agroforestry, social forestry, and management alternatives. Natural distribution of forest types. Causes, consequences, and extent of deforestation.


FR 5175. Forest and Wetland Hydrology. (3 cr; Stdnt Opt. Prereq-[Basic hydrology course, upper div or grad student]) or #) Current topics, methods/models in forest/wetland hydrology. Hydrologic role of forests, wetlands, riparian systems in snowfall/rainfall regimes. How activities such as deforestation, wetland drainage, and stream channel alterations, affect hydrologic response of watersheds. Runoff/streamflow response from undisturbed/altered forest/wetland watersheds. Problem-solving exercises.

FR 5161. Northern Forest Field Course. (2 cr; A-F or Aud. +FR 5161. Prereq-#) 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 Cloquet Forestry Center.

FR 5203. Forest Fire and Disturbance Ecology. (3 cr; A-F or Aud. +FR 3203. Prereq-[Grad student or #, course fee) Ecology, history, management, and control of fire, wind, insect infestation, browsing, and other disturbances in forests. Disturbance regimes of boreal, northern hardwood, and other major forest types of North America. Influence of disturbance on wildlife habitat, urban/wildland interfaces, forest management, and stand/wildscape dynamics. Guest speakers on fire organization, training, and operations. Two-day field trip.

FR 5204. Landscape Ecology and Management. (3 cr; A-F or Aud. +FR 3204. Prereq-Grad student or #) 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.

FR 5228. Advanced Assessment and Modeling. (3 cr; A-F or Aud. Prereq- 5218, Math 1272, Stat 5201) Application of recently developed mathematics, computer science, and statistics methodologies to natural resource functioning, management, and use problems. Specific topics, software, and methodologies vary.


FR 5471. Forest Planning and Management. (3 cr; A-F or Aud. +FR 3471. Prereq-Grad student or #) Processes/techniques for scheduling forest management. Goals of landowners, industry, government, and society. Issues/policies/regulations that influence management. Predicting outcomes, financial analysis, regulation, mathematical models, linear programming, economic analysis. Landscape-level management, historical range of variability, wildlife management, carbon sequestration, resource monitoring, certification, adaptive management.

FR 5480. Topics in Natural Resources. (1-3 cr; Stdnt Opt. +FR 5480. Prereq-Sr or grad student) Lectures in special fields of natural resources given by visiting scholar or faculty member. Topics specified in Class Schedule.

FR 5501. Urban Forest Management: Managing Greenspaces for People. (3 cr; Stdnt Opt. +FR 4501. Prereq-Grad student or #) 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.


FR 5615. Field Remote Sensing and Resource Survey. (1 cr; Stdnt Opt. Prereq-Grad student) Field applications of remote sensing, sampling/measurement methods to inventory/mapping of forest and other natural resources. Offered at Cloquet Forestry Center.


Field trips to visit timber harvesting and road planning sites with public and private organizations. Taught at Cloquet Forestry Center.

FR 5700. Colloquium in Natural Resources. (1-3 cr; max 3 cr; Stdnt Opt. Prereq-#) Colloquium in specialized topics in natural resources.

French (FREN)

Department of French and Italian College of Liberal Arts

FREN 1. Reading French in the Arts and Sciences. (10 cr; Stdnt Opt) Basic reading knowledge of French language; intensive reading and translation of texts from a wide variety of disciplines. Students successfully completing the course obtain Language Certification in French which satisfies a Graduate School requirement.

FREN 100. Reading French in the Arts and Sciences. (2 cr; S-N only) 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. (5 cr; Stdnt Opt) Basic listening, speaking, reading, and writing skills. Emphasis on communicative competence. Some cultural readings.

FREN 1002. Beginning French. (5 cr; Stdnt Opt. +FREN 4022. Prereq-1001 or equiv) Basic listening, speaking, reading, and writing skills. Emphasis on communicative competence. Some cultural readings.


FREN 1022. Accelerated Beginning French. (5 cr; Stdnt Opt. Prereq-2 or more yrs high school French) For students who have studied French in high school or at community colleges and who do not place high enough on placement exam to enter 1003. An accelerated review of Fren 1001 followed by the material covered in Fren 1002.

FREN 1004. The Poetry of Vision: Dante’s “Purgatory” and Trencher Painting. (3 cr; A-F or Aud. Prereq-Freshman) Examples of art of Dante’s time, including especially painting, but also architecture and manuscript illumination, from major Italian/French sources known to Dante.

FREN 1905. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.
FREN 1907W. Freshman Seminar. (3 cr; A-F only. Prereq-Fr or less than 30 cr) Cultural study of ‘French’ state of Louisiana through Cajun and Creole society, art, language and race politics in New Orleans from the 18th century to today, through newspapers, films, poetry, novels, comics, and music.

FREN 1909W. Remembering to Forget: Holocaust and Its Afterlife. (3 cr; A-F or Aud. +JWST 1909W. Prereq-Freshman) The urge to study Holocaust as singular event is studied through testimonies, artistic endeavors, popular culture, and theory. Drawbacks of a hyper-memory bordering on amnesia.

FREN 1910W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

FREN 3010. French Expression. (3-6 cr [max 6 cr]; Stdnt Opt) Intensive work in oral/written communication.


FREN 3015. Advanced French Grammar and Communication. (3 cr; Stdnt Opt. Prereq-1004 or equiv or #) Advanced study of French with particular emphasis on grammar review, vocabulary building, oral communication skills, and language usage in cultural contexts.

FREN 3016. Advanced French Composition and Communication. (3 cr; Stdnt Opt. Prereq-3015 or equiv or #) Advanced study of grammar in context; emphasis on writing for varied communicative purposes, reading for style and content, translation.


FREN 3019. French Diction and Speaking. (2 cr; Stdnt Opt. Prereq-3014) The relationship between the written and the spoken word in French. Learn to read prose and poetry aloud from a text using appropriate French pronunciation, etc. Leads to play readings and possible performance.

FREN 3022. The Language and Culture of Business in France. (3 cr; Stdnt Opt. Prereq-3015; completion of 3016 recommended) Examines French business language as well as business practices and culture in France. Includes cross-cultural analysis.


FREN 3111. Medieval Stories. (3 cr; Stdnt Opt. Prereq-3010) 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.

FREN 3170. The Unruly Subject(s) of Classicism: Writing, History, Power in Ancien Régime France. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3101 or equiv) The formation of subjectivity in the literature and culture of 17th- and 18th-century France. Aesthetics of classicism, consolidation of state power, and representations of the individual in theater, novel, and prose.

FREN 3181. Mapping Enlightenment in 17th- and 18th-Century French Prose. (3 cr; Stdnt Opt. Prereq-3101) The themes, values, and critical strategies of the social and intellectual movement designated by the term Enlightenment. The legacy of the Enlightenment project will also be evaluated.

FREN 3250. French Poetry. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3101) The historical, political, and social contexts of the evolution of French poetry from its origins to the modern era. While studying primarily lyric poetry, epic, and dramatic poetry may also be considered when appropriate.


FREN 3310. Literature of Revolution and Upliftment. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3101) 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.


FREN 3340. Topics in Modern French Literature. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3101) Different aspects of 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. Readings may be literary, critical, cultural, historical, political, etc. Specific content posted in department and in Course Guide.

FREN 3360. Coming of Age. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3101) A study of the literature of education and of the process of youth coming to terms with society. Readings will vary and will be drawn from a number of time periods.

FREN 3371. Writing Crisis in (Post) Modern Times. (3 cr; Stdnt Opt. Prereq-3101) Examines the meaning and purpose of the notion of crisis in French novels. How crises, both personal, social or political, prompt writers to create new modes of (dis)connecting with other persons, institutions, and society.

FREN 3410. Quebecois Literature. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3101) 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.


FREN 3471. Topics in Francophone African Literature and Cultures. (3 cr; Stdnt Opt. Prereq-3101W) Issues relevant to cultures/societies of francophone Sub-Saharan Africa as reflected in literature, film, and cultural critique.

FREN 3479. Francophone Writers of the African Diaspora. (3 cr; Stdnt Opt. Prereq-3101) 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.

FREN 3501. Structure of French: Phonology. (3 cr; Stdnt Opt. +FREN 5501. Prereq-3014, 3015, Ling 3001 or #) Advanced study of the sound system of contemporary French.


FREN 3531. Sociolinguistics of French. (3 cr; Stdnt Opt. +FREN 5531. Prereq-3015, Ling 3001 or #) Explores variation in the use of French associated with factors such as medium (oral/written), style (formal/informal), region, social and economic groups.

FREN 3541. Oral Discourse of French. (3 cr; Stdnt Opt. Prereq-3015; Ling 3001 recommended) 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.

FREN 3602. French Civilization and Culture II. (3 cr; Stdnt Opt. Prereq-3015) 1705 to present.

FREN 3650. Topics in French/Francophone Cultures. (3 cr [max 9 cr]; Stdt Opt. Prereq-3015) Focus on aspects of French and/or francophone cultures in various historical, social, political, and geographical contexts.

FREN 3671. Theaters of Pain: Violence and the Spectacular in Premodern France. (3 cr; Stdt Opt. Prereq-3015, &3016) Why physical violence is intimately linked to the theater. The plays as collective arena in which society attends to pressing problems. How/why repeated presence of violence was something meant to behold in early modern France and elsewhere.


FREN 3706. Quebec: Literature and Film in Translation. (3 cr; Stdt Opt. Prereq-Not for majors) A survey of Québec literature and film in English or with subtitles. Particular attention paid to cultural tensions as well as to the impact of women writers and filmmakers on each genre.

FREN 3710W. Reading Libertinage: Dangerous Lessons on Translation. (3 cr [max 9 cr]; Stdt Opt. Prereq-Non-major or minor in French or [French major or minor], #; students majoring or minoring in French arrange work in French [reading, writing] with instructor) Libertinage and the libertine in French literature of 17th/18th centuries. Literary forms as ways to produce/question desire. Taught in English. All readings in English.

FREN 3750. Topics in French or Francophone Literature and Culture. (3 cr [max 9 cr]; Stdt Opt. Prereq-Non-French major; knowledge of French helpful) Theories, problem, period, or topic of interest in French or Francophone literature or culture. See Class Schedule. Taught in English.

FREN 3995. Directed Teaching. (1-5 cr [max 25 cr]; S-N or Aud. Prereq-%) Directed teaching.


FREN 4101V. Honors: Seminar in French Studies. (3 cr; Stdt Opt. Prereq-Completion of all pre-elective requirements for major or permission of DUS) Reading/discussion of contemporary issues in French studies, workshop on senior projects.

FREN 4101W. Seminar in French Studies. (3 cr; Stdt Opt. Prereq-Completion of all pre-elective requirements for major or permission of DUS) Reading and discussion of contemporary issues in French studies and workshop on senior projects.

FREN 4510. Topics in French Linguistics. (3 cr [max 9 cr]; Stdt Opt. Prereq-3015) Topics from French syntax, pragmatics, discourse analysis, or sociolinguistics.

FREN 4970. Directed Readings. (1-4 cr [max 9 cr]; Stdt Opt. Prereq-%) 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.

FREN 5250. Promenades Poetiques: The Subject in Motion. (3 cr [max 9 cr]; Stdt Opt. Prereq-3111 or above) The search for the subject in poetry and poetic prose as revealed through the motif of the “promenade” and experimentation with literary forms.

FREN 5270. “To Change or not to Change?”: Speculations on (Post) Modern French Texts. (3 cr [max 9 cr]; Stdt Opt. Prereq-3111) The meaning and purpose of the notion of “change” in French novels. Explore how a multiplicity of causes produces major changes in an individual’s personal and public life. The notion of change as it relates to financial and intellectual speculation.

FREN 5350. Topics in Literature and Culture. (3 cr [max 12 cr]; Stdt Opt. Prereq-3101 or equiv) Problem, period, author, or topic of interest. See Class Schedule.


FREN 5501. Structure of French: Phonology. (3 cr; Stdt Opt. *FREN 3501. Prereq-[Ling 3001 or Ling 5001], grad student) Advanced study of sound system of contemporary French.

FREN 5531. Sociolinguistics of French. (3 cr; Stdt Opt. *FREN 3531. Prereq-3531; Ling 3001 or 5001, grad) Explores variation in the use of French associated with factors such as medium (oral/written), style (formal/informal), region, social and economic groups.

FREN 5995. Directed Teaching. (1-6 cr [max 24 cr]; S-N or Aud. Prereq-%) Directed teaching.

French and Italian (FRIT)

Department of French and Italian College of Liberal Arts


FRT 3803. New Wave Cinemas: Love, Alienation and Landscape in Post-War Italian and French Film. (3 cr; Stdt Opt) Modernist Italian and New Wave French cinema after WWII, focusing on film syntax, constructions of gender, and the individual’s relationship to the modern urban and rural landscape. Taught in English. Knowledge of Italian and French helpful but not necessary.

FRT 3804. Cinema and Culture: The City of Paris. (3 cr; Stdt Opt) How French cinema, from the silent era to the present, reflects and constructs the pleasures and anxieties of urbanization, new modes of entertainment, and new cultural roles for men and women. Taught in English. Knowledge of Italian and French helpful but not necessary.

FRT 3880. Topics in French and Italian Literatures and Cultures. (3 cr [max 9 cr]; Stdt Opt) 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.

FRT 5257. Passionate Beings: Literary and Medical Problematics in Italy and France from 1800 to the Present. (4 cr; Stdt Opt) Literary and medical representations of the passions in France and in Italy from 1800 to the present. Texts range from theatrical works to medical treatises on the passions as ways for exploring notions of subjectivity, responsibility, order. Taught in English.

Gay, Lesbian, Bisexual, and Transgender Studies (GLBT)

Department of Gender, Women, and Sexuality Studies

College of Liberal Arts

GLBT 1001. Introduction to GLBT Studies. (3 cr; Stdnt Opt)
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 3301. Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States. (3 cr; Stdnt Opt. + SW 3301. Prereq-1001 or SOC 1xxx or GWSS 1001 or GWSS 1002 or SW 2001 or SW 2501 or #) Interdisciplinary course. Development of GLBT social movements using social movement theory and service learning.


GLBT 3472. Gay Men and Homophobia in American Culture. (3 cr; Stdnt Opt) Historical experience of gay men. Social construction of same-sex desire in American society since 1700, in context of cultural history/discourse, including literature/the arts, journalism, science/medicine, religion, and law.

GLBT 3610. Topics in GLBT Studies. (2-4 cr [max 8 cr]; Stdnt Opt) Topics specified in Class Schedule.

GLBT 3993. Directed Studies. (1-6 cr [max 6 cr]; A-F or Aud. Prereq-GLBT studies minor, #) 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.

GLBT 413. Queering Theory. (3 cr; Stdnt Opt. Prereq-1002 or 3102 or #) Lesbianism and lesbian identities as products of cultural practices, relations, and meanings that are historically specific/changing.

GLBT 5993. (1-12 cr [max 12 cr]; Stdnt Opt)
GWSS 3202. Biology of Women. (4 cr; Stdnt Opt)

GWSS 3202H. Honors: Biology of Women. (4 cr; Stdnt Opt)

GWSS 3203W. Blood, Bodies and Science. (3 cr; Stdnt Opt)
Ways in which modern biology has been site of conflict about race/gender. Race/gender demographics of scientific professions.

GWSS 3207. Gender and the Global Politics of Health. (3 cr; A-F or Aud. +GLOS 3607)
Politics, global processes, and social relations that shape health/disease patterns worldwide. Case studies, including HIV/AIDS in Africa, diabetes and health care in the U.S., new reproductive technologies, and access to food. How gender, poverty, geographic/social location, citizenship, sexuality, and other factors help determine degree of vulnerability to disease or right to health.

GWSS 3290H. Topics: Biology, Health, and Environmental Studies: Enviro/Feminism. (3 cr; Stdnt Opt. Prereq-Honors)

GWSS 3301W. Women Writers. (3 cr; Stdnt Opt)
Complexities of women's roles. The way the female body is construed in terms of conformity and defiance. Fidelity and betrayal within relationships and societal perceptions. What images of femininity do these writers convey? What does it mean to be a woman in different racial, gendered, ethnic, national, and sexual configurations?

GWSS 3302. Women and the Arts. (3 cr; Stdnt Opt)
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. (3 cr; Stdnt Opt)
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 3305. Language and Gender. (3 cr; Stdnt Opt)
Gender and communication with an emphasis on interdisciplinary theory. Role of communication in creating, maintaining, reinforcing, and sometimes changing gender relations in society.

GWSS 3306. Pop Culture Women. (3 cr; Stdnt Opt)
Contemporary U.S. feminism as political/intellectual movement. Ways in which movement has been represented in popular culture.

GWSS 3307. Feminist Film Studies. (3 cr; Stdnt Opt)
Construction of different notions of gender in film, social uses of these portrayals. Lectures on film criticism, film viewings, class discussions.

GWSS 3308W. Women's Contemporary Fiction. (3 cr; Stdnt Opt)
Themes and features of style and content related to changes in women's roles in novels and short stories by English-language women writers of the late 20th century. Significance of race, sexual orientation, class, and age in the conditions of women's lives and their portrayal in literature.

GWSS 3331. Women and Diasporas in Modern History. (3 cr; Stdnt Opt)
Comparing diasporas across time. Focuses on gendering of lives/identities of people whose identities continue to be shaped by forced/free migrations of past 500 years.

GWSS 3390. Topics: Visual, Cultural, and Literary Studies. (3 cr; Stdnt Opt)
Topics specified in Class Schedule.

GWSS 3403W. Jewish Women in the United States. (3 cr; Stdnt Opt)
Twentieth century American Jewish women-historically, sociologically, religiously, and culturally; key developments over the century.

GWSS 3404. Transnational Sexualities. (3 cr; Stdnt Opt. +GLBT 3404. Prereq-1001 or 1002 or 3001 or 3601 or 3811)
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. (3 cr; Stdnt Opt)
Historical developments and contemporary manifestations of women's participation in labor force and global economy. Gender as condition for creation/maintenance of exploitable category of workers. How women's choices are shaped in various locations. Examples of women's labor organizing.

GWSS 3407. Women in Early and Victorian America: 1600-1890. (3 cr; Stdnt Opt)
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. (3 cr, Stdnt Opt. +HIST 3348)
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. (3 cr; Stdnt Opt)
Diversity of cultures designated “Asian American.” Understanding women's lives in historical, cultural, economic, and racial contexts.

GWSS 3410. La Chicana. (3 cr; Stdnt Opt)
Focus on Chicanas or politically defined women of the Mexican-American community. Method is interdisciplinary emphasizing the importance of historical context and cultural process to any discussion of the Chicana experience.

GWSS 3412. American Indian Women: Ethnographic and Ethnohistorical Perspectives. (3 cr; A-F or Aud)
Comparative survey of ethnographic/ethnohistorical writings by/about American Indian women.

GWSS 3413. Women and Gender in Latin American History. (3 cr; Stdnt Opt)
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 3414. Women in Medieval Europe. (3 cr; A-F or Aud)
Women's role in family, politics, religion, work, and social movements. Representations of women in religious texts, art, literature, scientific studies, and law. Methods/approaches to study of women's history.

GWSS 3415. Lesbian and Gay Life in Canada, 1600-2000. (3 cr; Stdnt Opt)
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 3469. History of Women and family in China, 1600-2000. (3 cr; Stdnt Opt)

GWSS 3490. Topics: Economic and Global Studies. (3 cr; Stdnt Opt)
Topics specified in Class Schedule.

GWSS 3503. Women and the Law. (3 cr; Stdnt Opt)
Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.

GWSS 3590. Topics: Women, Society, and Race in the United States. (3 cr; Stdnt Opt)
Topics specified in Class Schedule.

GWSS 3800H. Honors Directed instruction. (1-8 cr; max 12 cr; Stdnt Opt. Prereq-honors)
Directed instruction.

GWSS 3893H. Honors Directed Study. (1-8 cr; max 12 cr; Stdnt Opt. Prereq-honors)
Honors directed study.

GWSS 3980. Directed Instruction. (1-12 cr; max 12 cr; Stdnt Opt. Prereq-#, %, @)

GWSS 3993. Directed Study. (1-12 cr; max 12 cr; Stdnt Opt. Prereq-#, %, @)

GWSS 3994. Directed Research. (1-12 cr; max 12 cr; Stdnt Opt. Prereq-#, %, @)

For a guide to course numbers, symbols, and abbreviations, see page 376. 501
GWSS 4102. Women, Gender, and Science. (3 cr; Stdnt Opt. Prereq: 1001 or 3102 or #) 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.

GWSS 4103. Transnational Feminist Theories. (3 cr; Stdnt Opt) Western/nonWestern feminist theories in conversation. Historical, cultural, and political context. Relation of theory to activism.

GWSS 4103H. Transnational Feminist Theories. (3 cr; Stdnt Opt. Prereq-[3102, 8 cr WOST] or grad student or #) Western/nonWestern feminist theories in conversation. Historical, cultural, and political context. Relation of theory to activism.

GWSS 4108W. Senior Seminar: Writing. (3 cr; Stdnt Opt. Prereq-WoSt [jr or sr]) Writing seminar for senior project. Writing process. Project is completed under supervision of instructor and faculty adviser.


GWSS 4201. The Older Woman: A Feminist Perspective. (3 cr; Stdnt Opt. Prereq-12 cr in WoSt or substantial work in psych or sociol) Myths and realities surrounding conceptualizations of older women in public, private, personal, social, sexual, professional, and community interactions.

GWSS 4590. Topics: Visual, Cultural, and Literary Studies. (3 cr; Stdnt Opt. Prereq-Sr or grad student or #) Topics specified in Class Schedule.

GWSS 4415. Body Politics: A History. (3 cr; A-F only) The body as historically constituted and as site of political contest. Its constitution in relation to sex/gender, race, and sexuality. Notions of (dis)ability and normalcy. Ethnographic display. Modifi
cation. Discipline/surveillance.

GWSS 4490. Topics: Political Economy and Global Studies. (3 cr; Stdnt Opt. Prereq-Sr or grad student or #) Topics specified in Class Schedule.

GWSS 4502. Women and Public Policy. (3 cr; Stdnt Opt. Prereq-[Jr or sr] WoSt major or 9 cr [WoSt or pl sci or sociology] or #) Public policy issues, processes, and histories as these affect women-, children-, and gender-related issues.

GWSS 4504. Women and the Legislative Process. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #) Current/historical roles, impacts, and interactions of women as legislators, constituents, and professional or citizen lobbyists in state/national legislatures. Unique contributions, issues, challenges of women. Ways in which gender is operative in legislative process.

GWSS 4450. Legislative Internship. (3 cr; Stdnt Opt. Prereq-[4504 or equiv or grad student] %) Discussion group and learning community for students working as interns for a Minnesota legislator during the year's legislative session.


GWSS 4790. Topics: Sexuality Studies. (3 cr; Stdnt Opt) Topics specified in Class Schedule.

GWSS 4900W. Women's Studies Seminar. (3 cr [max 12 cr]; A-F or Aud. Prereq-WoSt major, junior or senior standing, or #) Includes a component on research methods/writing. Capstone experience. Culminates in a 20-25 page paper.

GWSS 4980. Directed Instruction. (1-8 cr [max 12 cr]; Stdnt Opt) Directed Instruction, faculty contract, %

GWSS 4993. Directed Study. (1-5 cr [max 10 cr]; Stdnt Opt. Prereq-Filled out student/faculty contract. %, @)

GWSS 4994. Directed Research. (1-8 cr [max 12 cr]; Stdnt Opt)

GWSS 5101. Feminist Approaches to Ethnography. (3 cr; Stdnt Opt) Preparation for feminist ethnographic research in the social sciences. Using recent works by feminist ethnographers, focus is on the methods, politics, and ethics, as well as gender, race, class, and cross-cultural issues pertaining to fieldwork.

GWSS 5103. Feminist Pedagogies. (3 cr; Stdnt Opt. Prereq-grad or #) Theory and practice of feminist pedagogies by comparing and evaluating various multicultural feminist theories of education/teaching and the application of specific theories, techniques, and teaching strategies.

GWSS 5104. Transnational Feminist Theory. (3 cr; Stdnt Opt) 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, nationalism, globalization, and capitalism. Concentrates on postcolonial context.

GWSS 5105W. Gendered Rhetoric of Science and Technology. (3 cr; Stdnt Opt. Prereq-[Rhet 5018, Rhet 8530]; 8 cr WoSt or grad or #) How cultural gender roles are affected by science and technology as well as influence scientific and technological thinking and communication strategies.


GWSS 5201. Global Processes and the Politics of Sexuality. (3 cr; Stdnt Opt. Prereq-12 cr WoSt or feminist studies grad student or #) Comparative examination of the social construction of sexuality. Formal/informal norms/regulations, categories of deviance, representation of sex in the media/arts, role of sexuality in relation to agency/subjectivity.

GWSS 5300. Communication and Gender. (3 cr; A-F or Aud. =COMM 5406. Prereq-one women’s studies course or #) How gender affects verbal communication. Development of analytical skills through readings, exercises, research that raise awareness of the power of language and the influence of gender prescriptions.


GWSS 5404. Working Class Women’s Cultures. (3 cr; Stdnt Opt. Prereq-12 cr WoSt or #) Myths and realities surrounding working class women and their cultures. Use sociological and literary material in an effort to learn about working class women and to hear their own voices.

GWSS 5490. Topics: Political Economy and Global Studies. (3 cr [max 12 cr]; Stdnt Opt) Topics specified in Class Schedule.

GWSS 5501. Women and the Law. (3 cr; Stdnt Opt. Prereq-9 cr [WoSt or pl-law grad] or #) Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.


GWSS 5770. Topics: Sexuality Studies. (3 cr [max 6 cr]; Stdnt Opt.) Topics specified in Class Schedule.

GWSS 5996. Directed Study. (1-12 cr [max 12 cr]; Stdnt Opt)
GWSS 5994. Directed Instruction. (1-12 cr [max 36 cr]; Stdnt Opt)
GWSS 5995. Directed Research. (1-8 cr [max 36 cr]; Stdnt Opt)

Genetics, Cell Biology and Development (GCD)

Department of Genetics, Cell Biology, and Development

College of Biological Sciences

GCD 3022. Genetics. (3 cr; Stdnt Opt. or BIOL 4003, Prereq-BIOL 1002 or BIOL 1009) Mechanisms of heredity, their implications for biological populations. Applications to practical problems.

GCD 3485. Bioinformatic Analysis: Introduction to the Computational Characterization of Genes and Proteins. (3 cr; A-F only; Prereq-One semester of college biology) Use of computer applications in manipulation/analysis of DNA, RNA, and protein sequences.

GCD 4015. Genetics Laboratory. (2 cr; Stdnt Opt. Prereq-3022 or BIOL 4003 or BIOL 4332) Introduction to experimental techniques used in genetic analyses. Although experiments may vary from semester to semester, genetic experiments with model systems ranging from viruses to plants and animals are performed.

GCD 4025. Cell Biology Laboratory. (2 cr; Stdnt Opt. Prereq-BIOL 4004 or #) Experimental approaches to cell structure, function, and replication. Microscopy, autoradiography, cell fractionation, molecular/chemical analyses.

GCD 4034. Molecular Genetics. (3 cr; Stdnt Opt. Prereq-BIOL 4003, BIOL 4004; advanced bioscience undergrad recommended) Molecular genetics of prokaryotes/eukaryotes. Gene regulation, genome analysis. Modern techniques such as recombinant DNA, targeted mutations, genome manipulation, and gene chip technology.


GCD 4134. Endocrinology. (5 cr; Stdnt Opt. Prereq-BIOL 3211 or Biol/BioC 3021 or BioC 4331 or #) Survey of structure and function of invertebrate and vertebrate endocrine systems.

GCD 4143. Human Genetics. (3 cr; Stdnt Opt. Prereq-3022 or Biol 4003 or #) 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.

GCD 4151. Molecular Biology of Cancer. (3 cr; Stdnt Opt. Prereq-BIOL 4003) Regulatory pathways involved in directing normal development of complex eukaryotic organisms, how disruptions of these pathways can lead to abnormal cell growth/cancer. Causes, detection, treatment, prevention of cancer.


GCD 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#) Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature. Written report.

GCD 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#) Laboratory or field investigation of selected areas of research including written report.

GCD 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#) Individual study on selected topics or problems. Emphasizes selected readings and use of scientific literature.

GCD 4994. Directed Research. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#) Laboratory or field investigation of selected areas of research.

GCD 5036. Molecular Cell Biology. (3 cr; Stdnt Opt. Prereq-BIOL 4004 or #; sr or grad student recommended) Modern, integrative approaches combining cell/molecular biology, biochemistry, and genetics to investigate cell organization/function. Membranes, signaling, extracellular matrix, secretion, endocytosis, cytoskeleton, nucleus. Analysis of scientific papers to illustrate new concepts in and experimental approaches to cell organization/function.

Geographic Information Science (GIS)

Department of Geography

College of Liberal Arts

GIS 5330. GIS Internship. (1-3 cr [max 6 cr]; S-N only, Prereq-#; strong GIS/mapping skills) Intensive hands-on experience using GIS to solve practical problems.


GIS 5571. ArcGIS I. (5 cr; Stdnt Opt. Prereq-GEOG 5561 or equiv, status in MGIS program, familiarity with computer operating systems) or #) Introduction to ArcGIS system. Data capture. Geometric transformations, map projections. Topology, editing systems, database management, map production.

GIS 5572. ArcGIS II. (5 cr; Stdnt Opt. Prereq-5571, (GEOG 5561 or equiv), in MGIS program) or #) In-depth exploration of topics from 5571, as well as dynamic segmentation, address matching, and macro language programming.

GIS 5573. Desktop Mapping. (1.5 cr; Stdnt Opt. Prereq-Geog 5561 or equiv, Geog 5511 or equiv, status in MGIS program or #) Introduction to desktop mapping systems such as ArcView, MapInfo and Maptitude. Emphasizes the application of these systems to the display and analysis of geographical data.

GIS 5574. GIS and the Internet. (1.5 cr; Stdnt Opt. Prereq-Geog 5561 or equiv, status in MGIS program or #) The role of the Internet in GIS applications. Topics include GIS data sources on the Internet, the role of the Internet in information dissemination, Internet capabilities for interactive mapping and issues surrounding the development of GIS-related Web sites.

GIS 5575. Surveying and the Global Positioning System (GPS). (2 cr; Stdnt Opt. Prereq-Geog 5561 or equiv, status in MGIS program or #) Introduction to GPS (Global Positioning System) and other surveying techniques of use to GIS professionals. Topics include geodesy, data adjustment, datums, ellipsoids, coordinate systems, and transformations.

GIS 5577. Spatial Data Administration. (3 cr; Stdnt Opt. Prereq-#) Theory/application for administration of geographic databases. Quality assurance, development planning/management, maintenance, access distribution, documentation.

GIS 5578. GIS Programming. (3 cr; Stdnt Opt. Prereq-MGIS student or #) Opportunities/flexibility that computer programming offers to application of GIS technologies. Programming techniques using Visual Basic, Python, and ArcObjects. Students apply GIS principles/concepts to programs using ESRI software.

GIS 5590. Special Topics in GIS. (1-3 cr [max 6 cr]; A-F or Aud. Prereq-#) Special topics in geographic information science (GIS). Topics vary according to student needs, technological developments in field.

For a guide to course numbers, symbols, and abbreviations, see page 376. 503
Geography (GEOG)

Department of Geography

College of Liberal Arts


GEOG 1301W. Our Globalizing World. (4 cr; Stdnt Opt) Introduction to geographical understandings of globalization and of connections/differences between places.


GEOG 1403. Biogeography of the Global Garden. (3 cr; Stdnt Opt. Prereq-Honors) 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. (4 cr; Stdnt Opt. Prereq-Honors) 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 1906W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

GEOG 1910W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Fr) Topics specified in Class Schedule.


GEOG 3010. Geography of the United States and Canada. (4 cr; Stdnt Opt. +GEOG 3102) Analysis of the ways in which the aspirations and abilities of diverse groups of people interact with the complexities of the natural environment to produce the contemporary pluralistic cultures and regional differentiation of the United States and Canada.

GEOG 3111. Geography of Minnesota. (3 cr; Stdnt Opt) 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 3141. Africa. (3 cr; Stdnt Opt. +AFRO 3141) Regional differentiation of human groups and environments; culture contact and problems of underdeveloped countries south of the Sahara.


GEOG 3161. Europe: A Geographic Perspective. (3 cr; Stdnt Opt. +GLOS 3921) 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. German language discussion group in conjunction with the course for 1 extra credit.


GEOG 3211. East Asia. (3 cr; Stdnt Opt. +GEOG 3215, GEOG 5215, GEOG 521N) 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. (3 cr; Stdnt Opt) 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 globalizing production and finance on the welfare of nations, regions, cities.

GEOG 3355. Environmental Quality. (3 cr; Stdnt Opt) The quality of the human environment depends on 1) how humans make decisions about how to act, 2) how they act, and 3) how they evaluate both. In the United States, this process is best described as disjointed incrementalism, in which governments, organizations, and individuals play distinct and important roles.

GEOG 3361W. Geography and Public Policy. (3 cr; Stdnt Opt) 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 3373. Changing Form of the City. (3 cr; Stdnt Opt) Urban origins, ancient cultures/cities, the medieval city, rediscovery of planning, colonial cities. Industrialization and urban expansion. Speculative cities, utopian cities, planning triumphs/disasters. Cities as reflections of society, culture, the past.

GEOG 3374V. Honors: The City in Film. (4 cr; Stdnt Opt. +GEOG 5374W, GEOG 3374W, Prereq-honors) 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). Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor.

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GEOG 3374W. The City in Film. (4 cr; Stdnt Opt. *GEOG 3374V, GEOG 5374W) 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 and children).

GEOG 3375. Minority Settlement in America. (3 cr; Stdnt Opt) Comparative analysis of minorities in American cities, including migration patterns, residential patterns, socioeconomic characteristics, public and private community enterprises, and class in urban structure.

GEOG 3376. Political Ecology of North America. (3 cr; Stdnt Opt) 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: Sounds and Bodies in Different Places. (3 cr; A-F or Aud) Geographical conceptions of place, space, embodiment, and identity. Case studies of music.


GEOG 3381W. Population in an Interacting World. (4 cr; Stdnt Opt) 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. (3 cr; A-F only) 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 Systems and Global Change. (4 cr; A-F or Aud. *GEOG 5401) Geographic patterns, dynamics, and interactions of atmospheric, hydroospheric, geomorphic, pedologic, and biologic systems as context for human population, development, and resource use patterns.

GEOG 3401H. Honors: Geography of Environmental Systems and Global Change. (4 cr; A-F or Aud. Prereq-Honors) Geographic patterns, dynamics, interactions of atmospheric, hydroospheric, geomorphic, pedologic, biologic systems as context for human population, development, resource use patterns.

GEOG 3411W. Geography of Health and Health Care. (4 cr; Stdnt Opt. *GEOG 5411) 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 3511. Principles of Cartography. (4 cr; Stdnt Opt. Prereq: 3 cr in geog or #) History and development of U.S. 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.

GEOG 3531. Numerical Spatial Analysis. (4 cr; Stdnt Opt. *GEOG 5531) 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 3561. Principles of Geographic Information Science. (4 cr; Stdnt Opt. Prereq: Jr or Sr) 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.


GEOG 3839. Introduction to Dendrochronology. (3 cr; Stdnt Opt. Prereq-[1403, [BIOL 1001 or BIOL 1009 or equiv]) or #) Historical development, operational techniques, biological background, and principles of tree ring analysis. Applications of tree-ring data to investigate environmental change and past cultures.

GEOG 3900. Topics in Geography. (3 cr [max 9 cr]; Stdnt Opt) Special topics/regions covered by visiting professors in their research fields.


GEOG 3985V. Honors Senior Project Seminar. (4 cr; Stdnt Opt. Prereq-Honors, #) Completion of research/writing of senior project.

GEOG 3985W. Senior Project Seminar. (4 cr; Stdnt Opt. Prereq: Jr or Sr, #) Complete the research/writing of senior project.


GEOG 3995. Community Service Learning supplemental credit. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-[83XX or 85XX] geography course with structured community service learning component, #) Community service learning component added to course.

GEOG 4001. Modes of Geographic Inquiry. (4 cr; Stdnt Opt) 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. (3 cr; Stdnt Opt. *Prereq: Jr or Sr) 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.

**GEOG 4121W. Latin America.** (4 cr; Stdnt Opt. +LAS 4121W) Interplay of natural environment and history in shaping contemporary Latin America. Political ecology of natural resources, food supply and distribution, urbanization and the informal economy, migration, ethnicity, and the role of the state and international agencies in domestic economies.

**GEOG 4382. Contemporary Immigrant America.** (3-5 cr [max 5 cr]; Stdnt Opt) Analysis and explanation of contemporary immigration trends; immigration policies; immigrant rights; immigrant integration and adaptation; ethnic group formation; ethnic identities; ethnic neighborhoods and communities; second generation; immigrant women; ethnic conflict; xenophobic reactions. Community Service Learning component for 2 extra credits.

**GEOG 4700. Community Service Learning.** (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-Concurrent enrollment in a Geog course that has community service learning as a component) Community service, readings, written assignments, class activities that promote reflection/synthesis. Students interrogate what they learn in more traditional geography courses and confirm/question their understanding of geographic themes and their own role as social actors.


**GEOG 5371W. American Cities I: Population and Housing.** (4 cr; Stdnt Opt. +PA 5201W, Prereq-Grad or #) Emergence of North American cities; residential building cycles, density patterns; metropolitan housing stocks, supply of housing services; population and household types; neighborhood-level patterns of housing use; housing prices; intraurban migration; housing submarkets inside metro areas; emphasis on linking theory, method, case studies.


**GEOG 5374W. The City in Film.** (4 cr; Stdnt Opt. +GEOG 3374V, GEOG 3374W. Prereq-student or #) 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), historical themes and its continuities with 3374. Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor.

**GEOG 5377. Music in the City: Sounds and Bodies in Different Places.** (3 cr; A-F only) Geographical conceptions of place, space, embodiment, and identity. Case studies of music.

**GEOG 5385. Globalization and Development: Political Economy.** (4 cr; Stdnt Opt, Prereq-Sr or grad or #) Nature/scope of modern world system (capitalism), its impact on regional development processes. Roles of state and of international financial institutions.

**GEOG 5393. Rural Landscapes and Environments.** (4 cr; Stdnt Opt) 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; Stdnt Opt. +GEOG 3401. Prereq-grad student or #) 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.

**GEOG 5411. Geography of Health and Health Care.** (4 cr; Stdnt Opt. +GEOG 3411W) 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 5421. Introduction to Atmospheric Science.** (3 cr; Stdnt Opt. +ES 5421. Prereq-Familiarity with fundamentals of physics, calculus, and statistics, including differential and integral calculus and basic differential equations and basic thermodynamics, mechanics, and the electromagnetic spectrum) Calculus-based introduction to atmospheric dynamics, radiation, thermodynamics, chemical composition, and cloud processes. Applications to climate, meteorology, the hydrologic cycle, air quality, and biogeochemical cycles.

**GEOG 5426. Climatic Variations.** (3 cr; Stdnt Opt. Prereq-4245 or 3401 or #) 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.

**GEOG 5441. Quaternary Landscape Evolution.** (3 cr; Stdnt Opt. Prereq-3401 or grad student or #) Roles of climate change, geomorphic history, vegetation change, and soil development in the evolution of landscape patterns during the Quaternary Period, with emphasis on North America.


**GEOG 5512. Cartography: Topics.** (3 cr; Stdnt Opt. Prereq-3511 or 5531 or #) Selected topics include the system of cartographic communication, map design, map reading, map analysis, history of cartography.


**GEOG 5561. Principles of Geographic Information Science.** (4 cr; Stdnt Opt. Prereq-grad) 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.


**GEOG 5563. Advanced Geographic Information Science.** (3 cr; Stdnt Opt. Prereq-B or better in 5361 or 5561 or #) 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.

**GEOG 5564. Urban Geographic Information Science and Analysis.** (3 cr; Stdnt Opt. Prereq-5550 or 5561) 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.


GEOG 5701. Field Research. (3 cr; Stdnt Opt. Prereq-9 cr in geog, #) Field investigation in physical, cultural, and economic geography: techniques of analysis and presentation; reconstruction of environments.

GEOG 5900. Topics in Geography. (3 cr [max 9 cr]; Stdnt Opt. Prereq-sr or grad, #) Special topics and regions. Course offered by visiting professors in their research fields.

Geological Engineering (GEOE)

Department of Civil Engineering

College of Science and Engineering


GEOE 4000H. Honors Research Seminar. (1 cr [max 2 cr]; A-F only. *CE 4000H, Prereq-Upper div CE) Research seminars in civil and geological engineering given by faculty members and visiting scholars.

GEOE 4011. Special Topics. (1-4 cr [max 12 cr]; A-F only. Prereq-Upper div IT) Topics, credits vary.

GEOE 4092H. Honors Selected Reading. (1 cr [max 2 cr]; A-F only. *CE 4092H, Prereq-Upper div CE) Selected readings, student presentations.

GEOE 4094H. Senior Honors Thesis. (2 cr; A-F only. *CE 4094H, Prereq-Upper div CE) Writing thesis under direction of CE faculty member.

GEOE 4102W. Capstone Design. (4 cr; A-F or Aud. *CE 4301, CE 4401, CE 4501, CE 4502) 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.

GEOE 4111. Engineering Systems Analysis. (5-4 cr; Stdnt Opt. *CE 4111, Prereq-Upper division IT) Systems Analysis focuses on a broader “systems” approach of viewing problems. The techniques of operations research—decision engineering, network analysis, simulation, linear programming, and expert systems—are used to represent systems, and especially to assess trade-offs.

GEOE 4194H. Senior Honors Thesis. (2 cr; A-F only. *CE 4194H, Prereq-Upper div CE) Writing thesis under direction of CE faculty member.


GEOE 4341. Engineering Geostatistics. (3 cr; A-F or Aud. *CE 4341, Prereq-GeoE, CE, or Geo upper division or grad student, Stat 3021 or #) Problem solving and decision making in civil and geological engineering using applied statistics. Emphasis on spatially correlated data, e.g. geographic site characterization, and spatial sampling design.


GEOE 5311. Experimental Geomechanics. (5 cr; A-F or Aud. *CE 5311, Prereq-IT upper division or grad student, GE 4301, CE 4301, or #) Machine stiffness; closed-loop testing. Small-strain theory. Measurement of deformation; strain gages, LVDTs, accelerometers, and associated circuits. Direct and indirect testing. Material behavior: experiments on anisotropic, damaged, and fluid-filled solids.

GEOE 5331. Geomechanics Modeling. (3 cr; A-F or Aud. *CE 5331, Prereq-IT upper division or grad student, GE 4301 or CE 4301) Soil and rock response in triaxial testing; drained and undrained behavior, elastic and plastic properties. Modeling stresses, strains, and failure in geomechanics problems.

Geology and Geophysics (GEO)

Department of Science and Engineering


GEO 1003. Dinosaur Evolution, Ecology, and Extinction: Introduction to the Mesozoic World. (3 cr; Stdnt Opt. GEO 5003) Dinosaurs and the Mesozoic Earth are used to introduce evolution, plate tectonics, climate change, and Earth systems. Overview of the history of dinosaur interpretations illustrates the principles and social aspects of scientific investigation.

GEO 1005. Geology and Cinema. (4 cr; Stdnt Opt. GEO 1105) Physical processes shaping the Earth, materials it comprises, its nearly five billion year history as told spectacularly, but often wrongly, by Hollywood movies.

GEO 1006. Oceanography. (4 cr; Stdnt Opt. GEO 1106, GEO 5006) How various processes shape 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.


GEO 1011. Volcanoes of the Earth. (4 cr; Stdnt Opt) Nonmathematical introduction to volcanoes, their origin and distribution on Earth and through time; theory of plate tectonics, origin of magmas and the Earth’s interior; products of volcanoes, types of eruptions and hazards, and impact on climate, vegetation, and society.

GEO 1081. Conspiracies, Fraud, and Deception in Earth History. (1 cr; Stdnt Opt) 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.


GEO 105. Geology and Cinema. (3 cr; Stdnt Opt. = GEO 1005) Physical processes shaping the Earth, materials it comprises, its nearly five billion year history as told spectacularly, but often wrongly, by Hollywood movies.


GEO 1906W. Freshman Seminar: Writing Intensive and Environmental Theme. (1-3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics vary. see freshman seminar topics.

GEO 2201. Solid Earth Dynamics. (4 cr; A-F or Aud. Prereq-APHYS 1301 or #) 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.


GEO 2301. Mineralogy. (3 cr; Stdnt Opt. Prereq-APhys 1021 and MATH 1271 or #) Crystallography, crystal chemistry, physics. Physical properties, crystal structures, chemical equilibria of major mineral groups. Lab includes crystallographic, polarizing microscope. X-ray powder diffraction exercises, hand-specimen mineral identification.

GEO 2302. Petrology. (3 cr; Stdnt Opt. Prereq-2301 or #) Magmatic and metamorphic processes, with an emphasis on plate tectonic interpretation of rock sequences.


GEO 3002. Climate Change and Human History. (3 cr; Stdnt Opt. = GEO 5102) 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.


GEO 3096. Iceland. (4 cr; A-F or Aud. Prereq-2301 or GEOG 3900, #) Geologic processes that form Iceland. Tectonics, volcanology, geomorphology, glaciology. Interplay between physical environment of Iceland and its social structure and culture. Lectures, field trips.

GEO 3303W. Geochronology and Earth History. (3 cr; Stdnt Opt. Prereq-2303) Modern high precision techniques for quantifying geologic time. Litho-, bio-, and chrono-stratigraphic correlation techniques for reconstructing geologic history.


GEO 3425. Atmospheric Composition and Chemistry. (3 cr; A-F or Aud. = ESRM 3425, Prereq-[CHEM 1021, CHEM 1022, [MATH 1271 or equiv] PHYS 1011] or #; ESRM 425/GEOG 1425 recommended) Processes governing the chemical makeup of Earth’s atmosphere and implications for air pollution, climate, and human welfare. Evolution of the atmosphere; atmospheric transport; biogeochemical cycles of C, N, O, mercury; greenhouse effect; aerosols; ozone hole; oxidizing power of the atmosphere; smog.

GEO 3870. Modeling Workshop. (1 cr [max 2 cr]; Stdnt Opt. Prereq-Geo or Geophys or GeoEng major or #) Modeling of geologic or geophysical systems.

GEO 3890. Field Workshop. (1 cr [max 2 cr]; Stdnt Opt. Prereq-Geo or Geophys or GeoEng major or #) Geologic or geophysical field study.

GEO 3891. Field Methods. (1 cr; A-F only) Methods in geologic field mapping.


GEO 4010. Undergraduate Seminar: Current Topics in Geology and Geophysics. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#) Topics in geology and geophysics investigated in a seminar format.

GEO 4093. Problems in Geology and Geophysics: Senior. (1-4 cr [max 6 cr]; Stdnt Opt. Prereq-#) Nonstructured research course enabling seniors to engage in independent research under faculty supervision.

GEO 4094. Senior Thesis. (2 cr [max 4 cr]; Stdnt Opt. Prereq Sr, Geo or Geophysics major, #) Nonstructured research course enabling senior-level majors to engage in independent research under faculty supervision. Select problems according to individual interests and in consultation with faculty committee. Thesis and oral defense.

GEO 4096. Geologic Field Studies in Iceland. (4 cr; A-F or Aud. Prereq-[[1001 or 1011], 2301, GEOG 2302] or #) Lectures, field research in various parts of Iceland. Focuses on individual projects in southwest Iceland. Write-up, oral presentation of field studies.


GEO 4203. Principles of Geophysical Exploration. (3 cr; Stdnt Opt. Prereq-Phys 1302) Seismic exploration (reflection and refraction); potential techniques (gravity and magnetics) and electrical techniques of geophysical exploration.
GEO 4204. Geomagnetism and Paleomagnetism. (3 cr; Stdnt Opt. Prereq-2201, Math 1302, Math 1272 or #) Prereq-geomagnetic field at Earth’s surface, secular variation, geomagnetic field reversals. Physical and chemical basis of paleomagnetism: origin of natural remnant magnetization, minerology of magnetic minerals, magnetic polarities in stratigraphy, apparent polar wander, and environmental magnetism.

GEO 4212. Solid Earth Geophysics II. (3 cr; A-F or Aud. Prereq-2201, Math 1302) Dynamics of the solid Earth, mostly mantle and core; seismic tomography, geothermal measurements, gravity, time-dependent deformation of the Earth, computer modeling.

GEO 4301. Igneous and Metamorphic Petrology. (3 cr [max 4 cr]; Stdnt Opt. Prereq-2302, Math 1272 or #) Theoretical development of basic thermodynamic tools, chemostratic analysis for interpreting chemical processes in igneous/metamorphic rocks. Problem sets.


GEO 4402. Biogeochemical Cycles in the Ocean. (3 cr; Stdnt Opt. Prereq- [Chem 3501, 1 yr of calculus] or #) Introduction to 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.


GEO 4502. Tectonic Styles. (3 cr; Stdnt Opt. Prereq-4501 or #) 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.

GEO 4602. Sedimentology and Stratigraphy. (3 cr; Stdnt Opt. Prereq-3402, [IT upper div major in Geology or geophysics or geoengineering or mining engineering] or CLA [jr or sr] major in geology] or #) Interpretation of origin of sedimentary rocks through application of basic physical/chemical principles. Modern depositional environments, petrographic microscopy, basin dynamics, stratigraphy.


GEO 4703. Glacial Geology. (4 cr; Stdnt Opt. Prereq-1001 or 1004 or #) Formation and characteristics of modern glaciers; erosional and depositional features of Pleistocene glaciers; history of quaternary environmental changes in glaciated and nonglaciated areas. Field trips and labs.

GEO 4911. Advanced Field Geology. (4 cr; A-F or Aud. Prereq-3911, #) Geologic mapping; study of igneous, metamorphic, and sedimentary rocks; structures and surficial features; problem solving. Paper required.


GEO 5102. Climate Change and Global History. (3 cr; Stdnt Opt. = GEO 3002, Prereq-1001 or equiv or #) 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.

GEO 5108. Principles of Environmental Geology. (3 cr; Stdnt Opt. Prereq-Geology majors: core curriculum through 4501 or #, Nonmajors: 1001 or #) Human impact on geological environment and effect of geology/geologic processes on human life from an ecosystems and biogeochemical cycles perspective. Geologic limits to resources and carrying capacity of Earth. Land use planning, environmental impact assessment, ecogeologic world models. Field project and trip.

GEO 5201. Time-Series Analysis of Geological Phenomena. (3 cr; A-F or Aud. Prereq-Math 2263 or #) 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.


GEO 5402. Isotope Geology. (3 cr; A-F or Aud. Prereq-2203 or #) Theory and uses of radioactive, radiogenic, and stable isotopes in geology. Radioactive dating, geothermometry, and tracer techniques in geologic processes.

GEO 5533. Electron Microprobe Theory and Practice. (3 cr; Stdnt Opt. Prereq-[One yr chem, one yr physics] or #) Characterizing solid materials with electron beam instrumentation, including reduction of X-ray data to chemical compositions.


GEO 5601. Advanced Sedimentology. (4 cr; Stdnt Opt. Prereq-4602 or #) Modern techniques of sedimentary basin analysis focusing on interactions among the lithosphere, atmosphere, and hydrosphere. Sedimentary facies of modern and ancient seas, petrology of clastic and carbonate deposits, tectonic and paleoclimatic interpretations, paleocurrent analysis, diagenetic effects on subsurface fluid flow, and volcanic sedimentation.


GER 5705. Limnogeology and Paleoenvironment. (3 cr; Stdnt Opt. Prereq-#) 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.

GER 5802. Scientific Visualization. (3 cr; Stdnt Opt. Prereq-CSci 1107 or CSCI 1113 or #) Visualization hardware and software, three-dimensional graphics, representation of scientific data, modeling, user interface techniques, output, commonly used algorithms, animation, case studies and examples.


German (GER)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

GER 222. Reading German. (0 cr; A-F or Aud) 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; Stdnt Opt) 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; Stdnt Opt. Prereq-1001) Listening, reading, speaking, writing. Emphasizes proficiency. Topics include free-time activities, careers, and culture of German-speaking areas.


GER 1022. Beginning German Review. (5 cr; Stdnt Opt. Prereq-Placement above 1001) 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. (3 cr; Stdnt Opt. +GER 1601H) 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 1601H. Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood. (3 cr; Stdnt Opt. +GER 1601H) 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 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Fr) Topics specified in Class Schedule.

GER 1905H. Honors Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Fr or fewer than 30 cr) Topics specified in Class Schedule.

GER 1909W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

GER 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

GER 3011W. Conversation and Composition. (4 cr; Stdnt Opt. Prereq-1002A) Achieving proficiency in professional or academic German. Refinement of oral/written expression. Review of important communicative modes of language. Wide range of topics to develop advanced level of proficiency.

GER 3012W. Conversation and Composition. (3 cr; Stdnt Opt. Prereq-3011) 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.


GER 3104W. Reading and Analysis of German Literature. (4 cr; Stdnt Opt. Prereq-3011) Introduction to literary analysis. Readings from drama, prose, and lyric poetry, from 18th century to present.

GER 3410. German Literature Before 1750. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3011) Representative literary texts of German High Middle Ages, Renaissance, Reformation, and the Baroque, in cultural-historical context. Readings in modern German translation or English.

GER 3421. 18th-Century German Literature. (3 cr; Stdnt Opt. Prereq-3011) German literature, 1720-1810, Enlightenment/Weimar classicism in historical/cultural context. Reading/discussion of literary/philosophical works, aesthetic criticism.

GER 3441. 20th-Century Literature. (3 cr; Stdnt Opt. Prereq-3011) German literature, from 1890 to present, in historical, political, social, and cultural context.

GER 3490. Topics in German Literature. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3011) Intensive exploration of specific authors, literary genres, or literary topics not covered in period courses.

GER 3501. Contemporary Germany. (3 cr; Stdnt Opt. Prereq-3011) Social, political, and cultural developments in Germany, from 1945 to present.

GER 3510. Topics in German Studies. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3011) One topic in depth dealing with culture or civilization of German-speaking countries.

GER 3511W. German Civilization and Culture: Middle Ages to 1700. (3 cr; Stdnt Opt) Survey of representative cultural-historical events in Germany from early Germanic times to 1700.

GER 3512W. German Civilization and Culture: 1700 to the Present. (3 cr; Stdnt Opt) Survey of representative cultural-historical events in Germany from 1700 to the present.
GER 3520. Topics in Austrian and Central European Culture. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3011)
Culture, politics, and economy in Austria and Central Europe. Comparative analysis of cultural/political developments. Topics vary.

GER 3531. Selected Writings in German Intellectual History. (3 cr; Stdnt Opt. Prereq-3011)
Philosophical writings on culture, history, and art. Authors include Lessing, Schiller, Kant, Hegel, Marx, Nietzsche, and Freud.

GER 3601. German Medieval Literature. (3 cr; Stdnt Opt. Prereq-No knowledge of German required)
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.

GER 3602W. Introduction to German Cinema. (3 cr; Stdnt Opt)
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]; Stdnt Opt. Prereq-No knowledge of German required; cr toward major or minor requires reading in German)
In-depth study of authors or topics from various periods in German literature.

GER 3631. Jewish Writers and Rebels in German, Austrian, and American Culture. (3 cr; Stdnt Opt. +JWST 3631, CSCL 3631; Prereq-No knowledge of German required; cr toward major or minor requires reading in German)
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.

GER 3634. German Women and Cultural History: Constructing Selves in Narrative Texts. (3 cr; Stdnt Opt. Prereq-No knowledge of German required; cr toward major or minor requires reading in German)
Examination of narrative texts by German women writers against a background of the cultural history of Germany during the 20th century. Focus on personal narrative texts, both written and pictorial, and readings in literary and cultural theory and history. All readings in English.

GER 3641. German Folklore. (3 cr; Stdnt Opt. Prereq-No knowledge of German required; cr for major or minor by arrangement with instructor)
Literary and cultural investigation of the main folklore 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.

GER 3701. History of the German Language. (3 cr; Stdnt Opt. Prereq-1004)
Change in grammar and lexicon, 750 A.D. to present.

GER 3704. German Dialects. (3 cr; Stdnt Opt. Prereq-1004)
Contemporary regional dialects recorded on tape and written in texts. Synchronic and diachronic analysis.

GER 4001. Beginning German. (2 cr; Stdnt Opt. Prereq-Grad student)
Meets concurrently with 1001. See 1001 for course description.

GER 4002. Beginning German. (2 cr; Stdnt Opt. Prereq-Grad student)
Meets concurrently with 1002; see Ger 1002 for course description.

GER 4003. Intermediate German. (2 cr; Stdnt Opt. Prereq-Grad student)
Meets concurrently with 1003. See 1003 for course description.

GER 4004. Intermediate German. (2 cr; Stdnt Opt. Prereq-Grad student)
Meets concurrently with 1004. See 1004 for course description.

GER 4040. German Play: Oral Interpretation and Performance of German. (1-3 cr [max 9 cr]; Stdnt Opt)
Dramatic reading of German play for pronunciation; preparation and rehearsal for production and performance of German play.

GER 5016. Advanced Translation: Theory and Practice. (3 cr; Stdnt Opt. Prereq-3011 or #)

GER 5410. Topics in German Literature. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3011)
Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in Class Schedule.

GER 5510. Topics in Contemporary German Culture. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3011)
A topic of contemporary German culture explored in depth.

GER 5610. German Literature in Translation. (3 cr [max 9 cr]; Stdnt Opt. Prereq-No knowledge of German required; cr toward major or minor requires reading in German)
Study in depth of authors or topics from various periods in German literature. Requires no knowledge of German.

GER 5630. Topics in German Cinema. (3 cr [max 9 cr]; Stdnt Opt. Prereq-3xx film course or #)
Topics chosen may focus on specific directors, genres, film production or reception, and/or other formal, theoretical, historical, or political issues.

GER 5711. History of the German Language I. (3 cr; Stdnt Opt. Prereq-3011)
Historical development of German, from beginnings to 1450.

GER 5712. History of the German Language II. (3 cr; Stdnt Opt. Prereq-5711)
Historical development of German from 1450 to 2000.

GER 5721. Introduction to Middle High German. (3 cr; Stdnt Opt)
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; Stdnt Opt. Prereq-5721)
Acquisition of fluency in reading Middle High German normalized as well as non-normalized texts, both poetry and prose.

GER 5731. Old High German I. (3 cr; Stdnt Opt)
Study of the monuments of Old High German. Detailed investigation of Old High German in comparison with the other Germanic languages.

GER 5732. Old High German II. (3 cr; Stdnt Opt. Prereq-5731)
Study of the monuments of Old High German. Detailed investigation of Old High German in comparison with the other Germanic languages.

GER 5734. Old Saxon. (3 cr; Stdnt Opt)
Study of the poetry of Old Saxon. Detailed investigation of Old Saxon in comparison with the other Old Germanic languages.

GER 5740. Readings in Philology. (3 cr [max 9 cr]; Stdnt Opt)
Philo[logical analysis of a chosen text in any medieval Germanic language.

GER 5993. Directed Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-5, %, @)
Guided individual reading or study.

German, Scandinavian, and Dutch (GSD)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

GSD 3451W. Honors Major Project Seminar. (3 cr; A-F or Aud. +GSD 3451W; Prereq- Honors student)
Major project under supervision of faculty member. Oral exam based on project.

GSD 3451W. Major Project Seminar. (3 cr; A-F or Aud. +GSD 3451W; Prereq- Honors student)
Students prepare major project under supervision of faculty member.

GSD 5103. Teaching of Germanic Languages. (3 cr; Stdnt Opt)
Second language acquisition theory, methods, testing, and technology applicable to teaching of modern Germanic languages.

Gerontology (GERO)

School of Public Health

GERO 5000. Topics in Gerontology. (1-4 cr [max 10 cr]; Stdnt Opt)
Timely topics related to the biology, sociology, and psychology of aging and applied aging services.


GLO 1122. Globalization and Social Justice. (3 cr; A-F only) How and why did the term “globalization” become commonplace, what it describes. Uses questions of social justice to explore portrayals of globalization in popular media and culture.

GLO 1200. Global Studies Practicum. (3 cr [max 6 cr]; A-F or Aud) Exploratory experience in one part of the world as an integral feature of an undergraduate education and as preparation for learning the language of the area visited.

GLO 1200H. Honors: Global Studies Practicum. (3 cr [max 6 cr]; A-F or Aud) Exploratory experience in one part of world as integral feature of undergraduate education and as preparation for learning language of area visited.

GLO 1600. Topics in Global Studies. (3 cr [max 9 cr]; Stdnt Opt) Topics vary every semester. See Class Schedule.


GLO 1901. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

GLO 1904. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

GLO 1905. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

GLO 1909W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Fr) Topics specified in Class Schedule.


GLO 3103. Empire and Modernity. (3 cr; Stdnt Opt. Prereq-[3101, 3144] or #) How modern world was reconstructed by colonial encounter. Role of colonialism in construction of west. Images of non-western societies. Modernity in colonial/postcolonial societies. Problems/potential of universal categories such as democracy, gender, history, human rights. Globalization at the margins.

GLO 3143. Living in the Global. (3 cr; A-F only) Contemporary condition of global connectedness. Ways our habits, tastes, and experiences involve a stream of encounters with the global. Terrains of interconnection, including tourism, music, the Internet, and mass culture.

GLO 3144. Knowledge, Power, and the Politics of Representation in Global Studies. (4 cr; Stdnt Opt. =GLOS 3144H. Prereq-6 cr in social sciences including [Geog 1301 or Hist 1015 or Hist 1019 or Hist 1012 or Hist 1018 or Pol 1025]) Introduction to theoretical issues. Power, production of knowledge about world regions. Knowledge, power, and politics in contemporary world. Colonialism, nationalism, and modernity in shaping academic disciplines.

GLO 3144H. Honors: Knowledge, Power, and the Politics of Representation in Global Studies. (4 cr; Stdnt Opt. =GLOS 3144H. Prereq-honors, 6 cr in social sciences including [Geog 1301 or Hist 1015 or Hist 1019 or Hist 1012 or Hist 1018 or Pol 1025]) Introduction to theoretical issues. Power, production of knowledge about world regions. Knowledge, power, and politics in contemporary world. Colonialism, nationalism, and modernity in shaping academic disciplines.

GLO 3145. Theoretical Approaches to Global Studies. (4 cr; A-F or Aud. =GLOS 3145H. Prereq-6 credits in the social sciences including at least one of the following: Geog 1301; Hist 1012/1018; GLOS 1015W; or PolSci 1025 or #) Theoretically informed introduction to the social, political, economic, cultural, and historical processes shaping contemporary global phenomena. Topics may include nationalism, colonialism, cultural production, environmental sustainability, globalization of the economy, migration and diasporas, global conflict and cooperation.

GLO 3145H. Theoretical Approaches to Global Studies. (4 cr; A-F or Aud. =GLOS 3145H. Prereq-6 credits in the social sciences including at least one of the following: Geog 1301; Hist 1012/1018; GLOS 1015W; or PolSci 1025; or #) Theoretically informed introduction to the social, political, economic, cultural, and historical processes shaping contemporary global phenomena. Topics may include nationalism, colonialism, cultural production, environmental sustainability, globalization of the economy, migration and diasporas, global conflict and cooperation.

GLO 3212. Globalization, Markets, and Inequality. (3 cr; A-F or Aud. =ANTH 3212) 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.

GLO 3302. Debating “Development”: Contested Visions. (3 cr; A-F or Aud. Prereq-[3101, 3144] or #) Radical critiques of idea/practice of “development.” Debates over development. Vocabularies (Marxist, feminist, post-structuralist, ecological) that drive the debates.

GLO 3304. Sustainable People, Sustainable Planet. (3 cr; Stdnt Opt. =SUST 3003. Prereq-Soph or jr or sr) 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.

GLO 3305. Life for Sale: Global Debates on Environment, Science, and Society. (3 cr; A-F only. Prereq-At least soph) Biopiracy, vaccine trials, use/abuse of genetics, genetically modified organisms.

GLOS 3613W. Food, Culture, and Society. (3 cr; A-F or Aud. Prereq: SOC 2613W) Tools to understand food issues from a sociological perspective. Cross-cultural differences in the way groups/societies think about and relate to food.

GLOS 3620. Foreign Language News Coverage of International Events. (1 cr; Stdnt Opt. Prereq: Completion of college language requirement in language used for course) Compares coverage of current news in selected foreign language newspapers with coverage in a U.S. paper such as The New York Times.


GLOS 3643. Islam and the West. (3 cr; Stdnt Opt. HIST 3566, RELS 3714, CAS 3533) Cultural/intellectual trends that have defined fundamental differences between Islam and the West. Development of historical, philosophical, and intellectual mindset of both spheres. Factors that have contributed and continue to contribute to tension, anxiety, and hatred between the Muslim world and Europe and the United States.

GLOS 3701W. Population in an Interacting World. (4 cr; Stdnt Opt) Comparative analysis/explanation of trends in fertility, mortality, and internal/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.

GLOS 3900. Topics in Global Studies. (1-5 cr [max 15 cr]; Stdnt Opt) Topics vary every semester. See Class Schedule.

GLOS 3906. Foreign Language Immersion Program Completion. (1 cr [max 2 cr]; N or Aud. Prereq: Enrolled in full course load in target language, permission of Foreign Language Immersion Program) Credit attached to Foreign Language Immersion Program.

GLOS 3920. Topics in European Studies. (3 cr [max 9 cr]; Stdnt Opt) Topics vary. See Class Schedule.


GLOS 3930. Topics in Latin American Studies. (3 cr [max 9 cr]; Stdnt Opt) Topics vary. See Class Schedule.

GLOS 3940. Topics in Middle Eastern Studies. (4 cr [max 12 cr]; Stdnt Opt) Description varies with topic title.

GLOS 3950. Topics in Russian Area Studies. (3 cr; Stdnt Opt) Description varies with topic title.


GLOS 3970. Topics in African Area Studies. (3 cr [max 9 cr]; Stdnt Opt) Topics vary. See Class Schedule.

GLOS 3981W. Major Project Seminar. (3 cr; A-F or Aud. Prereq: %) Students formulate research questions, select topic, and develop/produce 25-30 page paper.

GLOS 3993. Directed Study. (1-5 cr [max 12 cr]; Stdnt Opt. Prereq: %, @) Guided individual reading or study.


GLOS 4311. Race, Class, and the Politics of Nature. (3 cr; A-F only) Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations.

GLOS 4406. Sociology of International Law. (3 cr; A-F or Aud. Prereq: SOC 1001 or 3101 or 3102 or 3111 or #) Which cultural values/practices take precedence? Which are criticized, altered, eliminated? What role does international law play? Immigration, terrorism, Americanization, structure of international legal system.

GLOS 4609. MSID Directed Research. (2-8 cr [max 8 cr]; Stdnt Opt. Prereq: Admission to MSID program, %) Research project based on field work in Ecuador, India, Kenya, or Senegal through Minnesota Studies in International Development program.

GLOS 4801. International Development: Critical Perspectives on Theory and Practice. (4 cr; A-F or Aud. Prereq: %) Interdisciplinary approaches to development. Assumptions, competing paradigms, analysis of policies, projects, problems. Globalization, societal crisis, indigenous alternatives to dominant paradigm. Partially taught in separate sections to deepen understanding of particular topic (e.g., environment, health, education).

GLOS 4803. MSID Country Analysis. (4 cr; A-F or Aud. Prereq-%) Multidisciplinary study of host country. Emphasizes social sciences and history, especially concepts/information regarding development issues.

GLOS 4805. Community Internships in the Global South. (4 cr; A-F only. Prereq-Admission to MSID program, %) Grassroots internship with a host-country development agency or project through Minnesota Studies in International Development. Community characteristics, development strategies/problems, organizational structure/culture, cross-cultural communication issues.

GLOS 4806. Topics: Case Studies in International Development. (4 cr; A-F or Aud. Prereq-Admission to MSID program) Development issues illustrated in students. Local-level projects through MSID. Focuses on a particular sector as it relates to development of country. Sample topics: environment and development, health and development; education, literacy, and development; women and development.

GLOS 4807. Applied Field Methods. (4 cr; A-F or Aud) Application of selected field research methods in rural/urban settings in Asia, Africa, and Latin America. Analysis of practical ethical, and theoretical issues raised through small field assignments and individual research projects.

GLOS 4808. MSID Directed Research. (4 cr [max 8 cr]; A-F or Aud. Prereq-Admission to MSID program, %) Research project based on field work in Ecuador, India, Kenya, or Senegal through Minnesota Studies in International Development (MSID).

GLOS 4809. Advanced International Development Internship. (4 cr; A-F only) Study abroad course for Minnesota Studies in International Development.

GLOS 4900. Senior Seminar in Global Studies. (3 cr; A-F or Aud. +GLOS 4900H. Prereq-[3101, 3144], global studies major or %) Globalization, nationalism, colonialism, cultural production, environmental sustainability, globalization of economy, migration, diasporas, global conflict/ cooperation, human rights. Students examine theoretical debates and cutting edge scholarship and may develop their own research projects. Capstone course.

GLOS 4900H. Honors: Senior Seminar in Global Studies. (3 cr; A-F or Aud. +GLOS 4900H. Prereq-[3101, 3144], honors student, Global Studies major or %) Globalization, nationalism, colonialism, cultural production, environmental sustainability, globalization of economy, migration, diasporas, global conflict/ cooperation, human rights. Students examine theoretical debates and cutting edge scholarship and develop their own research projects. Capstone course.

GLOS 4940. Topics in Asian History. (1-4 cr [max 16 cr]; Stdnt Opt) Selected topics in Asian history not covered in regular courses.

GLOS 5103. Empire and Modernity. (3 cr; A-F or Aud. Prereq-[3101, 3144] or %) How modern world has been constituted by colonial empires. Role of colonialism in construction of west. Images of non-western societies. Modernity in colonial/postcolonial societies. Problems/potential of universal categories such as democracy, gender, history, human rights. Globalization at the margins.

GLOS 5114. International Perspectives: U.S.-Mexico Border Cultures. (3 cr; Stdnt Opt. Prereq-Grad student) The relations of Mexico and the United States from an international perspective with a central focus on the cultural interchange in the border lands between the two countries. Uses both literary and historical materials.


GLOS 5410. Interactive Global and Local Studies. (3 cr; A-F or Aud. Prereq- %) Global studies topics, locally in the Twin Cities and Minnesota, and internationally through linked communication with classes at cooperating universities in other countries. Students communicate with counterparts abroad through e-mail to develop comparative/interactive elements. Possible topics: role of river in local history, grain storage/processing, manufacturing/trade, growth of metropolitan area.

GLOS 5602. Other Worlds: Globality and Culture. (3 cr; A-F or Aud. Prereq-[3101, 3144, grad student] or %) Interconnectedness of world. Considering not one world, but many. Colonialism, consumption, diasporic conditions, global media, nationalism, supra-national governance. How globality is experienced/contexted locally specifically.

GLOS 5643. Colonialism and Culture. (3 cr; A-F or Aud. +ANTH 5043) Making of culture as colonial/anthropological object of knowledge. Relationship between colonial knowledge/formation of academic disciplines (especially anthropology). Colonial/postcolonial transformations of colony, nation, and metropole.


GLOS 5803. MSID Country Analysis. (3 cr; A-F or Aud. Prereq-Admission to MSID prog, grad student) Multidisciplinary study of host country. Emphasizes social sciences and history, especially concepts/information regarding development issues.

GLOS 5805. Community Internships in the Global South. (3 cr; A-F only. Prereq-Admission to MSID prog, grad student) Grassroots internship with a host-country development agency or project through Minnesota Studies in International Development. Community characteristics, development strategies/problems, organizational structure/culture, cross-cultural communication issues.

GLOS 5806. Topics: Case Studies in International Development. (3 cr; A-F or Aud. Prereq-Admission to MSID prog, grad student) Development issues illustrated in students. Local-level projects through MSID. Focuses on a particular sector as it relates to development of country. Sample topics: environment and development; health and development; education, literacy, and development; women and development.

GLOS 5808. MSID Directed Research. (3 cr; A-F or Aud. Prereq-Admission to MSID prog, grad student) Research project based on field work in Ecuador, India, Kenya, or Senegal through Minnesota Studies in International Development (MSID).

GLOS 5900. Topics in Global Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-Jr or sr or grad student) Proseminar. Selected issues in global studies. Topics specified in Class Schedule.

GLOS 5910. Topics in East Asian Studies. (1-3 cr [max 3 cr]; Stdnt Opt) Description varies with topic title.

GLOS 5920. Topics in European Studies. (3 cr; Stdnt Opt) Description varies with topic title.

GLOS 5940. Topics in Middle Eastern Studies. (3 cr; Stdnt Opt) Description varies with topic title.

GLOS 5960. Topics in South Asian Studies. (3 cr [max 4 cr]; Stdnt Opt) Description varies with topic title.

GLOS 5993. Directed Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-%, @) Guided individual reading or study. Open to qualified students for one or more semesters.

GLOS 5994. Directed Research. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-%, @) Qualified students work on a tutorial basis.

**Graphic Design (GDES)**

**DHA Graphic Design**

**College of Design**

**GDES 1170. Topics in Graphic Design. (1-4 cr [max 16 cr]; A-F or Aud) In-depth investigation of specific topic, announced in advance.**

**GDES 1311. Foundations: Drawing and Design in Two and Three Dimensions. (4 cr; A-F or Aud. Prereq-[Apparel design or graphic design or interior design] pre-major) Design elements/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 Aud. Prereq- [Apparel design or graphic design or interior design] pre-major)

Color theory, its application in two-/three-dimensional design. Emphasizes effective use of color by studying traditional color systems, perception, and interaction. Lectures, demonstrations, extensive studio work, critiques.

GDES 1315. Foundations: The Graphic Studio. (4 cr; A-F or Aud. Prereq-Graphic design pre-major or #)

Graphic design process of problem-solving. Visual communication of ideas and information. Use of design software to compose with words, images, and forms.

GDES 2196. Work Experience in Graphic Design. (1-4 cr; max 8 cr; S-N only. Prereq-Plan submitted/approved by [adviser, internship supervisor], written approval of supervisor, #) Supervised work experience in business, industry, or government, related to student’s area of study. Integrative paper or project.

GDES 2311. Drawing and Illustration. (3 cr; A-F or Aud. Prereq-[1311 or DHA 1311], [1312 or DHA 1312], [apparel design or graphic design or interior design] pre-major) or #) Drawing, illustration, and image-making for graphic designers, including image series and animation.

GDES 2334. Computer Applications I: Digital Composition for Design. (3 cr; A-F or Aud. Prereq-[1311 or DHA 1311], [1312 or DHA 1312], DHA 1315), graphic design major) Composition of visual elements in electronic realm. Use of computer to design for traditional media, digital environments.

GDES 2345. Typography. (3 cr; A-F or Aud. Prereq-Graphic design major, pass portfolio review)

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 2351. Graphic Design I: Text and Image. (3 cr; A-F or Aud. Prereq-2345 or DHA 2345), graphic design major, pass portfolio review)

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.

GDES 2385W. Design and Factors of Human Perception. (4 cr; A-F or Aud. Prereq-Graphic design major)

Introduction to human-factor variables of design. Color perception, type legibility, and other aspects of the human interface with designed objects. Students develop design prototypes. Methods to evaluate effectiveness of designed projects.

GDES 3170. Topics in Graphic Design. (1-4 cr [max 32 cr]; A-F or Aud)

In-depth investigation of specific topic.

GDES 3196. Field Study: National or International. (1-4 cr [max 10 cr]; A-F or Aud)

Faculty-directed field study in national or international setting.

GDES 3212. Color and Form in Surface Design. (3 cr; A-F or Aud. Prereq-[1311 or DHA 1311], [1312 or DHA 1312], [graphic design or apparel design or #])

Use of color/form representation in two-dimensional surface applications. Historical use of color and of spatial representation in visual communication.

GDES 3352. Graphic Design II: Identity and Symbols. (3 cr; A-F or Aud. Prereq-[2351 or DHA 2351], pass portfolio review, graphic design major)

Representation of abstract ideas through symbols. Development of visual identity systems.

GDES 3353. Graphic Design III: Packaging and Display. (3 cr; A-F or Aud. Prereq-[3351 or DHA 3352 or DHA 3352], graphic design major)

Application of graphic design principles to three-dimensional projects. Principles of three-dimensional design and space applied to labeling, packaging, and display.

GDES 4131W. History of Graphic Design. (4 cr; A-F or Aud. Prereq-Intro history or art history course)

Historical analysis of visual communication. Technological, cultural, and aesthetic influences. How historical events are communicated/received through graphic presentation/imagery.

GDES 4160H. Honors Capstone Project. (2 cr [max 4 cr]; A-F or Aud. Prereq-Graphic design honors)

Individualizes honors experience by connecting aspects of major program with special academic interests.

GDES 4193. Directed Study in Graphic Design. (1-4 cr [max 8 cr]; A-F or Aud. Prereq-Undergrad, #)

Independent study in Graphic Design under tutorial guidance.

GDES 4196. Internship in Graphic Design. (1-4 cr [max 4 cr]; S-N or Aud. IDES 4196, RM 4196, ADES 4196, HSG 4196, Prereq-Completion of at least one-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, #) Supervised work experience relating activity in business, industry, or government to the student’s area of study. Integrative paper or project may be required.

GDES 4330. Surface Fabric Design Workshop. (4 cr [max 8 cr]; A-F or Aud)

Studio experience in the development and production of surface design. Screen printing, batik, resist dying, shibori, cyanotypes, and dye transfers are included.

GDES 4334. Computer Applications II: Design for the Digital Environment. (3 cr; A-F or Aud. Prereq-[3344 or DHA 2334 or #], [graphic design major or grad student or #])

Design of visual communication for electronic environments. Use of software to manipulate/create digital images/animation. Sound/video input combined with graphic images.

GDES 4345. Advanced Typography. (4 cr; A-F or Aud. Prereq-2345 or DHA 2345, [graphic design major or grad student or #])

Expressive visual communication of words. Fundamental legibility of “invisible art,” overt expression through type. Students complete extended typographic project.

GDES 4351. Design Process: Photography. (3 cr; A-F or Aud. Prereq-[1311 or DHA 1311], [1312 or DHA 1312], [graphic design major or grad student or #])

Photography for graphic designers: digital/film photographic developing/image manipulation, printing.

GDES 4352. Design Process: Bookmaking. (3 cr; A-F or Aud. Prereq-Graphic design major or grad student or #)


GDES 4354. Graphic Design IV: Integrative Campaign. (4 cr; A-F or Aud. Prereq-[3353 or DHA 3353], graphic design major)

Multi-faceted graphic communication campaign project involving substantial investigation and concept development. Project supports unified concept for identified client and is aimed at specific market/interest group.

GDES 4355. Graphic Design Portfolio. (3 cr; S-N only. Prereq-[4354 or DHA 4354 or 4365], DHA 4356), graphic design major)


GDES 4365W. Graphic Design Senior Seminar. (3 cr; A-F or Aud. Prereq-DHA or GDES 4354, graphic design major)

Senior research design project involving social, conceptual, and technical aspects. Capstone course.

GDES 4399W. Theory of Electronic Design. (3 cr; A-F or Aud. Prereq-Graphic design major or #)

Theories, methodologies, histories of electronic design, its impact on visual communications. Digital artifacts, processes, paradigms.

GDES 5170. Topics in Graphic Design. (1-4 cr [max 32 cr]; A-F or Aud. Prereq-Jr or Sr or grad student)

In-depth investigation of specific topic, announced in advance.

GDES 5193. Directed Study in Graphic Design. (1-4 cr [max 8 cr]; A-F or Aud. Prereq-Jr or Sr or grad student)

Independent study in graphic design under tutorial guidance.

GDES 5196. Field Study: National/International. (1-10 cr [max 10 cr]; A-F or Aud. APST 5196, HSG 5196, DES 5196, IDES 5196, Prereq-#)

Faculty-directed field study in national or international setting.
GDES 5341. Interactive Design. (3 cr; A-F or Aud. Prereq-Graphic design major or grad student or #) Design of interactive multimedia projects. Interactive presentations and electronic publishing. Software includes hypermedia, scripting, digital output.

GDES 5342. Web and Interface Design. (3 cr; A-F or Aud. Prereq-Graphic design major or grad student or #) Internet-based design, including static Web pages, embedded media, and cascading style sheets. Design/usability of interface between humans and technology. Evaluation of visual elements that control/organize dealings with computers that are used to direct work. Students develop designs, evaluate their effectiveness through usability testing.

GDES 5383. Digital Illustration and Animation. (5 cr; A-F or Aud. Prereq-[4384 or DHA 4384 or DHA 5341 or DHA 5341]; [graphic design major or grad student], experience with computer illustration) or #) Advanced computer design. Focuses on integration of design knowledge with Macintosh computer applications. Students use software to create digital illustration and animations. Adobe Illustrator, After Effects, Flash.

GDES 5386. Fundamentals of Game Design. (3 cr; A-F or Aud. Prereq-[4384 or DHA 4384 or DHA 5341 or DHA 5341]; graphic design major, [or grad student]) or #) Games of all kinds. Theoretical/practical aspects of making games. Investigation of design process. Rules, strategies, methodologies. Interactivity, chance, action, outcome, rules in game design. Social interaction, story telling, meaning/ideology, semiotics. Signs, cultural meaning.

GDES 5388. Graphic Design Research. (5 cr; A-F or Aud. Prereq-Graphic design major or grad student or #) Experience in Graphic Design research strategies and methods. Applied, theoretical, and human-centered aspects directed at project development. Design prototyping, testing, analysis.

GDES 5399. Theory of Electronic Design. (3 cr; A-F or Aud. Prereq-Graphic design track student or #) Theories, methodologies, histories of electronic design, its impact on visual communications. Digitak artifacts, processes, paradigms.

Greek (GRK)

Department of Classical and Near Eastern Studies

College of Liberal Arts

GRK 1001. Beginning Classical Greek I. (5 cr; Stdnt Opt) Introduction to classical Greek.

GRK 1002. Beginning Classical Greek II. (5 cr; Stdnt Opt. Prereq-Grade of at least [C- or S] in 1001 or %) Greek grammar/syntax. Readings from classical Greek authors, including Herodotus and Aristophanes.

GRK 3003. Intermediate Greek Prose. (4 cr; Stdnt Opt. +GRK 3003, Prereq-Grade of at least [C- or S] in [1002 or 5001] or #) Readings in Classical Greek prose texts by one or more authors (e.g., Plato, Lysias, Xenophon, Herodotus). Review of grammar/morphology.

GRK 3004. Intermediate Greek Poetry: Homer. (4 cr; Stdnt Opt. +GRK 5004. Prereq-[Grade of at least [C- or S] in [3003, 3113]) or %) Introduction to Greek poetry through readings from Iliad or Odyssey. Nature of Homeric epic. Homeric dialect, Greek meter.

GRK 3960H. Honors Course: Advanced Undergraduate Greek Reading. (5 cr; max 12 cr; Stdnt Opt. Prereq-enroll in honors program or high ability as indicated by transcript) Student attends Greek 33xx, 3440, 3450 and does additional work for honors credit.

GRK 3993. Directed Studies. (1-4 cr; max 4 cr; Stdnt Opt. Prereq-)# Guided individual reading or study.

GRK 4951W. Major Project. (4 cr; A-F only; Prereq-Greek major, three 3xxx Greek courses, %) Research project using documents/other sources from ancient world. Students select project in consultation with faculty member, who directs the research/writing.

GRK 5000. Intensive Classical Greek. (3 cr; Stdnt Opt. Prereq-Previous experience in another foreign language recommended) Introduction to classical Greek. Covers two semesters of material in one semester.

GRK 5003. Intermediate Greek Prose: Graduate Student Enrollment. (3 cr; Stdnt Opt. +GRK 3003, Prereq-Grade of at least [C- or S] in [1002 or 5001] or #, grad student)) Readings in Classical Greek prose texts by one or more authors (e.g., Plato, Lysias, Xenophon, Herodotus). Review of grammar/morphology. Meets with 3003.

GRK 5004. Intermediate Greek Poetry: Graduate Student Enrollment. (3 cr; Stdnt Opt. +GRK 3004, Prereq-[5003 or equiv], grad student or %) Greek poetry. Readings from Iliad or Odyssey. Nature of Homeric epic. Homeric dialect, Greek meter. Meets with 3004.

GRK 5100. Advanced Reading. (5 cr; max 18 cr; Stdnt Opt. Prereq-[3004, at least two years of college level Greek] or # or CNES grad student) Reading in Greek texts/authors. Texts/authors vary.

GRK 5200. Biblical Greek. (3 cr; max 6 cr; Stdnt Opt. Prereq-Grade of at least [C- or S] in [3004 or 5004] or # or CNES grad student) Readings from Gospels, epistles of Paul, and related literature. Emphasizes proficiency in reading Greek New Testament. Selections vary.

GRK 5701. Prose Composition. (3 cr; Stdnt Opt. Prereq-Grad student or #) 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.


GRK 5704. Greek Paleography. (3 cr; Stdnt Opt. Prereq-Grad student or #) Analysis of various hands used in Greek manuscripts with attention to date/provenance. History of transmission of Greek literature.

GRK 5705. Introduction to the Historical-Comparative Grammar of Greek and Latin. (3 cr; Stdnt Opt. +LAT 5705. Prereq-Grad student or #) Historical/comparative grammar of Greek/Latin, from their Proto-Indo-European origins to classical norms.

GRK 5706. History of Greek. (3 cr; Stdnt Opt. Prereq-Grad student or #) Reading and formal analysis of documents illustrating evolution of Greek language from Mycenaean to modern times.

GRK 5800. Sight Reading for Graduate Students. (1 cr [max 6 cr]; S-N only. Prereq-Enrollment in a grad program in Department of Classic/Near Eastern Studies) Practice in reading Greek texts at sight.

GRK 5993. Directed Studies. (1-4 cr; max 18 cr; Stdnt Opt. Prereq-Grad student or #) Guided individual reading or study.

GRK 5994. Directed Research. (1-12 cr; max 18 cr; Stdnt Opt. Prereq-Grad student or #) Supervised original research on topic chosen by student.

GRK 5996. Directed Instruction. (1-12 cr; max 20 cr; Stdnt Opt. Prereq-Grad student or #) Supervised teaching internship.

Hausa (HAUS)

Department of African American and African Studies

College of Liberal Arts


Health Informatics (HINF)

Institute of Health Informatics

Academic Health Center Shared

HINF 5431. Health Informatics II. (4 cr; A-F or Aud)

HINF 5436. Seminar. (1 cr; S-N or Aud)
Presentation and discussion of research problems, current literature and topics of interest in Health Informatics.

HINF 5494. Topics in Health Informatics. (1-6 cr [max 6 cr]; S-N or Aud. Prereq-5430, 5431, #)
Individual or group studies in health informatics.

HINF 5496. Internship in Health Informatics. (1-6 cr [max 18 cr]; S-N or Aud. Prereq-5430, 5431, #)
Practical industrial experience not directly related to student's normal academic experience.

HINF 5499. Capstone Project for the Masters of Health Informatics. (3 cr; A-F or Aud. Prereq-[5430, 5431] or #). MHI student
Students select knowledge/skills to a practical problem in health informatics. Proper design of projects, past exemplar projects. Students work with adviser to design/complete a project in a practical setting. Students submit a written project report in lieu of a final examination.

Health Systems Management (HSM)
College of Continuing Education

HSM 5521. Health Care Delivery Systems. (5 cr; A-F or Aud. Prereq-30 cr)
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.

HSM 4501. Writing for the Health Professions. (3 cr; A-F or Aud. Prereq-45 cr)
How to critically review medical literature and present research data. Scientific method, logic, systematic approach, objective analysis. Students support a hypothesis using research of previously conducted work and present data in graphic/narrative form according to professional standards.

HSM 4541. Health Care Finance. (3 cr; A-F or Aud)
General principles of financial management for 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 policies, procedures, and ethical issues controlling the health care industry.

HSM 4561. Health Care Administration and Management. (3 cr; A-F or Aud. Prereq-45 cr)
Background/kills in business/administrative aspects of health care. Applications of business theory to medical settings. Organization models, reimbursement methodologies, information systems, staff scheduling, employee evaluation, accreditation agencies, productivity management, budget planning, group leadership.

HSM 4581. Teaching in the Health Care Setting. (3 cr; F or Aud. Prereq-45 cr)
Components of contemporary learning theory. How to design teaching strategies, evaluate educational outcomes. Evaluation of educational needs, development of curriculum, application of various instructional methods, assessment of learning. Working with allied health practitioners, patients, and families.

Hebrew (HEBR)
Department of Classical and Near Eastern Studies
College of Liberal Arts

HEBR 1001. Beginning Hebrew I. (5 cr; Stdnt Opt. +HEBR 4001)
For beginners whose goal is biblical or post-biblical Jewish studies, or modern Israeli Hebrew. Leads to speaking, listening comprehension, and reading/writing Hebrew. Emphasizes communication proficiency. Cultural materials are incorporated.

HEBR 1002. Beginning Hebrew II. (5 cr; Stdnt Opt. +HEBR 4002. Prereq-Grade of at least [C- or S] in [1001 or 1000] or #)
Continuation of 1001. Leads to speaking, listening comprehension, reading, and writing Hebrew. Emphasizes communication proficiency. Cultural materials are incorporated.

HEBR 1011. Beginning Biblical Hebrew I. (5 cr; Stdnt Opt. +HEBR 4101)
Basic grammar/syntax preparatory to reading simple narrative texts in Bible. Multiple approaches to problems/issues in biblical scholarship.

HEBR 1012. Intermediate Biblical Hebrew I. (5 cr; Stdnt Opt. +HEBR 4101. Prereq-Grade of at least [C- or S] in [1001 or 4002] or #)

HEBR 1013. Intermediate Biblical Hebrew II. (5 cr; Stdnt Opt. +HEBR 4101. Prereq-Grade of at least [C- or S] in 1001 or #)

HEBR 2090. Advanced Modern Hebrew. (3 cr [max 18 cr]; Stdnt Opt. Prereq-3012 or #)
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.

HEBR 3101. Intermediate Biblical Hebrew I. (4 cr; Stdnt Opt. +HEBR 4106. Prereq-Grade of at least [C- or S] in [1012 or 4105] or #)
Text of Hebrew Bible. Basic historical/philological/commentary. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies.

HEBR 3102. Intermediate Biblical Hebrew II. (4 cr; Stdnt Opt. Prereq-Grade of at least [C- or S] in 3101 or #)
Text of Hebrew Bible, basic research tools/commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies.

HEBR 3200. Advanced Classical Hebrew. (3 cr [max 18 cr]; Stdnt Opt. +HEBR 5200. Prereq-3012 or 3102 or #)
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 3300. Post-Biblical Hebrew: Second Temple Period. (3 cr [max 18 cr]; Stdnt Opt. Prereq-3102 or #)
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, pseudepigrapha). Focuses on historical development of Hebrew language/literature in relation to earlier biblical sources.

HEBR 3400. Rabbinic Texts. (3 cr [max 18 cr]; Stdnt Opt. Prereq-3012 or 3102 or #)
Language, idiom, and literary forms of classical Rabbinic sources in Hebrew. Selections drawn from legal, homiletical, and narrative texts (Mishnah, Tosefta, Talmud, Midrash). Original socio-historical/cultural background of Rabbinic literature, its enduring religious significance.

HEBR 3951W. Major Project. (4 cr; Stdnt Opt. Prereq-[Hebr major, three 3xxx Hebrew courses], #, %)
Research project using primary and secondary sources. Students select project in consultation with a faculty member, who directs the research/writing.

HEBR 3980. Directed Instruction. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-@)
Students observe/discuss classes. Gradually increased participation in preparing/presenting instructional materials to a beginning Hebrew class. Evaluation of materials, teaching techniques. Seminars on language teaching issues.

HEBR 3990. Topics in Hebrew Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#, %)
Historical, linguistic, literary, religious, or humanistic study of Hebrew society and culture. Approach and method of study varies with topic.

HEBR 4101. Beginning Hebrew I. (3 cr; Stdnt Opt. +HEBR 4011. Prereq-grad student)
Leads to speaking, listening comprehension, reading/writing Hebrew. Emphasizes communication proficiency. Cultural materials are incorporated.Meets concurrently with 1001.
HEBR 4002. Beginning Hebrew II. (3 cr; Stdnt Opt. +HEBR 1002. Prereq-Grade of at least [C- or S] in [1001 or 4001] or #)

HEBR 4011. Intermediate Hebrew I. (3 cr; Stdnt Opt. +HEBR 3011. Prereq-Grade of at least [C- or S] in [1002 or 4002] or #)

HEBR 4012. Intermediate Hebrew II. (3 cr; Stdnt Opt. +HEBR 3012)

Basic grammar, vocabulary, and study of the first 300 words of Hebrew. Introduction to complex grammatical sentences and translation of narrative sections of the Hebrew Bible. Meets with 1104.

HEBR 4105. Basics of Biblical Hebrew II. (3 cr; Stdnt Opt. +HEBR 1102. Prereq-Grad of at least [C- or S] in [1101 or 4104] or #)
Progression to more sophisticated reading of narrative, prophetic, and legal texts. Presentation/discussion of multiple approaches to problems/issues in biblical scholarship. Meets with 1105.

HEBR 4106. Intermediate Biblical Hebrew I. (3 cr; Stdnt Opt. +HEBR 3101. Prereq-Grade of at least [C- or S] in [1102 or 4105] or [* grad student])
Text of Hebrew Bible. Basic research tools/comments. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 3101.

HEBR 4107. Intermediate Biblical Hebrew II. (3 cr; Stdnt Opt. Prereq-Grad of at least [C- or S] in 1102 or 4105 or #)
Text of Hebrew Bible, basic research tools/comments. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 3102.

HEBR 5090. Advanced Modern Hebrew. (3 cr [max 18 cr]; Stdnt Opt. Prereq-3012 or [#; grad student])
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.

HEBR 5200. Advanced Classical Hebrew. (3 cr [max 18 cr]; Stdnt Opt. +HEBR 3200. Prereq-3 sem of biblical Hebrew, 5 sem of modern Hebrew or #)
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]; Stdnt Opt. Prereq-Grad student or #)
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, pseudodeiphrapra). Focuses on historical development of Hebrew language and literature in relation to earlier biblical sources.

HEBR 5400. Rabbinic Texts. (3 cr [max 18 cr]; Stdnt Opt. Prereq-Grad student or #)
Language, idiom, and literary forms of classical Rabbinic sources in Hebrew. Selections drawn from legal, homiletical, and narrative texts (Mishnah, Tosefta, Talmud, Midrash). Original socio-historical/cultural background of Rabbinic literature, its enduring religious significance.

HEBR 5590. Topics in Hebrew Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-Grad student or #)
Historical, linguistic, literary, religious, or humanistic study of Hebrew society/culture. Approach/method of study varies with topic.

HEBR 5992. Directed Readings. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#, %, @)
Guided individual reading or study.

Hindi (HNDI)
Department of Asian Languages and Literatures

College of Liberal Arts

HNDI 1001. Introduction to Conversational Hindi. (3 cr; A-F or Aud)
Advanced grammatical forms, oral forms, new vocabulary reinforced from lessons around everyday life situations. Oral/written drills, reading for comprehension, audio-visual work.

HNDI 1016. Accelerated Intermediate Hindi. (5 cr; Stdnt Opt. Prereq-1015 or 1102 or 4002 or #)

HNDI 1017. Accelerated Hindi. (5 cr; Stdnt Opt. Prereq-Ability in basic spoken Hindi)
Intensive course. Reading, writing, listening, and speaking in various functions and cultural contexts. Focuses on reading/writing.

Basic listening, speaking, reading, and writing skills. Emphasizes communicative competence.

HNDI 3101. Beginning Hindi. (5 cr; Stdnt Opt. +HNDI 4005. Prereq-1102 or #)
Development of reading, writing, speaking, and listening skills. Grammar review, some basic compositions and oral presentations.

Hindi and Urdu (HNUR)
Department of Asian Languages and Literatures

College of Liberal Arts

HNUR 1101. Beginning Hindi and Urdu. (5 cr; Stdnt Opt. +HNUR 4001)
Listening, speaking, writing, reading. Emphasizes development of communicative competence.

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HINST 1001. Visions of the Past: Thematic Approaches to Understanding History. (4 cr; [max 8 cr]: Stdnt Opt. Prereq-[Fr or soph or fewer than 60 cr])
Innovative thematic approaches to human past. Historical sources, methods, and concepts. Topics such as environmental history, faith/religion in history, war/society, the family in world history, technology as a motor of history.

HINST 1011V. Honors: Global Societies Before 1500. (4 cr; Stdnt Opt. =HIST 101IV, HIST 1017, Prereq-[Fr or soph], honors)
Sweep of history from 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.

HINST 1011W. Origins: Global Societies Before 1500. (4 cr; Stdnt Opt. =HIST 101IV, HIST 1017, Prereq-[Fr or soph or [Fr or sr], non-hist major])
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.

HINST 1012V. Honors: The Age of Global Contact. (4 cr; Stdnt Opt. =HIST 1018, Prereq-[Fr or soph], honors)
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.

HINST 1012W. The Age of Global Contact. (4 cr; Stdnt Opt. =HIST 1019, Prereq-[Fr or soph or [Fr or sr], non-hist major])
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.

HINST 1015V. Globalization: Issues and Challenges. (4 cr; Stdnt Opt. =GLOS 1015V, HIST 1019, GLOS 1015W, Prereq-[Fr or soph], honors)
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.

HINST 1015W. Globalization: Issues and Challenges. (4 cr; A-F or Aud, Prereq-[Fr or soph or [Fr or sr], non-hist major])
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.

HIST 1017. Origins: Global Societies Before 1500. (5 cr; Stdnt Opt. =HIST 101W, HIST 1011W)
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.

HIST 1018. The Age of Global Contact. (3 cr; Stdnt Opt. =HIST 1012V)
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.

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.

HIST 1021. Authority and Rebellion: American History to 1865. (4 cr; Stdnt Opt. =HIST 1021W, HIST 1020, Prereq-[Fr or soph], honors)
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.

HIST 1022. Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present. (3 cr; Stdnt Opt. =HIST 1022W)
Europe of a nation of empires. Transformations through revolutions, wars, and encounters with world regions.

HIST 1023. Europe and the World: Expansion, Encounter, and Exchange to 1500. (4 cr; Stdnt Opt. =HIST 1023, Prereq-[Fr or soph], honors)
Europe in the making, 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.

HIST 1024. Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present. (3 cr; Stdnt Opt. =HIST 1024)
Emergence of a Europe of empires. Transformations through revolutions, wars, and encounters with world regions.

HIST 1025. Europe and the World: Expansion, Encounter, and Exchange to 1500. (4 cr; Stdnt Opt. =HIST 1026, Prereq-[Fr or soph], honors)
Europe in the making, 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.

HIST 1027. Europe and the World: Expansion, Encounter, and Exchange from 1500 to Present. (3 cr; Stdnt Opt. =HIST 1027)
Emergence of a Europe of empires. Transformations through revolutions, wars, and encounters with world regions.

For a guide to course numbers, symbols, and abbreviations, see page 376. 519


HIST 1902. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

HIST 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

HIST 1905. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

HIST 1907W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

HIST 1908W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

HIST 1909W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq-Freshman) Topics specified in Class Schedule.

HIST 1910W. Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

HIST 3000W. Visions of the Past: Thematic Approaches to Understanding History. (4 cr [max 8 cr]; Stdnt Opt. Prereq-Jr or sr or at least 60 cr) Innovative thematic approaches to human past. Historical sources, methods, and concepts. Topics such as environmental history, faith/ religion in history, war/society, the family in world history, technology as a motor of history.

HIST 3001. Public History. (3 cr; A-F or Aud. Prereq-Jr or sr, #) Interpretations of a collective past as produced in various public venues, including museum exhibitions, films, theme parks, and Web sites. Intellectual/political issues associated with history produced for public audiences. Introduction to career opportunities in the field.

HIST 3051. Ancient Civilization: Near East and Egypt. (3 cr; Stdnt Opt) A broad survey of ancient Near Eastern and Egyptian history and cultures from the prehistoric to the rise of Persia around 550 B.C.

HIST 3052. Ancient Civilization: Greece. (3 cr; Stdnt Opt) 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. (3 cr; Stdnt Opt) A broad survey of the culture and history of Rome from origins to the decline and fall of the Roman Empire in the third and fourth centuries A.D.

HIST 3061. "Bread and Circuses": Spectacles and Mass Culture in Antiquity. (3 cr; Stdnt Opt) Development of large-scale public entertainment in ancient Greece and Rome, 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 cultural life of the societies that supported them.

HIST 3101. Introduction to Medieval History. (3 cr; Stdnt Opt) Europe from decline of Rome to early Renaissance. Politics, institutions, society, economy, and culture of Middle Ages.

HIST 3151W. British History to the 17th Century. (4 cr; Stdnt Opt) The making of the English nation: Anglo-Saxons 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. (3 cr; Stdnt Opt) Civil War, Revolution, and constitutional settlement. Ind. revolution, growth of trade and industry, and mechanization of agriculture. Rise of factory system.

HIST 3211. History of Sexuality in Europe. (3 cr; A-F or Aud) 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, abortion, sexual liberation.

HIST 3244. History of Eastern Europe. (3 cr; Stdnt Opt) 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 3271. The Viking World: Story, History, and Archaeology. (3 cr; Stdnt Opt. +HIST 5271) The Viking world: tradition and influence of Viking influence 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 3282. European Intellectual History: The Modern Period, 1750-1914. (3 cr; Stdnt Opt. +HUM 3282) 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 3347. Women in Early and Victorian America: 1600-1890. (3 cr; Stdnt Opt) The varied experiences of American women 1600-1900. Topics include women’s involvement in the dispossession of native peoples, westward expansion, slavery, industrialization, reform, religion, and sexuality.

HIST 3348. Women in Modern America. (3-4 cr [max 4 cr]; Stdnt Opt. +GWSS 3408) 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 3351. Women and Diasporas in Modern History. (3 cr; Stdnt Opt) Persistence of racial and ethnic identities as markers of diasporic consciousness. Comparing diasporas across time using social/cultural analysis. Gendering of lives/identities of people whose identities have been shaped by forced/free migrations of past 500 years.


HIST 3402W. Modern Latin America 1825 to Present. (4 cr; Stdnt Opt. +LAS 3402W) National and contemporary period 1825 to present, with emphasis on social, cultural, political, and economic change.

HIST 3415. Migrations in Modern Global History. (3 cr; Stdnt Opt) Today’s debates about migration in historical/ comparative perspective. Major migrations into, within, and out of America 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 3417. Food in History. (3 cr; Stdnt Opt) Significance of food in society, from earliest times to present. Why we eat what we eat. How foods have become “globalized.” Dietary effects of industrial modernity. Material culture, social beliefs. Examples from around world.

HIST 3418. Drink in History. (3 cr; Stdnt Opt) Significance of alcohol and spirit beverages. Interdisciplinary study of alcohol/prohibition regimes throughout history.

HIST 3424. Women and Gender in Latin American History. (3 cr; Stdnt Opt) 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; Stdnt Opt. +CHIC 3425) Mexico from independence to the present: struggles for land, liberty, and equality; ethnicity, gender, and class; economic growth, nationalism, and globalization; urbanization, immigration, demographic transition.

HIST 3427. History of Cuba and Puerto Rico. (3 cr; Stdnt Opt. +LAS 3427, CHIC 3427) Historical development of Cuba and Puerto Rico from pre-Columbian times through Spanish conquest to the present. Conquest and colonization, slavery, Hispanic Caribbean society and culture, Operation Bootstrap, Cuban Revolution.

HIST 3428. History of Relations Between U.S. and Mexico: 1821 to Present. (3 cr; Stdnt Opt) U.S.-Mexico relations in the 19th and 20th centuries. Examines histories as they intersect in the late 1820s through the loss of Texas, the Mexican-American War, and economic relations between the two countries including NAFTA and the Chaipas rebellion of 1994.

HIST 3429. Latin American History in Film and Text. (3 cr; Stdnt Opt) 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. (4 cr; Stdnt Opt. +AFRO 3431) 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 3433. Images of Africa. (3 cr; Stdnt Opt) Major themes in African history, from early human development to present. History of western “knowledge” about Africa. Assumptions that have influenced production of African history. Extent to which African history is “packaged” for public consumption inside/outside Africa. How history is used to support modern political agendas.

HIST 3435. History of South Africa from 1910. (3 cr; Stdnt Opt. +AFRO 3205) 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. Historical Background to Contemporary African Conflicts: Case Studies. (3 cr; Stdnt Opt) Using case studies, historical contexts in which specific contemporary political conflicts developed. Slave trade, colonial conquest, indirect rule, forced labor, discretionary justice, and other historical issues. Patterns of human rights vs. socio-political conflict. Cases studies might include Somalia, Democratic Republic of Congo, and Rwanda.

HIST 3438. History of Women in South Africa. (3 cr; Stdnt Opt. +AFRO 4001) Changing role/status of women in South Africa from pre-colonial era to present. Relationships to political, social, economic development.

HIST 3439. Popular Narratives of the African Past. (3 cr; Stdnt Opt) Diverse ways that ordinary Africans have interpreted/portrayed particular events in African history. Different popular depictions of African past, their relationships with academic histories.

HIST 3452. African Conservation Histories. (3 cr; Stdnt Opt) Historical roots of conservation in Africa in 19th/20th centuries. Historical context of contemporary laments about Africa's environmental degradation, older efforts to exploit/control African people/resources. Focuses on how Africans interacted with and managed their lands/resources.


HIST 3462. From Subjects to Citizens: The History of East Asia From 1500 to the Present. (3 cr [max 4 cr]; Stdnt Opt. +EAS 3462) How Asian states, societies, economies, and cultures linked with one another and with European powers. How Asia's historical effects still resonate. Covers India, China, Japan, Korea, and Indochina.

HIST 3464. China in the Song, Yuan, and Ming Dynasties. (3 cr; Stdnt Opt. +HIST 5464, EAS 3464) China during the Song (976-1279), Yuan (1279-1368), and Ming (1368-1644) dynasties; political institutions and social structures. Attention to primary sources and how historians ask and answer questions about the past.

HIST 3465W. China in the Ming and Qing Dynasties. (3 cr; Stdnt Opt. +HIST 5465, EAS 3465W) The political and social history of China from about 1600 until the end of the Qing dynasty in 1911. Topics include ethnicity, daily life, legal structures, city life, and peasantry.


HIST 3467W. State and Revolution in Modern China. (3 cr; Stdnt Opt. +EAS 3467W, HIST 5467W) Modern China’s political evolution, including the Taiping Rebellion, Republican Revolution, Rise of Nationalist and Communist Parties, Maoist era; reform under Deng Xiapng and the emergence of democracy in Taiwan.


HIST 3476. War and Peace in Japan Through Popular Culture. (4 cr; A-F or Aud) 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. Historizing Japanese Tradition, or How Samurai Became Japanese. (3 cr; A-F or Aud) How samurai, geisha, and Zen Buddhism came to be considered as the quintessential
HIST 3479. History of Chinese Cities and Urban Life. (3-4 cr; max 4 cr; A-F or Aud. Prereq. HIST 2471 or consent of instructor) 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; Stdvnt Opt) 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 3489. 20th Century India. (3 cr; A-F or Aud) India under British hegemony in 1914 through Mahatma Gandhi and his nationalist movement; World War II; the British departure; creation of India and Pakistan; Nehru; Indira and Rajiv Gandhi.


HIST 3504. The Cultures of the Silk Road. (3 cr; Stdvnt Opt) 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 3507. History of Modern Egypt. (3 cr; A-F only) 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 Aud) 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. (3 cr; Stdvnt Opt) 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 3544. Arab World 1920 to the Present. (3 cr; Stdvnt Opt. Prereq. MELC 3543, ARAB 5543, ARAB 5544) Arab world since independence; the struggle for liberation, political stability, development and unification; political structure and conflicts; impact of Arab-Israeli conflict.

HIST 3546. Islam and the West. (3 cr; Stdvnt Opt. Prereq. RELS 3714, CAS 3533, GLOS 3643) 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. Ottoman Empire. (3 cr; Stdvnt Opt. Prereq. ARAB 3547) Survey of Islam’s most successful empire, from its founding circa 1300 to its demise in 1923. Lands, institutions, peoples, historical legacy.

HIST 3560. Christians, Muslims, and Jews in the Middle Ages. (3 cr; Stdvnt Opt) Violent dimensions of these relations: Muslim/Christian expansion, jihad/crusade, anti-Jewish violence/persecution. Peaceful dimensions: trade, intellectual exchange, religious dialogue.

HIST 3608W. History of the Catholic Church in the Middle Ages. (3 cr; Stdvnt Opt. Prereq: Intro course in European history before 1500 recommended) Religious beliefs of Latin Christianity as officially taught and as received by ordinary folk; organization of the church and its implantation in lay society; relations between Latin Christendom and its neighbors, Orthodoxy and Islam.

HIST 3609. Military History of Medieval Western Europe. (3 cr; Stdvnt Opt) 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: 500-1000. (3 cr; Stdvnt Opt) Evolution of Western European cities from the late Roman town to the early Renaissance city-state.


HIST 3614. Women in Medieval Europe. (3 cr; Stdvnt Opt) Women’s role in family, politics, religion, work, and social movements. Representations of women in religious texts, art, literature, scientific studies, and law. Methods/approaches to study of women’s history.

HIST 3615W. Women in European History: 1500 to the Present. (3 cr; Stdvnt Opt) Women’s history and gender relations in modern European history. Methods and primary sources for women’s history and the implications of inclusion of women in historical study.

HIST 3616. France in the Middle Ages. (3 cr; Stdvnt Opt) Politics, society and culture in medieval France from the end of the Carolingians to the end of the Hundred Years War.

HIST 3618. The Dark Ages Illumined: Medieval Europe to 1050. (3 cr; Stdvnt Opt) Origins of medieval Europe, Germanic and Viking invasions, feudalism, mercantilism, Islam, the papacy, monarchies, intellectual developments.

HIST 3623W. Germany in the Age of Reformation. (3 cr; Stdnt Opt) Prereq-General course in European history before 1550.

History of religious reform movements - Lutheran, Calvinist, and Catholic - in the context of German politics, society, and culture; emphasis on primary source readings (written during the period).

HIST 3632. History of Germany; Reformation to Unification: 1500-1871. (3 cr; Stdnt Opt)

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; Stdnt Opt)

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 3642. Knights, Peasants, and Bandits in Medieval England. (3-4 cr [max 4 cr]; Stdnt Opt)

Social history of medieval England from 1066 to 1500. Peasants, nobility, and bourgeoisie, including their economic institutions, living conditions, and entertainments. Legal and illegal ways of coping with economic and social change resulting from plague and wars.

HIST 3681. Irish History. (3 cr; Stdnt Opt)

History of Ireland, primarily modern, with emphasis on politics and Anglo-Irish relations.

HIST 3691W. The British Empire. (3 cr; A-F or Aud)

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/domination.

HIST 3704W. Daily Life in Europe: 1300-1800. (3 cr; Stdnt Opt)

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 3705. From Printing Press to Internet: Media, Communications, and History. (3 cr; A-F or Aud; +GLOS 3605)

Print public sphere in 17th, early 18th century. Political conflicts over freedom of press in 18th, 19th century. Emergence of advertising, public relations industries in 20th century. Significance of broadcast, computer network technologies for democratic political systems.

HIST 3708. The Age of Curiosity: Art and Knowledge in Europe, 1500-1800. (3 cr; Stdnt Opt)

Ways in which making of art and scientific knowledge intersected. Connections between scientific curiosity and visual arts in major artists. Artfulness of scientific imagery/diagrams, geographical maps, cabinets of curiosities, and new visual technologies.

HIST 3709. Science and Enlightenment. (3 cr; Stdnt Opt)


HIST 3715. Modern Spain: 1500 to the Present. (5 cr; Stdnt Opt)

Ferdinand and Isabella, the Habsburg and Bourbon dynasties; the 20th-century Civil War and Franco regime, and into the present. Readings, lectures, films, slides, and music will provide a comprehensive view of a vibrant people and their modern history.

HIST 3721. Studies in 20th-Century Europe From the Turn of the Century to the End of World War II: 1900-45. (3 cr; Stdnt Opt)

+HIST 5721

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; Stdnt Opt; +GLOS 3422)

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. Women, Revolution, and War in 20th Century Europe. (3 cr; Stdnt Opt)

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 3727. History of the Holocaust. (3 cr; Stdnt Opt; +HIST 3727W, JWS 3521W, RELS 3521W)


HIST 3727W. History of the Holocaust. (3 cr; Stdnt Opt; +HIST 3727W, JWS 3521W, RELS 3521W)


HIST 3728. Race, Nation, and Genocides in the Modern World. (3 cr; A-F or Aud)

Meaning of the term “genocide.” Particular cases, such as Armenians in the late Ottoman Empire, Jews in the Third Reich, and Muslims in the former Yugoslavia.

HIST 3731. Citizens and the State in Modern France From the Revolution of 1789 to Post-de Gaulle: 1789-1991. (3 cr; Stdnt Opt)

A history of the citizen and the state in France from the French Revolution to the present.

HIST 3735. Politics of Ideas: European Thought in 20th Century Contexts. (3 cr; A-F or Aud)

Development of political ideas/ideologies in 20th century. How to understand ideas in various contexts of their production, dissemination, and appropriation. Students read primarily original political/social philosophical texts that have shaped social, cultural, and political landscape.

HIST 3748. Austria in the 20th Century. (3 cr; Stdnt Opt)

Austria from Paris Peace Treaties to present. Political instability, social conflict, and economic stagnation between the World Wars. Nazi rule and WWII. Economic miracle, consensus politics, and neutrality after 1945. Austria after Cold War.

HIST 3775. History of Jews in Europe and the Atlantic World, from 1700 to Present. (3 cr; Stdnt Opt)

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 3778. Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries. (3 cr; Stdnt Opt)


HIST 3797. History of Population. (3 cr; Stdnt Opt)

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 3800. Topics in Early American History. (3 cr [max 15 cr]; Stdnt Opt)

For advanced undergraduate majors and non-majors. Focus on intensive exploration of particular topics in early American history such as economic history, demographic regimes, social history, intellectual history, regions, slavery, religion, and witchcraft in colonial America.

HIST 3802. “Sinners, Saints, and Savages”: Religion in Early America. (3 cr; Stdnt Opt. Prereq-Non-fr or #)


HIST 3803. Radicalism in Early America. (3 cr; A-F or Aud. Prereq-Soph or Jr or Sr or #)

Radicalism to 1850s. Challenge to traditional structures of family/property; relations of gender, race, and class; notions of self/self-governance; and ideas about the divine. Visionaries, reformers. Radicalism and violence.


HIST 3821. United States in the 20th Century to 1945. (3 cr; Stdt Opt) 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. United States in the 20th Century Since 1945. (3 cr; Stdt Opt) 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 3834. Law in American Life, Colonial Era to Civil War. (3 cr; A-F or Aud) Understanding the property held by colonists, Indians. Conceptions of relationships among family, community, state held in colonial America; conceptions held today. Law of slavery in colonial era. American Revolution/Constitution. Law, industrialization. Legal legitimacy, federalism, Civil War as constitutional crisis.


HIST 3842. History of Silicon Valley. (3 cr; A-F or Aud) Critical, historical examination of birth/development of "Silicon Valley," the high-tech region around San Jose, California. Myths/ideologies that define Silicon Valley in popular imagination. Deeper history of region. Comparisons with Twin Cities as framework for analysis.


HIST 3852. U.S. Labor in the 20th Century. (3 cr; Stdt Opt) The development of a working class from the preindustrial to an industrial age. Responses of American workers through labor organization, slave resistance, and political reform. The Knights of Labor, the formation of the AFL, and the challenges of Marxism.


HIST 3865. African American History, 1865 to Present. (4 cr; A-F or Aud. = AFRO 3865) Integration migrations, industrialization, unionization, Great Depression, world wars, large-scale movements for social/political change.

HIST 3866. African American Gender History: 1865-Present. (3 cr; Stdt Opt) Relationship between race, gender, and the struggle for equality. Focuses on African-Americans. Changing definitions of manhood/womanhood over the past 130 years. Critical role race and racial thought have played in these changes. How ethnicity, class, and sexuality have transformed black gender experiences.

HIST 3868. Race, War, and Race Wars in American History. (3 cr; A-F only) Role that race has played in American war history. Impact that wars have had on race and race relations in the U.S. and the world. Literature, film.


HIST 3870. Topics in American Indian History. (3 cr; Stdt Opt. = AMIN 3870) Designed for advanced undergraduates. Topics may include social history, oral history, history of particular regions, political systems, education, and policy.

HIST 3871. American Indian History: Pre-Contact to 1830. (3 cr; Stdt Opt. = AMIN 3871) 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 colonism.

HIST 3872. American Indian History: 1830 to the Present. (3 cr; Stdt Opt.) 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. (4 cr; A-F or Aud) America through its cultural diversity. Changing notions of "American" national identity citizenship from nineteenth century to present. Historical experiences of Native Americans, African Americans, European immigrants, and Asian Americans: How these groups were defined in relation to each other and in relation to the nation.


HIST 3900. Topics in Medieval and Modern European History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Jr or sr or #) Selected topics in medieval and modern European history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3910. Topics in U.S. History. (1-4 cr [max 15 cr]; Stdnt Opt. Prereq-Jr or sr or #) Selected topics in U.S. history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3920. Topics in African History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Jr or sr or #) Selected topics in African history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3930. Topics in Ancient History. (3 cr [max 15 cr]; Stdnt Opt) Selected topics in Near Eastern, Egyptian, Greek, and Roman History.

HIST 3940. Topics in Asian History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Jr or sr or #) Selected topics in Asian history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3950. Topics in Latin American History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Jr or sr or #) Selected topics in Latin American history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3951H. Junior Honors Seminar. (4 cr; Stdnt Opt. Prereq-History honors candidate) Intended for History honors majors in their junior year, the course is run as a seminar, with emphasis on readings and discussion. Weekly sessions focus on selected topics relating to historical method and historiography.

HIST 3959. How to Do History. (3 cr; A-F or Aud. Prereq-History major or %) 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.

HIST 3959H. Honors: How to Do History. (3 cr; A-F only. Prereq-History major or %) How to locate/use historical sources, develop a thesis, and turn rough idea into full research proposal.

HIST 3960. Topics in History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Jr or sr or #) Selected topics in history not covered in regular courses and covering more than one geographic area/time period. To be taught as staffing and demand exist.

HIST 3970. Supplemental Discussion in History. (1 cr [max 3 cr]; Stdnt Opt. Prereq-Concurrent registration) Extra discussion section with T.A. Attached to concurrent 3xxx course.

HIST 3980W. Supplemental Writing in History. (1 cr [max 4 cr]; A-F or Aud. Prereq-#) must take a 3-credit 3xxx or 5xxx course taken concurrently
May be attached, by agreement of instructor and students, to any 3xxx or 5xxx course to make a writing-intensive experience.

HIST 3990. Historical Internship. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-#) Internship with a historical society, government, or community historical organization. Arranged through and supervised by department.

HIST 3993. Directed Study. (1-16 cr [max 16 cr]; A-F or Aud. Prereq-#; Q) Guided individual reading or study. Open to qualified students for one or more semesters.

HIST 3994. Directed Research. (1-16 cr [max 16 cr]; A-F or Aud. Prereq-#; Q) Qualified students work on a tutorial basis.

HIST 4051. Ancient Near East and Egypt: Neolithic to 1500 BCE. (3 cr; A-F or Aud. ±CNES 4051. Prereq-Previous coursework in ancient history recommended)
Land of Western Asia and Northeast Africa from Neolithic through Middle Bronze Age. Interdependent technological/political developments, such as agriculture, state formation, and writing. Use of literature/art as vehicles for articulating concepts. Changing relationships among culture/polities of ancient Near East and regions beyond.

HIST 4052. Ancient Near East and Egypt: 1500 to 323 BCE. (3 cr; A-F or Aud. ±CNES 4052. Prereq-4051 or prev coursework in ancient history recommended)
Land of Western Asia and Northeast Africa from Late Bronze Age to death of Alexander in 323 BCE. Growth/decline of empires. Diplomatic relations and sociopolitical transformations among Late Bronze and Iron Age states. New military technologies. Developments in religion/theology.

HIST 4061. History of the Greek World from Earliest Times to 400 B.C. (3 cr; Stdnt Opt) Trace the history of the Greeks from their initial appearance in Greece in the Bronze Age to the close of the 5th century B.C. Special attention will be devoted to the polis, military development, and intellectual change.

HIST 4071. History of Rome to 78 B.C. (3 cr; Stdnt Opt. Prereq-An appropriate introductory course is recommended) Intensively examine the political, institutional, and socioeconomic history of Rome from its origins to the death of Sulla in 78 B.C. The institutional strengths and weaknesses that led to the rise and fall of the Republic are the primary theme.

HIST 4073. History of Rome: A.D. 117 to 641. (3 cr; Stdnt Opt. Prereq-An appropriate introductory course is recommended) Intensively examine the political, institutional, and socioeconomic history of Rome from the death of Trajan in A.D. 117 to the death of Theodosius in A.D. 395. Explores one historical question—the decline and fall of the Roman Empire.

HIST 4337. Bill of Rights and the Supreme Court Since 1865. (4 cr; Stdnt Opt. Prereq-Jr or sr or grad student) Constitutional, political, philosophical, social context of leading U.S. Supreme Court cases on Bill of Rights. Emphasizes property rights, free speech, freedom of religion, right to bear arms, criminal defendants’ rights, death penalty.

HIST 4910. Topics in U.S. History. (1-4 cr [max 15 cr]; Stdnt Opt. Prereq-Jr or sr or grad or #) Selected topics in U.S. history not covered in regular courses. Taught as staffing permits.

HIST 4930. Topics in Ancient History. (1-4 cr [max 16 cr]; A-F or Aud. Prereq-Advanced undergrad or grad) Selected topics in Ancient history not covered in regular courses. Taught as staffing permits.

HIST 4961Y. Honors: Major Paper. (4 cr; A-F only. Prereq-#; ± sign up in Undergraduate Studies Office two sem in advance) Research paper on topic of student's choice. Work largely with primary sources. Faculty guidance.

HIST 4961W. Major Paper. (4 cr; A-F or Aud. Prereq-#; ± sign up in Undergraduate Studies Office two sem in advance) Research paper on topic of student's choice. Work largely with primary sources. Faculty guidance.

HIST 4962. History Undergraduate Proseminar. (3 cr [max 9 cr]; A-F only. Prereq-[Honors, [jr or sr] or [history major, %]) Themes vary by instructor. Reading/discussion of historiography/methodology. Research component.

HIST 4962H. Undergraduate Honors Proseminar. (3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr], honors) Themes vary depending on the instructor. Reading/discussion of historiography/ methodology, research.

HIST 4970. Historical Internship. (1-12 cr [max 24 cr]; Stdnt Opt) Internship with a historical society, government, or community historical organization. Arranged through and supervised by department.


HIST 5053. Doing Roman History. Sources, Methods, and Trends. (5 cr; Stdnt Opt. Prereq-Grad student or #) Survey of modern 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.
HIST 5111. Proseminar in the History of Medieval Europe. (3 cr; A-F or Aud. Prereq: Advanced undergrads of exceptional ability or grades, #) Examination of basic scholarly bibliography for medieval Western European history. Aim is to help students to prepare for M.A. and Ph.D. examinations.

HIST 5115. Medieval Latin Historians. (3 cr; Stdnt Opt. Prereq: Reading knowledge of Latin) 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.

HIST 5251. Socialist/Post-socialist Transformations. (3 cr; A-F or Aud. +GLOS 5603) Transformations underway in post-socialist societies of Eastern Europe, former Soviet Union. Radicalizations of abandonment of state socialism, introduction of market relations. Effect of former system, new market system on cultural institutions/identities.

HIST 5265. 20th-Century Russia: The Collapse of Imperial Russia, the Revolutions, and the Soviet Regime. (3 cr; Stdnt Opt) 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 Aud. +HIST 5271) 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 5285. Problems in Historiography and Representation of the Holocaust. (3 cr; Stdnt Opt. +JWST 5111, Prereq: JWST 3521 or RELS 3521 or #) Relationship of paintings, memorials, and other art forms to the question of understanding the Holocaust. Issues of sources, especially use of the Survivors of the Shoah project in U libraries.

HIST 5294. Social History of Russia and Eastern Europe Through the 19th Century. (3 cr; Stdnt Opt) Lives of peasants and workers, nobles and merchants. Topics include family, marriage, sexuality; culture and tradition; transformation from an agricultural to a modern society.

HIST 5395. Social History of Russia and Eastern Europe From the Late 19th Century to the Present. (3 cr; Stdnt Opt) Social movements (revolutionary, nationalist, women’s); communist and post-communist societies.

HIST 5379. Problems in Early American History. (3 cr; Stdnt Opt) Intensive consideration of topics in early American history. Topics may include readings in race, class, and gender; comparative colonialism; slavery; demography; economic history; religion; and regions in the colonial world.

HIST 5381. Minnesota History Workshop. (3-4 cr [max 8 cr]; Stdnt Opt. Prereq: 1301, 1302) 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.

HIST 5421. Gender in Latin American History. (3 cr; Stdnt Opt) Women’s history/femininity. Gender/colonialism, marriage, sexuality, nationalism, labor, political movements, feminism.

HIST 5436. Social History of African Women: 1850 to the Present. (3 cr; Stdnt Opt, Prereq-Grad or #) Explore the historical forces which have shaped African women’s everyday lives and the ways in which these women have been active agents in the making of their own histories.

HIST 5437. History of East Africa. (3 cr; Stdnt Opt. +AFRO 3437, AFRO 5437, HIST 3437) Major themes in history of East Africa, from era of early human cultural development to present. Methods that historians use to reconstruct history. Varying interpretations/constructions of history over time.


HIST 5441. Transformations in Pre-Colonial African History. (3 cr; A-F or Aud. Prereq-#) African internal/external processes before 1600. Framework by which early African history is understood, tools for reconstructing it, themes/debates that have shaped it, new directions in which it is moving.

HIST 5446. Problems in West African History. (3 cr; Stdnt Opt. Prereq-Grad or #) This problem-centered course explores several of the major historiographical, methodological, and theoretical debates in West African history. Core topics include state formation, trade, slavery, Islam, gender, and colonialism.

HIST 5464. China in the Song, Yuan, and Ming Dynasties. (3 cr; Stdnt Opt. +EAS 3464, HIST 3464) China during the Song (976-1279), Yuan (1279-1368) and Ming (1368-1644) dynasties, political institutions, and social structures. Attention to primary sources and how historians ask and answer questions about the past.

HIST 5465. China in the Ming and Qing Dynasties. (3 cr; Stdnt Opt. +HIST 3465W, EAS 3465W) Political/social history of China from 1600 until end of Qing dynasty in 1911. Ethnicity, daily life, legal structures, city life, peasantry.

HIST 5467. State and Revolution in Modern China. (3 cr; Stdnt Opt. +EAS 3467W, HIST 3467W) Modern China’s political evolution including the Taiping Rebellion, Republican Revolution, rise of Nationalist and Communist parties, Maoist era; reform under Deng Xiaoping, and the emergence of democracy in Taiwan.

HIST 5468. Social Change in Modern China. (3 cr; Stdnt Opt. +HIST 3468, EAS 3468) 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 Aud. Prereq-Grad student or #) Important recent English-language work on Chinese culture during the Song, Yuan, and Ming dynasties. Topics include religion, gender, family structures, ethnic identity, commerce/ economics, and political structures/events.

HIST 5474. Sex and the Politics of Desire: Japan and Beyond. (3 cr; A-F or Aud. Prereq-Grad student or #) History of gender/sexuality in modern Japan and Korea. Geography of Japan. Theoretical/methodological literature not specific to Japan. Sexology, eugenics, feminism, nationalism, colonialism, cyber sexuality.

HIST 5479. History of Chinese Cities and Urban Life. (3 cr; A-F or Aud. +HIST 5479) 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 5505. Survey of the Middle East. (3 cr; Stdnt Opt. Prereq-Grad or #) Peoples, lands, cultures of the Middle East, from earliest civilizations to present.


HIST 5611. Proseminar in Medieval History. (3 cr; A-F or Aud. Prereq-Grad student or #) Basic scholarly bibliography for medieval Western European history during early Middle Ages. Foundation for teaching courses in medieval history, preparing for general doctoral exam.
HIST 501. The Medieval Church. (3 cr; Stdnt Opt. Prereq-Grad student or #) 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.

HIST 506. Seminar in Medieval Spain. (3 cr; A-F or Aud. Prereq-#) Graduate research on the development of the medieval kingdoms of Spain from Roman times to ca. 1500. Emphasis on major social, economic, and cultural developments. Christian, Jewish, and Muslim interaction. Spain and the beginnings of European expansion.

HIST 567. Spain in the Early Modern Period: 1492-1814. (3 cr; A-F or Aud) Historiography, documents, and archives of early modern Spain analyzed. Includes reading in modern English and Spanish and practical experience with Spanish manuscript documents from the period.

HIST 5621. Seminar: The French Revolution. (3 cr; A-F or Aud. Prereq-Grad student or [advanced undergrad, #]) Historical analysis of French Revolution of 1789. Old Regime political culture, Enlightenment, origins of the revolution, revolutionary transformations in society, politics/culture both in France and abroad, the Terror, Napoleon, revolutionary legacy.

HIST 5631. Seminar: Comparative Early Modern Europe. (3 cr; A-F or Aud. Prereq- Hist grad or #) Critical reading of historical literature dealing with integration of the globe during the early modern period, ca. 1350-1750; book reports, class discussion.

HIST 5632. World History Seminar. (3 cr; A-F or Aud. Prereq-#) Theoretical approaches to world/global history. Review of major theories, controversies, chronologies, pedagogical approaches.

HIST 5633. Socio-Economic History of China. (3 cr; A-F or Aud. Prereq-Grad student or [adv undergrad, #]) Nature of Chinese sociopolitical formations and economic developments in early modern and recent China. Focus on themes such as the rise of the state, agrarian society, domestic industry, demographic regimes, and cultural and intellectual developments.


HIST 5643. Recent Trends in the Study of Law and Society. (3 cr; Adv Cmp) Recent trends in the study of law and society with special emphasis on legal, social, and political developments in modern society.

HIST 5644. Development of the Western European Legal Tradition. (3 cr; A-F or Aud) Evolution of and interaction among Roman and civil law, customary/folk law, canon law, and English common law. Primary/secondary sources in English.

HIST 5649. Ideas in Context: Making Early Modern Knowledge, 1500-1800. (3 cr; A-F or Aud. Prereq-Grad student or #) Role of institutions/local in development of early modern European science. University, academy, learned society, princely court, museum, printing house, workshop, trading company, armies/navies, state bureaucracies, salons, other independent associations of nascent civil society.

HIST 5650. Seminar: Early Modern Europe. (3 cr; A-F or Aud. Prereq-Hist grad or #) Critical reading of historical literature for early modern Europe, ca. 1450-1700, dealing with France, Germany, Italy, the Low Countries, and Spain. Each student chooses a country to focus on; book reports, class discussion.

HIST 5671. Seminar: Modern Britain. (3 cr; A-F or Aud. Prereq-#) Critical study of major writings in British history, 1760-1945, and preparation for research in field.

HIST 5715. Readings in European Women's History: 1450-1750. (3 cr; A-F or Aud) Introduces current historical research on European women's history. 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 [max 6 cr]; A-F or Aud. Prereq-Grad or #) Introduces 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 socio/political process, family history, evolution of public life, popular culture.

HIST 5721. Contemporary Europe From the Late 19th Century to the Beginning of the Cold War, 1890-1950. (3 cr; Stdnt Opt. +HIST 3721. Pre-requisite coursework in 19th- and/or 20th-century Europe, #) The historical literature and debates surrounding major issues in the social, cultural, political, and economic development of Europe from the turn of the century through the impact of WWII. Topics include the development of imperialism, nationalism, social and political conflict, the rise of fascism and communism, and the origins of war.


HIST 5740. Topics in Modern German History. (3-4 cr [max 12 cr]; A-F or Aud. Prereq-#) Readings and discussions on some central questions concerning the history of Germany during the modern period with a particular emphasis on the relationship between social change and political development. Offerings vary in thematic and chronological focus.

HIST 5761. Seminar-Imperial Russia. (3 cr; A-F or Aud. Prereq-Knowledge of Russian or German or French) (3 cr; A-F or Aud. Prereq-Grad or Aud. Prereq-#) Western and Russian historiography on crucial issues of imperialism. Political institutions; culture and society; modernization and reforms; new interpretations.

HIST 5762. Seminar in 20th Century Russia. (3 cr; A-F or Aud. Prereq-#) Western and Russian historiography on crucial issues of 20th-century Russia. The nature of revolutions, debate over the evolution of the Soviet regime, the collapse of empires, new interpretations.

HIST 5777. Seminar in Habsburg Central Europe. (3 cr; A-F or Aud. Prereq-#) 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 Siècle; the Empire and World War I.

HIST 5794. Seminar in European Economic History. (3 cr; A-F or Aud. Prereq-#) Europe's rise in the world economy; England's industrial revolution and uneven development in Europe; imperialism and World War I; the Great Depression; the post-1945 economic miracle; continuity and change in Eastern Europe.

HIST 5797. Methods of Population History. (3 cr; A-F or Aud) 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 Aud. Prereq-#) Introduction to the literature of early American history. Readings selected from some of the best scholarship in the field, the questions that now hold the attention of colonial historians, and the theories, methods, and sources they use in pursuit of those questions.

HIST 5802. Readings in American History, 1848-Present. (3 cr; A-F or Aud) 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 Aud)
Introduction to graduate and advanced undergraduate students to major historical writings on various Latin American themes.

HIST 5832. Latin America Proseminar: Colonial. (3 cr; A-F or Aud. Prereq-Grad or [advanced undergrad with #])
Introduction to graduate and advanced undergraduate students to major historical writings on various Latin American themes.

HIST 5841. Proseminar in American Economic History. (3 cr; A-F or Aud. Prereq-Grad or [advanced undergrad with #])
Selected topics in Latin American history not covered in regular courses. Taught as staffing permits.

HIST 5842. Topics: History of Medicine. (3-4 cr [max 16 cr]; A-F or Aud. Prereq-Prior history of medicine or history of science course recommended for undergrads)
An exploration of topics central to the history of medicine. Emphasis on mid-18th century to the present. Topics vary yearly.

HIST 5850. Topics in Latin American History. (1-4 cr [max 15 cr]; A-F or Aud. Prereq-Grad or advanced undergrad with #)
Selected topics in Latin American history not covered in regular courses. Taught as staffing permits.

HIST 5860. Topics in History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Grad or [advanced undergrad with #])
Selected topics in history not covered in regular courses. Taught as staffing permits.

HIST 5862. Expansion of Europe. (3 cr; A-F or Aud. Prereq-Grad student, #)
Research proseminar on actions of Europeans in wider world, 1350-1790. Based on documents in James Ford Bell Library.

HIST 5864. Comparative Economic History. (3 cr; A-F or Aud. Prereq-#)
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.

HIST 5870. Advanced Research in Quantitative History. (4 cr [max 16 cr]; A-F or Aud.
Students will carry out publishable-quality research on a quantitative historical topic.

HIST 5871. Readings in U.S. Intellectual History: 19th-20th Centuries. (3 cr; A-F or Aud. Prereq-Grad or Advanced undergrad with #)
Recent scholarship on social history of Africa. Focuses on new literature on daily lives of ordinary people in their workplaces, communities, households.

HIST 5872. African Historiography and the Production of Knowledge. (3 cr; A-F or Aud. Prereq: Major in African history or [grad student; #])
Recent scholarship on social history of Africa. Focuses on new literature on daily lives of ordinary people in their workplaces, communities, households.

HIST 5873. Seminar in Ancient History. (3 cr; A-F or Aud. Prereq: Previous coursework in Greek or Roman history, #)
Seminar on a selected topic in ancient history.

HIST 5874. Comparative History and Social Theory. (3 cr; A-F or Aud. Prereq: Grad student or [upper-div undergrad, #])
Works of history/sociology that are broadly comparative/theoretical. Issues of state formation, social movements, social structure, and economic development.

HIST 5875. Methods and Pedagogy in African History. (3 cr; A-F or Aud. Prereq: Grad student or #)
Current historical methods/sources of African history. Pedagogical issues. Students design their own courses.

HIST 5890. Problems in Modern Chinese History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq: Grad student or [advanced undergrad, #])
Possible topics include cultural, economic, intellectual, political, and social history.

HIST 5901. Latin America Proseminar: Colonial. (3 cr; A-F or Aud. Prereq-Grad or advanced undergrad with #)
Introduction to graduate and advanced undergraduate students to major historical writings on various Latin American themes.

HIST 5902. Latin America Proseminar: Modern. (3 cr; A-F or Aud. Prereq-Grad or advanced undergrad with #)
Introduction to graduate and advanced undergraduate students to major historical writings on various Latin American themes.

HIST 5903. Topics in U.S. History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Grad or advanced undergrad with #)
Selected topics in U.S. history not covered in regular courses. Taught as staffing permits.

HIST 5904. Topics in Modern Chinese History. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-Grad student or [advanced undergrad, #])
Possible topics include cultural, economic, intellectual, political, and social history.

HIST 5905. Readings in Chinese Documents. (3 cr; A-F or Aud. Prereq: Reading knowledge of Chinese)
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.
History of Medicine (HMED)

Medical School

HMED 3001W. Health, Disease, and Healing I. (4 cr; Stdnt Opt. =HMED 3001V) Prereq-Honors
Introduction to intellectual/social history of European/American medicine, health care from classical antiquity through 18th century. Meets with 3001W.

HMED 3002W. Health Care in History II. (3 cr; Stdnt Opt) Prereq-Honors
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. (3 cr; Stdnt Opt) Prereq-Honors
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. (3 cr; Stdnt Opt) Prereq-Honors
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 3065. Body, Soul, and Spirit in Medieval and Renaissance European Medicine. (3 cr; A-F or Aud) Prereq-Honors

HMED 3075. Technology and Medicine in Modern America. (3-5 cr [max 5 cr]; Stdnt Opt) Prereq-Honors
How technology came to medicines center-stage. Impact on production of medical knowledge, professionalization, development of institutions/industry, health policy, and gender/race disparities in health care.

HMED 3500. Directed Study. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#) Prereq-Honors

HMED 5002. Public Health Issues in Historical Perspective. (3 cr; Stdnt Opt) Prereq-Honors
Introduction to the evolution of major recurring problems and issues in public health including environment and health, food customs and nutrition, control of alcohol and drugs, venereal diseases and public policy, human resources regulation, and relationship of science to promotion of health.

HMED 5035. The Germ Theory and Modern Medicine. (3 cr; Stdnt Opt) Prereq-Honors
Analysis of the formulation of the germ theory of disease and of its consequences for medical procedures (therapeutics, surgery, management of hospitals), public health programs, and the structure and prestige of the medical profession.

HMED 5055. Women, Health, and History. (3 cr; Stdnt Opt. Prereq-Grad student or [jr or sr] with prev coursework in hist or #) Prereq-Honors
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 5075. Technology and Medicine in Modern America. (3 cr; A-F or Aud. Prereq-#) Prereq-Honors
How technology came to medicines center-stage. Impact on medical practice, institutions, consumers, production of medical knowledge, professionalization, health policy, gender/race disparities in health care.

HMED 5200. Early History of Medicine to 1700. (5 cr; A-F or Aud) Prereq-Honors
An introductory survey of the history of medicine in Europe and America.

HMED 5201. History of Medicine from 1700 to 1900. (3 cr; Stdnt Opt. Prereq-5200) Prereq-Honors
An introductory survey of the history of medicine in Europe and America.

HMED 5210. Seminar: Theories and Methods in Medical History. (3 cr; A-F or Aud) Prereq-Honors
Historiography of the history of medicine.

HMED 5211. Seminar: Theories and Methods in Medical History. (3 cr; A-F or Aud. Prereq-5210) Prereq-Honors
Use of archives, primary sources. Supervised research project.

HMED 5600. Directed Study. (0-4 cr [max 16 cr]; Stdnt Opt. Prereq-#) Prereq-Honors

HMED 5940. Topics in the History of Medicine. (3 cr [max 16 cr]; Stdnt Opt) Prereq-Honors
Seminar on the historical relations between medicine and the State from the 18th to 20th centuries.

History of Science and Technology (HSCI)

Department of History of Science and Technology

College of Science and Engineering

How humans have developed theories/observations over 400 years about life on earth. Applying historical methods to Holocene extinction, ENSO and famines, human population growth, the Dust Bowl and soil conservation, DDT and falcon repatriation, and disease and responses to pandemics.


HSCI 1214. Life on Earth: Perspectives on Biology. (4 cr; Stdnt Opt. =HSCI 1212) Prereq-Honors
How humans have developed theories/observations over 400 years about life on earth. Applying historical methods to Holocene extinction, ENSO and famines, human population growth, the Dust Bowl and soil conservation, DDT and falcon repatriation, and disease and responses to pandemics.


HSCI 1714. Technology and Civilization: Stone Tools to Steam Engines. (3-4 cr [max 4 cr]; Stdnt Opt. =HSCI 3714) Prereq-Honors
History of technology in its cultural context from earliest times to the Industrial Revolution. Neolithic Revolution, Bronze and Iron Ages, ancient civilizations, Greece, Rome, Middle Ages, and Renaissance.

HSCI 1715. Technology and Civilization: Waterwheels to the Web. (3-4 cr [max 4 cr]; Stdnt Opt) Prereq-Honors
Relations of technology to culture since Industrial Revolution. Diffusion of Industrial Revolution, modes of adaptation by different cultures, social impact.

HSCI 1814. Revolutions in Science: The Babylonians to Newton. (3-4 cr [max 4 cr]; Stdnt Opt. =HSCI 3814) Prereq-Honors
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. Revolutions in Science: Lavoisier, Darwin, and Einstein. (3-4 cr [max 4 cr]; Stdnt Opt. =HSCI 3815) Prereq-Honors

HSCI 1905. Freshman Seminar. (2 cr; A-F or Aud. Prereq-Fr with no more than 30 cr or FRFY) Prereq-Honors
Topics vary. See Class Schedule.

HSCI 3211. Biology and Culture in the 19th and 20th Centuries. (3 cr; Stdnt Opt. =HSCI 5211) Prereq-Honors
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. The Darwinian Revolution. (3 cr; Stdnt Opt. =HSCI 5242) Prereq-Honors

HSCI 3244. History of Ecology and Environmentalism. (3 cr; Stdnt Opt. =HSCI 5244) Prereq-Honors
Development of ecological thought from 18th century natural theology to contemporary
ecology and conservation biology; changing views of the “balance” and the “economy” of nature; conceptual and methodological developments in ecosystems ecology; connections between ecology and conservation, and between population and environmental politics.

HSCI 3332. Science and American Culture. (3 cr; Stdnt Opt. +HSCI 5332) American science since 1600, including transfer of science to America; development of indigenous traditions for pursuit of science; infrastructure for education and research; public response to scientific development.

HSCI 3333V. Honors Course: Issues in American Science and Technology in the Past Century. (3 cr; Stdnt Opt) Historical approach to understanding science and technology. Emphasizes intellectual, political, and social contexts. Decision-making by practitioners on issues of importance to the profession and the community. Topics relating to popular science, science, and warfare.

HSCI 3333W. Issues in American Science and Technology in the Past Century. (3 cr; Stdnt Opt) Historical approach to understanding science and technology. Emphasizes intellectual, political, and social contexts. Decision-making by practitioners on issues of importance to the profession and the community. Topics relating to popular science, science, and warfare.

HSCI 3401. Ethics in Science and Technology. (3 cr; Stdnt Opt. +HSCI 5401) Historical issues involve research ethics including utilitarian, social Darwinian, and other ethical systems developed in science. Ethical problems posed by modern science and technology, including nuclear energy, chemical industry, and information technologies.


HSCI 3715. Technology and Civilization: Waterwheels to the Web. (3-4 cr [max 4 cr]; Stdnt Opt) Relations of technology to culture since Industrial Revolution. Diffusion of Industrial Revolution, modes of adaptation by different cultures, social impact.


HSCI 4050. Special Topics in History of Science. (3 cr; Stdnt Opt) Topics specified in Class Schedule.


HSCI 4125. The Nuclear Age. (3 cr; Stdnt Opt) Discoveries of X-rays, radiation, the atom and its nucleus, and subatomic particles. Development of nuclear weapons/power. Nuclear legacies of Hiroshima, Eniwetak, Chernobyl, and the cold war.

HSCI 4211. History of Computing. (3 cr; Stdnt Opt. +CSCI 4921) 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. (3 cr; Stdnt Opt) 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. (3 cr; Stdnt Opt. +HSCI 3211) 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 5244. History of Ecology and Environmentalism. (3 cr; Stdnt Opt. +HSCI 3244) Development of ecological thought from 18th century natural theology to contemporary ecology and conservation biology; changing views of “balance” and the “economy” of nature; conceptual and methodological developments in ecosystems ecology; connections between ecology and conservation, population and environmental politics.


HSCI 5401. Ethics in Science and Technology. (3 cr; Stdnt Opt. +HSCI 3401) Historical issues involving ethics in science. Ethical problems posed by modern science/technology, including nuclear energy, chemical industry, and information technologies.

HSCI 5411. Art and Science in Early Modern Europe. (3 cr; Stdnt Opt) Interaction of art and science, from Renaissance to 19th century. Development of linear perspective, color theory, artistic practice, and scientific illustration/representation.

HSCI 5994. Directed Research. (1-15 cr [max 15 cr]; Stdnt Opt. Prereq-#)

Hmong (HMNG)

Department of Asian Languages and Literatures

College of Liberal Arts


HMNG 3031. Advanced Hmong. (4 cr; Stdnt Opt. +HMNG 4007; Prereq-3022 or equiv or #) Speaking, listening, reading, and writing. Complex vocabularies, sentence structures from Hmong newspapers, magazine, folktales, folk songs, novels, poetry, proverbs, and riddles. Concepts/terms from social/ritual settings. Idioms, slang, classifiers.

HMNG 3032. Advanced Hmong. (4 cr; Stdnt Opt. +HMNG 4008. Prereq-3031 or equiv or #) Speaking, listening, reading, writing. Complex vocabularies, sentence structures from Hmong
Honors Seminar (HSEM)

University Honors Program

HSEM 2005H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-Fr or soph honors) Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 2007H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-Freshman or sophomore Honors student) Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 2010H. Honors Seminar. (3 cr [max 9 cr]; A-F or Aud. Prereq-[Fr or soph with less than 60 cr], honors) Topic specified in Course Guide.

HSEM 2011H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Fr or soph] honors student) Special topics discussion course; active learning; frequently interdisciplinary.

HSEM 2017H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Fr or soph] honors student) Special topics discussion course; active learning; frequently interdisciplinary.

HSEM 2020H. Honors Seminar. (3 cr [max 9 cr]; A-F or Aud. Prereq-[Fr or soph with less than 60 cr], honors) Topic specified in Course Guide.

HSEM 2025H. Honors Seminar. (2-3 cr [max 12 cr]; A-F only) Emphasizes active learning. Frequently interdisciplinary.

HSEM 2030H. Honors Seminar. (3 cr [max 9 cr]; A-F or Aud. Prereq-[Fr or soph with less than 60 cr], honors) Topic specified in Course Guide.

HSEM 2039H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Fr or soph], honors) Emphasizes active learning. Frequently interdisciplinary.

HSEM 2040H. Honors Seminar. (2-3 cr [max 9 cr]; A-F or Aud. Prereq-[Fr or soph with less than 60 cr], honors) Topic specified in Course Guide.

HSEM 2050H. Honors Seminar. (3 cr [max 9 cr]; A-F or Aud. Prereq-[Fr or soph with less than 60 cr], honors) Special topics discussion course; active learning; frequently interdisciplinary.

For a guide to course numbers, symbols, and abbreviations, see page 376.
HSEM 2607H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-Fr or soph honors)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 2609H. Honors Seminar. (3 cr [max 6 cr]; A-F only)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 2630H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Fr or soph] honors student)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 2701H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Fr or soph] honors)
Topics course.

HSEM 2702H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Fr or soph] honors student)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 2707H. Honors Seminar. (2-3 cr [max 12 cr]; A-F only. Prereq-[Fr or soph] honors)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 2714H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Fr or soph] honors student)
Discussion oriented. Emphasizes active learning. Frequently interdisciplinary.

HSEM 2901H. Honors Directed Study. (1-2 cr [max 4 cr]; A-F only. Prereq-#)
Extra credit to be used in conjunction with an existing honors seminar.

HSEM 2902H. Honors Directed Study. (1-2 cr [max 4 cr]; A-F only. Prereq-#)
Extra credits to be used in conjunction with an honors seminar.

HSEM 2941H. Honors Topics. (2-3 cr [max 7 cr]; A-F only)
Special topics. Team taught.

HSEM 2942H. Honors Topics. (2-3 cr [max 7 cr]; A-F only)
Team taught.

HSEM 2991H. Honors Directed Research. (1-3 cr [max 6 cr]; A-F only)

HSEM 2992H. Honors Directed Research. (1-3 cr [max 6 cr]; A-F only)

HSEM 2994H. Honors Research. (1 cr; Stdnt Opt. Prereq-Fr or soph honors)
Honors research opportunity with faculty.

HSEM 3001H. Honors Seminar. (2-3 cr [max 12 cr]; A-F only)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3002H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only)
Topics course.

HSEM 3006H. Honors Seminar. (2-4 cr [max 8 cr]; A-F only)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3010H. Honors Seminar. (2-4 cr [max 12 cr]; A-F or Aud. Prereq-[Jr or sr], honors)
Special topics. Discussions. active learning. Often interdisciplinary.

HSEM 3011H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only)

HSEM 3012H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr], honors)
Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3019H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Jr or sr] honors student)
Special topics discussion; active learning; frequently interdisciplinary.

HSEM 3020H. Honors Seminar. (2-4 cr [max 12 cr]; A-F or Aud. Prereq-[Jr or sr], honors)
Special topics. Discussions. active learning. Often interdisciplinary.

HSEM 3021H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr] honors)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 3022H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr], honors)
Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3026H. Honors Seminar. (2-3 cr [max 12 cr]; A-F only)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3030H. Honors Seminar. (3 cr [max 9 cr]; A-F or Aud. Prereq-[Jr or sr], honors)
Special topics. Discussions. active learning. Often interdisciplinary.

HSEM 3033H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Jr or sr] honors student)
Special topics discussion; active learning; frequently interdisciplinary.

HSEM 3034H. Honors Seminar. (2-3 cr [max 3 cr]; A-F only. Prereq-[Jr or sr], honors)
Special topics. Discussions. active learning. Frequently interdisciplinary.

HSEM 3037H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Jr or sr] honors student)
Special topics discussion; active learning; frequently interdisciplinary.

HSEM 3038H. Honors Seminar. (2-3 cr [max 12 cr]; A-F only. Prereq-[Jr or sr], honors)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3039H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Jr or sr] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

HSEM 3050H. Honors Seminar. (3 cr [max 9 cr]; A-F or Aud. Prereq-[Jr or sr], honors)
Special topics. Discussions. active learning. Often interdisciplinary.

HSEM 3051H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only. Prereq-[Jr or sr] honors student)
Special topics discussion; active learning; frequently interdisciplinary.

HSEM 3053H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only)

HSEM 3054H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr], honors)
Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3055H. Honors Seminar. (2-3 cr [max 6 cr]; A-F only)
Topics course.

HSEM 3059H. Honors seminar. (2-3 cr [max 6 cr]; A-F only)

HSEM 3066H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr], honors)
Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3070H. Honors Seminar. (2-3 cr [max 9 cr]; A-F or Aud. Prereq-[Jr or sr], honors)
Special topics course designed to add breadth and depth to the education of honors students. Discussions and active learning. Often interdisciplinary in perspective.

HSEM 3080H. Honors Seminar. (3 cr; A-F or Aud. Prereq-[Jr or sr], honors)
Special topics course designed to add breadth and depth to the education of honors students. Discussions and active learning. Often interdisciplinary in perspective.

HSEM 3090H. Honors Seminar. (3 cr [max 12 cr]; A-F only. Prereq-[Jr or sr], honors)

HSEM 3093H. Directed Studies. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-[Jr or sr], honors, #, %, @)
Additional research related to seminar topic.

HSEM 3103H. Honors Seminar. (2-3 cr [max 9 cr]; A-F only. Prereq-[Jr or sr] honors student)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 3110V. Writing Intensive Honors Seminar. (3 cr [max 12 cr]; A-F only. Prereq-[Jr or sr], honors)
Special topics course. Discussions. active learning. Often interdisciplinary in perspective.
Horticultural Science (HORT)

Horticulture for Home & Garden.
3 cr. (3 cr; Stdnt Opt.)
Lecture, readings, lab.
Prereq-1001, BIOL 1009, soph)

Environmental Effects on Horticultural Crops.
3 cr. (Stdnt Opt.)
Computer-aided design, related software
and depth to the education of honors students.
Discussion and active learning. Often
interdisciplinary in perspective.

HseM 3320H. Honors Seminar. (2-3 cr [max 9
A-F only] Emphasizes active learning. Frequently
interdisciplinary.

HseM 3307H. Honors seminar. (2-3 cr [max 6
A-F only]

Hort 2031. Organic Food: How to Grow It,
Where to Buy It, Can it Feed the World?. (3
cr; A-F only)
Basis of organic food. Growing small-scale
organic fruits/vegetables. National Organic
Program, importance of organic certification.
Role of organics in food security and potential
to feed world. Lecture, “hands dirty” experience
on student organic farm.

Hort 2100. Agricultural Biochemistry. (3 cr;
A-F only. Prereq-CHEM 1011 or [1015, &1017]
or CHEM 1021 or #)
Chemical/biochemical foundation for
agricultural disciplines. Concepts in organic,
analytical and biological chemistry. Chemistry,
metabolism, and development of plants.

Hort 3300. Horticultural Global Seminar. (3
cr [max 6 cr])
Three-week travel course. In-depth study of
particular topic in horticulture in a foreign
country. Lectures and field trips for 15 days,
with weekends free.

Hort 3302W. Greenhouse Management. (3
cr; A-F or Aud. Prereq-1001 or #)
Worldwide horticultural production. Selection
of greenhouse site, construction, heating, and
Root media, sanitation, water, fertilization,
chemical growth regulation, temperature, light,
and marketing. Lab in greenhouse operations,
field trips.

Hort 3305W. Environmental Effects on
Horticultural Crops. (4 cr; Stdnt Opt.
Prereq-1001, BIOL 1009, soph)
Introduction to physiological basis for effects
of environment on plant growth/development. How
to produce optimal plant growth. Experimental
technique, data analysis, scientific writing.
Lecture, readings, lab.

Hort 3390. Directed Studies. (2-12 cr [max
72 cr], Stdnt Opt. Prereq-Nonfr, #)
Approved field, lab, or greenhouse experiences
in application of horticultural information/
practices.

Hort 3311. Student Organic Farm Planning,
Growing, and Marketing. (3 cr; Stdnt
Opt. +AGRO 5311, HORT 5311, AGRO 3311.
Prereq-1001 or AGRO 1101 or AGRO 1103 or
BIOL 1001 or BIOL 1009 or #)
Students plan/implement cropping/marketing
strategies for organic produce/flowers from
Student Organic Farm on St. Paul campus.

Hort 4000. International Experiences in
Horticultural Science. (3 cr [max 6 cr]; Stdnt
Opt. Prereq-1001 or #)
Perspectives in horticultural science and
cultural diversity through various international
settings. Focuses on different aspects,
depending on interests/expertise of lead faculty.
Preparation for international study tour of one
to three weeks, usually during May Session.

Hort 4015. Advanced Woody and
Herbaceous Plant Topics. (1 cr [max 7 cr]; A-F
only. Prereq-1015)
Species, cultivars, identification, and use for
each genus of one group of plants.

Hort 4022. Applications in Computer-
aided Design for Landscapes. (3 cr; A-F only.
Prereq-2021)
Computer-aided design, related software
programs for developing landscape design

For a guide to course numbers, symbols, and abbreviations, see page 376. 533
solutions. Real-life applications. Students produce base plans, concept, draft designs, and complete landscape design.

**Hort 4023. Landscape Design and Implementation II. (4 cr; A-F only. Prereq-4001)**


**Hort 4061. Turfgrass Management. (3 cr; A-F only. Prereq-1001 or #)**


**Hort 4062. Turfgrass Weed and Disease Science. (3 cr; A-F only. Prereq-4061, PI P a 2001)**

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. Prereq-4061)**

Ecology, physiology, and theory of turf population dynamics. Specialized management situations such as golf course, commercial sod production, and fine turf athletic settings.

**Hort 4071. Applications of Biotechnology to Plant Improvement. (4 cr; Stdt Opt. Prereq-[Biol 1009 or equiv or grad student], #)**

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/techniques. Lecture, lab.

**Hort 4090. Professional Experience Program: Internship. (1-6 cr [max 2 cr]; S-N only. Prereq-CFANS undergrad, #, completed internship contract)**

Professional experience in horticulture firms or government agencies attained through supervised practical experience. Students evaluate reports, consult with faculty advisers/employers.

**Hort 4141W. Nursery Management. (4 cr; A-F only. Prereq-1001 or 1015 or #)**

Basic techniques in producing nursery plants, including irrigation, fertilization, and pruning. Lectures, labs, weekly discussions.

**Hort 4401. Plant Genetics and Breeding. (4 cr; Stdt Opt. +AGRO 4401. Prereq-BIOL 1009 or equiv or grad, #)**

Principles of plant genetics and environmental variation. Applications of genetics to crop evolution and breeding of self-pollinated, cross-pollinated, and asexually propagated crops. Lab experiments involve hybridization, variation, and selection.

**Hort 4461. Horticultural Marketing. (3 cr; A-F only. =APEC 4461. Prereq-APEC 1101 or ECON 1101)**

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 5009. Pesticides in Horticulture: Their Use and Abuse. (3 cr; A-F or Aud. Prereq-[ENT 4015 or ENT 4255, PIPA 2001] or #)**

History of and practical information about pesticides used by horticulture industry. Pesticide modes of action. Use, application methods, environmental effects. Final three weeks devoted to labs on practical mixing/delivery systems.

**Hort 5018. Landscape Operations and Management. (3 cr; Stdt Opt. Prereq-1001 or #)**

Business, managerial, and technical aspects of landscape management relative to environmental horticulture and green industry. Tasks associated with maintaining turf and woody/herbaceous plants in landscape. Relationship of those tasks to preparation/justification of labor, equipment, and supply budgets. Labs, demonstrations, hands-on experiences associated with science and technically-based landscape maintenance/operations.

**Hort 5023. Public Garden Management. (2 cr; Stdt Opt)**


**Hort 5031. Organic Viticulture and Fruit Production. (5 cr; A-F or Aud. Prereq-[1001, 3005] or #)**

Principles of fruit production. Temperature fruit crops. Integrated management of fruit cropping systems. Site selection, cultural management practices, taxonomic classification, physiological/environmental control of plant development. Writing.

**Hort 5032. Organic Vegetable Production. (5 cr; A-F or Aud. Prereq-1005, ENT 3005, PLPA 2001, S OIL 2125] or #)**

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 5051. Floriculture Crop Production. (4 cr; A-F or Aud. Prereq-1001, 1015, 3002)**


**Hort 5052. Specialty Greenhouse Crop Production. (3 cr; A-F or Aud. Prereq-1001, 1015, 3002)**


**Hort 5071. Restoration and Reclamation Ecology. (4 cr; Stdt Opt. Prereq-[one college course in ecology, one college course in [plant science or botany]) or #)**


**Hort 5090. Directed Studies. (1-6 cr [max 18 cr]; Stdt Opt. Prereq-8 cr upper div Hort courses, #)**

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.

**Hort 5131. Student Organic Farm Planning, Growing, and Marketing. (3 cr; Stdt Opt. +AGRO 5131, HORT 3131, AGRO 3131, Prereq-1001 or AGRO 1101 or AGRO 1103 or BIOL 1001 or BIOL 1009 or #)**

Students plan/implement cropping/marketing strategies for organic produce/flowers from Student Organic Farm on St. Paul campus.

**Housing Studies (HSG)**

**DHA Housing Studies**

**College of Design**

**HSG 1170. Topics in Housing Studies. (1-4 cr [max 16 cr]; A-F or Aud)**

In-depth investigation of particular topic.

**HSG 2196. Work Experience in Housing Studies. (1-4 cr [max 8 cr]; S-N only. Prereq-Plan submitted/approved by [advisor, internship supervisor], written approval of supervisor, #)**

Supervised work experience in business, industry, or government, related to student’s area of study. Integrative paper or project.

**HSG 2401. Introduction to Housing. (3 cr; A-F or Aud)**

Physical, social, economic, and psychological aspects of housing. Housing as process/product...
Human Resource Development (HRD)

Department of Educational Policy and Administration

College of Education and Human Development


HRD 3201. Introduction to Training and Development. (3 cr; A-F or Aud) Processes to carry out theoretically sound training/development practices. Systemic relationship with host organization or system.

HRD 3301. Introduction to Organization Development. (3 cr; Srnt Opt. Prereq-Undergrad) Organization development theories, principles, concepts, and practices. How development is used to direct change in an organization.


HRD 4302. Managing Work Teams. (3 cr; A-F or Aud. Prereq-Two core courses in HRD) Frameworks and strategies for developing effective work teams. Skill development in facilitating resolution of conflicts in organizations. Foundational information as well as practical applications for participants to become small team leaders.

HRD 4627. Management and Supervisory Development. (3 cr; Srnt Opt) Problems, practices, programs, and methodologies relating to the training and development of managers and supervisors, including needed competencies, needs assessment, delivery modes, and evaluation.

HRD 5101. Foundations of Human Resource Development. (1 cr; Srnt Opt) Introduction to human resource development as a field of study and practice.

For a guide to course numbers, symbols, and abbreviations, see page 376. 535


HRD 5105. Strategic Planning Through Human Resources. (3 cr; A-F or Aud.) Evaluation of human resource development efforts from the perspective of impact on organizations, work processes, and individuals, plus follow-up decisions.

HRD 5111. Facilitation and Meeting Skills. (1 cr; Stdnt Opt) Introduction to the disciplines of planning and running effective meetings. Tools and methods for meeting management and evaluation are presented within the context of organization development.

HRD 5196. Internship: Human Resource Development. (1-10 cr [max 10 cr]; S-N or Aud. Prereq: [3001, 3196, 3201 or 3301], ADEN 3101, undergrad) or ([5001 or 5301], WHRE 5001, grad student)], 1 Students apply and contract for human resource development positions. Contracts describe specific HRD responsibilities to be fulfilled during internship and theory-to-practice learning outcomes.

HRD 5201. Training and Development of Human Resources. (3 cr; A-F or Aud. Prereq-Grad student only) Training/development of human resources in organizations. Process phases of analysis, design, development, implementation, and evaluation.

HRD 5202. Training on the Internet. (3 cr; Stdnt Opt. Prereq-Grad student only) Major concepts, skills, and techniques for giving and receiving training on the Internet.

HRD 5301. Organization Development. (3 cr; A-F or Aud. Prereq-Grad student only) Introduction to major concepts, skills, and techniques for organization development/change.

HRD 5302. Managing Work Teams in Business and Industry. (3 cr; A-F or Aud. Prereq-2 core courses in HRD) Frameworks and strategies for developing effective work teams. Skill development in facilitating resolution of conflicts in organizations. Provides foundational information as well as practical applications for participants (upper-level and graduate students) to become small team leaders.

HRD 5405. Quality Improvement Through Human Resources. (3 cr; A-F or Aud. Prereq: [5201, 5301] or #) Quality management, productivity improvement theory/practice from a human resource perspective. Organization development/training as integral components of quality improvement. HR role within quality standards. History of quality improvement, contributions of major leaders.

HRD 5409. Planning and Decision-Making Skills. (1 cr; Stdnt Opt) Introduction to the disciplines of planning and decision making typically used in process improvement interventions. Tools and methods for facilitating group decisions and problem solving.

HRD 5410. Survey of Research Methods and Emerging Research in Human Resource Development. (3 cr; A-F or Aud. Prereq-[Registered, independence] at conference of Academy of HRD) Role of research in HRD. Standards/criteria for evaluating research, critique of conference research papers, identification of emerging research themes. Offered in conjunction with the annual conference of Academy of HRD.

HRD 5624. Sales Training. (3 cr; A-F or Aud) Strategies and techniques for developing effective sales people.

HRD 5625. Technical Skills Training. (3 cr; Stdnt Opt) Analyzing technical skills training practices in business and industry. Systems and process analysis and troubleshooting of work behavior; design methods and developing training materials.

HRD 5626. Customer Service Training. (3 cr; A-F or Aud) Overview of customer service strategies used by successful organizations and training practices used to develop customer-oriented personnel.

HRD 5627. Management and Supervisory Development. (3 cr; Stdnt Opt) Problems, practices, programs, and methodologies relating to the training and development of managers and supervisors, including needed competencies, needs assessment, delivery modes, and evaluation.


Human Resources and Industrial Relations (HRIR)

Industrial Relations Center
Curtsis L. Carlson School of Management

HRIR 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F only. Prereq-Fr) Topics vary.


HRIR 3032. Training and Development. (2 cr; Stdnt Opt. Prereq-CSOM upper div undergrad major grad) Introduction to theory/research/practice of design/implementation/evaluation of employee training/development programs. Training as process for influencing individual/organizational outcomes (e.g., performance, job satisfaction, work climate).

HRIR 3041. The Individual in the Organization. (2 cr; Stdnt Opt) Focus on 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 3042. The Individual and Organizational Performance. (2 cr; Stdnt Opt) Factors influencing group, team, and organizational performance. Examines systems that drive organizational success. Topics include job design and organization structure, organization effectiveness measures, culture, group dynamics, teamwork; power and influence.

HRIR 3051. Compensation: Theory and Practice. (2 cr; Stdnt Opt. Prereq: [At least 60 sem cr or 75 qtr cr], 2.00 GPA) or %) Introduction to compensation/reward programs in employing organizations. Theories of organizational/employee behavior used in design/implementation of pay programs. Design, implementation, and evaluation of job evaluation, salary surveys, skill-based pay, merit-based pay, and other compensation programs.
HRIR 3071. Union Organizing and Labor Relations. (2 cr; Stdt Opt. Prereq-Csom upper div undergrad major grad) Analysis of labor unions, employee associations, and collective bargaining within the framework of contemporary American legislation and policy. Covers forming/organizing labor unions; union, employee, and management strategies/behaviors; and historical influences on policy and practice in the private and public sectors.

HRIR 3072. Collective Bargaining and Dispute Resolution. (2 cr; Stdt Opt. Prereq-Csom upper div undergrad major grad) Collective bargaining, contract administration, grievance processing, interest/rights arbitration, strikes and related policies and practices of employers, workers, and labor unions in dealing with worker representation in the private and public sectors. Impact and transfer of practices to the non-union sector are considered.

HRIR 4100W. Undergraduate HRIR Leadership Capstone. (4 cr; A-F only. Prereq-[3071 or 3072] & [3041 or 3042], [2 additional cr in HRIR undergrad program]). Preparing to become a leader. How to assist organizations with the development of HR programs, policies, and practices that nurture/support effective/authority leadership throughout the organization.

HRIR 5000. Topics in Human Resources and Industrial Relations. (2 cr; max 8 cr.; Stdt Opt)

HRIR 5021. Systems of Conflict and Dispute Resolution. (4 cr; Stdt Opt. Prereq-Upper div undergrad or grad major; HRIR students contact instructor before registering) Conflict settlement in interpersonal, work-related, community, business, and international settings. Lectures, discussions, observations of actual dispute resolution sessions, exercises. Students participate in simulations.


HRIR 5023. Employment and Labor Law for the HRIR Professional. (2 cr; A-F only. Prereq-[At least 60 sem cr or 75 qtr cr], 2.00 GPA) or grad student or %) Application of statutes and case law to work settings. Civil rights and equal opportunity. Discrimination and harassment. Compensation and benefits. Employee protection and privacy, labor relations. Emphasizes application and ability to recognize legal aspects of HRIR issues.


HRIR 5026. Innovative HR Leadership in the Context of Change and Uncertainty. (2 cr; Stdt Opt. Prereq-[At least 60 cr], 2.00 GPA) or grad student or %; grad majors must register A-F) Overview of leadership in managing human resources. Historical evolution. Major theories/models. Principles of effective HR leadership in practice. Effects of uncertainty/change on leadership/behavior. HR leadership as powerful management tool.

HRIR 5028. Leadership and Personal Development. (2 cr; A-F only) Effective/ethical leadership. Leadership theory. Personal leadership strengths/vulnerabilities. Exercises, role playing, giving/receiving feedback. Students create leadership development plan.


HRIR 5062. Personnel Economics. (2 cr; Stdt Opt. Prereq-[ECON 1101, at least 60 sem cr, 2.00 GPA] or HRIR grad major) Application of economic tools to problems in human resources and industrial relations. Human capital/training. Incentives, information, hiring, turnover.

HRIR 5991. Independent Study in Human Resources and Industrial Relations. (1-8 cr; [max 8 cr]; Stdt Opt. Prereq-% or %) Individual readings or research topics.

Humanities (HUM)

Department of Philosophy

College of Liberal Arts

HUM 1001. Humanities in the West I. (4 cr; Stdt Opt. -HUM 3001) Greek and Roman civilization, rise of Christianity. Epic/lyric poetry, drama, architecture, sculpture, philosophy of religion. Integrative study of works by creative figures such as Homer, Hesiod, Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle, Caesar, Lucretius Virgil, Ovid, Petronius, Augustine, Boethius.


HUM 1003. Humanities in the West III. (4 cr; Stdt Opt. -HUM 3003) European civilization from 15th/16th centuries. Religious/cultural reaction in northern Europe, humanism, counter-reformation, religious wars, philosophy, literature, art, music. Works by creative figures such as Petrarch, Machiavelli, Erasmus, Luther, Michelangelo, Josquin.

HUM 1004. Humanities in the West IV. (4 cr; Stdt Opt. -HUM 3004) European civilization from 17th/18th centuries. Old Regime through French Revolution/Napoleon, new science, Enlightenment, cult of sensibility, art, music. Integrative study of works by creative figures such as Cervantes, Descartes, Rembrandt, Bach, Pope, Voltaire, Rousseau, Goethe, Watteau, David, Goya, Mozart.


HUM 1909W. Freshman Seminar. (3 cr; max 6 cr.) A-F or Aud. Prereq-Freshman Topics specified in Class Schedule.

HUM 3001. Humanities in the West I. (4 cr; Stdt Opt. -HUM 1001) Greek and Roman civilization, rise of Christianity. Epic/lyric poetry, drama, architecture, sculpture, philosophy of religion. Integrative study of works by creative figures such as Homer, Hesiod, Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle, Caesar, Lucretius Virgil, Ovid, Petronius, Augustine, Boethius.


HUM 3003. Humanities in the West III. (4 cr; Stdt Opt. -HUM 1003) European civilization from 15th/16th centuries. Religious/cultural reaction in northern Europe, humanism, counter-reformation, religious wars, philosophy, literature, art, music. Works by creative figures such as Petrarch, Machiavelli, Erasmus, Luther, Michelangelo, Josquin.

HUM 3004. Humanities in the West IV. (4 cr; Stdt Opt. -HUM 1004) European civilization from 17th/18th centuries. Old Regime through French Revolution/Napoleon, new science, Enlightenment, cult of sensibility, art, music. Integrative study of
works by creative figures such as Cervantes, Descartes, Rembrandt, Bach, Pope, Voltaire, Rousseau, Goethe, Watteau, David, Goya, Mozart.

HUM 3005. Humanities in the West V. (4 cr; Stdnt Opt. = HUM 1005)

HUM 3006. Humanities in the West VI. (4 cr; Stdnt Opt. = HUM 1006)

HUM 3021. Introduction to Historical Foundations of Modern Education. (3 cr; Stdnt Opt. = EDPA 5021, EDPA 5021, HUM 4021)
Analysis and interpretation of important elements in modern education derived from pre-classical sources, the Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution. Basic background course.

HUM 3023. Introduction to History of Western Educational Thought. (3 cr; Stdnt Opt. = EDPA 5023, EDPA 5023, HUM 4023)
Great educational classics of Western civilization: by: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, and others.

HUM 3027. Lyric Song in Medieval Culture. (3 cr; Stdnt Opt)
Courtly, paratutical, and popular song traditions, 1100-1500, in specific contexts: castle, palace, monastery, nunnery, cathedral, theater, tavern, street and countryside. Social roles of men and women as patrons, performers, poets, composers. Writing historical narratives and recreating medieval performance traditions.

HUM 3036. Islam: Religion and Culture. (3 cr; Stdnt Opt)

Major movements in painting, literature, and poetry in France during second half of 19th century. Aesthetic concepts of artists and their critics, in context of historical events and social and political changes.

HUM 3282. European Intellectual History: The Late 19th and 20th Centuries. (3 cr; Stdnt Opt. = HIST 3282)
Second and concluding semester of readings in European texts dealing with issues in logic, philosophy and the methodologies of the historical, social and natural sciences, from the late nineteenth century to the present. There is no text. Readings are from original sources.

HUM 3653. Hinduism: From Guptas to 13th Century. (2 cr; Stdnt Opt)
Development of classical Hinduism in its multiple cultural and social manifestations, from the 4th to 13th century C.E. Art, religion, mythology, literature, philosophy, caste system.

HUM 3837. Nietzsche. (3 cr; Stdnt Opt. = HUM 4857, Prereq-Jr or Sr)
Nietzsche’s contributions to philosophy, psychology, and criticism of religion, culture, and society.

HUM 3910. Topics in the Humanities. (4 cr; Stdnt Opt)
Topics vary by offering.

HUM 4021. Historical Foundations of Modern Education. (3 cr; Stdnt Opt. = EDPA 5021, EDPA 5021, HUM 4021)
Analysis and interpretation of important elements in modern education derived from pre-classical sources, the Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution. Basic background course.

HUM 4023. History of Western Educational Thought. (3 cr; Stdnt Opt. = EDPA 5023, EDPA 5023, HUM 4023)
Great educational classics of Western civilization: by: Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, and others.

HUM 4837. Nietzsche. (3 cr; Stdnt Opt. = HUM 3837, Prereq-Sr or grad student)
Nietzsche’s contributions to philosophy, psychology, and criticism of religion, culture, and society.

IE 3041. Industrial Assignment I. (2 cr; A-F or Aud. Prereq-ME upper division, registration in ME co-op program)
Industrial work assignment in engineering intern program. Evaluation based on student’s formal written report covering semester’s work assignment.

IE 4042. Industrial Assignment II. (2 cr; A-F or Aud. Prereq-ME upper div, registration in ME co-op program)
Industrial work assignment in engineering intern program. Evaluation based on student’s formal written report.

IE 4521. Statistics, Quality, and Reliability. (4 cr; Stdnt Opt. Prereq-Upgr-Upper div or grad student or CNR)
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, availability.

IE 5080. Topics in Industrial Engineering. (1-4 cr; Stdnt Opt. Prereq-Upgr-Upper div or grad student)
Topics vary each semester.

IE 5111. Systems Engineering I. (2 cr; A-F or Aud. Prereq-IT upper div or grad student)
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.
IE 5112. Introduction to Operations Research. (3 cr; A-F or Aud. Prereq-[Math 2243 or Math 2373 or equiv], [one semester of probability or statistics], [IT upper div or grad student])
Survey of Operations Research models/methods in deterministic/stochastic settings. Linear programming, integer programming, networks, forecasting, Markov chains, and queuing systems. Examples from various application areas, such as systems engineering, logistics, design, and project management.

IE 5113. Systems Engineering II. (4 cr; A-F or Aud. Prereq-5111, a course on basic probability, [IT upper div or grad student])
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.

IE 5441. Financial Decision Making. (4 cr; A-F only, Prereq-IT upper div or grad student)

IE 5511. Human Factors and Work Analysis. (4 cr; A-F or Aud. Prereq-[ME 5211, HUMF 5211, Prereq-Upper div IT or grad student])
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.

IE 5512. Applied Ergonomics. (4 cr; A-F or Aud. Prereq-[Prereq-Upper div IT or grad student, 5511])
Small groups of students work on practical ergonomics problems in local industrial firms. Projects cover a variety of ergonomic issues: workstation design, equipment and tool design, back injuries and material handling, cumulative trauma disorders, illumination and noise, and safety.

IE 5521. Quality Engineering and Reliability. (4 cr; Stdnt Opt. Prereq-[4521 or equiv], [upper div or grad student or CNR])
Quality engineering/management, economics of quality, statistical process control design of experiments, reliability, maintainability, availability.

IE 5531. Engineering Optimization I. (4 cr; Stdnt Opt. Prereq-Upper div or grad student or CNR)
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.

IE 5541. Project Management. (4 cr; Stdnt Opt. Prereq-Upper div or grad student)
Introduction to engineering project management. Analytical methods of selecting, organizing, budgeting, scheduling, and controlling projects, including risk management, team leadership, and program management.

IE 5545. Decision Analysis. (4 cr; Stdnt Opt. Prereq-4521 or equiv)
Normative theories of decision making. Emphasizes structuring of hard decision problems arising in business and public policy contexts. Decision trees, expected utility theory, screening prospects by dominance, assessment of subjective probability, multiple attribute utility, analytic hierarchy process, benchmarking with data envelopment analysis, basics of game theory.

IE 5552. Design and Analysis of Manufacturing Systems. (4 cr; Stdnt Opt. Prereq-Upper div or grad student)
Flow lines, assembly systems, cellular manufacturing systems, and flexible manufacturing systems. Emphasis is on methodologies for modeling, analysis and optimization. Lead time analysis, capacity and workload allocation, scheduling and shop floor control, work-in-process management, facilities planning and layout, and information management.

Information and Decision Sciences (IDSC)

Department of Information and Decision Sciences

Curtis L. Carlson School of Management

IDSC 3001. Information Systems for Business Processes and Management. (3 cr; A-F or Aud. Prereq-BA 1001 or experience using Windows/Internet)

IDSC 3001H. Honors: Information Systems for Business Processes and Management. (3 cr; A-F or Aud. Prereq-BA 1001 or experience using Windows/Internet, honors)

IDSC 3010H. Honors: Information Systems and IT Governance. (2 cr; A-F only)
Programming concepts to develop large, full-featured applications. Object-oriented programming, database applications, Web applications. Style, performance, UI design.

IDSC 3103. Data Modeling and Databases. (2 cr; A-F only, Prereq-3001)

IDSC 3104. Information Technology Infrastructure. (2 cr; A-F only, Prereq-3001)

IDSC 3202. Analysis and Modeling for Business Systems Development. (4 cr; A-F or Aud. Prereq-3001)

IDSC 4131. Advanced Database Design and Administration. (3 cr; A-F or Aud. Prereq-4103)
Role, organization, functions, and tools of data administration. Data planning and information architectures. Object-oriented DBMS and support for graphics and CAD/CAM applications. Data security, maintaining database integrity, and managing data shared, networked or distributed environment. Strategies for using advanced DBMS tools and CASE tools.

IDSC 4204W. Managing Information Services. (4 cr; A-F only, Prereq-3202)
Information services as a service function. Techniques, activities, and issues for management/control of systems development at project level. Relationship of function, roles, and organizational structures. IS planning/business strategy, skill development, career pathing. Management of acquisition, subcontracting, outsourcing, operations, and user support.

IDSC 4301. Information Systems Capstone Course: A Live Case. (2 cr; A-F only, Prereq-4204W)
Working with people from a host organization, teams of students integrate various technologies to solve a significant problem using a “live case” format.

IDSC 4401. Information Security. (2 cr; A-F only, Prereq-3104 or #)
Concepts/issues of security and data integrity threats that undermine utility, robustness, and confidence in electronic technologies in facilitating business transactions.

IDSC 4411. Accounting Information Systems and IT Governance. (2 cr; A-F only, Prereq-3001)
Information technology audit function, internal control, audit process, smart operations, network security, systems development life cycle, enterprise resource planning risk.

For a guide to course numbers, symbols, and abbreviations, see page 376. 539
compliance issues. IT governance, business continuity, frameworks/methodologies.

Lectures, case studies, real-world examples.


IDSC 4431. Advanced Database Design. (2 cr; A-F or Aud. Prereq 3103 or CSCI 4707 or CSCI 5707 or #) Comparative review of data modeling methodologies. Advanced constructs in database design. Modeling subtypes/supertypes, ternary/higher-order relationships, integrity constraints. CASE tools. Representation of facts. Verbalization of data model.


IDSC 4490. Information Systems Special Topics. (2 cr [max 10 cr]; A-F or Aud) Discussion and analysis of current topics and developments in information systems.

IDSC 4491. Independent Study in Information Systems. (1-4 cr [max 4 cr]; A-F or Aud. Prereq-#) Information Networking (INET) College of Continuing Education

INET 1001. Survey of Information Technology. (1 cr; A-F or Aud) Facets of information technology. Differentiating degree programs within information technology. Trends, career opportunities, governing standards.

INET 3101. C Programming for the Java Programmer. (1 cr; A-F or Aud. Prereq- Programming experience or completed coursework in [Java or C or similar programming language]) 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.

INET 3550. Special Topics in IT Infrastructure. (3-3 cr [max 6 cr]; A-F or Aud) Topics in information technology infrastructure.

INET 4011. Network Administration. (4 cr; A-F or Aud. Prereq-CSCI 4211 or #) Network architecture, switching, routing, algorithms, protocols, infrastructure hardware, cable plant, security, network management. Lecture, expert guest speakers, labs. Network Programming. (4 cr; A-F or Aud. Prereq-[CSCI 4211 or equiv professional experience or #], 45 cr) Network/distributed programming concepts. Design using C, Java, and other higher level programming languages. Sockets, TCP/IP, RPC, streaming, CORBA, .NET, SOAP. Labs use UNIX/Linux and MS Windows operating systems.

INET 4031. System Administration. (4 cr; A-F or Aud. Prereq-[CSCI 4201 or #], 45 cr) Integration of hardware, software and operational practice. Recap of machine architecture/organization. Complex technology issues, e.g., designing for scalability, configuring systems, architecting storage systems, monitoring/testing performance, executing recovery processes, managing software licenses. Lab based, Microsoft Server, and Linux OS.

INET 4032. Storage Design and Administration. (2 cr; A-F or Aud) Strategies for addressing data management needs. Data storage, protection, encryption, disaster recovery and business continuity. Best practices, legal issues, emerging storage products, protection of personal data.


INET 4051. IT Infrastructure Operations. (3 cr; A-F or Aud. Prereq-[CSCI 4211 or #], sr) Network, server, and database operations. Infrastructure architecture, organizational structure, security, metrics, vendor relations, outsourcing, capacity planning, strategic planning, budgeting. Online case study.


INET 4153. Policy and Regulation: Effects on Global IT Infrastructure. (3 cr; A-F or Aud. Prereq-45 sem cr, experience with Windows/Internet) Progress/change in telecommunications networks as function of policies/regulations. Local/global telecommunications policy, technology convergence, emerging digital complex.


INET 4193. Directed Study. (1-4 cr [max 12 cr]; A-F or Aud. Prereq-ITI student, %) Independent project. Topic arranged with and supervised by ITI faculty.

INET 4596. Internship. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-[ITI major or certificate student], [jr or sr], %) Hands-on work experiences in a professional IT setting. Students apply coursework, contribute to knowledge of best practices, and participate in career development.

INET 4707. Practice of Database Systems. (3 cr; A-F or Aud. Prereq-[CSCI 5707, CSCI 4707, CSCI 4061, at least 45 cr completed; CSCI majors contact CSCI dept before registering]) Concepts, data models. Case studies, data manipulation languages, logical data models, database design, facilities for database security/integrity, applications.

INET 4709. Database Administration. (2 cr; A-F or Aud. Prereq-[4707 or CSCI 4707, CSCI 4061] or professional experience with SQL and basic operating systems) Relevant DBA concepts and technologies. How to plan, install, manage, and monitor relational database management systems. Working with database objects, architectural building blocks, configuration and hosting of db management systems, managing data and storage, production activities.

Innovation Studies (IS) College of Continuing Education


IS 5001. Introduction to Innovation Studies. (1-4 cr [max 4 cr]; A-F or Aud. Prereq-%) Key concepts/models from sociology, futures study, and business. Innovative, team leadership strategies. Definition/application of just-in-time concept. Life-long self-improvement skills.
College of Science and Engineering (IOFT)

IOFT 1 Fundamentals of Engineering Review (E.I.T. Refresher). (0 cr; S-N or Aud) Prereq-Bachelor's degree in engineering
For engineering graduates who are preparing for the Engineer-in-Training examination, the first of two written exams required for registration as a professional engineer. Review of mathematics, chemistry, materials, statics, dynamics, strength of materials, thermodynamics, electric circuits, fluid mechanics, and engineering economics.

IOFT 1101 Environmental Issues and Solutions. (4 cr; Stdtnt Opt. Prereq-High school chemistry or equiv, one yr high school algebra)
Importance of science in understanding/solving various environmental problems. Case studies. Laboratory exercises.


IOFT 1411 Exploring Careers in Science and Engineering. (1 cr; Prereq: Freshman)
How to research companies, industries, and careers. Career options related to major. Accessing career information. Gaining experience related to career objective; Resources for internships and full-time jobs. Interviewing. Developing a resume and cover letter. Seven-week course.

IOFT 1412 Preparing for Careers in Science and Engineering. (1 cr; Stdtnt Opt)
How to research companies, industries, and careers. Career options related to major. Accessing career information. Gaining experience related to career objective; Resources for internships and full-time jobs. Interviewing. Developing a resume and cover letter. Seven-week course.

IOFT 1511 Introduction to Engineering Design. (3 cr; S-N only)
History, career opportunities, portfolios, visualization, geometry, modeling, construction, analysis, documentation. Part of Project Lead the Way curriculum.

IOFT 1512 Principles of Engineering. (3 cr; S-N only)
Communication/documentation, design process, engineering systems, strength of materials, testing, reliability, statics/dynamics. Part of Project Lead the Way curriculum.

IOFT 1513 Digital Electronics. (5 cr; S-N only)
Fundamentals of digital electronics, number systems, gates, Boolean algebra, circuit design, adding, flip-flops, shift registers/counters, families/specifications, microprocessors, design topic. Part of Project Lead the Way curriculum.

IOFT 1514 Computer Integrated Manufacturing. (3 cr; S-N only)
Computer modeling, rapid prototyping, CNC machining, precision measurements, CAM software, robotics, control systems, rationale for CIM, components of CIM systems. Part of Project Lead the Way curriculum.

IOFT 1515 Overview of Civil Engineering and Architecture. (3 cr; S-N only)
Introduction to civil engineering and architecture, project planning, site planning, structural engineering, student presentations. Part of Project Lead the Way curriculum.

IOFT 1901 Freshman Seminar, Environment. (1-3 cr [max 4 cr]; A-F or Aud. Prereq-Freshman)
Topics vary. See Class Schedule.

IOFT 1904 Freshman Seminar: International Perspective. (1-3 cr [max 4 cr]; A-F or Aud. Prereq-Freshman)
Topics vary. See Class Schedule.

IOFT 1905 Freshman Seminar. (1-3 cr [max 4 cr]; A-F only. Prereq-Freshman)
Topics vary. See Class Schedule.

IOFT 1906 Freshman Seminar: Environment/Writing Intensive. (1-3 cr [max 4 cr]; A-F or Aud. Prereq-Freshman)
Topics vary. See Class Schedule.

IOFT 1910W Freshman Seminar, Writing Intensive. (1-3 cr [max 4 cr]; A-F or Aud. Prereq-FYFR)
Topics vary. See Class Schedule.

IOFT 4101W Communication Skills and Professional Practice. (3 cr; A-F or Aud. Prereq-Upper IT or #)
Non-technical skills/topics important in engineering/scientific work environment. Group/team dynamics, intellectual property, running meetings, professional ethics, effective communication, negotiation. Emphasizes realistic work scenarios requiring public speaking, teamwork, and writing.

IOFT 5101 Introduction to Engineering Design for Teachers. (3 cr Prereq-@)
History, career opportunities, portfolios, visualization, geometry, modeling, construction, analysis, documentation. Part of Project Lead the Way curriculum.

IOFT 5102 Principles of Engineering for Teachers. (3 cr Prereq-@)
Communication/documentation, design process, engineering systems, strength of materials, testing, reliability, statics/dynamics. Part of Project Lead the Way curriculum.

IOFT 5103 Digital Electronics for Teachers. (3 cr Prereq-@)
Fundamentals of digital electronics, number systems, gates, Boolean algebra, circuit design, adding, flip-flops, shift registers/counters, families/specifications, microprocessors, design topic. Part of Project Lead the Way curriculum.

IOFT 5104 Civil Engineering and Architecture. (3 cr Prereq-@)
Overview of civil engineering and architecture, their interrelationship/independence on each other. Students use software to solve real world problems. Project/site planning. Project documentation/presentation. Part of Project Lead the Way.

IOFT 5105 Gateway to Technology. (3 cr Prereq-@)
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 electrons, science of technology, and flight/space.

Insurance and Risk Management (INS)

Department of Finance

Curtis L. Carlson School of Management

INS 400 Corporate Risk Management. (2 cr; Stdtnt Opt)
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 4101 Employee Benefits. (2 cr; Stdtnt Opt. Prereq-4100 or 5100 or HRIR 3021 or #)
Design/administration of employee benefit plans and pension programs. Health insurance, disability plans. Salary reduction/deferred compensation programs, from social insurance to executive benefits. Multiple employer trusts. Alternative funding methods, including self-insurance. Ethical issues, legal liability, compliance with regulations.

INS 4200 Insurance Theory and Practice. (2 cr; Stdtnt Opt)
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.

INS 4201 Personal Financial Management. (2 cr; Stdtnt Opt)
In-depth treatment of estate planning and tax management techniques introduced in 5201. Charitable giving, probate process, use of health care directives, durable powers of attorney, revocable/irrevocable trusts, wills, asset distribution.


ID 5301. Introduction to Marxism. (3 cr; Stdt Opt) Marxist philosophy as a worldview and methodology for study of processes in nature, society, and thought; linkage between technological development and evolution of class-divided societies; economic theory of capitalism and socialism; transition to socialism theory and practice; racism, sexism, homophobia, and national conflicts; aesthetics.

ID 5311. Museum Exhibits: From Initial Vision to Practical Implementation. (2 cr; Stdt Opt. Prereq-# (for more information, call Kevin Williams at (612) 624-3898)) Introduces students to museum exhibit development culminating in the students designing a science exhibit. Study content research, educational strategies of informal science education, design, production stages, marketing, and evaluation. Multidisciplinary involving teachers in graphic art, biology, communication, marketing, science education, and others.

ID 5395. OMSAA: Pre-Law Program. (4 cr; Stdt Opt. Prereq-#) Non published course. OMSAA program for selected students to participate in a summer exchange program with William Mitchell Law School.

ID 5511. Community Leadership Seminar: Leadership, Ethics, and Community Building in Nonprofits. (3 cr; A-F only. Prereq-&5522, #) Cross-disciplinary course. Ethical leadership, community building, professional development.

ID 5522. Community Leadership Internship: Leadership, Ethics, and Community Building in Nonprofits. (3 cr; A-F only. Prereq-#5531) Cross-disciplinary course. Combines theoretical work in seminar with internship at local community, for 15-weeks, 12-15 hours/week.

ID 5561. HECUA Off-Campus Programs: Literature in Political, Social, and Historical Contexts. (4 cr; Stdt Opt. Prereq-#3562, &3563, #) Role of creative writers and literature in effecting social change.

ID 5562. HECUA Off-Campus Programs: Writing for Social Change: Creative Writing Workshop. (4 cr; Stdt Opt. Prereq-#3561, &3563, #) Testing theoretical perspectives of literature and social change by writing fiction, poetry, and creative nonfiction.

ID 5563. HECUA Off-Campus Study Program: Internship Seminar. (8 cr; Stdt Opt. Prereq-#3561, &3562, #) A project-based internship with professional-level responsibilities, with opportunities to integrate experience with learning from two companion courses.

ID 5564. Environment and Agriculture: Sustainable Food Systems. (4 cr; A-F only) Connection between the environment and agriculture. Firsthand experience of food systems. Environmental, economic, political, social and cultural issues that define modern farming. Seminars, field study trips, extended visits to sustainable Minnesota farms.

ID 5565. Environment and Agriculture: Sustainable Food Systems Internship. (2 cr; A-F only. Prereq-%) Students devote summer to practice of sustainable farming.


ID 5713. HECUA Off-Campus Study Program: Metro Urban Studies Term Internship Seminar. (8 cr; Stdt Opt. Prereq-#5711, #5712, %; contact CCLC, 345 Fraser H, 626-2044) Roots/strategies for addressing urban inequality/poverty. Interdisciplinary field study, seminar work, internship.


ID 5715. Civil Rights Movement: History and Consequences Internship. (2 cr; A-F only. Prereq-#5715) Internship.

ID 5716. City Arts: Creating Social Change - Art and Culture in Political, Social, Historical Context. (4 cr; Stdt Opt. Prereq-#3582, #3583, %) Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship.

ID 5718. City Arts: Arts Praxis - Social Justice Theory and Practice in the Field. (4 cr; Stdt Opt. Prereq-#3581, #3582, %) Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship.

ID 5783. HECUA Off-Campus Program: City Arts Internship Seminar. (8 cr; Stdt Opt. Prereq-#3582, #3583, %; contact CCLC, 345 Fraser H, 626-2044) Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship. Offered each spring semester.

ID 5791. HECUA Off-Campus Study Program: EnvironmentalSustainability: Adaptive Ecosystem Management. (4 cr; A-F only. Prereq-#3592, #3593, &3594, %) 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.

ID 5792. HECUA Off-Campus Study Program: EnvironmentalSustainability: Dimensions of Environmental Change. (4 cr; A-F only. Prereq-#3591, #3592, &3594, %) 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.

ID 3593. HECUA Off-Campus Study Program in Sustainability: Field Methods Research and Investigation. (4 cr; A-F only. Prereq-8591, 8592, 3594, %) Field research project on environmental issues. Students work with scientists and community members to conduct publishable research.

ID 3594. HECUA Off-Campus Study Program: Environmental Sustainability Internships. (4 cr; A-F only. Prereq-8591, 8592, 3593, %) 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.

ID 3901. Integrative Community Engagement Project Seminar. (1 cr; S-N only. Prereq-%, Community Engagement Scholars coordinator approval) Complements Integrative Community Engagement Project. Guidance, support, and structure to complete ICEP. Students reflect on previous academic/community work and prepare for next phase of their life.

ID 3993. Directed Study. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-#, %, @) Guided individual reading or study.

Interdisciplinary Archaeological Studies (INAR)

Department of Anthropology
College of Liberal Arts
INAR 5100. Topics in Interdisciplinary Archaeological Studies. (3 cr; A-F or Aud. Prereq-InAr grad major or #) Topics specified in the Class Schedule.

Interior Design (IDES)

DHA Interior Design

College of Design
IDES 1601. Interior Design Studio I. (4 cr; A-F or Aud. Prereq-Interior design pre-major) Theories used to solve interior design problems related to human behavior. Design process. Communication skills that are required for interior design profession.

IDES 1602. Interior Design Studio II. (4 cr; A-F only. Prereq-1601 or DHA 1601) with grade of at least C-, interior design pre-major) Introduction to interior design programming as method for understanding behaviors/requirements of humans in spaces. Use of color in three-dimensional environments. Developing communication skills. Problem-solving.

IDES 2196. Work Experience in Interior Design. (1-4 cr [max 8 cr]; S-N only. Prereq-Plan submitted/approved by [adviser, internship supervisor], written approval of supervisor.) Supervised work experience in business, industry, or government, related to student’s area of study.

IDES 2603. Interior Design Studio III. (4 cr; A-F only. Prereq-1602 or DHA 1602) with grade of at least C-, pass portfolio review, interior design major) Expanding presentation skills, visual communication of design process. Design of interior environment as influenced by neighborhood, adjacent structures, regional context, diverse cultures.

IDES 2604. Interior Design Studio IV. (4 cr; A-F or Aud. Prereq-[1603 or DHA 2603], [2612 or DHA 2612], [2621 or DHA 2621]) with grade of at least C-, interior design major) Relationship between exterior/interior design as it pertains to building construction. Methods/materials, principles of structure, building systems, construction details. Interface of electrical, HVAC, and plumbing systems in buildings.


IDES 2613. Lighting Design and Life Safety Issues. (4 cr; A-F or Aud. Prereq-2612 or DHA 2612 or #) Lighting design technology, aesthetics, and human factors for interior spaces. Codes, standards, and legislation related to built environment.

IDES 2621. Computer Aided Design: Interior Design. (4 cr; A-F only. Prereq-[Interior design major, pass portfolio review] or #) Application of two-/three-dimensional computer drawing in design/visualization of interior space. AutoCAD software used on Windows-based system.

IDES 3161. History of Interiors and Furnishings: Ancient to 1750. (4 cr; A-F or Aud) Study of European and American interiors and furnishings, including furniture, textiles, and decorative objects.

IDES 3162. History of Interiors and Furnishings: 1750 to Present. (4 cr; A-F or Aud. Prereq-3161 or DHA 4161 or #) Study of European/American interiors/furnishings, including furniture, textiles, and decorative objects.

IDES 3170. Topics in Interior Design. (1-4 cr [max 32 cr]; A-F or Aud) In-depth investigation of specific topic.

IDES 3196. Field Study: National or International. (1-4 cr [max 10 cr]; A-F or Aud. Prereq-#) Faculty-directed field study in national or international setting.

IDES 3601. Interior Design Studio V. (4 cr; A-F only. Prereq-[2402 or DHA 2402], [2604 or DHA 2604], [2615] with grade of at least C-, interior design major) 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. Prereq-[3605 or DHA 3605] with grade of at least C-) Interior design problems dealing with medium-scale spaces. Focuses on medium office design.

IDES 3614. Interior Design Ethics and Professional Practice. (4 cr; A-F or Aud. Prereq-2604 or DHA 2604) Business of interior design, professional ethics, responsible design. Responsibility to business, clients, colleagues, and community at large. Professional portfolios, credentials.

IDES 4160H. Honors Capstone Project. (2 cr [max 4 cr]; A-F only. Prereq-Interior design honors) Individualizes honors experience by connecting aspects of major program with special academic interests.

IDES 4193. Directed Study in Interior Design. (1-4 cr [max 8 cr]; A-F or Aud. Prereq-Undergrad, #) Independent study in interior design under tutorial guidance.

IDES 4196. Internship in Interior Design. (1-4 cr [max 4 cr]; S-N or Aud. +RM 4196, ADES 4196, GDES 4196, HSG 4196. Prereq-Completion of at least on-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, #) Supervised work experience relating activity in business, industry, or government to student’s area of study. Integrative paper or project may be required.

IDES 4607. Interior Design Studio VII. (4 cr; A-F only. Prereq-[3606 or DHA 3606] with grade of at least C-, 3614) Advanced interior design problems dealing with large scale spaces. Historic precedent, adaptive use, renovation.

IDES 4608. Interior Design Thesis. (4 cr; A-F only. Prereq-[4615W or DHA 4615W], [4607 or DHA 4607] with grade of at least C-) Comprehensive independent interior design project developed from student-conducted research/program developed in 4615W.

IDES 4615W. Interior Design Research. (2 cr; A-F only. Prereq-3606 or DHA 3606) Research methods for programming interior design solutions. Developing comprehensive program. Issues that affect interior design research/practices.

IDES 4616. Sustainable Commercial Interior Design. (3 cr; A-F only. Prereq-2613 or DHA 2613 or #) Students work with LEED for Commercial Interiors Standards. Intent, requirements, submittals, and technologies/strategies to achieve LEED CI standards in existing, new construction, or tenant improvement projects.
IBUS 5170. Topics in Interior Design. (1-4 cr [max 32 cr]; A-F or Aud. Prereq-Jr or sr or grad student) In-depth investigation of specific topic, announced in advance.

IBUS 5193. Directed Study in Interior Design. (1-4 cr [max 8 cr]; A-F or Aud. Prereq-Jr or sr or grad student) Independent study in interior design under tutorial guidance.

IBUS 5196. Field Study: National/ International. (1-10 cr [max 10 cr]; A-F or Aud. +GDES 5196, APST 5196, HSG 5196, DES 5196. Prereq-) Faculty-directed field study in national or international setting.

**International Business (IBUS)**

**International Program**

Curtis L. Carlson School of Management


IBUS 3100. International Business Topics. (4 cr [max 12 cr]; A-F only. Prereq-Carlson International Programs consent) Terms, concepts, and skills for analyzing fundamental business practices in global economy.


IBUS 4050. Management of Innovation and Change. (4 cr; A-F only. Prereq-[MGMT 3001 or MGMT 3010], CSOM upper div, #) Applying theories/research on how new organizational programs, products, and technologies are developed/implemented. Diagnostic skills. How innovation unfolds.


IBUS 4090. Corporate Strategy in Central and Eastern Europe. (4 cr; A-F only. Prereq-At least two of [FINA 3001 or FINA 6621 or IDSC 3001 or IDSC 4515 or MGMT 3001 or MGMT 3014 or MGMT 3040 or MGMT 3070 or MGMT 4005 or MGMT 4070 or MGMT 5019 or MKTG 3001 or MKTG 4020 or MKTG 4040 or MKTG 4070 or MKTG 4080 or OMS 3001 or OMS 3056], Carlson School International Programs consent) Unique opportunity to do live consulting project focused on regional strategy of major American company expanding operations in Central and Eastern Europe. Business practices of corporations operating in emerging markets. Marketing, operations and international business topics.

**Introduced Species and Genotypes (ISG)**

**College of Food, Agricultural and Natural Resource Sciences**

ISG 5020. Risk Analysis Modeling for Introduced Species and Genotypes. (1 cr; S-N only. Prereq-[5010 or equiv], #) Four-day workshop. Role/mechanics of mathematical modeling within ecological risk assessment. Integrated exercises, cases.

**Italian (ITAL)**

**Department of French and Italian**

ITAL 100. Reading Italian in the Arts and Sciences. (0 cr; S-N only) 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. (5 cr; Stdnt Opt. +ITAL 4001) Emphasis on the four language skills (listening, speaking, writing, and reading) and on Italian culture.

ITAL 1002. Beginning Italian. (5 cr; Stdnt Opt. +ITAL 4002. Prereq-1001 or #) Listening, speaking, writing, reading. Italian culture.

ITAL 1003. Intermediate Italian. (5 cr; Stdnt Opt. +ITAL 4003. Prereq-1001-1002) Grammar review and development of intermediate level of proficiency in listening, reading and writing. Emphasis on some cultural aspects of contemporary Italy.

ITAL 1004. Intermediate Italian. (5 cr; Stdnt Opt. +ITAL 4004. Prereq-1001, 1002, 1003) Grammar review and development of intermediate level of proficiency in listening, reading, writing and speaking. Emphasis on some cultural aspects of contemporary Italy.

ITAL 1022. Accelerated Beginning Italian. (5 cr; Stdnt Opt. Prereq-ITAL [in high school or community college], score on placement exam too low to enter 1003) Accelerated review of 1001 followed by material covered in 1002.

ITAL 1305. Imagining Italy: Italian and Italian-American Culture, History, and Society Through Film. (4 cr; Stdnt Opt. +ITAL 3837) Italian-American history, culture, and society through films. Name of the Rose, Cinema Paradiso, Big Night, Life is Beautiful. Lectures and class discussions. From different disciplinary perspectives. Urban life, nationalism, opera, terrorism, violence, food, family, emigration, ethnicity, desire.


ITAL 3201. Reading Italian Texts: Poetics, Rhetoric, Theory. (3 cr [max 9 cr]; Stdnt Opt. +ITAL 5201. Prereq-3015) A basic course in understanding the rhetorical and poetic aspects of language and literature; interpretive methods and theoretical concepts.

ITAL 3203. Italian Travelers: From the Enlightenment to the Present. (5 cr [max 12 cr]; Stdnt Opt. +ITAL 5203. Prereq-3015) Examines literary representations of travel, migration, immigration, exile, and tourism in Italy from the Enlightenment to the present.

ITAL 3219. Literature of the Despotisms. (4 cr [max 16 cr]; Stdnt Opt. Prereq-3015) Prose, verse, and drama of Italy under the Signorie and foreign invaders, 1400-1650.

ITAL 3305. Staging the Self: Theater and Drama in Modern Italy. (4 cr [max 16 cr]; Stdnt Opt. +ITAL 5305. Prereq-3015) Theatrical representations of the self in modern Italy. Particular attention given to issues of identity, gender, and class in theatrical works ranging from Alfieri’s Mirra, Pirandello’s Enrico IV to Dacia Maraini’s Clytemnestra.


ITAL 3550. Topics in 19th Century Italy. (3 cr [max 12 cr]; Stdnt Opt. Prereq-3015 or #) 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 and listed in Course Guide.

ITAL 3640. Topics in Italian Studies. (3 cr [max 12 cr]; Stdnt Opt. Prereq-1004) Topics of interest in studies of Italian or Italian American culture of 20th century. Literary, critical, cultural, historical, or social issues, a specific author, genre, or other topic. Readings could be literary, critical, historical, or political. Content varies by instructor, see Course Guide.

ITAL 3806. Negotiating the Terms: Italian Film and Literature. (3 cr [max 12 cr]; Stdnt Opt. +ITAL 5806) Examines cinematic representations of Italian literary texts; introduces the basic tools of literary and film analysis; discusses how both media impact Italian culture. Taught in English.

ITAL 4001. Beginning Italian. (2 cr; Stdnt Opt. +ITAL 1001. Prereq-Grad student or #) Meets concurrently with 1001. See 1001 for course description.
ITAL 4001. Beginning Italian. (2 cr; Stdnt Opt. =ITAL 1002. Prereq-Grad student or #) Meets concurrently with 1002. See 1002 for course description.

ITAL 4002. Intermediate Italian. (2 cr; Stdnt Opt. =ITAL 1003. Prereq-Grad student or #) Meets concurrently with 1003. See 1003 for course description.

ITAL 4004. Intermediate Italian. (2 cr; Stdnt Opt. =ITAL 1004. Prereq-Grad student or #) Meets concurrently with 1004. See 1004 for course description.

ITAL 4303. Drama and Spectacle in Italy, 1200-1770. (4 cr [max 16 cr]; Stdnt Opt. Prereq-3015) Italian drama, festival and spectacle from the medieval sacred plays to the reform of the theater by Goldoni.

ITAL 4970. Directed Readings. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-#) Meets unique requirements decided on by faculty member and student. Individual contracts list contact hours, number of credits, written and other work required.

ITAL 5201. Reading Italian Texts: Poetics, Rhetoric, Theory. (3 cr [max 12 cr]; Stdnt Opt. =ITAL 3201. Prereq-grad student or #) Rhetorical/poetic aspects of language and literature. Interpretive methods, theoretical concepts.

ITAL 5209. Trecento Literature: Ruling the Canon. (4 cr [max 16 cr]; Stdnt Opt. Prereq-3015, 3201 or #) Works of Boccaccio and Petrarch and their role in establishing the canon of Italian vernacular literature. Taught in English also as MeSt 5610.

ITAL 5305. Staging the Self: Theater and Drama in Modern Italy. (4 cr [max 16 cr]; Stdnt Opt. =ITAL 3305. Prereq-grad student or #) Theatrical representations of the self in modern Italy. 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.

ITAL 5337. Nation and Narration: Writings in the 19th Century. (4 cr [max 16 cr]; Stdnt Opt. Prereq-3015) Introduces the construction of modern Italian national identity by examining the role that literature plays in this process. Works by Manzoni, Foscolo, Leopardi, Giosa, Verga, Serao, and Deledda studied in the context of a range of sociopolitical and cultural issues.

ITAL 5502. Making of Modern Italy: From the Enlightenment to the Present. (3 cr [max 12 cr]; Stdnt Opt. =ITAL 3502. Prereq-grad student or #) Italian literary, cultural, and symbolic practices, from Enlightenment to present.

ITAL 5609. World of Dante. (4 cr [max 8 cr]; Stdnt Opt) 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 5806. Negotiating the Terms: Italian Film and Literature. (3 cr [max 12 cr]; Stdnt Opt. =ITAL 3806. Prereq-grad student or #) Cinematic representations of Italian literary texts. Basic tools of literary/film analysis. How both media impact Italian culture. Taught in English.

Japanese (JPN)

Department of Asian Languages and Literatures

College of Liberal Arts


JPN 3001. Japanese Calligraphy I. (2 cr; Stdnt Opt. Prereq-1012) Basic tools (e.g., brush, sumi ink stick, rice paper). Practice in basic brush strokes. Different characters or hieragana in expressions that are appropriate for season or that have cultural significance. Taught entirely in Japanese.


JPN 5040. Readings in Japanese Texts. (3 cr [max 9 cr]; A-F or Aud. Prereq-4042 or equiv or #) Students read authentic materials of various types to increase reading/speaking ability. Topics specified in Class Schedule.

JPN 5071. Communicative Competence for Japan-Oriented Careers. (4 cr; Stdnt Opt. Prereq-4041 or 4042 or #) Effective communication using spoken and written Japanese in contexts likely to be encountered by a career-oriented professional in Japan.


Jewish Studies (JWST)

Department of Classical and Near Eastern Studies

College of Liberal Arts

JWST 1034. Introduction to Jewish History and Civilization. (3 cr; Stdnt Opt. =JWST 3034, RELS 1034, RELS 3034) Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts.
of daily life. Emphasizes political, social, and cultural contexts that shaped development of Jewish ideas, practices, and institutions.

**JWST 1083. Jesus the Jew.**

(3 cr; Stndt Opt. + RELA 1083, JWST 3083, CLAS 1083)


**JWST 1701. Beginning Yiddish I.**

(3 cr; Stndt Opt.)

Introduction to Yiddish.

**JWST 1702. Beginning Yiddish II.**

(3 cr; Stndt Opt.)

First year, second semester introduction to Yiddish.

**JWST 1905. Freshman Seminar.**

(3 cr; Stndt Opt.)

Topics specified in Class Schedule.

**JWST 1909W. Remembering to Forget: The Holocaust and Its Afterlife.**

(3 cr; A-F or Aud. + FREN 1909W. Prereq: Fr or less than 30 cr)

Holocaust as incomparable event and as ultimate measure of all traumatic events in history. Testimonies, artistic endeavors, popular culture, and anti-Semitism both urge to study Holocaust as singular event and drawbacks of hyper-memory bordering on amnesia.

**JWST 3034. Introduction to Jewish History and Civilization.**

(3 cr; Stndt Opt. + RELS 1034, JWST 1034, RELS 3034)

Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shaped development of Jewish ideas, practices, and institutions.

**JWST 3083. Jesus the Jew.**

(3 cr; Stndt Opt. + RELA 1083, JWST 3083, CLAS 1083)


**JWST 3112. Jewish Mysticism, Magic, and Kabbalah.**

(3 cr; A-F or Aud. + RELS 5112, RELS 3112, JWST 5112)

Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hekhalot, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar/the Bahir. Schools of Providence, Gerona, and Zohar. Tension between legal/mystical aspects, magical theurgic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.

**JWST 3113. African American and Jewish American Relations in the United States.**

(3 cr; Stndt Opt.)

Historical and social scientific study of relations between African Americans and Jewish Americans in the U.S. during the 20th century. Includes immigration, work, cultures, gender, and alliance, and conflict.

**JWST 3116. Jews and Popular Culture in 20th Century United States.**

(3 cr; Stndt Opt. + AMST 3116)

Many types of 20th century American popular culture shaped, in part, by European Jewish immigrants and their native born descendants. How theater, film, music, humor, and television were affected by the Jews’ innovations, social marginality, their wish to assimilate and to resist assimilation to the culture. How the nation was and was not reshaped in the process.

**JWST 3201. The Bible: Context and Interpretation.**

(3 cr; Stndt Opt.)


**JWST 3224. Dead Sea Scrolls.**

(3 cr; Stndt Opt. + RELS 3224, RELS 5224, JWST 5224)

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.

**JWST 3315. Contemporary Israeli Literature in English.**

(3 cr; Stndt Opt. + FREN Knowledge of Hebrew not required)

Modern short stories and poetry. Works of Agnon, Yizhar, Hazaz, Yeheshua, Greenberg, Amihai, Pagis, and others. Alienation, the crisis of faith, war, holocaust, Jews and Arabs.

**JWST 3521W. History of the Holocaust.**

(3 cr; Stndt Opt. + HIST 3727W, HIST 3727, RELS 3521W)


**JWST 3522. History of the Arab-Israeli Conflict.**

(3 cr; Stndt Opt.)

The events leading to the re-establishment of the State of Israel in 1948 and subsequent conflicts and negotiations up to present. Zionism and Arab resistance, Great Powers’ involvement, War of Independence/First Palestine War, subsequent conflicts and their aftermath.

**JWST 3632W. Jewish Women in the United States.**

(3 cr; Stndt Opt. + AMST 3632W)

Analyzes of the cultural, social, economic, and religious conditions of European Jewry and American society in the 19th- and 20th-centuries that structured the lives of American Jewish women.

**JWST 3711. Intermediate Yiddish I.**

(4 cr; Stndt Opt. + JWST 4711. Prereq: Beginning Yiddish or equiv of one year of Yiddish study or #)

Continuing studies in Yiddish.

**JWST 3712. Intermediate Yiddish II.**

(4 cr; Stndt Opt. + JWST 4712. Prereq: 3711 or #)

Continuing studies in Yiddish.
Journalism and Mass Communication (JOUR)

School of Journalism and Mass Communication

College of Liberal Arts

JOUR 1001. Introduction to Mass Communication. (3 cr; A-F or Aud. Prereq: Pre-jour or non-jour major) Historical, economic, political, legal, ethical, and social aspects of mass communication.

JOUR 1001H. Honors: Introduction to Mass Communication. (3 cr; A-F or Aud. Prereq: Honors, Pre-jour or non-jour major) Historical, economic, political, legal, ethical, and social aspects of mass communication.


JOUR 1910W. Freshman Seminar. (3 cr; max 6 cr; A-F or Aud. Prereq: Freshman) Topics specified in Class Schedule.

JOUR 3004W. Honors: Information for Mass Communication. (3 cr; A-F only. Prereq: Honors, [jour major or mass comm minor or approved IDIM major or ICP major or BIS major]) Information resources for professional/academic work in mass communication. Techniques for locating, retrieving, appraising, and verifying information acquired from public records, libraries, research institutions, databases, the Internet, observation, and interviews.

JOUR 3004W. Information for Mass Communication. (3 cr; A-F or Aud. Prereq: Pre-req. Major or major or approved IDIM major or ICP major or BIS major; prerequisites do not apply to IQI sections) Information resources for professional/academic work in mass communication. Techniques for locating, retrieving, appraising, and verifying information acquired from public records, libraries, research institutions, databases, the Internet, observation, and interviews.

JOUR 3005. Mass Media Effects. (3 cr; A-F or Aud. Prereq: Non-jour major or [jour major, course approval in program plan] or [pre-jour, adviser approval]) Mass media as tools to change beliefs, attitudes, and behavior. How/when media has such effects, whether media effects will change as a function of trends in media development. Social science perspective of media effects.

JOUR 3006. Visual Communication. (3 cr; A-F or Aud. Prereq: Non-jour major or [jour major, course approval in program plan] or [pre-jour, adviser approval]) Visual media, role of images in mass communication. Social, cultural, historical, psychological approaches.

JOUR 3007. The Media in American History and Law: Case Studies. (3 cr; A-F or Aud. Prereq: Non-jour major or [jour major, course approval in program plan] or [pre-jour, adviser approval]) Media in socioeconomic-political-technological context of a spatial period. Focuses on legal context and ethics questions.

JOUR 3008. Mass Communication Processes and Structure. (3 cr; A-F or Aud. Prereq: Non-jour major or [jour major, course approval in program plan] or [pre-jour, adviser approval]) Communication theories as they relate to mass communication processes. Major structural aspects of mass communication systems.

JOUR 3101. News Reporting and Writing. (3 cr; A-F or Aud. Prereq: [3004W or &3004W or 3004V or &3004V], [jour major or jour minor or approved IDIM major or ICP major or BIS major], typing skill) Basic news gathering, journalistic writing. Developing story ideas. Problems associated with handling of news/features. Professional standards/responsibilities.

JOUR 3101H. Honors: News Reporting and Writing. (3 cr; A-F or Aud. Prereq: [3004W or &3004W or 3004V or &3004V], [jour major or jour minor or approved IDIM major or ICP major or BIS major], honors, typing skill) News gathering, journalistic writing. Developing story ideas. Problems associated with handling of news/features. Professional standards/responsibilities.

JOUR 3155. Publications Editing. (3 cr; A-F or Aud. Prereq: [3004W or 3004V or 3101H, [jour major or approved IDIM major or ICP major or BIS major]) Improving copy through copyediting/rewriting. Selecting/editing news-editorial content for newspapers, magazines, and online services. Experience using news judgment to present information in print and on the Web.

JOUR 3173W. Magazine Writing. (3 cr; A-F or Aud. Prereq: [3004W or 3304V, 3101 or 3101H], [jour major or approved IDIM major or ICP major or BIS major]; prerequisites do not apply to IDL sections) Writing feature articles for consumer/trade publications. Market free-lance methods.

JOUR 3201. Principles of Strategic Communication: Advertising. (3 cr; A-F or Aud. Prereq: [3004V or &3004V or 3004V or &3004V], [jour major or mass comm minor or design comm premajor or major or ICP design premajor or major or approved IDIM major or ICP major or BIS major]) Market analysis, positioning, creative/media strategies, evaluation. Structure of advertising industry. Economic, social, and regulatory contexts influencing advertising.

JOUR 3202. Principles of Strategic Communication: Public Relations. (3 cr; A-F or Aud. Prereq: [3004V or &3004V or 3004V or &3004V], [jour major or mass comm minor or approved IDIM major or ICP major or BIS major]) History/development of public relations practice/principles. Professional writing assignments in various institutional settings. Analysis/evaluation of public relations in contemporary society.

JOUR 3241. Creative Strategy and Copywriting. (3 cr; A-F or Aud. Prereq: [3004W or 3004V, 3201], [jour major or approved IDIM major or ICP major or BIS major]) Advertising appeals/strategy. Advertising for print/broadcast. Individual/group projects.
JOUR 3251. Strategic Communication Research. (3 cr; A-F or Aud. Prereq-3004W or 3004V, 3159 or 3201 or 3202, [jour major or approved IDIM major or ICP major or BIS major])
Introduction to applied quantitative/qualitative research methods in advertising/public relations campaign development, management, and evaluation.

JOUR 3279W. Public Relations Writing and Campaign Tactics. (3 cr; A-F or Aud. Prereq-3004W or 3004V, 3159 or 3201 or 3202, [jour major or approved IDIM major or ICP major or BIS major])
[professional jour track, #] Public relations tactics. Emphasizes professional skills in writing for various audiences/purposes.

JOUR 3321. Basic Media Graphics. (3 cr; A-F or Aud. Prereq-3004V or 3004W or &3004W, &3159 or 3201 or 3202, [jour major or approved IDIM major or ICP major or BIS major])
[pre-jour, adviser approval]

JOUR 3451. Electronic News Writing and Reporting. (3 cr; A-F or Aud. Prereq-3004V or 3004W, 3101 or 3101H, [jour major or approved IDIM major or ICP major or BIS major])
News writing, reporting, video photography/editing, on-air delivery.

JOUR 3551. Economics of New Media. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Economic issues related to traditional/new media companies and emerging communications technologies.

JOUR 3552. Internet and Global Society. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Structure/processes of the Internet and global society in a comparative context. The Internet, via the World Wide Web, as an ideal site to explore how/why societies come to see/know the world and its issues the way they do.

JOUR 3614. History of Media Communication. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Historical perspective on tools of communication, from earliest times to present. Impact of new technologies on society.

JOUR 3615. History of the Documentary. (3 cr; A-F or Aud. Prereq-Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)

JOUR 3741. People of the Color and the Mass Media. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Past present depictions of people of color in movies, literature, radio/TV, etc. against anthropological, psychological, and sociological knowledge/experience. Emphasizes personal/political effects of media depictions.

JOUR 3745M. Mass Media and Popular Culture. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Mass media’s role in formation of popular culture and cultural discourse. Prevalent media metaphors, caricatures, and stereotypes. Social/commercial pressures influencing media representation.

JOUR 3745H. Honors: Mass Media and Popular Culture. (3 cr; A-F or Aud. Prereq-Honors or non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Mass media’s role in formation of popular culture and cultural discourse. Prevalent media metaphors, caricatures, and stereotypes. Social/commercial pressures influencing media representation.

JOUR 3771. Mass Media Ethics: Moral Reasoning and Case Studies. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Overview of ethical dilemmas faced by journalists, advertisers, and public relations and communications specialists. Case studies, ethical principles/theories, professional codes of ethics, standards that have been used by mass media.

JOUR 3776. Mass Communication Law. (3 cr; A-F or Aud. Prereq-Non-jour major or jour minor or approved IDIM major or ICP major or BIS major or #)
Brief historical background, First Amendment rights, basic law of defamation, free press and fair trial, access to news, access to the press, privacy, contempt, obscenity, regulation of broadcasting/Advertising.

JOUR 3796. Mass Media and Politics. (3 cr; A-F or Aud. Prereq-Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)

JOUR 3990. Special Topics in Mass Communication: Professional. (1 cr [max 2 cr]; A-F or Aud. Prereq-[[3004W or 3004V, 3101] or [[&3004V or &3004W, &3101]], jour major in professional journalism track)] Professional-skills-learning opportunity not regularly offered. Topics specified in Class Schedule.

JOUR 3991. Special Topics in Mass Communication: Context. (3 cr [max 6 cr]; A-F or Aud. Prereq-Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Context course not regularly offered. Topiesspecified in Class Schedule.

JOUR 3993. Directed Study. (1-3 cr [max 6 cr]; A-F or Aud. Prereq-Jour major or jour minor or approved IDIM major or ICP major or BIS major, %, @)
Directed study projects.

JOUR 3996. Directed Internship. (1 cr [max 3 cr]; S-N or Aud. Prereq-Jour major, %)
Internship supervised by communications organization at which student is working and by student’s academic sponsor.

JOUR 4171. Capstone: Covering the Arts. (3 cr; A-F or Aud. Prereq-[[3004W or 3004V, 3101 or 3101H], [jour major or approved IDIM major or ICP major or BIS major] or #) 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.

JOUR 4193. Walter H Brovold and John Cameron Sim Community Newspaper Practicum. (3 cr; A-F or Aud. Prereq-3004W or 3004V, 3101 or 3101H or 3201, [jour major or approved IDIM or BIS or ICP]) Field-based practicum at community newspaper in metropolitan area. Students work with editors, reporters, or advertising staff to produce news, features, or advertising material. Weekly meetings with instructor, readings, projects, guest lectures.

JOUR 4242. Advertising Portfolio Development. (3 cr; A-F or Aud. Prereq-3004W or 3004V, 3201, 3241, [jour major or approved IDIM or BIS or G]) Creative development, conceptual thinking. Students develop creative ideas based on strategies. Emphasizes print. Applying creative thought to advertising ideas. How to put a book together.

JOUR 4259. Cases in Strategic Planning and Thinking. (3 cr; A-F or Aud. Prereq-[[3004W or 3004V, [3159 or 3201 or 3202], 3251, [jour major or approved IDIM major or ICP major or BIS major] or #])
Strategic communication cases related to campaigns/issues in business, government, education, or community.

JOUR 4261. Advertising: Media Strategy. (3 cr; A-F or Aud. Prereq-[[3004W or 3004V, [3159 or 3201 or 3202], 3251, [jour major or approved IDIM major or ICP major or BIS major] or #])
Strategic elements of media planning, media consumption patterns/trends. Context/role of media plan within marketing/advertising. Information resources, terminology, and tools used in media planning and negotiations.

JOUR 4263. Strategic Communication Campaigns. (4 cr; A-F or Aud. Prereq-3004W or 3004V, 3201 or 3202, 3251, [3179 or 3241 or 3279 or 4159 or 4259 or 4261], MKTG 3001, [jour major or approved IDIM major or ICP major or BIS major])
Developing campaign strategy/tactics. Emphasizes planning/decision-making skills. Students work in groups with varying specializations.
JOUR 4272. Interactive Advertising. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])
Interactive advertising models, how they differ from traditional ad models. Issues related to creating, measuring, pricing, and targeting interactive ads. Interactive ads in global, legal, and ethical contexts.

JOUR 4274W. Advertising in Society. (3 cr; A-F or Aud. Prereq-Jour major or mass comm minor or approved IDIM major or ICP major or BIS major)]
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. Electronic Photojournalism. (3 cr; A-F or Aud. Prereq-[3004W or 3004V], 3102, [jour major or approved IDIM major or ICP major or BIS major])
Practice of photojournalism in contemporary digital environment. Visual storytelling, digital processing, professional/ethical issues.

JOUR 4303. Capstone: Documentary Photojournalism. (3 cr; A-F or Aud. Prereq-[3004W or 3004V], 4302, [jour major or approved IDIM major or ICP major or BIS major] or #)
Students conceptualize, research, and produce documentary projects consisting of edited photographs and accompanying text. Projects presented in print or online. Examples of differing approaches, exemplary documentary work.

JOUR 4321. Publication Graphics. (3 cr; A-F or Aud. Prereq-3004, 3321, [jour major or IDIM major or ICP major or BIS major])
Design process applied to production of magazines, brochures, newsletters. Computer as tool to prepare electronic documents for printing.

JOUR 4451. Capstone: Advanced Electronic News Writing and Reporting. (3 cr; A-F or Aud. Prereq-[3004W or 3004V], [3101 or 3101H], 3121, 3451, [jour major or approved IDIM major or ICP major or BIS major])
Designing and producing electronic news/packaging. Lecture, lab.

JOUR 4452. Capstone: Electronic Newscast Producing. (3 cr; A-F or Aud. Prereq-[3004W or 3004V], [3101 or 3101H], 3121, 3451, [jour major or approved IDIM major or ICP major or BIS major])
Planning, writing, and producing live TV newscasts. Lecture, lab.

JOUR 4551. New Media Culture. (3 cr; A-F or Aud. Prereq-Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)
Impact of “new media” (all forms of internet communication, wireless media, and combinations of “old” and “new” media) on current/future cultures. How new media may change ways we communicate, distribute, and process information. Social impact.

JOUR 4721. Mass Media and U.S. Society. (3 cr; A-F or Aud. Prereq-Non-jour major or jour major with course appr on prog plan or pre-jour, adviser approval)

JOUR 4721H. Mass Media and U.S. Society. (3 cr; A-F or Aud. Prereq-Honors, [non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])

JOUR 4731H. Honors Senior Seminar. (1 cr; A-F or Aud. Prereq-Jour major, honors)
Discussion section in conjunction with capstone course in professional track or 4xxx or 5xxx course in mass communication track.

JOUR 4733H. Honors Thesis Seminar. (3 cr; A-F only. Prereq-Jour major, [jr or sr], honors, grad student)
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.

JOUR 4801. Global Communication. (3 cr; A-F or Aud. Prereq-Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])

JOUR 4990. Special Topics in Mass Communication: Professional. (3 cr [max 6 cr]; A-F or Aud. Prereq-Jour major or approved IDIM major or ICP major or BIS major)
Professional-skills-learning opportunity not regularly offered. Topics specified in Class Schedule.

JOUR 4990H. Honors: Special Topics in Mass Communication. (3 cr [max 6 cr]; A-F or Aud. Prereq-Honors, [jour major or approved IDIM major or ICP major or BIS major])
Professional-skills-learning opportunity not regularly offered. Topics specified in Class Schedule.

JOUR 4999. Special Topics in Mass Communication: Context. (3 cr [max 6 cr]; A-F or Aud. Prereq-Jour major or jour minor or approved IDIM major or ICP major or BIS major)
Topics specified in Class Schedule.

JOUR 4999H. Honors: Special Topics in Mass Communication. (3 cr [max 6 cr]; A-F or Aud. Prereq-Honors, [jour major or approved IDIM major or ICP major or BIS major])
Topics specified in Class Schedule.

JOUR 5004. Advanced Information for Mass Communication. (3 cr; A-F or Aud. Prereq-Enrollment in M.A. in health journalism)

JOUR 5101. Health Writing. (5 cr; A-F; Aud. Prereq-[3004W or 3004V], [3101 or 3101H], 3121, [jour major or approved ICP major or BIS major or IDIM major] or enrolled in MA in health journalism or grad student or #)
Overview/techniques of news reporting/writing. Complex health topics. Techniques of other forms of health writing, including health feature writing and health new media/communication.

JOUR 5131. Capstone: In-Depth Reporting. (3 cr; A-F or Aud. Prereq-[[3004W or 3004V], [3101 or 3101H], 3121], [jour major or approved IDIM major or ICP major or BIS major] or grad student)
Obtaining/analyzing digital data for computer-assisted reporting that can be published on various media platforms. Using spreadsheets/databases to manage information, find news stories, and produce maps/graphics.

JOUR 5174. Capstone: Magazine Editing and Production. (4 cr; A-F or Aud. Prereq-[3004W or 3004V], [3101 or 3101H], 3121, 3402, [jour major or approved IDIM major or ICP major or BIS major] or grad student)
Writing, editing, illustration, design, layout, and photography of print or Web magazine. Emphasizes reporting, telling substantive stories. Students work in groups with varying specializations.

JOUR 5195. Online Media Creation and Design. (3 cr; A-F or Aud. +JOUR 8195, JOUR 5195H. Prereq-[3004W or 3004V], 3101, 3121, jour major or #)
Concepts/development of online media products. Health news/informational opportunities in new media.

JOUR 5195H. Online Media Creation and Design. (3 cr; A-F or Aud. +JOUR 8195, JOUR 5195H. Prereq-[3004W or 3004V], 3101, 3121, jour major or #)
Concepts/development of online media products. Health news/informational opportunities in new media.

JOUR 5251. Psychology of Advertising. (3 cr; A-F or Aud. Prereq-Jour major or min or design comm or graphic pre-design or design comm or graph design or IDIM/ICP/BIS or #)
Psychological principles, research techniques, and applications in advertising/selling. Consumer attitudes/behavior. Psychological mechanisms upon which effectiveness of advertisements/commercials depends.
Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.

JOUR 5316. Theories of Visual Communication. (3 cr; A-F or Aud. Prereq: Instructor approval for non-jour majors or [jour major or jour minor or approved IDIM major or approved ICP major or approved BIS major] or Grad student) Perspectives on study/analysis of visual communication. Message structure, systems of production, use of visual media. Contributions from sociology, anthropology, psychology, and history.

JOUR 5501. Communication and Public Opinion. (3 cr; A-F or Aud. Prereq: Non-jour major or jour major with course appr on prog plan or prejour with adviser approval) Theories of communication, persuasion, attitude change. Functions of interpersonal/mediated communication in diffusion of information and in opinion formation.

JOUR 5541. Mass Communication and Public Health. (3 cr; Stdnt Opt. Prereq: Jour Major or jour major or jour major with course appr on prog plan or prejour with adviser approval) Intersection of mass media, public health, and communication in understanding intended/unintended campaign effect. Role of health journalism. Decisions that inform media-based interventions.

JOUR 5542. Theory-based Health Message Design. (3 cr; A-F or Aud. Prereq: Enrolled in MA in health journalism or grad student or Jour major or mass comm minor or approved IDIM major or ICP major or BIS major) Best practices for message design across media/contexts. Students apply concepts to design health campaign messages that affect various audiences. Implications of theories of message engagement for current public health practice.

JOUR 5543. Public Health Campaign Evaluation. (3 cr; A-F or Aud. Prereq: [JOUR 5541. enrolled in MA in health journalism or grad student or jour major or mass comm minor or approved IDIM major or ICP major or BIS major] or #) Draws upon the campaign evaluation literature. Recommendations on evaluation research design. Cross-sectional, experimental, and time-based designs. Focuses on summative efforts.

JOUR 5552. Law of Internet Communications. (3 cr; A-F or Aud. Prereq: Non-jour major or jour major with course appr on prog plan or [pre-jour with adviser approval] Which traditional legal doctrines apply to the Internet. Developing law of communication on Internet, global/ international affairs.

JOUR 5606W. Literary Aspects of Journalism. (3 cr; A-F or Aud. +ENGW 5606. Prereq: Jour major or jour minor or approved IDIM major or ICP major or BIS major; IDL sections are open to non-majors; prereqs do not apply to IDL sections) Literary aspects of journalism as exemplified in, and influenced by, works of American/British writers, past/present. Lectures, discussions, weekly papers, critiques.

JOUR 5616. History of the Documentary. (3 cr; A-F or Aud. Prereq: Non-jour major or jour major with course appr on prog plan or [pre-jour with adviser approval]) Social history of photography, film, video. Informational, documentary, propaganda, and entertainment functions of visual communication. Rise and influence of visual media industries and of public-image making.

JOUR 5725. Management of Media Organizations. (3 cr; A-F or Aud. Prereq: Non-jour major or jour major with course appr on prog plan or [pre-jour, adviser approval]) Introduction to concepts/principles of media management. Strategic planning, leadership, organizational strategies, ethical/illegal issues. Working in teams. Balance sheets, income statements. Motivating/promoting people.

JOUR 5771. Media Ethics: Principles and Practice. (3 cr; A-F or Aud. Prereq: Non-jour major or jour major, course appr on prog plan or [pre-jour, adviser approval]) Connecting theoretical approaches to media ethics with real-life case studies. History of ethical standards in print, broadcast, photojournalism, public relations, and advertising. Making ethical judgments in complex situations.

JOUR 5777. Contemporary Problems in Freedom of Speech and Press. (3 cr; A-F or Aud. +LAW 6030. Prereq: Jour major or jour minor or approved IDIM major or ICP major or BIS major) Legal/constitutional derivation of freedom of press/speech. Emphasizes case law, statutes, judicial theories. Leading cases in privacy torts, prior restraint decisions, access to courts/government, including via the Internet. Legal-research techniques.

JOUR 5825. World Communication Systems. (3 cr; A-F or Aud. Prereq: Non-jour major or jour major with course appr on prog plan or [pre-jour with adviser approval]) Mass media systems of world, described/analyzed regionally/nationally. Historical roots. Social, economic, cultural context. Contemporary conditions/prospects. Relevance of journalism/mass communication to international affairs.

JOUR 5990. Special Topics in Mass Communication: Professional. (3 cr [max 6 cr]; A-F or Aud. Prereq: Jour major or approved IDIM major or ICP major or BIS major) Professional-skills-learning opportunity not regularly offered. Topics specified in Class Schedule.

JOUR 5991. Special Topics in Mass Communication: Context. (3 cr [max 6 cr]; A-F or Aud. Prereq: Jour major or jour minor or approved IDIM major or ICP major or BIS major) Special context topics not regularly offered. Topics specified in Class Schedule.

JOUR 5993. Directed Study. (1-3 cr [max 6 cr]; A-F or Aud. Prereq: Jour major or jour minor or approved IDIM major or ICP major or BIS major) GPA of at least 3.00, @, %, ¥ Directed study/projects.

Kinesiology (KIN)

School of Kinesiology

College of Education and Human Development

KIN 1050. Beginning Military Physical Fitness Training. (1 cr [max 4 cr]; A-F or Aud) 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 1375. Play Behavior. (3 cr; Stdnt Opt) Overview of play behavior across species, cultures, social settings. Relationship of play between physical/psychological development, role of sports/games in play, design of toys/playgrounds.

KIN 1871. Survey of Kinesiology, Recreation, and Sport. (3 cr; A-F or Aud) Professional practice and disciplinary dimensions of kinesiology, recreation, and sport. Subdisciplines, relevant issues, practical applications.


KIN 3001. Lifelong Health and Wellness. (3 cr; A-F or Aud) 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 3050. Advanced Military Physical Fitness Training. (1 cr [max 4 cr]; A-F or Aud. Prereq: 9 cr of 1050 or ¥) 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.
KIN 3101. Human Anatomy. (2 cr; A-F or Aud) Beginning anatomy course for nonkinesiology students pursuing coaching licensure or for nonprofessional students interested in an exercise science approach to anatomy. Focus on a regional approach to muscle, nerve, and circulatory anatomy of the limbs and trunk and a systematic anatomy approach for circulatory, respiratory, digestive, urinary, and nervous systems. Students are encouraged to voluntarily attend arranged demonstrations of human cadaver dissections.

KIN 3112. Introduction to Biomechanics. (4 cr; A-F only. Prereq-[PHYS 1101 or PHYS 1201 or PHYS 1301 or PHYS 1401 or 1107], [3027 or 3111 or ANAT 3001 or ANAT 3601 or ANAT 3611 or INMD 3001 or INMD 3610]); 3385 recommended) Mechanical principles governing human motion. Human bone, muscle, and neuropsychology. Measurements of human performance. Clinical/ applied sport biomechanics. Lab introduces technology for assessing human motor function such as electromyography or force sensors.


KIN 3114. Prevention and Care of Athletic Injuries. (3 cr; A-F or Aud. Prereq-[3027 or 3111], CEHD student) or #) Principles in athletic training for prevention/ care of injury. Taping/bracing techniques. Lab.

KIN 3126W. Sport and Exercise Psychology. (3 cr; A-F or Aud. Prereq-Kin major or #) Thoughts, feelings, and behaviors of people in physical activity contexts. Foundations approach to sport psychology.

KIN 3131W. History and Philosophy of Sport. (3 cr; A-F or Aud. Prereq-Kin major or #) Introductory description and interpretation of the historical and philosophical development of physical education and sport from primitive societies to 20th century civilization.

KIN 3132. Introduction to Motor Development Across the Lifespan. (3 cr; A-F or Aud. Prereq-Kin major or #) Developmental aspects of human movement behavior/learning. Life span change of motor skills.

KIN 3135. Introduction to Motor Learning and Control. (3 cr; A-F or Aud. Prereq-Kin major or #) Main theoretical ideas/research that have advanced motor control/learning over last three decades.

KIN 3136. Mental Skills Training for Sport. (2 cr; A-F or Aud) 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 3143. Organization and Administration of Sport. (3 cr; A-F or Aud. Prereq-Kin major or #) How to organize/administer sports/activities. Practice/class organization, meet/game organization, facility/equipment needs, finances.

KIN 3151. Measurement and Evaluation in Kinesiology. (3 cr; A-F or Aud. Prereq-Kin major or #) Introduction to philosophy of measurement/ evaluation in physical education, exercise science, sport, and leisure. Test/assessment selection, construction, evaluation, and administration. Interpretation of scores.

KIN 3168. Soccer Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach soccer.

KIN 3169. Volleyball Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach volleyball.

KIN 3171. Baseball Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach baseball.

KIN 3172. Basketball Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach basketball.

KIN 3173. Football Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach football.

KIN 3174. Golf Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach golf.

KIN 3175. Gymnastics Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach gymnastics.

KIN 3176. Ice Hockey Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach ice hockey.

KIN 3177. Swimming and Diving Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach swimming and diving.

KIN 3178. Tennis Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach tennis.

KIN 3179. Track and Field Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory and skill development necessary to coach track and field.

KIN 3180. Wrestling Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory/skill development necessary to coach wrestling.

KIN 3184. Lacrosse Coaching Theory and Skill Development. (2 cr; A-F only. Prereq-[Enrolled in coaching program or KIN major or #], skills sufficient for participating in drills/game/match/context for demonstration/teaching purposes) Coaching theory/skill development necessary to coach lacrosse. Proficiency for being able to adequately demonstrate/teach lacrosse skills.

KIN 3327. Teaching Physical Education in the Elementary School. (2 cr; A-F or Aud. Prereq-Elem ed major) Overview of the elementary physical education process with focus on a classroom teacher’s perspective and needs. Representative experiences include participation, lecture, micro-teaching, final test.

KIN 3385. Human Physiology. (4 cr; A-F or Aud. Prereq-[3027 or 3111 or equiv], kin major) or #) 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.

KIN 3505. Intro to Human-Centered Design. (3 cr; Stdnt Opt. = KIN 5505) 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 [max 10 cr]; S-F or Aud. Prereq-#) On-the-job supervised practical experience in the fields of sport and exercise under a specialist in a particular area of study or emphasis.

KIN 3993. Directed Study in Kinesiology. (1-10 cr [max 10 cr]; A-F only. Prereq-#) 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.

KIN 3993H. Directed Study in Kinesiology: Honors. (1-10 cr [max 10 cr]; A-F only. Prereq-Kin honors, #) Student-selected clinical or research experience.

KIN 4001H. Honors Seminar in Kinesiology. (3 cr [max 6 cr]; A-F or Aud. Prereq-Kinesiology honors) 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.

KIN 4133. Perceptual-Motor Control and Learning. (3 cr; A-F or Aud. Prereq-[3112, 3120, 3125, 3135, Kin major or #]) 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.

KIN 4136. Embodied Cognition. (3 cr; A-F or Aud. Prereq-4133 or #) Introduction to relations between physical behavior and mental activity. Cognitive, emotional, and social aspects. Concepts of embodied cognition, their relation to traditional concepts of mind/body. Lifespan development, empirical research.

KIN 4214. Health Promotion. (3 cr; A-F only. Prereq-1871 or #) Behavioral/environmental theories of health promotion. How to develop/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 or Aud. Prereq-[4385 or PHSL 3051, or equiv]. Kin major or #) 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.

KIN 4520. Current Topics in Kinesiology. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-Upper div in KIN or REC or SMGT or coaching or #) Issues in kinesiology or in areas not normally available through regular curriculum offerings.

KIN 4641. Training and Conditioning for Sport. (3 cr; A-F or Aud. Prereq-[KIN 4385 or exercise physiology course], [upper level undergrad or M.Ed. or grad student]) Physiology/methodology of training/conditioning athletes. Students construct training/conditioning programs for athletes. Different components that enhance training adaptation.

KIN 4697. Student Coaching and Seminar. (3 cr; S-N or Aud. Prereq 5697. Prereq-[coaching minor or certificate] student, GPA of at least 2.50) Student coaching practicum under supervision of mentor. Seminar classes. Development of integrative project.

KIN 4741. Strength and Power Development and Program Design. (3 cr; A-F or Aud. Prereq-Kinesiology major or coaching minor or coaching certificate or kinesiology Med or #) How to scientifically design resistance training programs and modify them for special populations (athletes, children, seniors, etc.). How exercise prescription design works in applied field.

KIN 4841. Athletic Performance and Environmental Considerations. (3 cr Prereq-4385 or 4641 or #) Physiological mechanisms controlling body’s response to training. Environmental factors that affect athletic performance, such as heat, humidity, and altitude.

KIN 4941. Applied Sport Science. (3 cr Prereq-4981 or #) Introduction to varied contributions of sport sciences to athletic performance. Evaluation of historical research’s contributions toward modern day research questions.

KIN 4981. Understanding Kinesiology Research. (3 cr; A-F only. Prereq-Intro statistics recommended) Prepares students to critically analyze research specific to kinesiology.

KIN 5001. Foundations of Human Factors/Ergonomics. (3 cr; A-F or Aud. +HUMF 5001) 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 5103. Developmental/Adapted Physical Education. (3 cr; A-F or Aud) Introduction to physical education for students with disabilities, emphasizing conceptual, organizational, and administrative issues. Topics include historical and legal foundations, service components, individualized education plans, professional roles, and assessment of movement skills.

KIN 5104. Physical Activities for Persons with Disabilities. (3 cr; A-F or Aud) 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 Aud. Prereq-Kin or Rec grad student or MEd student) Steps in planning/building facilities for athletics, physical education, and sport for college, professional, and public use.

KIN 5115. Event Management in Sport. (3 cr; A-F or Aud. Prereq-Grad student, #) Techniques/principles of planning, funding, and managing sport events. Collegiate championships, non-profit events, benefits, professional events.

KIN 5122. Applied Exercise Physiology. (3 cr; A-F or Aud. Prereq-4385 or equiv or #) 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.

KIN 5123. Motivational Interventions in Physical Activity. (3 cr; A-F only. Prereq-3126W or grad student) Psychological principles related to physical activity (PA). Delivery of motivational interventions for physical activity. Motivational PA interventions. Two papers, one presentation, two exams.

KIN 5126. Sport Psychology. (3 cr; A-F only. Prereq-3126W or equiv or #) Theory/research in sport psychology. Human behavior in sport and physical activity settings.

KIN 5136. Psychology of Coaching. (3 cr; Stdnt Opt) Psychological dimensions of coaching across age levels, including coaching philosophy, leadership, communication skills, motivation, and mental skills training for performance enhancement.


KIN 5171. Foundations of Kinesiology. (3 cr; A-F or Aud. Prereq-Kin major or #) Introduction to the emerging field of kinesiology, broadly conceived as the study of human movement. Development and emergence of the term kinesiology and the scholarly, political, and educational ramifications of its development.
KIN 5196. Practicum: Developmental/Adapted Physical Education. (1-4 cr [max 6 cr]; S-N or Aud. Prereq-5103 or S5103 or 5761 or 5981 or #; KIN undergraduate pre-teaching with Sr status are limited to 2 practicum hrs) Observation of, participation in physical education instruction for students with disabilities. Current issues in developmental/adapted physical education. Exchange of ideas/problems.


KIN 5371. Sport and Society. (3 cr; A-F or Aud. Prereq-[3126W, grad student] or #) 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.

KIN 5375. Competitive Sport for Children and Youth. (3 cr; Stdnt Opt) 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 Disease Prevention and Management. (3 cr; A-F or Aud. Prereq-Undergrad [physiology or biology]) Exercise and disease prevention with modifications required because of special considerations associated with aging, gender differences, environmental conditions, or presence of medical conditions.


KIN 5435. Advanced Theory and Techniques of Exercise Science. (3 cr; A-F or Aud. Prereq-[3385, 4385, Kin major] or #) Theoretical constructs, in-depth description of procedures used in exercise science research and clinical settings. Laboratory exercises, lectures.

KIN 5461. Foundations of Sport Management. (3 cr; A-F or Aud. Prereq-Kin or rec or postbac or grad student or #) Theories/techniques in administration/management of sport enterprises. Organizational theory/policy, practical examples of sport management skills/strategies.

KIN 5485. Advanced Electrocardiogram Interpretation. (3 cr; A-F only. Prereq-[3385, 4385] or #) Placement and interpretation. Clinical exercise testing hands-on experience in electrocardiogram for resting and exercise testing situations.

KIN 5505. Human-Centered Design - Principles and Applications. (3 cr; Stdnt Opt. +KIN 3505) 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. Women in Sport and Leisure. (3 cr; A-F or Aud. +REC 5511) Critically examines women's involvement in/contributions to sport, physical activity, and leisure.

KIN 5601. Sport Management Ethics and Policy. (3 cr; A-F or Aud. Prereq-MEd or grad student or #) 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.

KIN 5631. Programming and Promotion in Sport. (3 cr; A-F or Aud. Prereq-Kin or Grad student) Introduction to marketing concepts as they apply to sport industry. Consumer behavior, market research, marketing mix, corporate sponsorship, licensing. Discussion, practical application.

KIN 5641. Scientific Theory and Application of Training and Conditioning in Sport. (3 cr; A-F only. Prereq-4385 or SPST 3641 or SPST 4641 or exercise physiology course or #) 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.

KIN 5696. Practicum in Kinesiology. (1-6 cr [max 6 cr]; S-N only. Prereq-[Kin MEd or grad student], #) Practical experience in kinesiology under supervision of a University faculty member and an agency supervisor.

KIN 5720. Special Topics in Kinesiology. (1-8 cr [max 8 cr]; Stdnt Opt. Prereq-Kin upper div undergrad or grad student or #) Current issues in the broad field and subfields in kinesiology, or related coursework in areas not normally available through regular offerings.

KIN 5722. Human Factors Psychology. (3 cr; A-F or Aud. Prereq-Grad student or #) Psychological principles that underlie human interactions with technological systems. Techniques/methodologies to assess faulty/incorrect system design. Emphasizes human-centered approaches. Rigorous evaluation of human-machine interaction.


KIN 5725. Organization and Management of Physical Education and Sport. (3 cr; A-F or Aud. Prereq-Grad/initial licensure or #) 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.

KIN 5801. Legal Aspects of Sport and Recreation. (4 cr; A-F or Aud. Prereq-Kin or rec major) 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. Prereq-[Upper div undergrad or grad student] in KIN, #) Governance structure, policies, and procedures in intercollegiate athletics. Careers in college athletics as coach, administrator, athletic trainer, counselor, etc.

KIN 5941. Neural Basis of Movement. (3 cr; A-F or Aud. Prereq-[3111, CBN 1027 or equiv], [Phsl 3051 or equiv]) Overview of various neural subsystems involved in controlling human/primate sensorimotor behavior. Effects of brain lesions on overt behavior, possibilities for rehabilitation. Systems theory approach. Lectures, seminars, class presentations.

KIN 5987. Professional Skills and Grant Writing for Health Sciences. (2 cr Prereq-Grad student) Introduction to structure/function of different organizations (e.g., NIH, AHA). Writing/reviewing grants/manuscripts. Preparing for a job in academia.

KIN 5992. Readings in Kinesiology. (1-9 cr [max 9 cr]; A-F only. Prereq-[Kin upper div undergrad or MEd or grad student], #) Independent study under tutorial guidance.

KIN 5995. Research Problems in Applied Kinesiology. (1-6 cr [max 6 cr]; A-F only. Prereq-[Kin upper div undergrad or MEd or grad student], 15 cr of major coursework [including 4981 or 5981], #) Selected topics in physical activity and human performance.

Korean (KOR)

Department of Asian Languages and Literatures
College of Liberal Arts


KOR 3993. Directed Studies. (1-3 cr [max 12 cr]; Stdnt Opt. Prereq—#, %, @) Directed study in topics of Korean literature, culture, language, or linguistics.


KOR 4041. Advanced Readings in Modern Korean. (4 cr; Stdnt Opt. Prereq-3032 or equiv or #) Speaking, listening, reading, writing. Content/ task-based course. Students study vocabulary and read novels, journals, and selections from Korean history/arts. Writing summaries, reports, and simple reaction papers.

KOR 4042. Advanced Readings in Modern Korean. (4 cr; Stdnt Opt. Prereq-4041 or equiv or #) Speaking, listening, reading, writing. Content/ task-based course. Students study vocabulary and read novels, journals, and selections from Korean history/arts. Writing summaries, reports, and simple reaction papers.

KOR 5140. Readings in Sino-Korean Texts. (5 cr [max 9 cr]; Stdnt Opt. Prereq-4003 or equiv or #) 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.

Laboratory Medicine and Pathology (LAMP)

Department of Laboratory Medicine and Pathology

Medical School

LAMP 4172. Pathology for Allied Health Students. (3 cr; Stdnt Opt. Prereq-Regis allied health program, anatomy course, physiology course or #) General and organ system pathology.


LAMP 5125. Chronobiology. (2-6 cr [max 6 cr]; O-N or Aud) How to interpret biologic time series and how to use them as practice as well as in designing chronobiology experiments. Chronobiologic procedures of data collection and analysis, interpretation of the output in clinical practice.

Landscape Architecture (LA)

Department of Landscape Architecture

College of Design

LA 101W. Introduction to Design Thinking. (4 cr; A-F or Aud) Introduction to theories and processes that underpin design thinking. Survey of the design professions; the power of design; and interactions between humans and their natural, social, and designed environments.

LA 1201. Learning from the Landscape. (3 cr; A-F or Aud) 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. (3 cr; A-F or Aud. LA 5201) Development of basic skills in perceiving/ representing material environment. Sketching/drawing conventions of visual phenomena/ forms.

LA 1401. The Designed Environment. (3 cr; A-F or Aud) 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 2302. Computer-Aided Representation for Environmental Design. (3 cr; Stdnt Opt. Prereq-1301, 2301) Use of computer-aided design (CAD) technologies in developing, representing, and communicating environmental design ideas. Adobe Creative Suite, Autodesk AutoCADs, DynasCAPEs ESRI ArcMap, etc. Integration of images generated from various computer and hand-rendered technologies.

LA 3001. Understanding and Creating Landscape Space. (3 cr; A-F or Aud. Prereq-B.E.D major or pre-LA student or #) Introduction to spatial design issues at all scales.

LA 3002. Informants of Creating Landscape Space. (3 cr; A-F or Aud. Prereq-3001, Arch 3401, 3501) Development of the design program. Site analysis of landscape space. Design exercises show how design program and site analysis inform creation of landscape space in developing schematic designs at varying geographic scales and in different geographic settings. Lectures, readings, discussions.

LA 3003. Case Studies in Sustainable Landscape Planning and Design. (3 cr; Stdnt Opt) Sustainable landscape design/planning practices. Integrative potential between practices and changes in global biodiversity, quality of air/water resources, development/consumption of resources, and climate. Practice-/metrics-based selection, deployment, and management of sustainable design.

LA 3004. Regional Landscape Planning. (3 cr; Stdnt Opt. Prereq-SE 3131 or GEOG 3561) Critical environmental parameters affecting growth/development of metropolitan areas. Students assess these parameters and prepare multi-functional land use plan for a defined locale.

LA 3204. Holistic Landscape Ecology and Bioregional Practice. (3 cr; A-F or Aud. Prereq-[EEB 3001 or ESPM 3108] or BED major or equiv) Bioregional practice, how it responds to landscape ecology of great bioregions. Scientific/cultural basis for bioregional design and landscape sustainability.
LA 3413. Introduction to Landscape Architecture, Architectural History. (3 cr; A-F or Aud) Study of landscape architecture'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. (3 cr; A-F or Aud) Dynamic relationships between environmentally designed places and biological/physical contexts. Integration of created place and biological/physical contexts. Case studies, student design.

LA 3514. Making the Mississippi. (3 cr; A-F or Aud. + LA 5514) 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 Aud. Prereq-BED major or BED minor or #) Theory applications of landform 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.


LA 4096. Internship in Landscape Design and Planning. (1 cr; S-N only. Prereq-1301, 2301, 2302, 3001, 3002, 3003) Supervised professional experience in environmental design firms or government agencies. Students perform professional services and relate these experiences to their education in environmental design.


LA 5201. Making Landscape Spaces and Types. (6 cr; A-F for Aud. Prereq-B.E.D. accelerated status or LA grad or #) 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 landform, plants, and structures to give physical, emotional, cognitive, and social definition to created places.

LA 5202. Landscape Analysis Workshop. (1 cr; S-N or Aud) 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 Aud. Prereq-LA major or #; recommended for both BED and Grad students) Design studio experience drawing on ecological, cultural, aesthetic influences to explore development of design ideas responsive to ecological issues and human experience.

LA 5204. Metropolitan Landscape Ecology. (3 cr; Stdnt Opt. Prereq-BED accelerated status or LA grad student or #) Theories/principles of holistic landscape ecology. People, nature, and environmental stewardship in metropolitan landscapes. Urban areas, rural areas that provide food, water, energy, and recreation.


LA 5351. AutoCAD I. (3 cr; Stdnt Opt. Prereq-B.E.D. major or LA grad or #; may not be taken for graduate credit) Basic concepts, tools, and techniques of computer-aided drawing. Introduction to current AutoCAD Release software. Strategies and techniques for producing dimensioned and annotated drawings. Introduction to 3-D drawing capabilities. Use of dimension variables, attributes, blocks, symbols, and creation of customized menus.

LA 5352. AutoCAD II. (3 cr; Stdnt Opt. Prereq-Arch 5351 or LA 5351. B.E.D. major or LA grad or #; may not be taken for graduate credit) Intermediate concepts, tools, and techniques of computer-aided drawing with current AutoCAD Release software. Strategies and techniques for producing dimensioned and annotated drawings. Use of dimension variables, attributes, blocks, symbols, and creation of customized menus.

LA 5371. Computer Methods I. (3 cr; Stdnt Opt. Prereq-B.E.D. accelerated status or LA grad or #) Introduction to current techniques, programs, and new editions of computer programs, and their application to landscape architecture computing.

LA 5372. Computer Methods II. (1 cr; S-N or Aud. +ARCH 5371. Prereq-B.E.D. accelerated status or LA grad or #) Current techniques and computer programs, and their application to landscape architecture computing.

LA 5373. Computer Methods III. (3 cr; Stdnt Opt. +ARCH 5375. Prereq-LA grad or #) Advanced techniques and computer programs, and their application to landscape architecture computing in design, theory, and technology.


LA 5400. Topics in Landscape Architecture. (1-3 cr [max 12 cr]; Stdnt Opt. Prereq-B.E.D. accelerated status or LA grad or #) Current topics in landscape architecture. Taught by regular or visiting faculty in their areas of specialization.

LA 5401. Directed Studies in Emerging Areas of Landscape Architecture. (1-3 cr [max 12 cr]; Stdnt Opt. Prereq-#) Independent studies under the direction of landscape architecture faculty.

LA 5403. Directed Studies in Landscape Architecture Technology. (1-6 cr [max 12 cr]; Stdnt Opt. Prereq-#) Independent studies under the direction of landscape architecture faculty.

LA 5404. Directed Studies in Landscape Architecture Design. (1-6 cr [max 12 cr]; Stdnt Opt. Prereq-#) Independent studies under the direction of landscape architecture faculty.

LA 5405. Interdisciplinary Studies in Landscape Architecture. (1-6 cr [max 12 cr]; A-F or Aud. Prereq-#) Research, planning, or design projects. Topics vary.

LA 5406. Urban Design Journal. (3-4 cr [max 4 cr]; A-F or Aud. Prereq-Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark) Methods and theories in urban design and human behavior. Students develop journal as tool for experiencing, analyzing, and recording the urban landscape, its fabric, spatial elements, and individual components, and for analyzing design solutions.

LA 5407. Landscape Architecture Studio. (3-4 cr [max 4 cr]; A-F or Aud. Prereq-Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark) Individual and capstone projects focusing on urban issues; design process in Danish conditions; solutions based on knowledge of Danish problems in landscape and urban design and an understanding of how these problems are solved within Danish and European contexts.

For a guide to course numbers, symbols, and abbreviations, see page 376. 555
LA 5408. Landscape Architecture, Architecture, and Planning. (3-4 cr [max 4 cr]; A-F or Aud. Prereq-Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark) Methods and theories in urban design and human behavior. Students develop urban design journal as tool for experiencing, analyzing, and recording the urban landscape, its fabric, spatial elements, and individual components, and for analyzing design solutions.

LA 5413. Introduction to Landscape Architectural History. (3 cr; A-F or Aud. Prereq-One course in history at 1xxx or higher) Introductory course examines the multiple roots of landscape architecture by examining the making of types of landscapes over time. Emphasis on ecological and environmental issues, and issues related to political, economic, and social contexts of landscape architectural works.

LA 5431. History of Landscape Architecture: Individual Influences. (3 cr; A-F or Aud) Assessment of influences of individuals on formation of the profession of landscape architecture from 1800 to present. Lectures, presentations, field trips, readings, papers, projects.

LA 5514. Making the Mississippi. (3 cr; A-F or Aud. +LA 5514) Critical environmental parameters affecting growth/development of metropolitan areas. Students assess these parameters and prepare a multi-functional land use plan for a defined locale.

LA 5571. Landscape Construction: Landform Systems and Spatial Performance. (3 cr; A-F or Aud. Prereq-Accelerated BED student or LA grad student) Theory and professional applications of landform 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.

LA 5572. Plants in Design. (3 cr; A-F or Aud. Prereq-[5201, 5203, plant identification course] or #) Design principles for using plants in landscape. Cultural/ocular principles in design projects of various scales. Lectures, presentations, field trips, readings, projects.

LA 5573. Landscape Technology: Introduction to Geographic Information Systems. (3 cr; A-F or Aud, Prereq-jr or sr B.E.D. major or LA grad or #) GIS as an analytical tool to solve geographical problems of regional landscape design and resource management. Topics include application techniques, analytical procedures, data characteristics, data sources, input/output methods, and implementation.

LA 5721. Proseminar in Metropolitan Design. (3 cr; A-F or Aud. +ARCH 5721. Prereq-[[Arch 5711 or equiv], enrollment in CMD prog or #) Reading seminar. Evolution of the contemporary city. Dynamics that created contemporary urban spatial patterns. Planning/design theories that have guided public interventions in the built environment. Thematic texts, classroom discussions.

LA 5790. Special Topics in Metropolitan Design. (3 cr [max 6 cr]; A-F or Aud. +ARCH 5790. Prereq-Enrollment in CMD prog or #)

Language, Teaching, and Technology (LGTT)

College of Liberal Arts


LGTT 5710. Special Topics in Language Teaching and Technology. (1 cr [max 3 cr]; Stdnt Opt) Examine, evaluate, apply specific area of technology to K-higher education, second/foreign language teaching/learning in classroom, independent study, distance education environments.


Latin (LAT)

Department of Classical and Near Eastern Studies

College of Liberal Arts


LAT 1002. Beginning Latin II. (5 cr; Stdnt Opt, Prereq-Grade of at least [C- or S] in 1001 or #) Latin grammar/syntax. Graduated readings from Roman authors, including Cicero, Catullus, and Roman comedy.


LAT 3112. Intermediate Latin, Recitation. (3 cr; Stdnt Opt. Prereq-concurrent registration in 3111; previous exper in another foreign language desirable) Drills and composition exercises. Students must also register for 3111 when taking this course.

LAT 3199. Latin AP Credit. (4-8 cr [max 8 cr]; No grade. Prereq-Score of [3 or 4 or 5] on [AP Vergil or AP Latin Literature] exam)


LAT 3960H. Honors Course: Advanced Undergraduate Latin Reading. (3 cr [max 12 cr]; Stdnt Opt. Prereq-Regis in honors program or high ability as indicated by transcript) Student attends Latin 33xx, 3440, or 3450 and does additional work for honors credit.

LAT 3993. Directed Studies. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-# and %) Guided individual reading or study.

LAT 495W. Major Project. (4 cr; Stdnt Opt. Prereq-[Greek-Latin or Latin major], three 3xxx Latin courses, #, %) 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.

LAT 5001. Intensive Latin. (3 cr; Stdnt Opt. +LAT 1001, LAT 1111H, Prereq-Prev experience in another foreign language is desirable) Covers material usually taught over two semesters.

LAT 5003. Intermediate Latin Prose: Graduate Student Enrollment. (3 cr; Stdnt Opt. +LAT 3003. Prereq-[Grade of at least [C- or S] in 1002 or 5001 or #], grad student) Reading Latin. Reviews elementary grammar, vocabulary, and morphology. Introduction to major themes/issues in Latin literature/Roman culture. Meets with 3003.


LAT 5100. Advanced Reading. (3 cr [max 18 cr]; Stdnt Opt. Prereq-[[[3004 or equiv], at least two yrs of college level Latin] or #) Reading in Latin texts/authors. Texts/authors vary.

LAT 5200. Advanced Reading in Later Latin. (3 cr [max 18 cr]; Stdnt Opt. Prereq-3004 or equiv or # or CNES grad student) Reading course. Authors of late antiquity, Middle Ages, and Renaissance. Topics specified in Class Schedule.

LAT 5701. Latin Prose Composition. (3 cr; Stdnt Opt. Prereq-Grad student or #) Latin grammar, syntax, diction, and prose style. Graduated exercises in prose composition.

LAT 5703. Epigraphy. (3 cr; Stdnt Opt. Prereq-Grad student or #) 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.

LAT 5704. Latin Paleography. (3 cr; Stdnt Opt. Prereq-Grad student or #) Analysis of various hands used in manuscripts of Latin authors, with attention to date/provenance. Transmission of ancient Latin literature.

LAT 5705. Introduction to the Historical-Comparative Grammar of Greek and Latin. (3 cr; Stdnt Opt. =GRK 5705. Prereq-Two yrs college [Greek or Latin] or #) Historical/comparative grammar of Greek/ Latin, from proto-Indo-European origins to classical norms.

LAT 5706. History of Latin. (3 cr; Stdnt Opt. Prereq-Grad student or #) Reading/analysis of documents illustrating stylistic registers/evolution of Latin language, from its earliest attestations through Middle Ages.

LAT 5800. Sight Reading for Graduate Students. (1 cr [max 6 cr]; S-N only. Prereq-Enrolled in a grad program in Department of Classical/Near Eastern Studies) Practice in reading Latin texts at sight.

LAT 5993. Directed Studies. (1-4 cr [max 18 cr]; Stdnt Opt. Prereq-#, %) Guided individual reading or study.

LAT 5994. Directed Research. (1-12 cr [max 20 cr]; Stdnt Opt. Prereq-Grad student or #) Guided research on original topic chosen by student.

LAT 5996. Directed Instruction. (1-12 cr [max 20 cr]; Stdnt Opt. Prereq-Grad student or #) Supervised teaching internship.

Latin American Studies (LAS)

Institute for Global Studies

College of Liberal Arts

LAS 3019. Hispanic Cultures of Latin America. (3 cr; Stdnt Opt. =ANTH 3019. Prereq-ANTH 1003 or 1005 or #) Overview of Hispanic cultures from Mexico to South America. Economy, underdevelopment. Family, ritual kinship. Gender, religion, values, ideology, change. Several concepts are introduced to explore continuity/change.

LAS 3114. International Perspectives: U.S.-Mexico Border Culture. (3 cr; Stdnt Opt. =CHIC 3114, CHIC 5114) Examines the relations of Mexico and the United States from an international perspective, with an central focus on the cultural interchange in the border lands between the United States and Mexico, using both literary and historical materials.

LAS 3401W. Early Latin America to 1825. (4 cr; A-F or Aud. =HIST 3401W) Begins with American and Iberian societies before contact. Emphasizes social, cultural, and economic interactions among Native Americans, African slaves, Europeans, and peoples of mixed race during colonial period.

LAS 3402W. Modern Latin America 1825 to Present. (4 cr; Stdnt Opt. =HIST 3402W) National and contemporary period 1825 to present, with emphasis on social, cultural, political, and economic change.

LAS 3405. Latin American Women's Lives. (3 cr; Stdnt Opt. Prereq-WoSt 1001, WoSt 1002 or WoSt 1003 or #) An interdisciplinary approach to understanding women's lives in Latin America. Use of ethnography, history, poetry, fiction, and “testimonio” to understand the conditions of women's lives in Latin America.

LAS 3427. History of Cuba and Puerto Rico. (3 cr; Stdnt Opt. =CHIC 3427, HIST 3427) Historical development of Cuba and Puerto Rico from pre-Columbian times through Spanish conquest to the present. Conquest and colonization, slavery, Hispanic Caribbean society and culture, Operation Bootstrap, Cuban Revolution.

LAS 3441. Chicana/o History to 1900. (3 cr; Stdnt Opt. =CHIC 3444, HIST 3444, HIST 3443) The history of the Mexican people from the 16th through 19th centuries. Historical theories of colonialism, expansion, economy, assimilation, migration and settlement; race, class and gender, political, social and cultural interaction, and conflict.

LAS 3442. Chicana/o History: 1900 to Present. (3 cr; Stdnt Opt. =HIST 3442, CHIC 3442) The 20th-century Chicana/o experience: migration, repatriation, the Bracero program, politics, the Chicana/o movement, work, society, and culture.

LAS 3502W. Foundations of Brazilian Culture. (3 cr; Stdnt Opt. =PORT 3502W, PORT 3502V. Prereq-Port 3003 or equiv) Emphasis on Brazilian modern society. History, culture (music, art, cinema, literature, intellectual thought, popular culture, media), and social problems (ethnicity, tropical deforestation). Discussions and readings are in Portuguese.

LAS 4121W. Latin America. (4 cr; Stdnt Opt. =GEOG 4121W) Interplay of natural environment and history in shaping contemporary Latin America. Political ecology of natural resources, food supply and distribution, urbanization and the informal economy, migration, ethnicity, and the role of the state and international agencies in domestic economies.

LAS 4445. Housing in World Perspective. (3 cr; A-F or Aud. Prereq-DHA 2401, DHA 2403 or #) Evaluation of theories and concepts that allow an understanding of housing policies and housing choices of individuals, families, and households in developed and developing countries.

Learning and Academic Skills (LASK)

Department of Educational Psychology

College of Education and Human Development

LASK 1001. Mastering Skills for College Success. (2 cr; Stdnt Opt) Practical assistance to develop efficient, effective learning/academic performance skills. Improve reading, memorization, test-taking, critical thinking; identify academic and career Learning styles, motivation, life skills, and their relation to successful academic performance.

LASK 1101. Academic Refresher. (1 cr; S-N or Aud. Prereq-#) 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.

LASK 1102. Academic Success. (2 cr [max 4 cr]; S-N only. Prereq-#; preference given to students on academic probation or returning from academic suspension) 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.

Liberal Studies (LS)

College of Continuing Education

LS 5100. Liberal Studies Seminar. (1-4 cr [max 24 cr]; A-F or Aud. Prereq-%) Interdisciplinary topics.

LS 5125. Field Experience. (1-8 cr [max 8 cr]; A-F or Aud. Prereq-MLS student or #) Off-campus observation, experience, and evaluation in interdisciplinary field of study.

LS 5950. Special Topics. (1-4 cr [max 12 cr]; A-F or Aud. Prereq-%) Interdisciplinary topics.

LS 5993. Directed Studies. (1-4 cr [max 15 cr]; Stdnt Opt. Prereq-Grad student, %) Guided individual reading or study.

Linguistics (LING)
Institute of Linguistics, ESL, and Slavic Languages and Literatures
College of Liberal Arts
LING 1701. Language and Society. (4 cr; Stdnt Opt)
Role of language in human social interaction; linguistic indicators of social status and attitudes; language and sex roles; linguistic ecology; language planning for multilingual communities; implications for education and public policy.
LING 1904. Freshman Seminar (IP). (3 cr [max 6 cr]; Stdnt Opt. Prereq-Fr)
Topics specified in Class Schedule and Course Guide.
LING 1905. Freshman Seminar. (3 cr [max 6 cr]; Stdnt Opt. Prereq-Fr or no more than 30 cr)
Topics specified in Course Guide.
LING 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F for Aud. Prereq-Freshman)
Topics specified in Class Schedule.
LING 3001. Introduction to Linguistics. (4 cr; Stdnt Opt. =LING 5001, LING 3001H)
LING 3001H. Honors: Introduction to Linguistics. (4 cr; Stdnt Opt. =LING 5001, LING 3001H, LING 5001. Prereq-Honors candidate or #)
LING 3051H. Honors: Thesis. (3 cr; Stdnt Opt. Prereq-Linguistics honors candidate or #)
Supervised planning and research for honors thesis to be completed in 3052.
LING 3052V. Honors: Thesis. (3 cr; A-F only, Prereq-3051)
Supervised research, writing, and revision for honors thesis begun in 3051.
LING 3101W. Languages of the World. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #)
Survey of language families of the world. Classifying languages genetically/typologically. Historical relationships among languages.
LING 3301. Phoneticics. (4 cr; Stdnt Opt. =LING 5301. Prereq-3001 or 3001H or 5001 or concurrent registration 3001 or concurrent registration 3001H or concurrent registration 5001 or #)
LING 3601. Historical Linguistics. (3 cr; Stdnt Opt. =LING 5601. Prereq-3001 or #)
Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages.
LING 3707. Ethnic Bilingualism in the United States. (3 cr; Stdnt Opt. Prereq-Some knowledge of linguistics and a 2nd language helpful)
Social, behavioral, and cognitive aspects of bilingualism; the linguistic experience of American immigrants and ethnic minority groups, especially Asian Americans; attitudes and public policies with regard to linguistic minorities; field experience in bilingual communities.
LING 3721. Bilingualism. (3 cr; Stdnt Opt. =LING 5721. Prereq-3001 or 3001H or 5001)
LING 4002. Linguistic Analysis. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #)
Techniques for analyzing phonological, morphological, and syntactic data from a variety of languages. Discovering, stating, and justifying generalizations. Comparing diverse languages.
LING 4201. Syntax I. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #)
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.
LING 4302W. Phonology I. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #)
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.
LING 4901W. Major Project Seminar. (3 cr; S-N only, Prereq-Ling major, [fr or sr])
Revision/expansion of a paper completed for a linguistics course.
LING 5001. Introduction to Linguistics. (4 cr; Stdnt Opt. =LING 3001H, LING 5001. Prereq-grd or #)
Phonetics, phonology, morphology, syntax, semantics, and historical-comparative linguistics; language learning and psychology of language; linguistic universals; language in society.
LING 5005. Applications of Linguistics. (5 cr; Stdnt Opt. Prereq-3001 or 3001H or 3011 or 5001 or #)
Relationships between linguistics and neighboring disciplines. Applications to practical fields such as lexicography, orthography, translation/interpreting, language planning, reading, language teaching, bilingual education, education of the deaf, and correction of language disorders. Computer applications, forensic applications. Topics vary.
LING 5101. Language Types and Linguistic Universals. (3 cr; Stdnt Opt. Prereq-[(3001 or 3001H or 5001), 5201, 5302] or #)
Comparison of languages and language types. Cross-linguistic similarities and universals of language, their explanation.
LING 5105. Field Methods in Linguistics I. (4 cr; Stdnt Opt. Prereq-[5201, 5302, grad major] or #)
Techniques for obtaining/analyzing linguistic data from unfamiliar languages through direct interaction with a native speaker.
LING 5106. Field Methods in Linguistics II. (4 cr; Stdnt Opt. Prereq-[5105, grad major] or #)
Techniques for obtaining/analyzing linguistic data from unfamiliar languages through direct interaction with a native speaker.
LING 5201. Syntactic Theory I. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #)
Concepts/issues in current syntactic theory.
LING 5202. Syntax II. (3 cr; Stdnt Opt. Prereq-5201)
Foundation in modern syntactic theory. Syntactic phenomena in various languages. Emphasizes syntactic argumentation, development of constraints on grammar formalisms.
LING 5205. Semantics. (3 cr; Stdnt Opt. Prereq-5201 or #)
Analysis of sentence meaning. Semantic properties. Relations such as analyticity, 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.
LING 5206. Linguistic Pragmatics. (3 cr; Stdnt Opt. Prereq-5201 or #)
The 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.
LING 5301. Phonetics. (4 cr; Stdnt Opt. =LING 3301. Prereq-3001 or 3001H or 5001 or &5001)
LING 5302. Phonological Theory I. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #)
LING 5303. Phonology II. (3 cr; Stdnt Opt. Prereq-5302 or #)
Phonology of human languages. Preparation for reading papers in the literature and for doing research in phonology.
LING 5461. Conversation Analysis. (3 cr; Stdnt Opt. =COMM 5461. Prereq-3001 or 3001H or 5001 or #)
Discourse processes. Application of concepts through conversation analysis.
LING 5462. Field Research in Spoken Language. (3 cr; Stdnt Opt. =COMM 5462. Prereq-3001 or 3001H or 5001 or #) Transcribing/analyzing talk and movement related to talk. Applying concepts to recorded conversations.

LING 5501. Introduction to Language Acquisition. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #) First/second language acquisition.


LING 5701. Sociolinguistics. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 3011 or 5001 or #) Social determinants of linguistic diversity, variation, and change. Topics may include social and regional dialects, language style/register, style/code-switching, quantitative study of speech, linguistic/social inequality.

LING 5801. Introduction to Computational Linguistics. (3 cr; Stdnt Opt. Prereq-5201 or programming experience or #) Methods/issues in computer understanding of natural language. Programming languages, their linguistic applications. Lab projects.

LING 5802. Computational Linguistics. (3 cr; Stdnt Opt. Prereq-5801 or #) Computer processing of natural language. Applications to such areas as speech recognition and information retrieval.

LING 5906. Topics in Linguistics. (1-4 cr [max 12 cr]; Stdnt Opt) Topics vary. See Class Schedule.

LING 5911. Morphology and Syntax of Contemporary English. (3 cr; Stdnt Opt. Prereq-3001 or 3001H or 5001 or #) Linguistic analysis of word/sentence structure of contemporary English. Focuses on data from recorded/written texts.

LING 5912. Topics in the Structure of Modern English. (3 cr [max 12 cr]; Stdnt Opt. Prereq-[[3001 or 3001H or 5001, [5201 or 5931] or #] Aspects of the morphology, syntax, or semantics/pragmatics of modern English. Emphasizes analysis of written or recorded texts. Topics vary.


Management (MGMT)

Department of Strategic Management and Organization

Curtis L. Carlson School of Management


MGMT 3001. Fundamentals of Management. (3 cr; A-F or Aud) 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. =MGMT 4004W. Prereq-CSOM soph or jr) Integrative perspective on overall direction of enterprise. Choice of products/markets, selection of organization structures and management styles. Case analysis. Key issues, evaluating options, and making recommendations, under conditions of uncertainty and incomplete information.


MGMT 3014. Topics in International Business, Government, and Society. (4 cr; A-F or Aud) Selected topics.

MGMT 3033V. Honors: Business Communication. (3 cr; A-F or Aud. Prereq-[Jr or sr] honors student) Written/oral communication skills for organizations. Communication technology. Cases, simulations of real-world situations. Small groups meet with instructor three times for presentation coaching/feedback. Recitation times are arranged.

MGMT 3033W. Business Communication. (3 cr; A-F or Aud. Prereq- Carlson School Fr or soph) Written/oral communication skills for effective participation in contemporary organizations. From basic principles to communication strategy. Communication technology. Cases, simulations of “real-world” situations. Student small groups meet with instructor three times for presentation coaching/feedback. Recitation times are arranged with instructor at start of semester.


MGMT 3040H. Honors: Understanding the International Environment of Firms, International Business. (3 cr; A-F only. Prereq-3001, honors student, at least 60 cr) 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 socio-cultural factors influence behavior/functions of firms in international competition.

MGMT 3070. Topics in Management. (2-4 cr [max 12 cr]; A-F or Aud) Selected topics.

MGMT 3080. Topics in Ethics. (4 cr; A-F or Aud. Prereq-At least 60 cr [taken or in progress]) Topics vary with each offering.

MGMT 3480. Topics: Natural Resources. (3 cr; A-F only) Individual topics related to natural resources.

MGMT 3602. Topics: Environmental Regulations. (5 cr; A-F only. =ESPM 5602, ESPM 5602) Concepts/issues relating to industrial ecology and industry as they are influenced by current standards/regulations at local, state, and national levels.

MGMT 3603. Topics: Environmental Issues. (3 cr; A-F only. =ESPM 3603. Prereq-[MATH 1142 or [MATH 1271, MATH 1272]], [APEC 1101 or ECON 1101 or 3261W]) 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.”

MGMT 3604. Topics: Environmental Issues. (3 cr; A-F only) Environmental problems such as climate change, ozone depletion, and loss of biodiversity.
MGMT 4000. Issues in Nonprofit Management. (4 cr; A-F only. Prereq-Sr, prior nonprofit/business coursework) Capstone course. Students choose a project with nonprofit organization in local community. Readings/discussions tie managerial theory to actual experiences.

MGMT 4002. Managerial Psychology. (4 cr; A-F or Aud) Behavioral principles, methods, and skills that underlie 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 4004W. Business Policy: Strategy Formulation and Implementation. (3 cr; A-F or Aud. +MGMT 3004, Prereq-3040, 90 cr, completion of business core courses) Integrative perspective on overall direction of the enterprise involving both choice of products and markets and selection of organization structures and management styles; case analysis involving the identification of key issues, evaluation of options, and making recommendations under conditions of uncertainty and incomplete information.

MGMT 4005. Managing the Multinational Business. (4 cr; A-F or Aud. Prereq-1001 or 3001) Structures/strategies of global business. Personnel, technology, and operations in host nations. Challenges unique to management of multinational firm. May include topics such as comparative culture, trade, and ethics.


MGMT 4040. Negotiation Strategies. (4 cr; A-F only) 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. Management of Innovation and Change. (2 cr; A-F or Aud. Prereq-3010 or #) Applying theories/research on how new organizational programs, products, and technologies are developed/implemented. Diagnostic skills. How innovation unfolds.

MGMT 4060. Entrepreneurial Perspectives. (2 cr; A-F only. Prereq-3010) Students are paired in small groups with entrepreneur of a leading Minnesota business to write/present paper on the development of their business. Students analyze cases of five other participating entrepreneurs.

MGMT 4080W. Applied Technology Entrepreneurship. (4 cr; Stdnt Opt) 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 4101. Independent Study in Strategic Management and Organization. (1-4 cr; max 4 cr; A-F or Aud. Prereq-3rd yr) Students contract with faculty on independent studies.

MGMT 4171. Entrepreneurship in Action I. (4 cr; A-F only. Prereq-3010, 4008 or &4008, completed coursework in business core, CSOM upper division, approved application) 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.

MGMT 4172. Entrepreneurship in Action II. (4 cr; A-F only. Prereq-4171) Second of two-semester sequence. In fall, students identify business opportunity, develop concept, determine resources required, and launch the business. In spring, students implement business plan, manage business, and determine exit strategy.


MT 3011. Elements of Microelectronic Manufacturing. (3 cr; A-F only. Prereq-Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr) Common micro fabrication processes, how they are applied to CMOS manufacturing.

MT 3112. Elements of Micro and Nano Manufacturing Laboratory. (1 cr; A-F only. Prereq-3111) 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.

MT 3121. Thin Films Deposition. (3 cr; A-F only. Prereq-Physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr) Thin film materials such as metals/oxides. Photolithography, methods of deposition. HV/UHV range. Vacuum evaporation, sputtering, chemical vapor deposition.

MT 3131. Introduction to Materials Characterization. (4 cr; A-F only. Prereq-Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr) Four methods: electron beam microscopy, optical microscopy/FTIR, proximal probe techniques, x-ray/ion beam scattering. Principles for, and information from, each method.


MT 3142. Nanoparticle Technology and Engineering Laboratory. (1 cr; A-F only. Prereq-Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr) Overview of challenges and tools for measuring properties of nanoaerosols. Optical particle counters, condensation particle counters, differential mobility analysis, electrosprays, atomizers, single-particle mass spectrometers.

cost of capital, capital structure. Capital budgeting under capital rationing. Management decisions, investment.

**MT 4011. Design of Manufacturing Systems and Simulation.** (3 cr; A-F or Aud. Prereq-3001 or manufacturing experience) 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.

**MT 4012. Manufacturing Processes and Technology.** (3 cr; A-F or Aud. Prereq-3001 or manufacturing experience) Description/modeling of commonly used manufacturing processes. Process descriptions, process capabilities/performance, process models relating process parameters to part/process characteristics, process control.

**MT 4035. Global Supply Chain Technology.** (3 cr; A-F or Aud. Prereq-4102 or professional experience) Technology/processes to manage operations/quality accurately and real-time in global business environment. Supplier selection, costs of procurement, risk, time management, outsourcing. Current issues/trends.


**MT 4501. Global Manufacturing Enterprise.** (3 cr; A-F or Aud. Prereq-MT major or minor or certificate or #) Capstone project or internship integrating core knowledge/themes.

**MT 4550. Special Topics in Manufacturing.** (1 cr [max 3 cr]; A-F or Aud) Seminar. Timely issues/themes in manufacturing.

**Marathi (MAR)**

**Department of Asian Languages and Literatures**

**MAR 3101. Beginning Marathi.** (4 cr; Stdnt Opt. +MAR 1101) Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence.
MATS 3041. Industrial Assignment I. (2 cr; A-F only. +CHEN 3041. Prereq-MatS upper div, completion of required courses in MatS program through fall sem of 3rd yr, GPA of at least 2.80, reg in co-op program) Industrial work assignment in engineering co-op program. Formal written report.

MATS 3045. Materials Science and Engineering Industrial Internship. (1-2 cr [max 2 cr]; A-F only) Industrial internship, three to eight months. Requirements for grade are a proposed plan approved by supervisor and Faculty Internship Co-op Coordinator (FI/CC), and report describing engineering work completed, signed by industrial supervisor prior to submission to faculty internship co-op coordinator.


MATS 3851W. Materials Properties Lab. (3 cr; A-F or Aud. Prereq-[3011, MatS upper div] or %) Characterization of properties of engineering materials. Mechanical, electrical, optical, magnetic, thermal properties. Relationship between properties, materials structure. Specimen preparation. Data collection/analysis, including statistical analysis. Laboratory notebook/report writing.


MATS 4041. Industrial Assignment II. (2 cr; A-F only. +CHEN 4041. Prereq-3041, completion of required courses in MatS program through fall sem of 4th yr, GPA of at least 2.80, registration in co-op program) Industrial assignment in engineering co-op program. Application of materials science principles to engineering design problems in an industrial work environment. Formal written report.


MATS 4214. Polymers. (3 cr; A-F or Aud. Prereq-[3011, [4001 or CHEN 4101], [upper div MatS or ChEn]] or %) Polymer structure-property relations: structure/morphology of crystalline/amorphous state. Crystallization kinetics. Vitrification and glass transition. Mechanical properties, failure, permeability, optical/electrical properties, polymer composites, effect of processing on properties.

MATS 4221. Materials Design and Performance. (4 cr; A-F only. Prereq-MatS 3012 or %) Thermal and mechanical processing to control properties, selection of materials for electronic applications and other applications, analysis of costs/performance, analysis of failure in metallurgical structures by use of fracture mechanics methodology. Laboratory experiments involve creep, fracture, fatigue, optical and SEM metallurgy, surface science analysis, and statistics.

MATS 4223W. Polymer Laboratory. (2 cr; Stdnt Opt. +CHEN 4223W, CHEM 4222W, Prereq-4214 or CHEM 4214 or CHEM 4221 or MATS 4214 or %) Synthesis, characterization, and physical properties of polymers. Free radical, condensation, emulsion, anionic polymerization. Infrared spectroscopy/gel permeation chromatography. Viscoelasticity, rubber elasticity, crystallization.


MATS 4400. Senior Design Project. (3 cr; A-F only. +MATS 4202. Prereq-Sr, [MatS major or ChEn major]) Students work in teams to apply their expertise in materials science/engineering toward a specific project. With guidance from a mentor from industry or a faculty member, each team defines a problem and follows design steps that culminate in a product design.

MATS 4401. Senior Design Thesis I. (2 cr; A-F only. Prereq-4400; MatS senior, %, GPA of at least 3.00, project approval by faculty adviser) 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.


MATS 4511W. Corrosion and Electrochemistry of Corrosion. (4 cr; A-F or Aud. Prereq-MatS 3011 or %, upper div IT or grad) Electrochemical thermodynamics, electrochemical kinetics, theory of aqueous corrosion, theory of high temperature oxidation; specific topics include general corrosion, passivation, pitting, galvanic protection/corrosion, environmental degradation of mechanical properties, corrosion of electronic components, growth of oxide scales by diffusion, materials selection and design. Computers used to collect lab data.

MATS 4512. Corrosion and Electrochemistry of Corrosion. (4 cr; Stdnt Opt. Prereq-MatS 3011 or %, upper div IT or grad) Electrochemical thermodynamics, electrochemical kinetics, theory of aqueous corrosion, theory of high temperature oxidation; specific topics include general corrosion, passivation, pitting, galvanic protection/corrosion, environmental degradation of mechanical properties, corrosion of electronic components, growth of oxide scales by diffusion, materials selection and design. Computers used to collect lab data.

MATS 4591. Independent Study in Materials Science. (1-3 cr [max 6 cr] Prereq-Upper div mat sc) 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. Design credits available if arranged with professor. May be used for upper division Honors Program experience if arranged with professor.

MATS 4592. Directed Study in Materials Science. (1-4 cr [max 6 cr]; A-F only. Prereq-Upper div MatS) 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.

MATS 4594. Directed Research in Materials Science. (1-3 cr [max 6 cr] Prereq-MatS) 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.

MATS 5517. Electron Microscopy. (3 cr; A-F or Aud) Transmission electron microscope, scanning and diffraction, electron sources, lenses, apertures and resolution, specimen preparation, diffraction patterns, kikuchi diffraction, planar defects, strain fields, high resolution imaging, X-ray spectrometry.
MATH 1051. Prereq-3 yrs high school math. (4 cr; Stdnt Opt.) Theory/practice of scanning electron microscopy. Classroom sessions cover how instrument works, best-use practices. Practical sessions allow students to hone skills.

MATH 1038. College Algebra and Probability Submodule. (1 cr; A-F or Aud. Prereq-1051 or 1151 or 1155) For students who need probability/permutations/combinations portion of 1031. Meets with 1031, has same grade/work requirements.

MATH 1051. Prereq-I. (3 cr; Stdnt Opt. =MATH 1155, MATH 1031, MATH 1151. Prereq-3 yrs of high school math or satisfactory score on placement test or grade of at least C- in [PSTL 731 or PSTL 732]). Graphs of equations/functions, transformations of graphs; linear, quadratic, polynomial, and rational functions, with applications; zeros of polynomials; inverses and composition of functions; exponential and logarithmic functions, with applications; coverage beyond that found in the usual 3 years of high school math.

MATH 1131. Finite Mathematics. (3 cr; Stdnt Opt. Prereq-3 1/2 yrs high school math or grade of at least C- in [1031 or 1051]) Financial mathematics, probability, linear algebra, linear programming; Markov chains, some elementary computer programming.

MATH 1142. Short Calculus. (4 cr; Stdnt Opt. =MATH 1371, MATH 1271, MATH 1571H, MATH 1281. Prereq-Satisfactory score on placement test or grade of at least C- in [1031 or 1051]). Derivatives, integrals, differential equations, partial derivatives, maxima/minima of functions of several variables covered with less depth than full calculus. No trigonometry.

MATH 1151. Precalculus II. (3 cr; Stdnt Opt. =MATH 1155, MATH 1031, MATH 1051. Prereq-Satisfactory score on placement exam or grade of at least C- in [1031 or 1051]). 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.

MATH 1155. Intensive Precalculus. (5 cr; Stdnt Opt. =MATH 1131, MATH 1151, MATH 1051. Prereq-3 yrs high school math or satisfactory score on placement exam or grade of at least C- in [PSTL 731 or PSTL 732]). Graphs of equations and functions; polynomial and rational functions; inverses and composition of functions; exponential and logarithmic; trig functions, graphs, identities; polar coordinates; complex numbers; systems of linear equations; arithmetic, geometric sequences, series, applications.


MATH 1272. Calculus II. (4 cr; Stdnt Opt. =MATH 1252, MATH 1272, MATH 1282, MATH 1372. Prereq-[1271 or equiv] with grade of at least C-) Techniques of integration. Calculus involving transcendental functions, polar coordinates. Taylor polynomials, vectors/curves in space, cylindrical/spherical coordinates.


MATH 1372. IT Calculus II. (4 cr; Stdnt Opt. =MATH 1252, MATH 1572H, MATH 1272, MATH 1282. Prereq-Grade of at least C- in [1371 or equiv], IT) Techniques of integration. Calculus involving transcendental functions, polar coordinates, Taylor polynomials, vectors/curves in space, cylindrical/spherical coordinates. Emphasizes use of calculators, cooperative learning.

For a guide to course numbers, symbols, and abbreviations, see page 376. 563
MATH 2243. Linear Algebra and Differential Equations. (4 cr; Stdnt Opt. = MATH 2574H, MATH 2373) Prereq-[1272 or 1282 or 1372 or 1572] w/grade of at least C-
Linear algebra: basis, dimension, matrices, eigenvalues/eigenvectors. Differential equations: first-order linear, separable; second-order linear with constant coefficients; linear systems with constant coefficients.

MATH 2263. Multivariable Calculus. (4 cr; Stdnt Opt. = MATH 2374, MATH 3251; MATH 2573H, Prereq-[1272 or 1372 or 1572] w/grade of at least C-) 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.


MATH 2373. IT Linear Algebra and Differential Equations. (4 cr; Stdnt Opt. = MATH 2574H, Prereq-[1272 or 1282 or 1372 or 1572] w/grade of at least C-, IT) Linear algebra: basis, dimension, eigenvalues/eigenvectors. Differential Equations: linear equations/systems, phase space, forcing/resonance, qualitative-numerical analysis of nonlinear systems, Laplace transforms. Emphasizes use of computer technology.

MATH 2374. IT Multivariable Calculus and Vector Analysis. (4 cr; Stdnt Opt. = MATH 2263, MATH 3251, MATH 2573H, Prereq-[1272 or 1282 or 1372 or 1572] w/grade of at least C-, IT) 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. Emphasizes use of computer technology.

MATH 2472. Honors Calculus IIIA for Secondary Students. (3 cr; Stdnt Opt. Prereq-[&1243 or &1263 or &1343 or &1363]) Accelerated honors sequence for selected mathematically talented high school students. The geometry of IR^2 and IR^3. Vectors and vector functions. Multivariable calculus through differentiation using linear algebra.


MATH 2573H. Honors Calculus III. (4 cr; Stdnt Opt. = MATH 2265, MATH 2374, MATH 3251. Prereq-Math 1572H, honors student and permission of University Honors Program) Integral calculus of several variables. Vector Analysis, including theorems of Gauss, Green, Stokes.

MATH 2574H. Honors Calculus IV. (4 cr; Stdnt Opt. = MATH 2424, MATH 2373, Prereq-2573H, honors student and permission of University Honors Program) Advanced linear algebra, differential equations. Additional topics as time permits.

MATH 2582H. Honors Calculus II: Advanced Placement. (5 cr; A-F or Aud. Prereq-96) First semester of integrated three semester sequence covering infinite series, multivariable calculus (including vector analysis with Gauss, Green and Stokes theorems, linear algebra (with vector spaces), ODE, and introduction to complex analysis. Material is covered at a faster pace and at a somewhat deeper level than the regular honors sequence.

MATH 2583H. Honors Calc 3 - Adv Placement. (5 cr; A-F or Aud. Prereq-2582H or #) Second semester of three-semester-sequence. Infinite series. Multivariable calculus including vector analysis with Gauss, Green, and Stokes theorems. Linear algebra (with vector spaces), ODE, and introduction to complex analysis. Material is covered at a faster pace and at a somewhat deeper level than the regular honors sequence.

MATH 3116. Topics in Elementary Math II: Short Course. (2 cr; A-F or Aud. Prereq-Grade of at least C- in 3113) Probability/Statistics, vector geometry, real/complex numbers. Meets during first half of semester only. Grading standard one-third higher than 3116.

MATH 4116. Topics in Elementary Mathematics II. (4 cr; Stdnt Opt. Prereq-Grade of at least C- in 4113) Probability/statistics, vector geometry, real/complex numbers, finite fields building on previously learned modular arithmetic, trees. Grading standard one-third higher than 3118.

MATH 4151. Elementary Set Theory. (3 cr; Stdnt Opt. Prereq-One soph math course or #) Basic properties of operations on sets, cardinal numbers, simply and well-ordered sets, ordinal numbers, axiom of choice, axiomatics.

MATH 4152. Elementary Mathematical Logic. (3 cr; Stdnt Opt. = MATH 5165. Prereq-one soph math course or #) 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.


MATH 4281. Introduction to Modern Algebra. (4 cr; Stdnt Opt. Prereq-2283 or 3283 or #) Equivalence relations, greatest common divisor, prime decomposition, modular arithmetic, groups, rings, fields, Chinese remainder theorem, matrices over commutative rings, polynomials over fields.


MATH 4512. Differential Equations with Applications. (3 cr; Stdnt Opt. Prereq-2243 or 2373 or 2573) Laplace transforms, series solutions, systems, numerical methods, plane autonomous systems, stability.


MATH 4603. Advanced Calculus I. (4 cr; Stdnt Opt. Prereq-2243 or 2373, [2263 or 2374]) or 2574 or #) Axioms for the real numbers. Techniques of proof for limits, continuity, uniform convergence. Rigorous treatment of differential/ integral calculus for single-variable functions.

MATH 4606. Advanced Calculus. (4 cr; Stdnt Opt. Prereq-2263 or 2374 or 2573, [2283 or 2574 or 3283 or #]; Credit will not be granted if credit has been received for 5605) Axioms for the real numbers. Techniques of proof for limit theorems, continuity, uniform convergence. Rigorous treatment of differential/ integral calculus for single/multi-variable functions.


MATH 4990. Topics in Mathematics. (1-4 cr [max 12 cr]; Stdnt Opt) MATH 4995. Senior Project for CLA. (1 cr; A-F or Aud. Prereq-2 sem of upper div math, %) 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.

MATH 4997. Senior project (Writing Intensive). (1 cr [max 2 cr]; A-F or Aud. Prereq-2 sem upper div math, %) Directed study. A 10-15 page paper on a specialized area, including some math that is new to student. At least two drafts of paper given to instructor for feedback before final version. Student keeps journal of preliminary work on project. Scope/topic vary with instructor.

MATH 5067. Actuarial Mathematics I. (4 cr; Stdnt Opt. Prereq-4065, [one sem 4xxx or 5xxx] [probability or statistics course]) Future lifetime random variable, survival function. Insurance, life annuity, future loss random variables. Net single premium, actuarial present value, net premium, net reserves.


MATH 5075. Mathematics of Options, Futures, and Derivative Securities I. (4 cr; Stdnt Opt. Prereq-Two yrs calculus, basic computer skills) Mathematical background (e.g., partial differential equations, Fourier series, computational methods, Black-Scholes theory, numerical methods—including Monte Carlo simulation). Interest-rate derivative securities, exotic options, risk theory. First course of two-course sequence.

MATH 5076. Mathematics of Options, Futures, and Derivative Securities II. (4 cr; A-F or Aud. Prereq-5075) 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. Theory of computability; notion of algorithm, Turing machines, primitive recursive functions, recursive functions, Kleene normal form, recursion theorem. Propositional logic.

MATH 5165. Mathematical Logic I. (4 cr; Stdnt Opt. +MATH 4152. Prereq-2283 or 3283 or Phil 5201 or CSC1 course in theory of algorithms or #) Theory of computability; notion of algorithm, Turing machines, primitive recursive functions, recursive functions, Kleene normal form, recursion theorem. Propositional logic.


MATH 5285H. Honors: Fundamental Structures of Algebra I. (4 cr; Stdnt Opt. Prereq-2243 or 2373 or 2573, [2283 or 2574 or 3283]) 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.

MATH 5286H. Honors: Fundamental Structures of Algebra II. (4 cr; Stdnt Opt. Prereq-5285) Ring/module theory, including ideals, quotients, homomorphisms, domains (unique factorization, euclidean, principal ideal), fundamental theorem for infinitely generated modules over euclidean domains, Jordan canonical form. Introduction to field theory, including finite fields, algebraic/ transcendental extensions, Galois theory.

MATH 5335. Geometry I. (4 cr; Stdnt Opt. Prereq-2243 or 2373 or 2573, [2283 or 2574 or 3283]) 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.


MATH 5345. Introduction to Topology. (4 cr; Stdnt Opt. Prereq-2263 or 2374 or 2573, [2283 or 2574 or 3283]) Set theory. Euclidean/metric spaces. Basics of general topology, including compactness/connectedness.

MATH 5378. Differential Geometry. (4 cr; Stdnt Opt. Prereq-2263 or 2374 or 2573, [2283 or 2574 or 3283] recommended) Basic geometry of curves in plane and in space, including Frenet formula, theory of surfaces, differential forms, Riemannian geometry.
MATH 5385. Introduction to Computational Algebraic Geometry. (4 cr; Stdnt Opt. Prereq-[2263 or 2374 or 2573], [2243 or 2373 or 2574])
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.


MATH 5467. Introduction to the Mathematics of Image and Data Analysis. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573], [2283 or 2374 or 3283 or #]; [2263 or 2374 or 2574]; [2243 or 2373 or 2574]) or [2283 or 2574])
Topics in industrial math, including crystal precipitation, air quality modeling, electron beam lithography. Problems treated both theoretically and numerically.

MATH 5481. Mathematics of Industrial Problems I. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573], [2265 or 2374 or 2574], familiarity with some programming language)
Topics in industrial math, including color photography, catalytic converters, photocopying.

MATH 5485. Introduction to Numerical Methods I. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573], familiarity with some programming language)
Solution of nonlinear equations in one variable. Interpolation, polynomial approximation, numerical integration/differentiation, numerical solution of initial-value problems.

MATH 5486. Introduction To Numerical Methods II. (4 cr; Stdnt Opt. Prereq-[5485])

MATH 5487. Computational Methods for Differential and Integral Equations in Engineering and Science I. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573])

MATH 5525. Introduction to Ordinary Differential Equations. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573]; [2283 or 2574 or 3283])

MATH 5535. Dynamical Systems and Chaos. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573], [2265 or 2374 or 2574])
Dynamical systems theory. Emphasizes iteration of one-dimensional mappings. Fixed points, periodic points, stability, bifurcations, symbolic dynamics, chaos, fractals, Julia/Mandelbrot sets.

MATH 5583. Complex Analysis. (4 cr; Stdnt Opt. Prereq-2 sems soph math [including [2263 or 2374 or 2573], [2283 or 3283] recommended])
Topics in complex math, including complex functions, theorems of Liouville/Morera. Reflection principle. Singularities, Laurent series. Residues.

MATH 5587. Elementary Partial Differential Equations I. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573], [2265 or 2374 or 2574], familiarity with some programming language)

MATH 5588. Elementary Partial Differential Equations II. (4 cr; max 400 cr; A-F or Aud. Prereq-[2243 or 2373 or 2573], [2265 or 2374 or 2574], [5587] or #)

MATH 5594H. Honors Mathematics - Topics. (4 cr with 12 cr; A-F or Aud. Prereq-[5594H with grade of at least B, experience in writing proofs] or #; intended for mathematically-talented students with proven achievement in theoretical mathematics courses)
Topics vary depending on interests of instructor. Theoretical treatment of chosen topic.

MATH 5615H. Honors: Introduction to Analysis I. (4 cr; Stdnt Opt. Prereq-[2243 or 2373], [2265 or 2374], [2283 or 3283] or 2574)

MATH 5616H. Honors: Introduction to Analysis II. (4 cr; Stdnt Opt. Prereq-[5615])

MATH 5651. Basic Theory of Probability and Statistics. (4 cr; Stdnt Opt. Prereq-[2263 or 2374 or 2573], [2243 or 2373 or 3283]; [2283 or 2574 or 3283] recommended; Credit will not be granted if credit has been received for: Stat 4101, Stat 5101)
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.

MATH 5652. Introduction to Stochastic Processes. (4 cr; Stdnt Opt. Prereq-[5651] or Stat 5101)
Random walks, Markov chains, branching processes, martingales, queuing theory, Brownian motion.

MATH 5654. Prediction and Filtering. (4 cr; Stdnt Opt. Prereq-5651 or Stat 5101)

MATH 5705. Enumerative Combinatorics. (4 cr; Stdnt Opt. Prereq-[2243 or 2373 or 2573], [2263 or 2374 or 2574 or 3283])
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.

MATH 5707. Graph Theory and Non-Enumerative Combinatorics. (4 cr; Stdnt Opt. 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)
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.
MATH 5711. Linear Programming and Combinatorial Optimization. (4 cr; Stdnt Opt. 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 Aud)

Individually directed study.

Mathematics Education (MTHE)

Department of Curriculum and Instruction

College of Education and Human Development

MTHE 3101. Mathematics and Pedagogy for Elementary Teachers I. (4 cr; A-F only. Prereq-[College algebra, elementary FOE student] or #)

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, numeration.

MTHE 3102. Mathematics and Pedagogy for Elementary Teachers II. (4 cr; A-F only. Prereq 3101, college algebra)

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.

MTHE 5011. Arithmetic Structures in School Mathematics. (3 cr; Stdnt Opt. Prereq-Enrollment in math initial licensure program or Tchg exper)

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.

MTHE 5021. Algebraic Structures in School Mathematics. (3 cr; Stdnt Opt. Prereq-Tchg exper or insr consent)

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.

MTHE 5031. Geometric Structures in School Mathematics. (3 cr; Stdnt Opt. Prereq-Enrollment in math initial licensure program or Tchg exper)

Pedagogy, content, and instructional strategies for teaching 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.

MTHE 5100. Topics in Mathematics Education. (4 cr; Stdnt Opt. Prereq-Ed or grad student)

Issues, materials, and instructional techniques focusing on a single current topic of particular relevance to secondary school and college mathematics teachers.

MTHE 5101. Teaching Elementary School Mathematics. (3 cr; Stdnt Opt. Prereq-Tchg license or student elem ed MEd or special ed or #)

Modern trends, methods, and materials used to convey mathematical ideas.

MTHE 5155. Rational Number Concepts and Proportionality. (3 cr; Stdnt Opt. Prereq-Educ student or #)

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.

MTHE 5161. Developing Leadership in School Mathematics. (3 cr; Stdnt Opt. Prereq-Tchg exper or #)

Current developments in the psychology and pedagogy of mathematics education as related to the evolving nature of mathematics education objectives. Emerging use of technology in the mathematics classroom. Techniques for the development of supervisory abilities. Characteristics of effective staff development.

MTHE 5171. Teaching Problem Solving. (3 cr; Stdnt Opt)

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.

MTHE 5172. Teaching Probability and Statistics. (3 cr; Stdnt Opt)

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.

MTHE 5305. Middle School Mathematics Methods. (2 cr; A-F only. Prereq-Elem ed licensure student)

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.

MTHE 5314. Teaching and Learning Mathematics. (3 cr; Stdnt Opt. Prereq-Math Ed or MEd or CI MEd or grad student or #)


MTHE 5335. Mathematics for Diverse Learners. (3 cr; Stdnt Opt. Prereq-Teaching license or student in elem ed or special ed program) or #)

Mathematical concepts and methods for exceptional students, both low achieving and gifted. Experimental materials and methods designed for underachieving students.

MTHE 5366. Technology-Assisted Mathematics Instruction. (3 cr; Stdnt Opt)

Technology—include 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 5696. Student Teaching in Mathematics. (1-8 cr [max 8 cr]; S-N only. Prereq-MEd/initial licensure student or #)

Student teaching in secondary school mathematics classes.

MTHE 5993. Directed Studies in Mathematics Education. (2 cr [max 3 cr]; S-N or Aud. Prereq-Math ed MEd student, #)

Secondary school classroom teaching project to improve specific teaching skills, planned by student, approved/directed by student’s adviser.

Mechanical Engineering (ME)

Department of Mechanical Engineering

College of Science and Engineering

ME 1. Refresher Course for Mechanical Engineers. (0 cr; S-N or Aud)


ME 2011. Introduction to Engineering. (4 cr; A-F or Aud. Prereq-IT lower div)

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.

ME 3041. Industrial Assignment I. (2 cr; A-F or Aud. Prereq-ME upper div, enrolled in ME co-op program)

Industrial work assignment in engineering intern program. Evaluation based on student’s formal written report covering the quarter’s work assignment.

ME 3080. Topics in Mechanical Engineering. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-%)

Specialized topics within various areas of mechanical engineering. Topics vary each semester.


For a guide to course numbers, symbols, and abbreviations, see page 376. 567
ME 3222. Design and Manufacturing II. (4 cr; A-F or Aud. Prereq-3221 or 3222, [CSCI 1113 or equiv], ME upper div) Selection of standard mechanical components such as bearings, gears, and fasteners. Analysis/synthesis of motion in machines. Displacement, velocity, and acceleration of mechanisms. Machine design project: Apply lecture topics to design new machines that fulfill customer specifications.


ME 4031W. Basic Mechanical Measurements Laboratory. (4 cr; A-F or Aud. Prereq-ME upper div) IE 4521, upper div ME) Experimental methods, instrumentation for engineering measurements, statistical estimates of experimental uncertainty, calibration, signal conditioning, selected transducers for mechanical measurements, data acquisition/processing, presentation of results. Measurement of temperature, pressure, humidity, stress-strain, force, velocity, and flow/radiative properties.

ME 4042. Industrial Assignment II. (2 cr; A-F or Aud. Prereq-ME upper div, enrolled in ME co-op program) Industrial work assignment in engineering intern program. Evaluation based on student’s formal written report covering the quarter’s work assignment.

ME 4043W. Industrial Assignment II. (4 cr; A-F only. Prereq-3041) Solution of system design problems that require developing one or more design alternatives, and generating a preliminary design. Final report emphasizes design communication and describes design decision process, analysis, and final recommendations.

ME 4044. Industrial Assignment III. (2 cr; A-F only. Prereq-ME upper div, registration in ME co-op program) Industrial work assignment in engineering co-op program. Evaluation based on student’s formal written report covering semester work assignment.

ME 4054W. Design Projects. (4 cr; A-F or Aud. Prereq-2011, 3221, 3222, 3281, 3321, 3322, 4031W, AEM 2021, AEM 3031, EE 3005) Students work in teams and undertake single, substantial design project. Design problems are open-ended. Product design process. Teams give formal presentation of progress at mid-semester design review, show complete work at design show.

ME 4081H. Mechanical Engineering Honors Thesis I. (2 cr; A-F or Aud. Prereq-ME upper div honors student, #) Unstructured research course enabling honors students to do independent research supervised by faculty. Selection of suitable topics according to individual interests and faculty approval. Thesis and oral defense.

ME 4082H. Mechanical Engineering Honors Thesis II. (2 cr; A-F or Aud. Prereq-ME upper div honors student, #) Unstructured research course enabling honors students to do independent research supervised by faculty. Selection of suitable topics according to individual interests and faculty approval. Thesis and oral defense.

ME 4131W. Thermal Environmental Engineering Laboratory. (4 cr; A-F or Aud. Prereq-3322, 4031W, ME upper div or grad student) Experiments in psychrometrics, refrigeration, air conditioning, solar energy, indoor air quality, and other topics related to refrigeration, building heating/cooling, and indoor air quality.

ME 4231. Motion Control Laboratory. (4 cr; A-F or Aud. Prereq-3281, 4031W, ME upper div) Microprocessor programming, digital filters, frequency response testing, modeling of electromechanical systems, closed loop velocity and position control, programmable logic controllers, factory automation, open loop position control of a vibratory system using input shaping, closed loop position control using pole placement.


ME 4331. Thermal Engineering Laboratory. (4 cr; A-F or Aud. Prereq-3321, 3322, 4031W, IT upper div or grad student) Measurement and analysis of heat transfer in single phase, multiphase, and reacting environments. Emphasis on experimental measurements relevant to thermal/fluid systems as well as the statistical design of experiments and uncertainty analysis. Heat exchange.

ME 4431W. Energy Conversion Systems Laboratory. (4 cr; A-F or Aud. Prereq-3333, 4031W, IT upper div or grad student) Material from courses is applied to analyze operation/control of engines, power plants, and heating/ventilation systems. Emphasizes principles underlining performance characteristics of devices, measurement techniques, interpretation of experimental data, and presentation of results.

ME 5080. Topics in Mechanical Engineering. (1-4 cr [max. 4 cr]; Stdt Opt. Prereq-IT upper div or grad student, submission of permission form, #) Topics vary each semester.

ME 5090. Advanced Engineering Problems. (1-4 cr [max. 4 cr]; Stdt Opt. Prereq-ME upper div, #) Independent research project with faculty liaison. Adviser in mechanical engineering, typically related to adviser’s research interests. Student contacts adviser to develop project description well before project’s start date.

ME 5101. Vapor Cycle Systems. (4 cr; A-F or Aud. Prereq-IT upper div or grad student) Vapor compression and absorption refrigeration systems; heat pumps; vapor power cycle analysis, regeneration, reheating, compound cycle modifications, combined gas turbine--vapor cycle systems.

ME 5103. Thermal Environmental Engineering. (4 cr; A-F or Aud. Prereq-IT upper div or grad, 3322 or 3323) Thermodynamic properties of moist air; psychrometric charts; HVAC systems; solar energy; human thermal comfort; indoor air quality; heating and cooling loads in buildings.

ME 5105. HVAC System Design. (4 cr; A-F or Aud. Prereq-5103, IT upper div or grad student) Design procedures used for heat exchangers, cooling towers, hydronic systems, and air handling systems. HVAC system design for a commercial building.

ME 5113. Aerosol/Particle Engineering. (4 cr; A-F or Aud. Prereq-IT upper div or grad student) Kinetic theory, definition, theory and measurement of particle properties, elementary particle mechanics, particle statistics, Brownian motion and diffusion, coagulation, evaporation and condensation, sampling and transport.
ME 5115. Air Quality and Air Pollution Control. (4 cr; A-F or Aud. Prereq-IT upper div or grad student) Air pollution sources, atmospheric transport, transformations, fate, and emissions control. Air pollution meteorology, dispersion, chemistry of secondary pollutant formation, standards and regulation. Control devices and techniques for gaseous and particulate emissions. Cyclones, electrostatic precipitators, wet and dry scrubbers, combustion modification.


ME 5278. Introduction to Finite Element Modeling, Analysis, and Design. (4 cr; A-F or Aud. Prereq-IT upper div or grad, 3221, AEM 3031, CSCI 1113, MatS 2001) Finite element analysis and computer-aided design tool (CAD); theoretical issues and implementation aspects for modeling and analyzing engineering problems encompassing stress analysis, heat transfer, and flow problems for linear situations. One-, two-, and three-dimensional practical engineering applications.

ME 5241. Computer-Aided Engineering. (4 cr; A-F or Aud. Prereq-IT upper div or grad, 3222, CSCI 1113 or equiv) Apply computer-aided engineering to mechanical design. Engineering design projects and case studies using computer-aided design and finite element analysis software; design optimization and computer graphical presentation of results.

ME 5243. Advanced Mechanism Design. (4 cr; A-F or Aud. Prereq-IT upper div or grad, 3222 or equiv, basic kinematics and dynamics of machines; knowledge of CAD packages such as Pro-E recommended) Analytical methods of kinematic, dynamic, and kinetoelastic analysis and synthesis of mechanisms. Computerized design for function, path, and motion generation based on Burmester theory.

ME 5248. Vibration Engineering. (4 cr; Stdnt Opt. Prereq-IT upper div or grad, 3281) Apply vibration theory to design; optimize isolators, detuning mechanisms, viscoelastic suspensions and structures. Use modal analysis methods to describe free vibration of complex systems, relating to both theoretical and test procedures.


ME 5286. Robotics. (4 cr; A-F or Aud. Prereq-[3281 or equiv], [upper div ME or AEM or CSCI or grad student]) Manipulator forward/inverse kinematics, homogeneous transformations, coordinate frames, Jacobian/yelocity control, task primitives/programming, computational issues. Determining path trajectories. Reaction forces, manipulator dynamics/control. Vehicle kinematics, dynamics, and guidance. Lab project demonstrates concepts.


ME 5341. Case Studies in Thermal Engineering and Design. (4 cr; A-F or Aud. Prereq-IT upper div or grad student, 3321, 3322) Characteristics of applied heat transfer problems: nature of problem specification, incompleteness of needed knowledge base, accuracy issues. Categories of applied heat transfer problems (e.g., materials processing, turbomachinery, cooling of electronic equipment, biomedical thermal therapeutic devices, heat exchangers, HVAC systems).


ME 5351. Computational Heat Transfer. (4 cr; A-F or Aud. Prereq-IT upper div or grad student, 3322) Numerical solution of heat conduction and analogous physical processes. Develop and use a computer program to solve complex problems involving steady and unsteady heat conduction, flow and heat transfer in ducts, flow in porous media, and other special applications.

ME 5361. Plasma-Aided Manufacturing. (4 cr; A-F or Aud. EE 5611, Prereq-Grad or IT upper div, 3321, ME 3322 or equiv) Properties of plasmas as a processing medium, process control and system design considerations using specific examples of medium plasma coating, welding, and microelectronics processing.

ME 5381. Biological Transport Processes. (4 cr; A-F or Aud. & CHEN 5753, BMEN 5311, Prereq-IT upper div or grad student, transport class, [3322 or CHEN 5103] or #) Fluid, mass, and heat transport in biological systems. Mass transfer across membranes, fluid flow in capillaries, intestinaria, veins and arteries. Biotransport issues in single cells and tissues, artificial organs, membrane oxygenators, and drug delivery applications.

ME 5446. Introduction to Combustion. (4 cr; A-F or Aud. Prereq-IT upper div or grad student, 3321, 3322) Thermodynamics, kinetics, energy and mass transport, and 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.

ME 5461. Internal Combustion Engines. (4 cr; A-F or Aud. Prereq-IT upper div or grad student, C or better in 3322 or 3324) Basic spark ignition and diesel engine principles, air, fuel-air and actual engine cycles, cycle modeling, combustion and emissions, knock phenomena, air flow and volumetric efficiency, mixture requirements, ignition requirements and performance. Lectures and complementary labs.


ME 5666. Modern Thermodynamics. (4 cr; A-F only, Prereq-3331 or equiv) 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.
Medical Industry Leadership Institute (MILI)

Curtis L. Carlson School of Management

MILI 5993. Medical Industry Valuation Laboratory. (2 cr; A-F only, Prereq-#) 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.

MILI 5999. Independent Study. (1-6 cr [max 16 cr]; A-F only) Independent study.

Medieval Studies (MEST)

College of Liberal Arts

MEST 3610. Topics in Medieval Studies. (3-4 cr [max 2 cr]; Stdnt Opt) Fall of Rome through end of the Middle Ages (ca. 300-1500 A.D.) Current topics specified in Class Schedule.

MEST 3993. Directed Studies in Medieval Studies. (1-3 cr [max 5 cr]; Stdnt Opt. Prereq-Previous work in a medieval studies discipline) Directed study with one of core faculty members of Medieval Studies program.

MEST 4610. Intermediate Topics in Medieval Studies. (3-4 cr [max 32 cr]; Stdnt Opt) Topics between fall of Roman Empire and end of Middle Ages (ca. 300-1500 A.D.). Topics specified in Class Schedule.

MEST 5410. Advanced Topics in Medieval Studies. (3-4 cr [max 15 cr]; Stdnt Opt. Prereq-One yr work in some area of Middle Ages, reading knowledge of appropriate language, #) From late antiquity through end of Middle Ages (ca. 300-1500 A.D.). Current topics specified in Class Schedule.

MEST 5993. Directed Studies in Medieval Studies. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-One yr work in some area of Middle Ages, reading knowledge of appropriate language, #) Directed study with one of the core faculty of medieval studies program.

Microbial Engineering (MICE)

BioTechnology Institute

College of Biological Sciences


Microbiology (MICB)

Department of Microbiology

College of Biological Sciences, Medical School


MICB 4111. Microbial Physiology and Diversity. (3 cr; Stdtnt Opt. Prereq-[2022 or VBP 2022 or Biol 2032 or VBP 2032 or VBS 2032 or 3301 or Bio 3301], [BioC 3021 or Biol 3021 or BioC 4331]) Structural-functional organization of bacteria/arkaeia. Energy metabolism utilizing light, inorganic/organic chemicals. Cell morphologies, roles/assembly of surface structures. Growth/survival mechanisms in various extreme environments. Adaptation to changing conditions by development of specialized cells/structures, altering metabolic patterns.


MICB 4131. Immunology. (3 cr; Stdtnt Opt. Prereq-[2022 or VBP 2022 or BIOL 2032 or VBP 2032 or VBS 2032 or 3301 or BIOL 3301], [BIOL 3021 or BIOL 3021 or BIOL 4331]) Molecular, genetic, and cellular bases for humoral/Cell-mediated immunity. Innate immunity. Antigen recognition by B/T lymphocytes. Interactions between lymphocytes and other cells of immune system. Cytokines. Immunoregulation. Key aspects of clinical immunology.


MICB 4151. Molecular and Genetic Bases for Microbial Diseases. (3 cr; Stdnt Opt. Prereq-[3301, [4131 or 4131], [BIOC 3021 or BioC 4331], [Bioc 4003 or GCD 3022 recommended]) Genetic basis of microbial pathogenesis. Effect of gene transfer/regulation on evolution of microbial pathogens and on their capacity to colonize, induce disease. Biochemical/cellular interactions between bacteria and their human hosts.

MICB 4161. Eukaryotic Microbiology. (3 cr; A-F only. Prereq-[3301, [4131 or &4131], [BIOC 3021 or BioC 4331], [Biol 4003 or GCD 3022]) Cell biology of higher eukaryotes, animal/plant pathogenesis, evolution, industrial microbiology. Tetrahymena, Chlamydomonas, Paramaecium, Toxoplasma, Aspergillus, Neurospora.

MICB 4171. Biology, Genetics, and Pathogenesis of Viruses. (3 cr; A-F or Aud. Prereq-[MICB 3021, [4171. Prereq-[[BIOC 3021, BIOL 4003], [3301 or BIOL 4004], 4131) Structure, attachment, entry. Genome replication/mRNA production by RNA viruses. Reverse transcription. Transcription from DNA virus templates. Replication of DNA virus genomes. Processing of viral pre-mRNA. Translational control. Assembly, host defense, tumor viruses, pathogenesis, HIV, emerging viruses, antivirals and vaccines. Lectures, in-class activities, interactive Web site.
Middle Eastern Languages and Cultures (MELC)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

MELC 3601. Persian Fiction in Translation. (3 cr; Stdnt Opt. *ALL 5836, MELC 5601, ALL 3836) Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

MELC 3602. Persian Poetry in Translation. (3 cr; Stdnt Opt. *ALL 5831, ALL 5831, MELC 5602) Major poetic works of Iran in translation dealing with life at the medieval courts, Sufic poetry, and “new” poetry. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

MELC 3601. Persian Fiction in Translation. (3 cr; Stdnt Opt. *ALL 5836, MELC 3601, ALL 3836) Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Daneshvar, and Behrangi are analyzed/interpreted.

MELC 3602. Persian Poetry in Translation. (3 cr; Stdnt Opt. *ALL 5831, ALL 5831, MELC 3602) Major poetic works of Iran in translation dealing with life at the medieval courts, Sufic poetry, and “new” poetry. Rudaki, Khayyam, Rumi, Hafiz, Yushij, and Farrukhzad are among the poets whose works are examined.

Military Science (MIL)

Undergraduate Education Administration

MIL 104. MS I Zero Credit Lead Lab. (0 cr; A-F only. Prereq- MILB 3301, MicB 4131) Basic/clinical human immunology, medical microbiology. Molecular/cellular basis of immune responses, tolerance. Immunologic disease, serology, antimicrobial agents, chemotherapy. Basic/medical bacteriology, parasitology, mycology, virology. Unifying principles governing pathogenesis. Diseases are grouped with organisms important in differential diagnosis.

MIL 301. Military Science III Leadership Lab. (0 cr; Stdnt Opt. Prereq-Enrollment in 3130) Open only to students in the associated Military Science Course series with different roles for students at different levels. Involves leadership responsibilities for planning, coordination, execution, and evaluation of various training and activities with Basic course students and for the ROTC program as a whole. Students develop, practice, and refine leadership skills by serving in a variety of leadership positions.

MIL 303. MS III Zero Credit Lead Lab. (0 cr; A-F only. Prereq-Completion of basic courses, 3301) Army ROTC leadership and personal development lab.

MIL 304. MS III Zero Credit Lead Lab. (0 cr; A-F only. Prereq-Completion of basic courses, 3302) Army ROTC leadership and personal development lab.

MIL 401. Military Science IV Leadership Lab. (1 cr; A-F only. Prereq-&3101) Leadership responsibilities for planning, executing, and evaluating various training activities within program. Additional duties as primary or secondary staff member. Students assist in developing basic and advance course cadets’ leadership skills.

MIL 403. MS IV Zero Credit Lead Lab. (0 cr; A-F only. Prereq-Completion of basic courses, 3401) Army ROTC leadership and personal development lab.

MIL 404. MS IV Zero Credit Lead Lab. (0 cr; A-F only. Prereq-Completion of basic courses, 3402) Army ROTC leadership and personal development lab.

MIL 102. Military Science I Leadership Lab. (1 cr; Stdnt Opt. Prereq-Enrollment in 1011) Learn and practice basic skills. Gain insight into the Advance Course in order to make an informed decision whether to apply for it. Build self confidence and team building leadership skills that can be applied throughout life.

MIL 103. Military Science II Leadership Lab. (1 cr; A-F only. Prereq- &1102) Basic skills. Preview advanced course. Team-building leadership skills.

MIL 105. Military Science III Leadership Lab. (1 cr; Stdnt Opt. Prereq-Enrollment in 3130) Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 106. Military Science III Leadership Lab. (1 cr; A-F only. Prereq- &3301) Leadership responsibilities for planning, coordinating, executing, and evaluating various training/activities with basic course students and for ROTC program. Students serve in and are evaluated in various responsible positions.
MIL 1007. Military Science IV Leadership Lab. (1 cr; Stdnt Opt. Prereq-Enrollment in 3140)
Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 1008. Military Science IV Leadership Lab. (1 cr; Stdnt Opt. Prereq-Enrollment in 3141)
Involves leadership responsibilities for the planning, coordination, execution, and evaluation of various training and activities with Basic Course students and for the ROTC program. Students develop, practice, and refine leadership skills by serving and being evaluated in a variety of responsible positions.

MIL 1101. Introduction to ROTC. (1 cr; Stdnt Opt. Prereq-Enrollment in 1001)
Increase self-confidence through team study and activity; basic drill, physical fitness, rapping, leadership reaction course, first aid, making presentations, and basic marksmanship. Learn fundamental concepts of leadership in a profession in both classroom and outdoor lab environments.

MIL 1102. Introduction to Leadership. (1 cr; Stdnt Opt. Prereq-Enrollment in 1002)
Learn/apply principles of effective leading. Reinforce self-confidence through participation in physically and mentally challenging exercises. Relate organizational ethical values to the effectiveness of a leader. Participation in a weekend exercise is optional, but highly encouraged.

MIL 1101. Leadership and Personal Development. (1 cr; A-F only)
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, officerhood, and the Army profession.

MIL 1102. Introduction to Tactical Leadership. (1 cr; A-F only)
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 1103. MS I One Credit Lead Lab. (1 cr; A-F only, Prereq-3100)
Army ROTC leadership and personal development lab.

MIL 1104. MS I One Credit Lead Lab. (1 cr; A-F only, Prereq-3102)
Army ROTC leadership and personal development lab.

MIL 1201. Innovative Team Leadership. (2 cr; A-F only, Prereq-2101)
Explores the dimensions of creative and innovative tactical leadership strategies and styles by examining team dynamics and two historical leadership theories that form the basis of the Army leadership framework (trait and behavior theories). Cadets practice aspects of personal motivation and team building in the context of planning, executing, and assessing team exercises and participating in leadership labs.

MIL 1202. Foundations of Tactical Leadership. (2 cr; A-F only, Prereq-Must enroll in lab)
Examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). Highlights dimensions of terrain analysis, patrolling, and operation orders. Further study of the theoretical basis of the Army Leadership Requirements Model explores the dynamics of adaptive leadership in the context of military operations.

MIL 1203. MS II One Credit Lead Lab. (1 cr; A-F only, Prereq-1201)
Army ROTC leadership and personal development lab.

MIL 1204. MS II One Credit Lead Lab. (1 cr; A-F only, Prereq-1202)
Army ROTC leadership and personal development lab.

MIL 1220. Self/Team Development. (2 cr; A-F or Aud. Prereq-Enrollment in Basic Course)
Learn and apply ethics-based leadership skills that develop individual abilities and contribute to the building of effective teams. Develop skills in oral presentations, writing concisely, planning of events, coordination of group efforts, advanced first aid, land navigation, and basic military tactics. Fundamentals of ROTC’s Leadership Development program.

MIL 1221. Individual/Team Military Tactics. (2 cr; A-F or Aud. Prereq-Enrollment in Basic Course)
Individual and team aspects of military tactics in small unit operations. Use of radio communications, making safety assessments, movement techniques, planning for team safety/security and methods of pre-execution checks. Practical exercises with upper division ROTC students.

MIL 3130. Leading Small Organizations I. (3 cr; Stdnt Opt. Prereq-Enrollment in Advanced Course)
Series of practical opportunities to lead small groups, receive personal assessments and encouragement, and lead again in situations of increasing complexity. Uses small unit defensive tactics and opportunities to plan and conduct training.

MIL 3131. Leading Small Organizations II. (3 cr; Stdnt Opt. Prereq-Enrollment in Advanced Course)
Continues methodology of 3130. Analyze tasks; prepare written or oral guidance for team members to accomplish tasks. Delegate tasks and supervise. Plan for and adapt to the unexpected in organizations under stress.

MIL 3140. Leadership Challenges and Goal Setting. (3 cr; Stdnt Opt. Prereq-Enrollment in Advanced Course)
Plan, conduct, and evaluate activities of the ROTC cadet organization. Articulate goals, put plans into action to attain them. Assess organization cohesion and develop strategies to improve it. Develop confidence in skills to lead people and manage resources. Learn/apply various Army policies and programs.
Modern Greek (MDGK)

Department of Classical and Near Eastern Studies
College of Liberal Arts

MDGK 1001. Beginning Modern Greek I. (4 cr; Stdnt Opt)
Speaking and reading demotic Greek. Pattern-practice drill, simple readings, some grammar.

MDGK 1002. Beginning Modern Greek II. (4 cr; Stdnt Opt. Prereq-1001 or #)
Speaking and reading demotic Greek. Pattern-practice drill, simple readings, some grammar.

MDGK 1003. Intermediate Modern Greek I. (4 cr; Stdnt Opt. Prereq-1002 or #)
Review the fundamentals of syntax through various readings from Modern Greek prose writers and poets. Provides additional grammatical elements which are reinforced through reading, conversation, and composition.

MDGK 1004. Intermediate Modern Greek II. (4 cr; Stdnt Opt. Prereq-1003 or #)
Review the fundamentals of syntax through various readings from Modern Greek prose writers and poets. Provides additional grammatical elements which are reinforced through reading, conversation, and composition.

MDGK 3015. Advanced Modern Greek 1. (4 cr; Stdnt Opt. Prereq-1004 or #)
Communication skills, grammar, vocabulary building. Readings in a variety of styles. Film, field trips followed by discussion. Writing, oral presentations, exercises.

MDGK 3016. Advanced Modern Greek 2. (4 cr; Stdnt Opt. Prereq-1004 or #)
Communication skills, grammar, vocabulary building. Readings in a variety of styles. Film, field trips followed by discussion. Writing, oral presentations, exercises.

Mortuary Science (MORT)

Mortuary Science (MORT)
Medical School

MORT 3005. History of Funeral Service. (2 cr; A-F or Aud)
Development of funeral practices from a historical perspective with emphasis on ethnic and cultural groups that have had an impact on contemporary funeral service.

MORT 3012. Organization and Management of Funeral Business. (3 cr; A-F or Aud. Prereq-Mortuary science major)
To create an entrepreneurial marketing strategy and business plan for a small funeral business. Various forms of ownership. Financial requirements, management, human resources management. Theory supplemented with practical information, real-life experiences.

MORT 3014. Funeral Service Rules and Regulations. (2 cr; A-F or Aud. Prereq-Mortuary science major)
Licensing/government regulations, compliance with regulations of state/federal regulatory agencies, cemetery and crematory rules and regulations, and Federal Trade Commission Funeral Practice Rule for the funeral industry.

MORT 3016. Funeral Service Marketing and Merchandising. (3 cr; A-F or Aud. Prereq-Mortuary science major)
Introduction to key elements of funeral service merchandising/marketing. How to manage delivery process. Theory supplemented with contemporary product offerings, merchandising techniques.

MORT 3018. Funeral Practice. (3 cr; A-F only. Prereq-Mortuary science major)
Practices and procedures related to funeral directing, including social, religious, ethical, and cultural issues; event planning; conducting funeral ceremonies; record keeping; computer applications.

MORT 3019. Funeral Practice II. (3 cr; A-F only. Prereq-3018, mortuary science major)

MORT 3021W. Funeral Service Psychology. (5 cr; A-F only. Prereq-Introductory course in general psychology)
Principles of psychology/counseling related to funeral service. Grief, bereavement, mourning, aftercare, crisis intervention.

MORT 3022W. Funeral Service Arrangements. (3 cr; A-F only. Prereq-3021W)
Principles, techniques, and basic helping skills as applied to funeral arrangement conference.

MORT 3025. Business Law. (5 cr; A-F only)

MORT 3030. Funeral Service Law. (2 cr; A-F only. Prereq-3025)

MORT 3049. Microbiology. (2 cr; A-F or Aud. Prereq-General biology course w/lab.
Students who have already taken a microbiology course are exempt from this course)
Basic principles of microbiology, bacteriology, rickettsiology, virology, protozoology, mycology. Methods of transmission of infectious diseases. Control procedures for protection of public health as related to funeral service practice.

MORT 3050. Pathology. (3 cr; A-F only. Prereq-General biology course w/lab.
Scientific focus on causes of disease, mechanisms of disease development, and pathways by which morphologic changes occur.

MORT 3051. Restorative Art. (2 cr; A-F only. Prereq-3171 or &3171), &3061, mortuary science major)
Theories, principles, and techniques related to process of preparing human remains for viewing.

MORT 3061. Embalming Theory. (3 cr; A-F only. Prereq-[3171 or &3171], &3051, mortuary science major)
Process of chemically treating human remains to reduce presence/growth of microorganisms, to temporarily inhibit organic decomposition, and to restore decedent’s physical appearance.

MORT 3065. Embalming Chemistry. (3 cr; A-F only. Prereq-Intro course in general chemistry)

MORT 3080. Independent Study Project. (1-15 cr [max 30 cr]; Stdnt Opt. Prereq-Mortuary science major)
Independent study contracted between instructor, program director, and student.

MORT 3091W. Independent Study in Funeral Service. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-Mortuary science major)
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.

MORT 3151. Restorative Art Laboratory. (1 cr; S-N only. Prereq-[3171 or &3171], &3051, mortuary science major)
Principles/techniques for restorative art.
Modeling facial features with clay or wax. Use of restorative techniques. Cosmetic application on human remains.

MORT 3161. Embalming Laboratory. (1 cr; S-N only. Prereq-[3171 or &3171], &3061, mortuary science major)
Practices/procedures of chemically preserving/restoring human remains.


MUS 1051. Class Piano for Nonmusic Majors I. (2 cr) 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) 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 1151. Piano: Class Lessons I. (2 cr; A-F or Aud. Prereq-Music major, #) Functional skills such as reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and repertoire.

MUS 1152. Piano: Class Lessons II. (2 cr; A-F or Aud. Prereq-#) Functional skills such as reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and repertoire.

MUS 1155. Keyboard Skills I. (2 cr; A-F or Aud. Prereq-Keyboard major or music major with extensive keyboard background or #) Reading, transposing, harmonizing, improvising, playing by ear. Keyboard theory, technique, and music learning skills.

MUS 1156. Keyboard Skills II. (2 cr; A-F or Aud. Prereq-1155, #) Reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and music learning skills.

MUS 1260. Voice Class. (2 cr [max 4 cr]; Stdnt Opt. Prereq-Basic musicianship for learning and performing simple songs) The fundamentals of speech and singing information about the vocal instrument, the vocal process, vocal technique, and how to learn and perform three simple songs.

MUS 1471. Guitar: Class Lessons I. (2 cr; A-F or Aud) Fundamentals for the beginning guitarist; progressive development of skills. Basic strumming techniques, harmonizations in major and minor keys. Students must furnish acoustic guitar.

MUS 1472. Guitar: Class Lessons II. (2 cr; A-F or Aud. Prereq-1471 or #) Fundamentals for the beginning guitarist; progressive development of skills. Advanced strumming techniques, bass runs, finger-picking structures. Students must furnish acoustic guitar.

MUS 1501. Theory and Analysis of Tonal Music I. (2 cr; A-F or Aud. Prereq-#) Common-practice tonal harmony, part-writing, music analysis in various contexts.

MUS 1502. Theory and Analysis of Tonal Music II. (2 cr; A-F or Aud. Prereq-[[1501, 1511] with grade of at least C-] or diagnostic test administered by School of Music) Basics of common-practice tonal harmony/part-writing. Music analysis in various contexts.

MUS 1511. Ear-Training and Sight-Singing I. (1 cr; A-F or Aud. Prereq-#)

MUS 1512. Ear-Training and Sight-Singing II. (1 cr; A-F or Aud. Prereq-[[1501, 1511] with grade of at least C-] or diagnostic exam administered by School of Music) [music major or #]) Ear-training, sight-singing of tonal music.

MUS 1801W. Music, Society, and Culture. (3 cr; A-F or Aud. Prereq-[Music major or #], permission number) Study rural, urban, tribal musics throughout world with interdisciplinary methods of humanities/social sciences. World-wide distribution of musical creativity with audio/video documentation.

MUS 1804. World Music. (3 cr; Stdnt Opt) 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.

MUS 1902. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.
MUS 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud) Topics vary.
MUS 1905. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.
MUS 1907. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.
MUS 1921. Introduction to Music. (3 cr; Stdnt Opt. +MUS 1021) Survey of European and American art and popular music in the context of those cultures; aural analyses of musical styles and forms.
MUS 3029. Music in the 20th Century. (3 cr; Stdnt Opt) Music in European and American culture from 1890s to present. Emphasizes interactions between high art, popular and ethnic musics, contributions of men and women as composers and performers, concurrent developments in the arts, dance, and literature, and music as social commentary.
MUS 3150. Accompanying Skills. (1 cr [max 8 cr]; A-F or Aud. Prereq: Jr or Sr piano or organ major or #) A practical introduction to every facet of the art of piano as an accompaniment and collaborative instrument.
MUS 3230. Chorus. (1-2 cr [max 16 cr]; Stdnt Opt. Prereq-Choral and/or instrumental music background, audition, #) Includes the University Women’s Chorus, Men’s Chorus, Concert Choir, and Choral Union. Chorus participates 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.
MUS 3241. Vocal Literature (German Lieder) and Pedagogy. (1 cr; A-F or Aud. Prereq-Vocal performance or accompanying major, 2 yrs music theory/history) 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.
MUS 3242. Vocal Literature (French Melodie) and Pedagogy. (1 cr; A-F or Aud. Prereq-Vocal music or accompanying major, 2 yrs music theory/history) French Melodie: its origins, composers, and development. Musical/textual analysis of representative works. Poetry that serves as song text. French symbolist poets. Listening assignments.
MUS 3261. Italian Diction for Singers. (1 cr; A-F or Aud. Prereq-Voice or choral music major, &applied voice) 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.
MUS 3262. English Diction for Singers. (1 cr; A-F or Aud. Prereq-Voice or choral music major, &applied voice) 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.
MUS 3263. German Diction for Singers. (1 cr; A-F or Aud. Prereq-Voice or choral music major, &applied voice) 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.
MUS 3264. French Diction for Singers. (1 cr; A-F or Aud. Prereq-Voice or choral music major, concurrent enroll in applied voice) Principles and practice of French lyric diction for classical vocal music. Transcriptions of French melodie 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.
MUS 3321. Jazz Improvisation I. (2 cr; A-F or Aud. Prereq-Music major or #) 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.
MUS 3332. Jazz Improvisation II. (2 cr; A-F or Aud. Prereq-#) Transposition; analysis; improvisation on blues in three major keys and standard American popular jazz compositions from swing era to early bebop; II-V7-I progressions; ear training.
MUS 3340. Jazz Ensemble. (1 cr [max 8 cr]; A-F or Aud. Prereq-Audition, #) A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.
MUS 3350. Jazz Combo. (1 cr [max 8 cr]; A-F or Aud. Prereq-Audition, #) A performance laboratory class with emphasis on improvisation and learning the jazz vocabulary. A minimum of two public performances is required each semester.
MUS 3400. University and Campus Bands. (2 cr [max 20 cr]; Stdnt Opt) Lab course.
MUS 3401. Basic Conducting. (2 cr; A-F or Aud. Prereq:1502, music major) Beginning course in basic conducting techniques and role of the conductor.
MUS 3410. University Wind Bands. (1 cr [max 14 cr]; A-F or Aud. Prereq-Audition, #) Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate.
MUS 3420. Orchestra. (1 cr [max 8 cr]; A-F or Aud. Prereq-Audition, #) Symphony orchestra performs standard repertoire and major works with chorus; concerts and tour appearances. Players from all colleges may participate.
MUS 3430. Campus Orchestra. (2 cr [max 16 cr]; Stdnt Opt. Prereq:Non-music major or unable to register for University Orchestra) Orchestra for players who are not music majors or are unable to register for University Orchestra. Standard chamber/string orchestra literature rehearsed/performd.
MUS 3440. Chamber Ensemble. (1 cr [max 8 cr]; A-F or Aud. Prereq-#) Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and voices.
MUS 3460. Ensemble for the Performance of Early Music, c900-1750. (1 cr [max 8 cr]; A-F only) Performance of medieval, renaissance, and baroque music (sacred and secular) according to traditions established from c900 to 1750. Ensemble consists of a chamber chorus and ensembles of period instruments. Repertoire includes Gregorian chant, masses, motets, chansons, madrigals, and choral/instrumental movements from canzatas, oratorios, passions, all in original languages.
MUS 3480. Marching Band. (2 cr [max 8 cr]; A-F or Aud. Prereq-#) A 250-member performing organization open to players from all colleges. Performs at University football games and other athletic functions.
MUS 3490. Athletics Bands. (1 cr [max 16 cr]; A-F or Aud. Prereq-#) Athletics bands for men’s hockey, men’s baseball, and women’s sports.
MUS 3501. Theory and Analysis of Tonal Music III. (2 cr; A-F or Aud. Prereq:[1501, 1502, 1511, 1512] with grade of at least C-) or diagnostic test administered by School of Music) Harmony and voice-leading. Diatonic and basic chromatic chords. Form. Analysis of music from 18th/19th centuries.
MUS 3502. Theory and Analysis of Tonal Music IV. (2 cr; A-F or Aud. Prereq-[[3501, 3511] with grade of at least C-] or diagnostic test administered by School of Music) Harmony and voice-leading. Chromatic tonal practices. Form, including sonata, rondo, variations, and other standard categories of tonal composition. Analysis of music from 18th/19th centuries.


MUS 3511. Ear-Training and Sight-Singing III. (1 cr; A-F or Aud. Prereq-[[1501, 1511] with grade of at least C-] or diagnostic test administered by School of Music), [music major or #)] Melodic, harmonic, and rhythmic dictation. Sight-singing. Clef reading. Emphasizes chromatic harmony.

MUS 3512. Ear-Training and Sight-Singing IV. (1 cr; A-F or Aud. Prereq-[[3501, 3511] with a grade of at least C- or diagnostic exam administered by School of Music], [music major or #)] Melodic, harmonic, and rhythmic dictation. Sight-singing. Clef reading. Emphasizes chromatic harmony.


MUS 3601W. History of Western Music I. (3 cr; A-F or Aud. Prereq-#) History of European art-music tradition, its social contexts from antiquity to 1700: composers, styles, structures, social institutions.

MUS 3602W. History of Western Music II. (3 cr; A-F or Aud. Prereq-1502, 3601, music major, #) History of European art-music tradition, its social contexts, from 1700 to 1850. Composers, styles, structures, social institutions.

MUS 3603W. History of Western Music III. (3 cr; A-F or Aud. Prereq-[[3501, 3511], 3602] with a grade of at least C-, music major) or #) History of European/American art, popular music traditions, from 1850 to present. Composers, styles, structures, social institutions.

MUS 3950. Topics in Music. (1-3 cr [max 15 cr]; Stdnt Opt) Each offering focuses on a single topic. Topics specified in Class Schedule.


MUS 3993. Directed Studies. (1-4 cr [max 10 cr]; A-F or Aud. Prereq-#, %, @) Guided individual reading or study.

MUS 3995. Major Project. (1 cr; A-F or Aud. Prereq-Undergrad music major in B.A. program, #, %) Required of music majors in senior year of the B.A. program. Research paper on topic of student’s choice in consultation with faculty mentor. Sign up in Undergraduate Studies office one term in advance.


MUS 4504. Intensive Theory and Analysis of 20th-Century Music. (3 cr; A-F or Aud. Prereq-[[3502, 3512] or #)] Theory analysis of art music in various styles developed in 20th century.


MUS 4514. Ear-Training and Sight-Singing for 20th-Century Music. (1 cr; A-F or Aud. Prereq-Completion of [[3502, 3512] with grade of at least C-) Developing aural skills relevant to 20th-century Western art musics. Focuses on pitch relations, rhythmic techniques, form, and to a lesser degree, timbre and texture.


MUS 5101. Piano Pedagogy I. (2 cr; Stdnt Opt. Prereq-8 cr in MusA 1301 or MusA 1401 or #) Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the elementary, early intermediate, and late intermediate levels.


MUS 5151. Organ Literature I. (3 cr; A-F or Aud. Prereq-3502, 3603, sr or grad or #) 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.

MUS 5160. Instrumental Accompanying Skills and Repertoire. (2 cr [max 4 cr]; A-F or Aud. Prereq-Accomp major) Performance class in accompanying skills particular to orchestral reductions and non-sonata instrumental accompanying. Repertoire to include, but not be limited to, classical and romantic string concerti, and “encore” pieces.

MUS 5170. Vocal Accompanying Skills and Repertoire. (2 cr [max 4 cr]; A-F or Aud. Prereq-French, German and Italian diction, accomp or grad vocal major) Performance class (lieder, melodic, opera) with emphasis on coaching techniques and performance skills of pianists and singers.

MUS 5182. Advanced Piano Literature I. (2 cr; A-F or Aud. Prereq-grad piano major or #) Literature for piano from late Baroque period to mid-20th century.

MUS 5230. Chorus. (1-2 cr [max 16 cr]; Stdnt Opt. Prereq-Choral and/or instrumental music background; audition, #) 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, and collaborative campus/community performances.

MUS 5240. University Singers. (1 cr [max 8 cr]; A-F or Aud. Prereq-Audition, #) 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.

MUS 5241. Vocal Literature I. (3 cr; A-F or Aud. Prereq-[12 cr in MusA 1304, grad music student] or #) Vocal literature of major/minor composers from 17th century to present. Structure, style, performance practice.

MUS 5242. Vocal Literature II. (3 cr; A-F or Aud. Prereq-12 cr in MusA 1304 or MusA 1304, grad music major or #) Vocal literature of major and minor composers from 17th century to present; structure, style, and performance practice.


MUS 5270. Voice Practicum. (1 cr [max 2 cr]; Stdnt Opt. Prereq-Undergrad sr vocal major or #) Teaching voice class or individual students with peer and faculty feedback. Assist in class voice instruction or teach two students weekly in conjunction with two one-hour observation labs. May be taken for two semesters.
MUS 5271. Diction for Singers I. (2 cr; A-F or Aud. Prereq-12 cr MusA 1304 or grad music major or #) Principles and techniques of singing in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used.

MUS 5272. Diction for Singers II. (2 cr; A-F or Aud. Prereq-12 cr MusA 1304 or grad music major or #) Principles and techniques of singing in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used.

MUS 5275. Vocal Pedagogy I. (1 cr; Stdnt Opt. Prereq-Sr vocal major or #) 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.

MUS 5276. Vocal Pedagogy II. (3 cr; A-F or Aud. Prereq-Sr vocal major or #) 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.

MUS 5279. Group Voice: Performance/Pedagogy. (2 cr; A-F or Aud. Prereq-perform; performance only track: 2 cr per sem; performance/pedagogy track: 3 cr per sem; upper div student or grad student[1], #) Foundations/fundamentals of speech/singing. Vocal production, anatomy, physiology, terminology. Application of vocal techniques in learning/performing repertoire. Teaching methods, including voice/motion exercises.


MUS 5331. Jazz Improvisation I. (2 cr; A-F or Aud. Prereq-Music major or #) 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.

MUS 5336. Jazz Arranging. (3 cr; A-F or Aud. Prereq-3502 or #) Beginning techniques of arranging for jazz combo and jazz ensemble; vocal and instrumental.

MUS 5340. Jazz Ensemble. (1 cr [max 6 cr]; A-F or Aud. Prereq-audition, #) A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.

MUS 5341. Jazz Pedagogy. (2 cr; A-F or Aud. Prereq-#) Teaching methods of vocal and instrumental jazz improvisation, basic arranging techniques, and jazz history; bibliographies and materials.


MUS 5400. University and Campus Bands. (1 cr [max 10 cr]; Stdnt Opt) Lab course.

MUS 5410. University Wind Bands. (1 cr [max 14 cr]; A-F or Aud. Prereq-audition, #) Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate.

MUS 5420. Orchestra. (1 cr [max 8 cr]; A-F or Aud. Prereq-audition, #) Symphony orchestra performs standard repertory and major works with chorus; concert band and wind band. Players from all colleges may participate.

MUS 5421. Suzuki Violin Pedagogy I. (2 cr; A-F or Aud. Prereq-Violin major or #) Philosophy and teaching techniques of Japanese pedagogue Shinichi Suzuki and their applications in Western culture. Discussion, playing experience, and observation of children's lessons in the MacPhail Center Suzuki Program.

MUS 5422. Suzuki Violin Pedagogy II. (2 cr; A-F or Aud. Prereq-5421 or #) Philosophy and teaching techniques of Japanese pedagogue Shinichi Suzuki and their applications in Western culture. Discussion, playing experience, and observation of children's lessons in the MacPhail Center Suzuki Program.

MUS 5423. Suzuki Pedagogy Practicum. (1 cr; A-F or Aud. Prereq-[&5424 or &5425], grad music student[1] or #, grad consent) Supervised teaching of both individual and group lessons. Instructor provides periodic critiques from observation of live or videotaped lessons.


MUS 5425. Advanced Suzuki Violin Pedagogy II. (2 cr; A-F or Aud. Prereq-5424 or #) Intensive examination of Suzuki techniques for intermediate and advanced violin students in Western society. Discussion, playing experience, observation of children's lessons in the MacPhail Center Suzuki Program, and practical teaching experience.

MUS 5427. Violin Pedagogy I. (2 cr; A-F or Aud. Prereq-Violin or viola major or #) Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

MUS 5428. Violin Pedagogy II. (2 cr; A-F or Aud. Prereq-Violin or viola major or #) Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

MUS 5430. Contemporary Music Workshop. (1 cr [max 8 cr]; A-F or Aud. Prereq-#) Generation/performance of new chamber works set within context to situate musical works within dynamic field of historical, philosophical, and expressive import.

MUS 5440. Chamber Ensemble. (1 cr [max 8 cr]; A-F or Aud. Prereq-audition, #) Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and/or voices.

MUS 5450. Orchestral Repertoire. (1-3 cr [max 9 cr]; A-F or Aud. Prereq-#) Investigation of practical and performance problems in standard orchestral repertoire with regard to style and interpretation.

MUS 5460. Ensemble for the Performance of Early Music, c900-1750. (1 cr [max 8 cr]; A-F only) Performance of medieval, renaissance, and baroque music (sacred and secular) according to traditions established from c900 to 1750. Ensemble consists of a chamber chorus and ensembles of period instruments. Repertoire includes Gregorian chant, masses, motets, chansons, madrigals, and choral/ instrumental movements from cantatas, oratorios, passions, all in original languages.

MUS 5461. Guitar Literature I: History and Repertoire before 1900. (2 cr; Stdnt Opt) Early history of classical guitar through its repertoire/composers. Related instruments such as renaissance lute, vihuela, baroque guitar, and baroque lute. Development of modern classical instrument.

MUS 5462. Guitar Literature II: History and Repertoire Since 1900. (2 cr; Stdnt Opt) Repertoire/composers, concert/recording artists, and instrumental innovation of Segovia/post-Segovia eras.

MUS 5464. Cello Pedagogy. (2 cr; A-F or Aud) Concentrated study of cello teaching methods. Provides students with the strategies for teaching cello privately, develops analytical skills, and increases knowledge of cello repertoire. For practical application in conjunction with string technique course.

MUS 5466. Guitar Pedagogy. (2 cr; A-F or Aud. Prereq-Guitar principal or major or #) Historical survey of methods and studies from late 18th century to present, reflecting variety of content and approach. Works by Aguado, Sor, Giuliani, Tarrega, Segovia, Carlevaro, Duncan, Iznaola, Dodgson, and Brindle.

MUS 5471. Woodwind Literature and Pedagogy I. (3 cr; A-F or Aud. Prereq-Music major or #) A study of the major teaching materials for the five woodwind instruments including methods, duets, and solos used primarily for pedagogical reasons.

MUS 5472. Woodwind Literature and Pedagogy II. (3 cr; A-F or Aud. Prereq-Music major or #) A study of chamber music involving one or more woodwind instruments. May include additional instruments such as piano, strings, and/or voice.
MUS 5473. History and Acoustics of Single Reed Instruments. (2 cr; A-F or Aud. Prereq-Music major or #) Study of clarinet, saxophone history and literature, mechanical design and development, acoustics, modern schools of performance, selected teaching and performance techniques.

MUS 5480. University Brass Choir. (1 cr [max 8 cr]; Stdnt Opt. Prereq-audition, #) The University Brass Choir is an ensemble of 16 brass 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.

MUS 5481. Trumpet Pedagogy. (2 cr; Stdnt Opt. Prereq-Sr or grad in music or #) Principles of trumpet pedagogy. Development of skills in identifying, locating, and understanding (generic, expressive, social).

MUS 5485. Transcription for Winds. (2 cr; Stdnt Opt. Prereq-3502 or #) Principles of music manuscript and examination of transcription examples. Transcription projects with score and parts. Smaller projects that involve arrangements and original compositions.

MUS 5491. Percussion Literature I. (2 cr; A-F or Aud. Prereq-Jr or sr or grad or #) 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.

MUS 5541. 16th-Century Counterpoint. (3 cr; A-F or Aud. Prereq-3501, 3508 or pass basic skills exam) Polyphonic counterpoint in modal style of Renaissance. Writing exercises in species counterpoint of 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 Atti, Banchieri, Diruta, Morley, Zarlino, and others.

MUS 5550. Class Composition. (2 cr [max 8 cr]; A-F or Aud. Prereq-3502 or #) Original works in various forms. Development of individual compositional style in a post-tonal idiom. Various forms, performing forces, techniques.

MUS 5561. Orchestration I. (3 cr; A-F or Aud. Prereq-3502) Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries.

MUS 5562. Orchestration II. (3 cr; A-F or Aud. Prereq-5561) Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries.

MUS 5571. Schenkerian Analysis for Performers. (3 cr; A-F or Aud. Prereq-3502) Theory/analysis of tonal music using principles developed by Henrich Schenker. Basic concepts/notation, their application to excerpts/short pieces from 18th-19th centuries.

MUS 5573. Analysis of Late-Romantic Orchestral Literature. (3 cr; A-F or Aud. Prereq-3502 or Theory IV Exam or F; [5504 or equiv] recommended) Advanced tonal analysis. Dramatic orchestral music by Wagner, Strauss, Tchaikovsky, Rimsky-Korsakov, Moussorgsky, and Rachmaninoff as focus for projects/discussions related to dramatic harmony, form, and orchestration.


MUS 5592. Computer Music 2: Interactive Techniques and Theory. (3 cr; A-F or Aud. Prereq-5591 or #) Topics such as filtering, formant synthesis, reverberation techniques, and additive synthesis. Work with interactive MIDI applications.

MUS 5597. Music and Text. (3 cr; A-F or Aud. Prereq-3502) Designed for music majors only, this course gives an introduction to the analysis of music with texts such as art song and opera.


MUS 5620. Topics in Opera History. (3 cr [max 6 cr]; A-F or Aud. Prereq-grad music major or #) Study of specific operas. Development of opera in context of other artistic, social, cultural, and political events, movements, and changes. Periods/countries vary each semester.

MUS 5621. Baroque Music and Its Contexts. (3 cr; A-F only. Prereq-Grad student in music or #) Genres, styles, and contexts of music composed in Western Europe between 1600 and 1750. Emphasizes works typically not covered in undergraduate music history classes. Individual works as representative of larger aesthetic, social, political, and theological issues.

MUS 5624. Music of J. S. Bach. (3 cr; A-F or Aud. Prereq-Grad student in music or #) 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.

MUS 5647. 20th-Century European/ American Music. (3 cr; Stdnt Opt. Prereq-3603 or equiv, 5501 or equiv, 12 cr in music history) 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.

MUS 5658. History of the Symphony in the 20th Century. (3 cr; A-F or Aud. Prereq-3603, 5501 or #) History of symphony (and related genres) in Europe and America, ca. 1890 to present. Changing aesthetic concerns, structural, harmonic, and timbral innovations. Sociocultural contexts; analysis and criticism.

MUS 5668. Beethoven's Symphonies. (3 cr; A-F or Aud. Prereq-3603, #) Analytical overview of selected movements from Beethoven's 9 symphonies. Principles of sonata analysis (norm and deformation); introduction to wider contexts of interpretation and understanding (generic, expressive, social).

MUS 5950. Topics in Music. (1-4 cr [max 15 cr]; Stdnt Opt. Prereq-%, @) Guided individual reading or study.

Music Applied (MUSA)

School of Music
College of Liberal Arts

Note: MUSA 1101 through MUSA 1123 are private instruction and include the following: (2-4 cr [max 32 cr]; A-F or Aud. Prereq-%)

MUSA 1102. Harpsichord: Elective.
MUSA 1103. Organ: Elective.
MUSA 1107. Cello: Elective.
MUSA 1109. Flute: Elective.
MUSA 1111. Oboe: Elective.
MUSA 1112. Clarinet: Elective.
MUSA 1113. Saxophone: Elective.
MUSA 1114. Bassoon: Elective.
MUSA 1115. French Horn: Elective.
MUSA 1116. Trumpet: Elective.
MUSA 1117. Trombone: Elective.
MUSA 1118. Euphonium: Elective.
MUSA 1119. Tuba: Elective.
MUSA 1121. Percussion: Elective.
MUSA 1123. Guitar: Elective.

Note: MUSA 1301 through MUSA 1423 are private instruction and include the following: (2-4 cr [max 16 cr]; A-F or Aud. Prereq-Audition, %)

MUSA 1301. Piano—Major.
MUSA 1302. Harpsichord—Major.
MUSA 1303. Organ—Major.
MUSA 1304. Voice—Major.
MUSA 1305. Violin—Major.
MUSA 1306. Viola—Major.
MUSA 1307. Cello—Major.
MUSA 1308. Double Bass—Major.
MUSA 1309. Flute—Major.
MUSA 1311. Oboe—Major.
MUSA 1312. Clarinet—Major.
MUSA 1313. Saxophone—Major.
MUSA 1314. Bassoon—Major.
MUSA 1315. French Horn—Major.
MUSA 1316. Trumpet—Major.
MUSA 1317. Trombone—Major.
MUSA 1318. Euphonium—Major.
MUSA 1319. Tuba—Major.
MUSA 1321. Percussion—Major.
MUSA 1322. Harp—Major.
MUSA 1323. Guitar—Major.
MUSA 1401. Piano—Secondary.
MUSA 1402. Harpsichord—Secondary.
MUSA 1403. Organ—Secondary.
MUSA 1409. Flute—Secondary.
MUSA 1411. Oboe—Secondary.
MUSA 1413. Saxophone—Secondary.
MUSA 1415. French Horn—Secondary.
MUSA 1416. Trumpet—Secondary.
MUSA 1417. Trombone—Secondary.
MUSA 1418. Euphonium—Secondary.
MUSA 1419. Tuba—Secondary.
MUSA 1421. Percussion—Secondary.
MUSA 1422. Harp—Secondary.
MUSA 1423. Guitar—Secondary.

Note: MUSA 1901 through MUSA 1923 are private instruction for transfer students, one semester only and include the following: (2-4 cr [max 4 cr]; A-F or Aud. Prereq—Audition, %)

MUSA 1901. Piano—Transfer.
MUSA 1902. Harpsichord—Transfer.
MUSA 1903. Organ—Transfer.
MUSA 1904. Voice—Transfer.
MUSA 1905. Violin—Transfer.
MUSA 1906. Viola—Transfer.
MUSA 1907. Cello—Transfer.
MUSA 1908. Double Bass—Transfer.
MUSA 1909. Flute—Transfer.
MUSA 1911. Oboe—Transfer.
MUSA 1912. Clarinet—Transfer.
MUSA 1913. Saxophone—Transfer.
MUSA 1914. Bassoon—Transfer.
MUSA 1915. French Horn—Transfer.
MUSA 1916. Trumpet—Transfer.
MUSA 1917. Trombone—Transfer.
MUSA 1918. Euphonium—Transfer.
MUSA 1919. Tuba—Transfer.
MUSA 1921. Percussion—Transfer.
MUSA 1922. Harp—Transfer.
MUSA 1923. Guitar—Transfer.

MUSA 1903. Organ—Transfer.
MUSA 1905. Violin—Transfer.
MUSA 1908. Double Bass—Transfer.

For a guide to course numbers, symbols, and abbreviations, see page 376.
MUSA 5107. Cello: Elective.
MUSA 5109. Flute: Elective.
MUSA 5111. Oboe: Elective.
MUSA 5112. Clarinet: Elective.
MUSA 5113. Saxophone: Elective.
MUSA 5115. French Horn: Elective.
MUSA 5116. Trumpet: Elective.
MUSA 5117. Trombone: Elective.
MUSA 5119. Tuba: Elective.
MUSA 5121. Percussion: Elective.
MUSA 5123. Guitar: Elective.

Note: MUSA 5401 through MUSA 5423 are private instruction and, unless otherwise noted, include the following: (2-4 cr [max 24 cr]; A-F or Aud. Prereq--Audition, %)

MUSA 5401. Piano—Secondary.
MUSA 5402. Harpsichord—Secondary.
MUSA 5403. Organ—Secondary.
MUSA 5405. Violin—Secondary.
MUSA 5406. Viola—Secondary.
MUSA 5407. Cello—Secondary.
MUSA 5409. Flute—Secondary.
MUSA 5411. Oboe—Secondary.
MUSA 5412. Clarinet—Secondary.
MUSA 5413. Saxophone—Secondary.
MUSA 5415. French Horn—Secondary. (2-4 cr [max 4 cr]; Stdnt Opt. Prereq--Audition, %)
MUSA 5416. Trumpet—Secondary.
MUSA 5417. Trombone—Secondary.
MUSA 5419. Tuba—Secondary.
MUSA 5421. Percussion—Secondary.
MUSA 5422. Harp—Secondary.
MUSA 5423. Guitar—Secondary.

Music Education (MUED)

School of Music
College of Liberal Arts

MUED 1201. Introduction to Music Teaching and Learning. (1 cr; A-F or Aud)
Orientation to profession of music education. In-school observations, readings, presentations, and self-reflection. Technology for music educators.

MUED 1202. Experiences in Music Teaching and Learning. (2 cr; A-F only. Prereq-1201 or #)

MUED 1801. Introduction to Music Therapy. (2 cr; A-F or Aud)
Methods, materials, and applications of music therapy in various clinical settings with emphasis on field observation.

MUED 3301. General Music I. (3 cr; A-F or Aud. Prereq-MUS 3502, MUS 3512, successful completion of soph proficiency exam, music education major)
Methods, materials, curriculum development, principles of learning. The child voice. Rhythm, music reading, history, appreciation, listening, creativity, classroom instruments. Applications of technology for elementary school classroom music.

MUED 3302. General Music II. (3 cr; A-F or Aud. Prereq-MUS 3502, 3512, [music education major or #], successful completion of soph proficiency exam)

MUED 3415. Choral Conducting and Methods I. (4 cr; A-F or Aud. Prereq-MUS 3502, MUS 3512, [music education major or #], successful completion of soph proficiency exam)

MUED 3416. Choral Conducting and Methods II. (4 cr; A-F or Aud. Prereq-3415 with grade of at least C-) Methods, materials, curriculum, principles of learning. Teaching students in secondary schools to sing, play, create, listen to, and evaluate music. Interdisciplinary connections, the adolescent voice. Repertoire/arranging, applications of technology. Peer/field teaching.

MUED 3417. Instrumental Methods and Materials. (4 cr; A-F or Aud. Prereq-MUS 3502, MUS 3512, music education major, successful completion of soph proficiency exam, %)

MUED 3517. Beginning Instrumental Methods and Materials. (4 cr; A-F or Aud. Prereq-3516, MUS 3502, MUS 3512 music education major, %)
Development of skills for teaching beginning instrumentalists.

MUED 3518. Instrumental Methods and Conducting II. (3 cr; A-F or Aud. Prereq-[1201, 3502, 3503, 3504, 3505, 3516, 3517, MUS 3401] with at least C-)
Students synthesize knowledge/skills to develop and maintain a comprehensive instrumental music program.

MUED 3519. Advanced Conducting and Repertoire (Instrumental). (2 cr; A-F only. Prereq-3517, MUS 3502, MUS 3512, music education major, %)
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.

MUED 3502. String Techniques and Teaching. (2 cr [max 3 cr]; A-F or Aud. Prereq-Music ed or music therapy major or #)

MUED 3503. Woodwind Techniques and Teaching. (2 cr; A-F or Aud. Prereq-Music ed or music therapy major or #)

MUED 3504. Brass Techniques and Teaching. (2 cr [max 3 cr]; A-F or Aud. Prereq-Music ed or music therapy major or #)

MUED 3505. Percussion Techniques and Teaching. (2 cr [max 3 cr]; A-F or Aud. Prereq-Music ed or music therapy major or #)

MUED 3516. Instrumental Methods and Conducting I. (4 cr; A-F or Aud. Prereq-MUS 3502, MUS 3512 music education major, successful completion of soph proficiency exam, %)

MUED 3518. Instrumental Methods and Conducting II. (3 cr; A-F or Aud. Prereq-[1201, 3502, 3503, 3504, 3505, 3516, 3517, MUS 3401] with at least C-)
Students synthesize knowledge/skills to develop and maintain a comprehensive instrumental music program.

MUED 3519. Advanced Conducting and Repertoire (Instrumental). (2 cr; A-F only. Prereq-3517, MUS 3502, MUS 3512, music education major, %)
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.

MUED 3802. Guitar I for Music Education and Music Therapy Majors: Developing Group Songleading Skills. (2 cr; A-F only. Prereq-Music therapy or music education major), %
How to play standing up, accompany oneself, cue/prompt, move around room while playing, sight-read chords, read tablature. Open chords, tuning, keys that facilitate group singing. Eye contact. Simple 2-5 chords songs. Teaching guitar to novice players.

580 Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.
MUED 3803. Guitar II for Music Education and Music Therapy Majors: Developing Group Songleading Skills. (2 cr; A-F only. Prereq: 3802 with grade of at least C; [music therapy or music education major], %)

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.

MUED 3900. Lab Ensemble. (1 cr [max 16 cr]; A-F only)

Instrumental/choral method books/reertoire through playing of secondary instruments. Students teach individual applied lessons/sectionals and conduct large ensembles using quality, age-appropriate repertoire.

MUED 5011. Music in the Elementary Classroom Curriculum. (2-3 cr [max 3 cr]; Stdnt Opt. Prereq: Elem Ed major or %)

Fundamentals of music, methods, and materials for incorporating singing, rhythmic activities, classroom instruments, movement, listening, appreciation, and creation in context of classroom curriculum.

MUED 5211. Foundations of Music Education. (3 cr; A-F or Aud)

An overview of the historical, philosophical, and psychological foundations of music education.

MUED 5350. Student Teaching in Classroom Music. (4-8 cr [max 8 cr]; A-F or Aud. Prereq: Music ed major, #)

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 5433. Techniques and Materials: Choral Ensembles. (2-3 cr [max 3 cr]; Stdnt Opt. Prereq: Elem Ed major or %)

Research and literature on vocal and choral music education; curriculum issues; repertoire selection; rehearsal techniques.

MUED 5450. Student Teaching in Vocal Music. (4-8 cr [max 8 cr]; A-F or Aud. Prereq: Music ed major, #)

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 5500. Guitar Methods for Music Education/Therapy Professionals. (2 cr [max 8 cr]; Stdnt Opt. Prereq: 3502 recommended)

Accelerated program for developing guitar performance skills. Classroom applications, therapy applications, pedagogy.

MUED 5550. Student Teaching in Instrumental Music. (4-8 cr [max 8 cr]; A-F or Aud. Prereq: Music ed major, #)

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 5611. Teaching Music with Related Arts. (2 cr; A-F or Aud)

Methods and materials for teaching music in cultural context including other art forms.

MUED 5647. Teaching the Percussion Instruments. (2 cr; A-F or Aud)

Contemporary approaches for teaching percussion in the schools; development of curricular materials and practice in performance techniques.

MUED 5664. Teaching Music with Technology. (3 cr; A-F or Aud)

Home page development techniques, software/materials, audio/video utilities, research applications.

MUED 5669. Psychology of Music. (3 cr; A-F or Aud. Prereq: Psy 1001 or Psy 3604 or #)

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.

MUED 5750. Topics in Music Education. (1-4 cr [max 16 cr]; A-F or Aud, Prereq-Grad student in [music education/therapy or education] or #)

Focuses on single topic, specified in Class Schedule.

MUED 5800. Group Music Leadership Skills. (3 cr; A-F or Aud. Prereq: Completion of MUS 1151, MUS 1152 or MUS 1155, music therapy major or #)

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.

MUED 5803. Therapeutic Management in Music Settings. (4 cr; A-F only. Prereq: 5804, 5805 or #)

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.

MUED 5804. Music Therapy Methods and Procedures I. (4 cr; A-F or Aud. Prereq: 5800 or #)

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.

MUED 5805. Music Therapy Methods and Procedures II. (4 cr; A-F only. Prereq: 5804 or #)

Second course in professional sequence for music therapy. Topics include psychotherapy techniques and other music therapy approaches. Practicum in the community, in-class lab.

MUED 5806. Career Preparation. (3 cr; A-F or Aud. Prereq: 5805 or #)

Ethics, grant writing, resume/CV preparation, supervision, board certification, professional responsibilities. Students design evidence-based research/music therapy program, present their proposals to class/community.

MUED 5807. Psychiatric Music Therapy. (3-4 cr [max 4 cr]; A-F only. Prereq-Grad music therapy student or #)

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.

MUED 5808. Medical Music Therapy. (3-4 cr [max 4 cr]; A-F only. Prereq-Grad music therapy major or #)

Role/scope of music therapy in medical treatment. Medical diagnoses. How to program appropriate music therapy interventions to address patient needs.

MUED 5855. Music Therapy Internship. (G-13 cr [max 13 cr]; S-N or Aud. Prereq-Music therapy major, #)

Six-month resident internship in music therapy at an affiliated, approved hospital or clinic.

MUED 5891. Independent Study. (1-4 cr [max 8 cr]; A-F or Aud. Prereq-Music ed or music therapy major or grad, %)

Independent study project organized by the student in consultation with the appropriate instructor.

Naval Science (NAV)

Undergraduate Education Administration

NAV 1000. Professional Training in Naval Science. (1 cr; S-N or Aud. Prereq-enrolled in NROTC)

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.

NAV 1101. Introduction to Naval Science. (3 cr; A-F or Aud)

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 Aud)

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 Aud. Prereq-Soph enrolled in NROTC)

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.
NAV 2201. Ship Systems I: Naval Engineering. (3 cr; A-F or Aud)
Detailed study of ship characteristics/types. Design, hydrodynamic forces, stability, compartmentation, propulsion, electrical/auxiliary systems, damage control, administration. Basic concepts of theory/design for steam, gas turbine, diesel, nuclear propulsion.

NAV 2202. Ship Systems II: Science and Technology in Naval Weapons Systems. (3 cr; A-F or Aud)

NAV 3000. Professional Training in Naval Science. (1 cr; S-N or Aud. Prereq-Jr enrolled in NROTC)
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.

NAV 3301. Navigation I: Piloting and Celestial Navigation. (3 cr; A-F or Aud)
Theory/practice piloting a ship near land. Coordinate systems, chart reading, dead reckoning, fixes, tides, currents, anchoring. Theory based on observance of celestial bodies.

NAV 3302. Navigation II: Seamanship and Ship Operations. (3 cr; A-F or Aud. Prereq-3301)
National/international nautical rules of the road, seamanship, tactical maneuvering/signaling, relative motion, vector-analysis, formation tactics, ship employment, ship behavior/characteristics. Application of maneuvering board in solving motion problems.

NAV 3310. Evolution of Warfare. (3 cr; A-F or Aud)
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; S-N or Aud. Prereq-Sr enrolled in NROTC)
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.

NAV 4401W. Leadership and Management I. (3 cr; A-F or Aud)

NAV 4402W. Leadership and Ethics. (3 cr; A-F or Aud. Prereq-4401)
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.

NAV 4410. Amphibious Warfare. (3 cr; A-F or Aud)
Development of amphibious doctrine, its expansion in Pacific Campaign of World War II. Detailed case studies of Tarawa, Iwo Jima, Okinawa illustrate amphibious planning.

Neuroscience (NSC) Department of Neuroscience Medical School

NSC 4185. Itasca Summer Neurobiology Laboratory. (3 cr; A-F or Aud, Prereq-#)
Concepts in cellular neurosciences. Basis of membrane properties, including ionic/molecular mechanisms of rest, action, and synaptic potentials. State-of-the-art equipment and contemporary techniques used to examine experimental evidence.

NSC 5031W. Perception. (3 cr; Stdnt Opt. =PSY 5031W. Prereq-Psy 301W or Psy 3051 or #)
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.

NSC 5037. Psychology of Hearing. (3 cr; Stdnt Opt. =PSY 5037. Prereq-Psy 301 or #)
Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical and other applications.


NSC 5461. Cellular and Molecular Neuroscience. (4 cr; A-F or Aud. Prereq-NSC grad student or #)
Lectures by team of faculty, problem sets in important physiological concepts, discussion of original research papers.

Current research on drugs of abuse, their mechanisms of action, characteristics shared by various agents, and neuronal systems affected by them. Offered biennially, spring semester of even-numbered years.

NSC 5481. Invertebrate Neurobiology. (3 cr; A-F or Aud. =ENT 5481)
Fundamental principles/concepts underlying cellular bases of behavior and “systems” neuroscience. Particular invertebrate preparations. Offered annually the last 10 weeks of spring semester.

NSC 5540. Advanced Survey of Biomedical Neurosciences. (2 cr; A-F or Aud. Prereq-# intended for members of biomedical community or students with advanced scientific backgrounds)
Current topics in biomedical neuroscience, accompanied by supporting, fundamental concepts. Intensive, one week course.

NSC 5551. Itasca Cell and Molecular Neurobiology Laboratory. (4 cr; S-N or Aud. Prereq-Neuroscience grad or #)
Intensive lab introduction to cellular and molecular aspects of research techniques in contemporary neurobiology; held at Itasca Biological Station. Electrophysiological investigations of neuronal properties, neuropharmacological assays of transmitter action, and immunohistochimical studies in experimental preparations.

NSC 5561. Systems Neuroscience. (4 cr; A-F or Aud. Prereq-NSC grad student or #)

NSC 5565. Behavioral Neuroscience. (3 cr; A-F or Aud. Prereq-Grad NSC major or grad NSC minor or #)
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.

NSC 5567. Neurobiology in Disease. (2-3 cr; max 3 cr); S-N or Aud. =NSU 5567. Prereq-#)
Basic clinical/pathological features, pathogenic mechanisms. Weekly seminar course.

NSC 5568. Neurodegeneration and Repair. (2 cr; Stdnt Opt. Prereq-)
Pathogenic mechanisms of neuronal death, neurodegenerative disease, neuronal repair. Weekly seminar course.

Neuroscience Department (NSCI) Department of Neuroscience Medical School

NSCI 1001. Fundamental Neuroscience: Understanding Ourselves. (3 cr; A-F only)
Assessing objectively the neuroscience information presented to public at-large across various media outlets. Examining the potential importance of these discoveries.

NSCI 3101. Introduction to Neuroscience I: From Molecules to Madness. (2 cr; A-F or Aud. =PHSL 3101, BIOL 3101. Prereq-BioC 3021 or BioC 3021 or BioC 4331 or BioC 4331 recommended)
Basic principles of cellular/molecular neurobiology and nervous systems.
NSCI 3102W. Introduction to Neuroscience II: Biological Basis of Behavior. (3 cr; A-F or Aud. Prereq-3101; grade of at least B+ in 3101 recommended) Organization of neural systems/subsystems underlying sensory/motor aspects of behavior. Writing intensive.


NSCI 4111. Advanced Topics in Neuroscience. (3 cr; A-F or Aud. +PHSL 4151, BIOL 4251, ANPH 4151, PHSL 5150. Prereq-4151, Biostats [PHSL 3101 or #]) 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 Aud. Prereq-#) 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 to middle school learners.

NSCI 4793W. Directed Studies: Writing Intensive. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#, %; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements) Individual study of selected topics. Emphasis on readings, use of scientific literature. Writing intensive.

NSCI 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#, %; no more than 7 cr of [4793, 4794, 4993, 4994] may count toward major requirements) Lab or field investigation of selected areas of research. Writing intensive.

NSCI 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#, %; max of 7 cr of 4993 and/or 4994 may count toward major requirements) Individual study of selected topics with emphasis on selected readings and use of scientific literature.

NSCI 4994. Directed Research. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#, %; max of 7 cr of 4993 and/or 4994 may count toward major requirements) Lab or field investigation of selected areas of research.

NSCI 5101. Introduction to Neuroscience for Graduate Students. (3 cr; A-F or Aud. Prereq-[BioC 3021 or BioC 4331], %; intended for grad students outside neuroscience program who require comprehensive intro) Basic principles of cellular/molecular neurobiology and nervous system. A term paper supplements lectures. Multiple-choice exams.

NSCI 5111. Medical Neuroscience for Graduate Students. (5 cr; A-F or Aud. Prereq-#; 6111; BioC 3021, BioL 4004, %; intended for grad students who require a comprehensive medically-oriented neuroscience course) Survey of molecular, cellular, and systems neuroscience as related to medicine. Lecture/lab.

NSCI 5540. Advanced Survey of Biomedical Neuroscience. (2 cr; Stdnt Opt. Prereq-#; intended for members of biomedical community or students with advanced scientific backgrounds) Current topics in biomedical neuroscience. Supporting, fundamental concepts. Intensive, one week course.

NSCI 5913. BrainU 101: Neuroscience in the Classroom. (5 cr; A-F or Aud, Prereq- [Elementary or middle school or high school or preschool] teacher, %, application) Two-week summer workshop. Week one focuses on training teachers in neuroscience through lectures, activities, and discussion sessions. Week two focuses on designing inquiry-based classroom investigations based on neuroscience education given during week one. Follow-up activities held during the academic year include BrainU staff/faculty classroom presentations and use of training materials.

NSCI 5915. BrainU 303: Neuroscience in the Classroom. (2 cr; A-F or Aud. Prereq-[5913 or BioL 5100], 5914, %, application) One-week summer workshop. Focuses on critiquing previously implemented neuroscience class activities and assessment tools, and expanding neuroscience content knowledge. Follow-up activities held during academic year include BrainU 303 participants. Use of training materials and implementation of neuroscience investigations.

Norwegian (NOR)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

NOR 1001. Beginning Norwegian. (5 cr; Stdnt Opt. +NOR 4001) 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. (5 cr; Stdnt Opt. +NOR 4002. Prereq-1001) Continued the presentation of all four language modalities (listening, reading, speaking, writing) with a proficiency emphasis. Topics include free-time activities, careers, and the Norwegian culture.
NURS 3115. Health Informatics and Information Technology. (3 cr; A-F only. Prereq-Undergrad or #) Health informatics, information technology from consumer, clinical, and public health perspectives. Using information technology to communicate, manage knowledge, mitigate error, and support decision-making.

NURS 3690. Life Span, Growth, and Development I. (2 cr; Stdtnt Opt. Prereq-One general psychology and one general biology course or #) An introductory, multimedia course that incorporates biological, sociological, and psychological perspectives of human life span development from the prenatal period through young adulthood.

NURS 3691. Life Span, Growth, and Development II. (1 cr; Stdtnt Opt. Prereq-3690, one general psychology and one general biology course or #) 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 3700. Human Experience of Health and Illness. (2 cr; A-F or Aud. Prereq-Nursing student or #) Uses literature, film, and fine arts to explore health/illness as multicultural individual, family, and community experiences. Theoretical perspectives about health/illness. Social-cultural organization of health services, social mandate for professional participation in health/illness events.


NURS 3703. Assessment and Beginning Interventions: Nursing Lab I. (2 cr; A-F only. Prereq-Enrolled in School of Nursing; at least soph semester) Psychomotor skills/interventions. Focuses on health history and physical assessment. Experiential learning activities to build skill in assessment, planning and implementation of select nursing interventions.

NURS 3704. Nursing Fundamentals I: Assessment and Intervention. (5 cr; A-F or Aud. Prereq-Nursing student or #) Foundational psychomotor skills/interventions used in nursing practice when caring for persons in various contexts. Theory/skills of health assessment, including health history and physical exam of adults.

NURS 3706. Therapeutic Communication. (3 cr; A-F or Aud. Prereq-Nursing student or #) Developing therapeutic use of self. Applying communication strategies to provide optimal nursing care and to communicate with individuals, families, interdisciplinary teams, and communities.


NURS 3800. Nursing Topics. (1-4 cr [max 8 cr]; Stdtnt Opt. Prereq-*) Topics not included in regular courses.

NURS 3801. Patient Centered Care of Adults/Older Adults I. (4 cr; A-F or Aud. Prereq-Admitted to Nurs BSN program) Person-centered, evidence based nursing care for adults, including physical and mental health promotion and acute/chronic illness management. Critical analysis of patient needs and planning nursing care.


NURS 3806. Nurse as Professional. (2 cr; A-F or Aud. Prereq-Admitted to nursing BSN program) 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.

NURS 3999. Clinical Internship. (1 cr; S-N or Aud. Prereq-Completed 1 yr of a baccalaureate nursing program, accepted into an approved clinical internship prog.) Clinical-based learning opportunities to encourage application of theory and research based knowledge in clinical practice. Students engage in experiences to enhance the development of their professional nursing role.


NURS 4203. Nursing Fundamentals II: Assessment and Intervention. (3 cr; A-F or Aud. Prereq-Nursing student or #) Foundational, complex, and advanced psychomotor nursing interventions and their research basis. Lab components provide opportunities to perform psychomotor skills used in nursing/complementary interventions. Skills taught within caring framework.

NURS 4205V. Honors: Nursing Theory and Research. (3 cr; Stdtnt Opt. Prereq-Nurs honors) 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.

NURS 4207. Critical Thinking in Nursing. (4 cr; A-F or Aud. Prereq-Undergrad in nursing) 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.


NURS 4322. Population-based Public Health Nursing. (5 cr; A-F or Aud. Prereq-Nursing or #) Applying nursing process with individuals, families, communities, and systems. Students complete a community assessment, apply evidence-based practice within the context of social justice.

NURS 4324. Transcultural Nursing and Global Health. (3 cr; A-F or Aud. Prereq-Nursing student or #) Influence of culture on nursing care delivery and the role of the nurse in providing culturally appropriate care for increasingly diverse populations. Global health issues and factors affecting the health status of populations.


NURS 4402. Taking Ethical Action in Health Care. (1 cr; A-F only. Prereq-[4104, nursing sr] or #) Ethical dimensions and role obligations of health care professionals related to selected social issues with health consequences.

NURS 4403. Nursing Care of Childbearing Families. (4 cr; A-F or Aud. Prereq-4201, 4203) Nurse's role in providing care for childbearing families during antepartum period, birth experience, and immediate postpartum phase. Emphasizes health promotion, risk reduction, and active participation of clients to achieve optimum family health.

NURS 4404. Applied Nursing Research and Research Utilization. (2 cr; Stdtnt Opt. Prereq-4205 or #) Design and carry out a research project of limited scope to develop fundamental skills in systematic inquiry, and interpreting and evaluating research as it applies to nursing practice. The final product is a scholarly research report.
Nursing (NURS)

Fundamental skills in systematic inquiry. Interpreting/evaluating research for applicability to nursing practice. Implement study proposed in 4205V. Write report to serve as honors research project or thesis.

NURS 4406W. Leadership and Management for Shaping Professional Nursing Practice. (4 cr; A-F or Aud. Prereq-4103, 4205, 4306)
Provides a basis for synthesis of current leadership and management theories within the professional practice of nursing. Examine the interaction among professional nursing issues, health care trends, and the leadership potential of nurses.

NURS 4408. Nursing Care of Infants, Children, and Adolescents. (4 cr; A-F or Aud. Prereq-4201, 4203)
Family centered nursing care. Emphasizes culturally competent and developmentally appropriate nursing care during wellness/illness to promote healthy childhood/adolescence and family function.

NURS 4414. Chronic Health Conditions of Elders: A Cross-Cultural, International Perspective. (3 cr; A-F or Aud. Prereq-4100, 4101, 4102, 4103, 4104, 4200, 4202, 4205, 4310, 4300, 4302)
Assessment/management of chronic health conditions of elders from cross-cultural, international perspective. Complex long-term health needs of elders, care delivery models that address these needs.

NURS 4430. Immunization Tour. (1 cr; S-N or Aud. PHAR 6210. Prereq-4202, level II nursing student, #)
Student teams plan/implement influenza immunization clinics for U of M faculty, staff, and students. Interdisciplinary collaboration, public health principles, public health nursing interventions, leadership.

NURS 4500W. Nursing Leadership and Health Care Systems. (4 cr; A-F or Aud. Prereq-Nursing student or #)
Nurse as leader/manager in client care and as colleague. Status, structure, environment, and operations of healthcare systems. Social, economic, technological, and political factors influencing nursing care and health quality, access, and cost.

NURS 4501. Critical Care Nursing Practice. (3 cr; Stdnt Opt. Prereq-4400, 4401, 4402, [4404 or 4404H], 4406W, 4410)
Students participate in care of critically-ill patients with a nurse preceptor. Synthesize theoretical knowledge and practice skills. Increase competence in evaluating patient data from numerous sources. Provide safe, organized care to patients with life-threatening, multi-system problems.

NURS 4502. Clinical Immersion. (6 cr; A-F or Aud. Prereq-3702, 3704, 3706, 4200, 4203, [4205V or 4205W], 4322, 4326, 4500, 4504)
Underlying clinical processes associated with complex, acute, or chronic health disruptions of individuals, families, and populations (communities). Students design, provide, manage, and coordinate nursing interventions to meet client physiological, psychosocial, and spiritual needs and promote health. Students evaluate influence of health care system on achieving client outcomes for optimal function/quality of life. Preceptored professional internship in a selected setting.

NURS 4503. Acute and Critical Nursing Care of Children With Chronic Conditions. (3 cr; Stdnt Opt. Prereq-4100, 4101, 4104, 4106, 4200, 4302, 4205, 4210, 4300, 4412)
Acute/critical care setting. Students participate with preceptors in evaluating data from numerous sources, providing holistic care to children with life-threatening conditions or multi-system disorders, and providing care to their families.

NURS 4504. Professional Issues. (2 cr; A-F or Aud. Prereq-4500)
Social, economic, organization, and regulatory factors influencing profession/practice of nursing. Professional/social role of nurses in influencing policies/practices to improve health of persons/community. Preparing for transition from student to novice nurse.

NURS 4505. Managing Chronic Health Conditions of Elders: A Study Abroad Practicum. (3 cr; A-F or Aud. Prereq-4100, 4101, 4102, 4103, 4104, 4200, 4202, 4205, 4210, 4300, 4411)
Practicum in care of elders with complex, chronic health conditions in international setting using culturally focused, holistic framework. Students evaluate patient information from multiple sources to develop appropriate plans of care, analyze model of nursing and health care delivery.

NURS 4800. Nursing Topics. (0-16 cr [max 48 cr]; Stdnt Opt. Prereq-#)
Exploration of a topic to meet individual student needs.

NURS 4801. Research Topics. (1-16 cr [max 16 cr]; Stdnt Opt)
Exploration of research topic to meet individual student needs.

NURS 5016. Critical Reading of Scientific Literature in Adolescent Health. (1 cr; Stdnt Opt. Prereq-[Grad-level research methods course, inferential statistics course] or #)
Application of skills, from research methods and statistics courses to critical reading of empirical literature on adolescent health. Relevance of research findings to adolescent health practice.

NURS 5031. Human Response to Health and Illness: Adults and Elders. (6 cr; A-F or Aud. Prereq-Professional master of nursing [MN] student)
Individual responses to health/illness, in context of families/environments. Clinical component emphasizes application of nursing process in adult/elderly populations.

Family responses to health/illness. Emphasizes application of nursing process in children and childbearing families. Seminar/community-based project focus on family as unit of care.

NURS 5033. Population Response to Health and Mental Illness. (5 cr; A-F or Aud. Prereq-Nursing postbaccalaureate certificate prog)
Population-based nursing practice. Emphasizes application of nursing process in promoting mental health and public health, and in preventing illness across life span. Clinical experiences include interactions with individuals, families, communities, and systems.

NURS 5034. Clinical Seminar: Nursing Care of Clients With Special Conditions. (2 cr; A-F or Aud. Prereq-4033, 8100, Nursing Postbaccalaureate Certificate Prog)
Exemplar cases from students. Clinical settings used as basis for development of clinical decision-making. Critical analysis of current/emergent nursing care issues associated with caring for complex/diverse populations.

NURS 5040H. Seeking Solutions to Global Health Issues. (3 cr; A-F only. Prereq-Grad student or upper div honors or #)
Global health issues from an interdisciplinary perspective. Ethical and cultural sensitivity, complexities. Students propose realistic actions to resolve issues.

NURS 5113. Web-based Teaching and Learning Strategies. (2 cr; S-N or Aud)
Skills necessary to design, produce, implement, and evaluate effective technology enhanced learning environments. Pedagogical/technological issues surrounding teaching with technology.

NURS 5115. Interprofessional Health Care Informatics. (3 cr; A-F or Aud)
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 Self-Care Informatics. (1-2 cr [max 2 cr]; Stdnt Opt. Prereq-#)

NURS 5120. Palliative Care for Children. (1 cr; Stdnt Opt. Prereq-#)

NURS 5141. Ethical Issues in Health Care of Elders. (3 cr; Stdnt Opt. Prereq-Grad student or nursing sr or #)
Health care related ethical issues that confront elders, their families, health care providers, and society.

NURS 5172. Decision Making in Health Care. (2 cr; Stdnt Opt. Prereq-Grad student, #)
Selected classical conceptual models of decision making, their particular perspectives/limitations/usefulness for decision making about health care issues. Models/components used to assess, evaluate, teach, or help healthy people, patients, families, health care professionals, or policy making groups in making health care decisions.

NURS 5190. Essentials of Holistic Health Assessment. (5 cr; A-F only. Prereq-Admission to MN Program)
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.

For a guide to course numbers, symbols, and abbreviations, see page 376.
NURS 5200. Holistic Health Assessment and Therapeutics for Advanced Practice Nurses. (3 cr; Stdnt Opt. Prereq-Nursing grad student or professional master of nursing (MN) student)
Health assessment knowledge/skills for advanced nursing practice with patients across age span, including pregnancy. Selected nursing interventions, complementary therapies for application to specific population/illnesses.

NURS 5202. Introduction to Complementary Healing Practices. (3 cr; Stdnt Opt)
Historical and cultural context of the allopathic and complementary healing traditions. Philosophies and paradigms of selected complementary therapies and culturally based healing traditions; descriptions of selected interventions.

NURS 5221. Refugee Health: Trauma, Stress, and Coping. (3 cr; Stdnt Opt, Prereq-Grad student or #)
War, displacement, and associated stressors affecting psychosocial health of refugees. Migration experiences, family/community dynamics, approaches for recovery. Creating community-based interventions to support refugee health.

NURS 5222. Advanced Physiology. (3 cr; Stdnt Opt)
Systems approach to human physiology/pathophysiology. Physiologic changes across life span. Emphasizes clinical application using population-specific content related to various specialty areas in advanced practice nursing.

NURS 5223. Assessment of Psychopathology for Advanced Practice Psychiatric/Mental Health Nursing. (4 cr; Stdnt Opt. Prereq-Nurs grad or #)
Advanced concepts from nursing theory and research, social sciences, neuropsychology, and neuropsychology used in the assessment of psychiatric symptoms and disorders across the age continuum. During clinical, develop proficiency in the assessment of psychopathology in clients with psychiatric symptoms.

NURS 5224. Clinical Pharmacotherapeutics. (3 cr; Stdnt Opt, Prereq-Nursing grad student in advanced practice in primary care, physiol.-ogy course, #)
Foundation in pharmacotherapeutics across life span. Pharmacodynamics/kinetics/epidemiology, client patterns of medication use, selection of appropriate drugs for selected client conditions, and prescriptive writing privileges for advanced practice nurses.

NURS 5225. Psychopharmacology for Advanced Practice Psychiatric/Mental Health Nursing. (3 cr; Stdnt Opt, Prereq-Grad student or RN [with master’s degree] or #)
Advanced concepts in neuroscience, psychopharmacology, and clinical management related to psychopharmacologic treatment of psychiatric disorders/symptoms. Application to problems in various clinical settings.

NURS 5228. Pharmacology for Advanced Practice Nursing. (2 cr; A-F or Aud, Prereq-Grad nursing student or #)
Overview of pharmacological principles for commonly used medication classes. Each drug class, related physiology, Pharmacodynamics and pharmacokinetics of drug classes and specific medications.

NURS 5229. Clinical Pharmacotherapeutics. (2-4 cr [max 4 cr]; Stdnt Opt. Prereq-Nurs 5222, nursing DNP student, #)

NURS 5241. Nursing Leadership for Effective Practice. (3 cr; A-F or Aud. Prereq-Final sem of MN Program)
Leadership theory/application. System issues affecting nursing practice and patient outcomes.

NURS 5300. Health Behavior Intervention: Theory and Application. (3 cr; Stdnt Opt. Prereq-Grad or #)
Interdisciplinary course examining theoretical foundations and research base of intervention strategies to promote health behavior acquisition, behavioral change, and maintenance for adults (individuals and groups). Critical examination of health behavior and patterns and health risk assessment; approaches to program creation.

NURS 5340. Group as a Health-Care Intervention. (2 cr; Stdnt Opt, Prereq-Grad or #)
Theoretical concepts and research findings from the areas of group therapy and dynamics are applied in the development of a model for using group as an intervention for various client populations.

NURS 5501. Professional Issues in Nurse-Midwifery. (1-2 cr [max 2 cr]; S-N or Aud. Prereq-Nurs grad major, #)
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.

NURS 5522. Sociopolitical Context of Women’s Health. (1-2 cr [max 3 cr]; S-N or Aud. Prereq-Grad student)
Women’s health issues from multidisciplinary perspective. Sexual/reproductive health issues affecting health, such as poverty/violence.

NURS 5800. Nursing Topics. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-#)
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.

NURS 5801. Policymaking, Health Policy, Political Action and Nursing. (3 cr; Stdnt Opt) Analysis of sociocultural values, public policymaking, health care policy, and the relationship to the health care delivery system. The impact of health care policy on the profession and practice of nurses, and on consumers. Enhanced participation of nurses in policymaking and political action.

NURS 5802. Spirituality and Nursing Practice. (2 cr; Stdnt Opt. Prereq-For undergrad cr: nurs sr or RN; for grad cr: nurs grad student or #)
Exploration of the concept of spirituality as integral to the whole person. Discussion of spiritual nursing care interventions.

NURS 5803. Transcultural Nursing: Theories and Issues. (2 cr; Stdnt Opt. Prereq-Cultural anth course or #)
Study of cultural factors that influence theories, issues, and nursing care practices in diverse cultures and subcultures. Emphasis on nursing within international systems of health care and nursing practices related to various health-illness systems in this country and worldwide.

NURS 5805. The ‘M’ Technique. (1 cr; S-N or Aud. Prereq-Undergrad nursing student or grad student in health sciences or health professional)

NURS 5808. American Indian Health and Health Care. (2 cr; Stdnt Opt. Prereq-Upper div or grad student or #)
Examines health of native nations in Minnesota within historical-cultural contexts. Epidemicology of major health conditions, health services, traditional Indian medicine, health beliefs. Opportunities for contact with Native American community.

NURS 5820. Foundations of Infection Control. (3 cr; Stdnt Opt. Prereq-Baccalaureate degree in health related field or)
Integrates microbiology, epidemiology, and patient care practices applied to a population-focused practice. Focuses on risk identification, prevention strategies.

NURS 5830. Advanced Clinical Nursing. (1-6 cr [max 6 cr]; Stdnt Opt. Prereq-Grad nursing major, #)
Independent study or faculty seminar on special clinical topic.

NURS 5900. Introduction to Principles and Practice of Anesthesia. (6 cr; A-F or Aud. Prereq-Grad student in nurse anesthesia)
Administration of anesthesia. Application in operating room setting under one-to-one guidance of Certified Registered Nurse Anesthetist (CRNA).

NURS 5901. Basic Principles and Practice of Nurse Anesthesia. (2 cr; A-F or Aud. Prereq-5900)
Students apply principles of anesthesia to formulate nurse anesthesia care plans for care of adults undergoing anesthesia.

NURS 5920. Nurse Anesthesia Care: Advanced Principles for Special Populations. (6 cr; A-F or Aud. Prereq-5910)
Examination/application of principles used to deliver anesthesia by nurse anesthetists to special populations.

NURS 5925. Grant Writing and Critique. (1 cr; Stdnt Opt. Prereq-Grad student or #)
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.

NURS 5940. Contemporary Issues in Nurse Anesthesia. (2 cr; S-N only. Prereq-5930)
Analysis of economic, legal, political, ethical, and social factors that influence the practice and profession of CRNAs.
Nutrition (NUTR)

Department of Food Science and Nutrition

College of Food, Agricultural and Natural Resource Sciences


NUTR 5625. Nutritional Biochemistry. (3 cr; A-F only. Prereq-BIOC 3021 or #) Overview of biochemical molecules and pathways important in nutritional events.

Ojibwe (OJIB)

Department of American Indian Studies

College of Liberal Arts


OJIB 4101. Beginning Ojibwe I. (3 cr; S-Stdt Opt. OJIB 1101, Prereq-1004 in another language or passing score on LPE or grad student) Speaking, grammar, writing systems.

OJIB 4102. Beginning Ojibwe II. (3 cr; S-Stdt Opt. OJIB 1102, Prereq-1004 in another language or passing score on LPE or grad student) Speaking, grammar, writing systems.


OJIB 4104. Intermediate Ojibwe II. (3 cr; S-Stdt Opt. OJIB 3104, Prereq-1102, 1102) Speaking, grammar, storytelling, oral history. Translation projects.

OJIB 4106. Advanced Ojibwe I. (3 cr; A-F or Aud) Focuses on immersion method.

OJIB 4109. Advanced Ojibwe Language I. (3 cr; A-F or Aud) Focuses on immersion method.

OJIB 5106. Advanced Ojibwe Language I. (3 cr [max 12 cr]; A-F or Aud) Focuses on immersion method.

OJIB 5109. Advanced Ojibwe Language II. (3 cr [max 12 cr]; A-F or Aud) Focuses on immersion method.

Operations and Management Sciences (OMS)

Department of Operations and Mgmt Science

OMS 2550. Business Statistics: Data Sources, Presentation, and Analysis. (4 cr; A-F or Aud. =OMS 2550H. Prereq=[Math 1031 or equiv], at least 30 cr) Data analysis, basic inferential procedures, statistical sampling/design, regression/time series analysis. How statistical thinking contributes to improved decision making.

OMS 2550H. Honors: Business Statistics: Data Sources, Presentation, and Analysis. (4 cr; A-F or Aud. =OMS 2550. Prereq-[Math 1031 or equiv], honors, at least 30 cr) Data analysis, basic inferential procedures, statistical sampling/design, regression/time series analysis. How statistical thinking contributes to improved decision making.


OMS 3041. Project Management. (2 cr; A-F or Aud. Prereq-3000 or #) Principles and methods useful for planning and controlling a project, including development of project plan, resource planning and scheduling, and project monitoring and control. Selected computerized packages are studied, including PERT and CPM, and examples of different types of projects from manufacturing and service industries are used.

OMS 3045. Sourcing and Supply Management. (2 cr; A-F only) Strategic/operational role of purchasing/supply. Supply management. Supplier-selection criteria such as quantity, quality, and cost/price considerations. Buyer-supplier relationships.

OMS 3048. Transportation and Logistics Management. (2 cr; A-F only. Prereq-3001) Linkages between logistics/transportation and marketing, operations, and finance. How different industries integrate logistics, warehousing, transportation, and information systems.

OMS 3051. Service Management. (2 cr; A-F only. Prereq=3001) Issues unique to managing service processes. Identifying service needs, designing services, and managing services.

OMS 3056. Supply Chain Planning and Control. (4 cr; A-F or Aud. Prereq-3001 or #) 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.
Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.


**OMS 5061. Lean Thinking.** (2 cr; A-F only. Prereq: 3001) Approaches to waste, flow, error proofing, and daily management that simultaneously improves quality, cost, and delivery, while building worker engagement/skill. Philosophical foundations. Tools to identify, measure, and eliminate non-value-added activities.

**OMS 5072. Managing Technologies in the Supply Chain.** (2 cr; A-F only. Prereq: 3001) Technologies and technological change within/between firms as opportunities for professional leadership. Selecting technologies, nurturing their adoption, and ensuring their exploitation.

**OMS 5850. Topics in Operations and Management Science.** (2-4 cr [max 16 cr]; A-F only. Prereq: 3001) Discussion/analysis of current topics/developments in operations/management science.

**OMS 4065W. Supply Chain and Operations Strategy.** (4 cr; A-F only. Prereq: 3001, 3056, 3059, 4 OMS elective cr) 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.

**Persian (PERS)**

**Department of Asian Languages and Literatures**

**College of Liberal Arts**

**PERS 1101. Beginning Persian I.** (5 cr; Stdent Opt. +PERS 1101) Listening, speaking, reading, and writing in modern standard Persian (Farsi).


**PERS 3101. Intermediate Persian I.** (5 cr; Stdent Opt. +PERS 3103 Prereq: 1102 or #) Listening, speaking, reading, and writing in modern standard Persian (Farsi).

**PERS 3102. Intermediate Persian II.** (5 cr; Stdent Opt. +PERS 3104 Prereq: 3101 or #) Listening, speaking, reading, and writing in modern standard Persian (Farsi).

**PERS 4101. Beginning Persian.** (3 cr; Stdent Opt. +PERS 1101 Prereq: Grad student) Listening, speaking, reading, and writing in modern standard Persian (Farsi).

**PERS 4102. Beginning Persian.** (3 cr; Stdent Opt. +PERS 1102 Prereq: 4101, grad student) Listening, speaking, reading, and writing in modern standard Persian (Farsi).

**PERS 4103. Intermediate Persian.** (3 cr; Stdent Opt. +PERS 3101 Prereq: 4102, grad student) Listening, speaking, reading, and writing in modern standard Persian (Farsi).

**PERS 4104. Intermediate Persian.** (3 cr; Stdent Opt. +PERS 3102 Prereq: 4103, grad student) Listening, speaking, reading, and writing in modern standard Persian (Farsi).

**Pharmaceutics (PHM)**

**College of Pharmacy**


**Pharmacology (PHCL)**

**Department of Pharmacology**

**Medical School**

**PHCL 3100. Pharmacology for Pre-Med and Life Science Students.** (2 cr; A-F or Aud. Prereq: College-level biology, biochemistry or physiology recommended) Principles/mechanisms of drug action. Major drug categories for different organ systems.


**PHCL 5109. Problems in Pharmacology.** (1-18 cr [max 18 cr]; Stdent Opt. Prereq: Upper div or grad student or #) Principles/mechanisms of drug action. Major drug categories for different organ systems.

**PHCL 5110. Introduction to Pharmacology.** (3 cr; A-F or Aud. Prereq: Grad student or #) Basic principles of Pharmacology. Focuses on molecular mechanisms of drug action.

**PHCL 5111. Pharmacogenomics.** (3 cr; A-F or Aud. Prereq: Grad student or #) Human genetic variation, its implications. Functional genomics, pharmacogenomics, toxicogenomics, proteomics. Interactive, discussion-based course.

**PHCL 5462. Neuroscience Principles of Drug Abuse.** (2 cr; Stdent Opt. +NSC 5462 Prereq: #) 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.

**Pharmacy (PHAR)**

**College of Pharmacy**

**PHAR 1. Community Engagement.** (0 cr; No grade) Volunteer opportunities in pharmacy patient care.

**PHAR 1001. Orientation to Pharmacy.** (2 cr; Stdent Opt) Pharmaceutical care practice model, various pharmacy settings, pharmacy education. Current opportunities/challenges within profession.

**PHAR 1002. Health Sciences Terminology.** (2 cr; Stdent Opt) How to analyze/build words by using combining forms, suffixes, and prefixes. Course information is sent to U-e-mail addresses of registered students. Partially Internet-delivered course.


**PHAR 1004. Common Prescription Drugs and Diseases.** (2 cr; Stdent Opt) Self study. Frequently prescribed medications. Conditions medications are intended to treat. Diagnostic criteria, complications, mechanism-of-action, side effects. Direct-to-consumer advertising. Students use Vista to view presentations, download materials, and complete study guides. Partially Internet-delivered course.


**PHAR 3700. Fundamentals of Pharmacotherapy.** (3 cr; A-F only. +PHAR 3700 PHAR 5700. Prereq: Medical terminology) Drug therapy. Emphasizes recognition of brand/generic drug names, their therapeutic classes, common uses. Use of drug information resources.

**PHAR 3800. Pharmacotherapy for the Health Professions.** (3 cr; A-F or Aud. Prereq: Anatomy/physiology, enrolled [nursing or respiratory care] student) Online course. Drug therapy, its implications in patient care. Students use WebVista. Course information is sent to U of M e-mail addresses of registered students.
PHAR 4200W. Drugs and the U.S. Health Care System. (3 cr; A-F only; PHIL 5200) Online course. How to be informed/responsible user of medications. Medication development, regulation, distribution. Business, political, and legal/ethical issues. Weekly writing assignments, self-reflections, final paper.


PHAR 4294. Directed Study I for Undergraduates. (1-6 cr [max 6 cr]; A-F only) Individualized study. Students work with faculty on special projects.

PHAR 5201. Health Sciences Applied Terminology. (2 cr; Stdnt Opt. Prereq-Basic knowledge of human anatomy/physiology) Self-study course. Medical terms, how to apply them when documenting/reporting patient care procedures. Course information is sent to U of M e-mail addresses of registered students. Partially Internet-delivered course.

Philosophy Department


PHIL 1003V. Honors: Introduction to Ethics. (4 cr; Stdnt Opt. PHIL 1103, PHIL 1003W) Are values and 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 1003W. Introduction to Ethics. (4 cr; Stdnt Opt. PHIL 1003V, PHIL 1003) 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. Honors: Introduction to Political Philosophy. (4 cr; Stdnt Opt. PHIL 1004V) Central concepts, principal theories of political philosophy.

PHIL 1004W. Introduction to Political Philosophy. (4 cr; Stdnt Opt. PHIL 1004V) Central concepts, principal theories of political philosophy.

PHIL 1005. Scientific Reasoning. (4 cr; Stdnt Opt. PHIL 1005H. Prereq-[lst or 2nd] yr student or #) 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.

PHIL 1005H. Scientific Reasoning. (4 cr; Stdnt Opt. PHIL 1005, Prereq-[lst or 2nd] yr honors student or #) 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.


PHIL 1007. Introduction to Political Philosophy Practicum. (1 cr; Stdnt Opt. Prereq-g1004W) Students do at least two hours a week of community service and connect their service activities in writing to issues discussed in 1004.


PHIL 1012. Introduction to Ethics. (4 cr; Stdnt Opt. PHIL 1003V, PHIL 1003W) 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 1203. Business Ethics. (4 cr; A-F or Aud) Purpose of business, its obligations to various stakeholders (e.g. stockholders, customers, employees), its social function.

PHIL 1905. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

PHIL 1910V. Honors Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Fr or fewer than 30 cr) Topics specified in Class Schedule.

PHIL 1910W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.


PHIL 3003. General History of Western Philosophy: Medieval Period. (3 cr; Stdnt Opt) Survey of several major figures (e.g., Augustine [pre-medieval], Anselm, Maimonides, Aquinas, Ockham, Cusanus).

PHIL 3005V. General History of Western Philosophy: Modern Period. (4 cr; Stdnt Opt. PHIL 3005W, PHIL 3105, Prereq-honors) Major developments in philosophical thought of the modern period: renaissance beginnings, Descartes through Hume, with some attention paid to Kant.

PHIL 3005W. General History of Western Philosophy: Modern Period. (4 cr; Stdnt Opt. PHIL 3005V, PHIL 3005V) Major developments in philosophical thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3007. History of Western Philosophy: 19th-Century. (3 cr; Stdnt Opt) Survey of several major figures from 19th century, e.g., Hegel, Schopenhauer, Mill, Kierkegaard, Marx, Nietzsche. Kant (18th century) is studied as background.

PHIL 3001W. Classical Ancient Text. (3 cr; Stdnt Opt) Introduction to and in-depth analysis of Plato's Republic.

PHIL 3100. Value Theory Practicum. (1 cr [max 3 cr]; Stdnt Opt. Prereq-[&3301 or &3302W or &3304 or &3307 or &3308], #) Combines issues in ethics/political philosophy courses to needs of persons in Twin Cities through community service. At least 26 hours of community service for semester is required.


PHIL 3105. General History of Western Philosophy: Modern Period. (4 cr; Stdnt Opt. PHIL 3005W, PHIL 3005V) Major developments in philosophical thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3231. Philosophy and Language. (4 cr; Stdnt Opt)
Philosophical issues concerning the nature and use of human language.

PHIL 3234. Knowledge and Society. (4 cr; Stdnt Opt)
Critical discussion of concepts such as knowledge, objectivity, justification, rationality, evidence, authority, expertise, and trust in relation to the norms and privileges of gender, race, class, and other social categories.

PHIL 3301. Environmental Ethics. (4 cr; Stdnt Opt)
Philosophical basis for membership in moral community. Theories applied to specific problems (e.g., vegetarianism, wilderness preservation). Students defend their own reasoned views about moral relations between humans, animals, and nature.

PHIL 3302W. Moral Problems of Contemporary Society. (4 cr; Stdnt Opt)
+PHIL 3322W, PHIL 3302W
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 3302W. Introduction to Aesthetics. (3 cr [max 4 cr]; Stdnt Opt)
Development of aesthetic theories with applications to specific aesthetic problems.

PHIL 3304. Law and Morality. (4 cr; Stdnt Opt)
A study of the relationship among law, morality, and our role as citizens.

PHIL 3305. Medical Ethics. (4 cr; Stdnt Opt)
Moral problems confronting physicians, patients, and others concerned with medical treatment, research, and public health policy. Topics include abortion, living wills, euthanasia, genetic engineering, informed consent, proxy decision-making, and allocation of medical resources.

PHIL 3307. Social Justice and Community Service. (4 cr; Stdnt Opt)
Exploration of concepts of justice, charity, equality, freedom, community service. Perspectives from philosophy, history, literature, and student involvement in the community. Community service for at least three hours per week.

PHIL 3308. Social Justice and Community Service. (4 cr; Stdnt Opt)
Special exploration of diversity in connection with concepts of justice, charity, equality, freedom, community service. Perspectives from philosophy, history, literature, and student involvement in the community. Community service for at least three hours per week.

PHIL 3311W. Introduction to Ethical Theory. (4 cr; Stdnt Opt)
Nature and justification of moral judgments and moral principles; analysis of representative moral views.

PHIL 3322W. Moral Problems of Contemporary Society. (3 cr; Stdnt Opt. +PHIL 3402, PHIL 3302W)
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 33402. Moral Problems of Contemporary Society. (3 cr; Stdnt Opt. +PHIL 3322W, PHIL 3302W)
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 33502W. Introduction to Aesthetics. (3 cr [max 4 cr]; Stdnt Opt)
Development of aesthetic theories with applications to specific aesthetic problems.

PHIL 3521. Philosophy of Religion. (3 cr; Stdnt Opt)
Conceptual problems that arise from attempts to provide rational justification for religious belief.

PHIL 3601W. Scientific Thought. (4 cr; Stdnt Opt. Prereq-One course in philosophy or natural science)
Introduction to philosophical issues concerning the nature of scientific knowledge. Reading of historical and contemporary sources that describe major scientific achievements and controversies.

PHIL 3602. Science, Technology, and Society. (3 cr; A-F or Aud)
Philosophical issues that arise out of interaction between science, technology, society (e.g., religion and science, genetics and society, science and the environment).

PHIL 3607. Philosophy of Psychology. (4 cr; Stdnt Opt. Prereq-One course in philosophy or psychology)
Major theories of mind including the “invention” of the mind by Descartes, classical empiricism, the impact of Darwinism, Freud’s theories, Gestalt psychology, behaviorism, Chomsky’s rationalism, contemporary functionalism, the computer model.

PHIL 3900H. Honors Seminar. (3 cr; Stdnt Opt. Prereq-honors enroll, 6 crs of 3xx-5xxx philosophy courses)
Topics of current interest varying from semester to semester.

PHIL 3993. Directed Studies. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-*).@)
Guided individual reading or study.

PHIL 4008. Survey of Contemporary Philosophy. (3 cr; Stdnt Opt. Prereq-3005 or #)
Survey of major figures in contemporary analytic/phenomenological philosophy (e.g., Dewey, Russell, Wittgenstein, Heidegger, Carnap, de Beauvoir).

PHIL 4009. Existentialism. (5 cr; Stdnt Opt. Prereq-3005 or 4004 or #)
Central themes (e.g., being-in-the-world, freedom, engagement) of several important existentialist thinkers (e.g., Kierkegaard, Jaspers, Sartre, de Beauvoir, Baldwin).

PHIL 4010. Ancient Philosophers. (3 cr [max 6 cr]; Stdnt Opt. Prereq-3001 or #)
Major work of selected ancient philosophers (e.g., Plato’s Parmenides, Plato’s Sophist, Aristotle’s Metaphysics). Works discussed may vary from offering to offering.

PHIL 4030. Medieval Philosophers. (3 cr [max 6 cr]; Stdnt Opt. Prereq-3001 or 4003 or #)
Major work of selected medieval philosophers (e.g., Anselm’s Proslogion, Aquinas’s Summa contra Gentiles, Books I/III, Nicholas of Cusa’s On Learned Ignorance). Works discussed may vary from offering to offering.

PHIL 4050. Empiricists. (3 cr [max 6 cr]; Stdnt Opt. Prereq-3005 or #)
Major work of selected early modern empiricists (e.g., Locke’s Essay Concerning Human Understanding, Berkeley’s Principles of Human Knowledge, Hume’s Treatise of Human Nature). Works discussed may vary from offering to offering.

PHIL 4055. Kant. (3 cr; Stdnt Opt. Prereq-3005 or 4004 or #)
Major work (e.g., Critique of Pure Reason).

PHIL 4070. Selected 19th- or Early to Middle 20th-Century Philosophy. (3 cr [max 6 cr]; Stdnt Opt. Prereq-One sem history of philosophy)
Major writings of selected 19th- or early to middle 20th-century philosopher (e.g., Schopenhauer’s World as Will and Idea, Thoreau’s Walden, Du Bois’s The Souls of Black Folk, Wittgenstein’s Philosophical Investigations, de Beauvoir’s The Second Sex).

PHIL 4085. Wittgenstein. (3 cr; Stdnt Opt. +PHIL 5085. Prereq-3005 or 4231 or #)
Major work (e.g., Philosophical Investigations).

PHIL 4100. Value Theory Practicum. (1 cr [max 3 cr]; Stdnt Opt. Prereq-4320 or 4321 or or &4330 or or &4324 or or &4414)
Issues studied in ethics/political philosophy courses applied to needs of people in Twin Cities through community service. At least 26 hours of community service for semester is required.

PHIL 4101. Metaphysics. (3 cr; Stdnt Opt. Prereq-One course in history of philosophy or #)
Philosophical theories concerning nature of reality.

PHIL 4105W. Epistemology. (3 cr; A-F or Aud. Prereq-1001 or #)
Theories of knowledge/sources of knowledge/ evidence.

PHIL 4231. Philosophy of Language. (3 cr; Stdnt Opt. Prereq-1001 or 5201 or #)
Theories of reference, linguistic truth, relation of language/thought, translation/synonymy.

PHIL 4310W. History of Moral Theories. (3 cr; Stdnt Opt. Prereq-1003 or #)
Issues in western moral philosophy from classical age to present.

PHIL 4321W. Theories of Justice. (3 cr; Stdnt Opt. Prereq-1003 or 1004 or #)
Philosophical accounts of concept/principles of justice.

PHIL 4324W. Ethics and Education. (3 cr; Stdnt Opt. +PHIL 5324. Prereq-6 cr in [philosophy or education] or #)
What constitutes good education, both in terms of educational outcomes and of processes that promote learning? What connections are there between concepts of good education and of good society?
PHIL 4225. Education and Social Change. (4 cr; A-F or Aud. ∗PHIL 5323) Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.


PHIL 4330. Contemporary Moral Theories. (3 cr; Stdnt Opt. Prereq-1005 or #) Discusses view that evaluative judgments cannot be based on factual considerations alone, relation of this view to objectivity of ethics.

PHIL 4350. Catching Lives Worth Living: Participation in the Growth of a Living-Learning Community. (2 cr; max 4 cr; Stdnt Opt. Prereq-Application. #) 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.

PHIL 4414. Political Philosophy. (3 cr; Stdnt Opt. Prereq-1004 or #) Survey of historical/contemporary works in political philosophy.

PHIL 4501. Principles of Aesthetics. (3 cr; Stdnt Opt. Prereq-3502 or one philosophy course or #) Problems arising in attempts to identify, characterize, or evaluate art.

PHIL 4510. Philosophy of the Individual Arts. (3 cr; Stdnt Opt. =PHIL 5510. Prereq-3502) Aesthetic problems that arise in studying or practicing an art.

PHIL 4605. Space and Time. (3 cr; Stdnt Opt. =PHIL 5605. Prereq-Courses in [philosophy or physics] or #) Philosophical problems concerning nature/structure of space, time, and space-time.


PHIL 4614. Philosophy of Psychology. (3 cr; Stdnt Opt. Prereq-5607 or Psy 3031 or #) Problems/prospects in recent developments in psychology, cognitive science, and philosophy of mind.


PHIL 4760. Selected Topics in Philosophy. (3 cr [max 9 cr]; Stdnt Opt. Prereq-33xx-5xxx cr in philosophy or philosophy) Philosophical problems of contemporary interest. Topics specified in Class Schedule.

PHIL 4993. Directed Studies. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-#; @) Guided individual reading or study.

PHIL 4995. Senior Project (Directed Studies). (1 cr; Stdnt Opt. Prereq-#) Guided individual study leading to research paper that satisfies senior project requirement.

PHIL 4995H. Honors Senior Project. (1 cr; Stdnt Opt. Prereq-#) Guided individual study leading to research paper that satisfies senior project requirement.

PHIL 5040. Rationalists. (3 cr [max 6 cr]; Stdnt Opt. Prereq-3005 or #) 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 5050. Empiricists. (3 cr [max 6 cr]; Stdnt Opt. Prereq-3005 or #) Major work of selected early modern empiricists (e.g., Locke’s Essay Concerning Human Understanding, Berkeley’s Principles of Human Knowledge, Hume’s Treatise of Human Nature). Works discussed may vary from offering to offering.

PHIL 5085. Wittgenstein. (3 cr; Stdnt Opt. =PHIL 4085. Prereq-3005 or 4131 or #) Major work (e.g., Philosophical Investigations).


PHIL 5202. Symbolic Logic II. (4 cr; Stdnt Opt. Prereq-5201 or #) Elements of set theory, including the concepts of enumerability and nonenumerability. Turing machines and other computations; the results of Church, Godel, and Tarski and the philosophical significance of those results.

PHIL 5211. Modal Logic. (3 cr; Stdnt Opt. Prereq-5201 or #) Axiomatic and semantic treatment of propositional and predicate modal logics; problems of interpreting modal languages.

PHIL 5222. Philosophy of Mathematics. (3 cr; Stdnt Opt. Prereq-College level logic or mathematics course or #) 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.

PHIL 5323. Education and Social Change. (4 cr; A-F or Aud. ∗PHIL 4325) Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.

PHIL 5324. Ethics and Education. (3 cr; Stdnt Opt. =PHIL 4324. Prereq-6 cr in [philosophy or education] or #) What constitutes good education in terms of educational outcomes and of processes that promote learning. Connections between concepts of good education and of good society.


PHIL 5415. Philosophy of Law. (3 cr; Stdnt Opt. =PHIL 5415. Prereq-1003 or 1004 or 3302 or social science major or #) Analytical accounts of law and legal obligation.

PHIL 5510. Philosophy of the Individual Arts. (3 cr; Stdnt Opt. =PHIL 4510. Prereq-3502) Aesthetic problems that arise in studying or practicing an art.

PHIL 5601. History of the Philosophy of Science. (3 cr; Stdnt Opt. Prereq-#) 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.

PHIL 5603. Scientific Inquiry. (3 cr; Stdnt Opt. Prereq-#) Philosophical theories of methods for evaluating scientific hypotheses, role of experimentation in science, and of how hypotheses come to be accepted within a scientific community.

PHIL 5606. Philosophy of Quantum Mechanics. (3 cr; Stdnt Opt) 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 5622. Philosophy and Feminist Theory. (3 cr; Stdnt Opt. Prereq-# or equiv or #)
Encounters between philosophy/feminism. Gender’s influence in traditional philosophical problems/methods. Social role of theorist/theorizing as they relate to politics of feminism.

PHIL 5993. Directed Studies. (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-# & @)
Guided individual reading or study.

Physical Education (PE)

School of Kinesiology
College of Education and Human Development

PE 1004. Diving; Springboard. (1 cr Prereq-1007 or equiv or #)

PE 1007. Beginning Swimming. (1 cr)
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 1012. Beginning Running. (1 cr)

PE 1014. Conditioning. (1 cr)
Fundamentals of personal fitness. Principles of fitness; fundamentals of health; principles of conditioning programs; nutrition; weight control; common fitness injuries; motivation and consistency in fitness programs; stress management.

PE 1015. Weight Training. (1 cr)
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)
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)
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)
Basic sabre techniques, movement, an overview of fencing as a recreational sport and as an Olympic sport, and the history of fencing.

PE 1032. Badminton. (1 cr Prereq-#)
Fundamentals including etiquette, terminology, game rules for singles and doubles, footwork, shot selection, and strategy.

PE 1033. Foil Fencing. (1 cr)
Funding 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)
Basic skills for throwing, falling, 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)
Japanese Traditional Shotokan Karate (JTSK) is non-contact—no protective pads or gear are worn. Structural foundation, discipline and control, posture, basic body dynamics, blocking, kicking, punching techniques, as well as basic sparring (kumate) and forms (kata).

PE 1036. Racquetball. (1 cr)
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)
Enter-level technique, basic equipment, international dimension courts, and fitness.

PE 1038. Beginning Tennis. (1 cr)
Fundamental strokes, including forehands, backhands, volleys, lobs, overheads, and serves; introduction to doubles play; terminology, rules, and etiquette.

PE 1042. Orienteering. (1 cr)
Fundamentals, including navigation of an orienteering course using map and compass; types of orienteering courses; multiple techniques and tactics of orienteering. Course is physically challenging and requires participation in three orienteering meets (Sunday afternoons).

PE 1043. Beginning Horse Riding. (1 cr)
Techniques, styles, and communication of English riding. Students will learn riding techniques at a walk, trot, canter, and jumping.

PE 1044. Self-Defense. (1 cr)
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 Prereq: Good general health, no [neck or back] problems)
Safety, knots, equipment, techniques, and anchor systems used in climbing. Course includes all necessary equipment. Held at St. Paul Gym climbing wall.

PE 1046. Tae Kwon Do. (1 cr)
Fundamentals of Tae Kwon Do. Principles of martial arts, body mechanics of Tae Kwon Do, practical self-defense.

PE 1047. Backpacking. (2 cr Prereq-Good general health, no back problems)
Packaging, fitting a backpack, trip planning, trail safety, gear selection, backcountry cooking, minimum impact camping/travel. Emphasizes practical skills and best practices. Four-day backpacking trip.

PE 1048. Bowling. (1 cr)
Fundamentals, including stance, approach and delivery, scoring, bowling terminology, and etiquette.

PE 1053. Ice Skating. (1 cr)
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)
Proper grip, stance, ball address, swing, club selection, psychological management, rules, and etiquette. Basic instruction in analyzing, assisting with, and coaching golf.

PE 1056. Nordic (Cross-Country) Skiing. (1 cr)
Introduction to the fundamental techniques of classical and freestyle cross country skiing. Students will be taught through lecture and direct experience on cross country skiing trails.

PE 1057. Beginning Skiing. (1 cr)
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 Prereq-Good general health, injury free)
Alpine snowboarding. Uses American Teaching System. Classes are split into nine skill levels, beginning through advanced. Held at Hyland Ski and Snowboard School in Bloomington.

PE 1059. Track and Field. (1 cr)
Introduction to track and field: conditioning and training, events and skills, strategies, track and field knowledge, equipment, facilities, and technology.

PE 1065. Beginning Tumbling and Gymnastics. (1 cr)
Rolls, handstands, cartwheels, extensions, head springs, tucks (flips). Spinning techniques. Skills on bars, vault, and beam.

PE 1067. Basketball. (1 cr)
Fundamental skills and rules of basketball, with emphasis on basic court movement and different offensive and defensive strategies.

PE 1071. Beginning Cricket. (1 cr)
Fundamentals of Cricket. Laws of Cricket, bowling/batting techniques, competitive/recreational Cricket opportunities.

PE 1072. Soccer. (1 cr)
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 1073. Softball. (1 cr)
Development of basic skills for lifetime involvement.

PE 1074. Beginning Volleyball. (1 cr)
Basic skills, team play, rules, officiating, and strategy.
PE 1075. Ice Hockey. (1 cr Prereq-1053 or equiv or #) Offensive/defensive strategies/techniques, goal tending, scrimage play. Students need their own equipment.

PE 1076. Flag Football. (1 cr) Introduction to flag football, techniques, field positions, rules/regulations. Students will participate in vigorous exercise activities including running, throwing, kicking, and catching.

PE 1077. Lacrosse. (1 cr) Introduction to lacrosse, techniques, field positions, rules, regulations. Students participate in vigorous exercise activities including running, throwing, catching, and stick handling.

PE 1078. Ultimate Disc. (1 cr) Introduction to ultimate disc, techniques, field positions, safety considerations. Students participate in vigorous exercise activities including running, throwing, and catching.

PE 1079. Rugby (Non-contact). (1 cr) 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 1082. Broomball. (1 cr) Techniques. Safe play using appropriate rules and regulations. Vigorous exercise activities, including running, stick handling, shooting, passing, and other physical activity associated with broomball.

PE 1107. Intermediate Swimming. (1 cr Prereq-1007 or equiv, proficient ability to swim 100 meters or #) Intermediate swimming skills. Fundamentals of swimming and hydrodynamics.


PE 1135. Intermediate Karate. (1 cr Prereq-1035 or equiv or #) Techniques of Japanese traditional Shotokan Karate taught through Ippon Kumite (one step parrying), San Kumite (three step sparring), and Heian Shodan Kata/Nidan Kata (forms). Testing for orange belt is optional.

PE 1136. Intermediate Racquetball. (1 cr Prereq-1036 or equiv or #) Improvement of basic skills and strategies. Format is determined by the number of players and their level of ability.


PE 1138. Intermediate Tennis. (1 cr Prereq-1038 or equiv or #) Review terminology, rules, etiquette. Improve basic skills. Singles/doubles strategy, competitive play.


PE 1154. Figure Skating. (1 cr Prereq-1053 or equiv or #) Terminology, rules. Basic moves, jumps, spins. On-ice/off-ice assignments.

PE 1157. Intermediate Skiking. (1 cr Prereq-1057 or equiv or #; assessment is made to determine skill level) Developing advanced skills in alpine skiing. Skiing safely on more difficult terrain. Class held at Highland Hills ski area in Bloomington.

PE 1174. Intermediate Volleyball. (1 cr Prereq-1074 or equiv, #) Volleyball systems of play. Incorporating offensive/defensive formations. Team play, transition, coaching, officiating.

PE 1205. Scuba and Skin Diving. (1 cr Prereq-Ability to swim 400 yds comfortably or #) Diving equipment, physics, physiology, decompression, emergencies, recreational dive planning, oceans, currents and aquatic life, snorkeling/SCUBA equipment usage, buoyancy control, entries, emergencies.

PE 1207. Advanced Swimming. (1 cr Prereq-[PE 1007, PE 1107, PE 1206, PE 1411] or #) Principles of lifetime physical fitness, derived from aquatic exercise. Workout made up of various drills and exercises demonstrating value of swimming fundamentals and training. Training variety, proper technique, and appropriate safety procedures.

PE 1262. Marathon Training. (3 cr Prereq-No pre-existing medical condition that would prevent finishing a marathon, #) Physical challenge achieved through physiological/psychological adaptation. Goal setting that fosters adaptation in many facets of life. Marathon history.

PE 1306. Lifeguard Training. (1 cr Prereq-[Proficiently swim 500 meters, at least 17 yrs old] or #) Upon completion, certifications are obtained in the following categories: American Red Cross Lifeguarding Today and First Aid; CPR for the Professional Rescuer; and Waterfront Lifeguarding.

PE 1411. Water Safety Instructor. (2 cr Prereq-[Proficiency in basic strokes, completion of skill] written pre tests] or #) Advanced lifesaving techniques, treading strategies.

PE 1415. Advanced Weight Training and Conditioning. (1 cr Prereq-[1014, 1015 or equiv]) or #; one yr of serious weight training recommended) Introduction to advanced forms of cardiovascular/weight training. Powerlifting, Olympic weightlifting, bodybuilding, sport-specific training. Proper technique, exercise selection, programming, nutrition, anatomy/physiology of weight training.

**Physical Therapy (PT)**

Department of Physical Medicine and Rehabilitation

Medical School

PT 1002. Orientation to Physical Therapy. (1 cr; S-N or Aud) Introduction to the profession of physical therapy through lectures, discussions, patient presentations, clinic visit, videotapes, and exposure to treatment equipment.

**Physics (PHYS)**

School of Physics and Astronomy

College of Science and Engineering


PHYS 1011. Physical World. (3 cr; A-F or Aud. Prereq-yr high school algebra) Fundamental laws and principles governing the physical world, discussed in the context in which encountered in modern science and technology.

PHYS 1012. Elementary Physics. (4 cr; A-F or Aud. Prereq-yr high school algebra, Internet connectivity) Topics represented in context of real world situations. Motion, forces, momentum, energy, heat, vibrations, sound, light, electricity, magnetism. Emphasizes development of logical reasoning skills. Lab.

PHYS 1101W. Introductory College Physics I. (4 cr; S-N or Aud. Prereq-High school algebra, plane geometry, trigonometry; primarily for students interested in technical areas) 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.

PHYS 1102W. Introductory College Physics II. (4 cr; S-N or Aud. Prereq-1101W or 1107) 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.

PHYS 1107. Introductory Physics Online I. (4 cr; S-N or Aud. Prereq-High school algebra, plane geometry, trigonometry) Principles of physics in context of everyday world. Use of kinematics/dynamics principles together with quantitative/qualitative problem solving techniques to understand natural phenomena.
PHYS 1108. Introductory Physics Online II. (4 cr.; Stdnt Opt. Prereq-1101W or 1107; primarily for students interested in technical areas) Fundamental principles of physics in context of everyday world. Use of conservation principles and quantitative/probabilistic problem solving techniques to understand natural phenomena. Lecture content, recitation, lab.


PHYS 1114. General Physics, Transition. (2.67 cr.; A-F or Aud. Prereq-[High school calculus or Math 1142 or equiv], [high school trigonometry or Math 1008 or Math 1151])

PHYS 1115. General Physics, Transition. (2.67 cr; A-F or Aud)

PHYS 1116. General Physics, Transition. (2.67 cr; A-F or Aud)


PHYS 1402V. Honors Physics II. (4 cr; Stdnt Opt. Prereq-1202W, PHYS 1302W, Prereq-honors student and permission of University Honors Program) Second semester of comprehensive, calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Description of motion, forces, conservation principles, fields. Structure of matter, with applications to electro-magnetic phenomena.


PHYS 1901. Freshman Seminar: Environment. (1.5 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics vary. See Class Schedule.


PHYS 1905. Freshman Seminar. (1.3 cr [max 6 cr]; A-F or Aud. Prereq-Fr) Topics vary. See Class Schedule.

PHYS 1910H. Freshman Seminar: Writing Intensive. (1.3 [max 3 cr]; A-F or Aud. Prereq-Freshman) Topics vary. See Class Schedule.

PHYS 2201. Introductory Thermodynamics and Statistical Physics. (3 cr.; Stdnt Opt. Prereq-[1302V or 1402V], [&Math 1272 or MATH 1372 or MATH 1572H]) Thermodynamics, its underlying statistical nature.


PHYS 2403H. Honors Physics III. (4 cr; Stdnt Opt. Prereq-2503, PHYS 2503, Prereq-1402V, honors student and permission of University Honors Program) Third semester of comprehensive calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Applications to 20th-century physics such as classical/quantum mechanical waves, optics, special relativity, and atomic structure of materials.


PHYS 2601. Quantum Physics. (4 cr; Stdnt Opt. Prereq-[2403H or 2503], [MATH 2373 or Math 2574H]) Introduction to quantum mechanics. Applications to atomic, molecular, condensed-matter, nuclear, elementary-particle, and statistical physics. Associated lab is 2605.

PHYS 2605. Quantum Physics Laboratory. (3 cr; Stdnt Opt. Prereq-2601) Laboratory experiments in atomic, solid state, and nuclear physics offered in conjunction with 2601.

PHYS 3022. Introduction to Cosmology. (3 cr; Stdnt Opt. Prereq-2601) Introduction to cosmology. Topics selected to apply to elementary school curriculum: earth’s motion, properties of matter, heat/temperature, kinematics, electric current.

PHYS 3071W. Laboratory-Based Physics for Teachers. (4 cr; Stdnt Opt. Prereq-No IT credit, college algebra; designed for students intending to be education majors) Laboratory-based introductory physics. Topics selected to apply to elementary school curriculum: earth’s motion, properties of matter, heat/temperature, kinematics, electric current.

PHYS 3993. Directed Studies. (1-5 cr [max 10 cr]; Stdnt Opt. Prereq-4, dept consent) Directed study in Physics in areas arranged by the student and a faculty member.

PHYS 3994. Directed Research. (1-5 cr [max 10 cr]; Stdnt Opt. Prereq-4, %) Independent, directed study in physics in areas arranged by the student and a faculty member.

PHYS 4001. Analytical Mechanics. (4 cr; Stdnt Opt. Prereq-[2305 or 2601 or Chem 3501 or Chem 3502], two sems soph math) Analytic Newtonian mechanics. Mathematics beyond prerequisites developed as required.

PHYS 4002. Electricity and Magnetism. (4 cr; Stdnt Opt. Prereq-[2305 or 2601 or Chem 3501 or Chem 3502], two sems soph math) Classical theory of electromagnetic fields using vector algebra and vector calculus.
PHYS 4051. Methods of Experimental Physics I. (5 cr; Stdnt Opt. Prereq-2601 or equiv lab experience or #) 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.

PHYS 4052W. Methods of Experimental Physics II. (5 cr; Stdnt Opt. Prereq-4051) Second semester of laboratory sequence. Contemporary experimental techniques illustrated by experiments with data analysis. Students design and execute an experimental project. Lectures on specialized topics of professional concern.


PHYS 4211. Introduction to Solid-State Physics. (3 cr; Stdnt Opt. Prereq-4101, 4201) 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.

PHYS 4303. Waves, Optics, and Relativity. (3 cr; Stdnt Opt. Prereq-4001, 4002) Further topics in analytical mechanics, electricity and magnetism including mechanical and electromagnetic wave phenomena, physical and geometrical optics, and relativistic dynamics of particles and fields.

PHYS 4501. Experimental Project. (1-5 cr [max 5 cr]; Stdnt Opt. Prereq-4052, #) Research project in physics area of contemporary interest. Project must be approved by faculty coordinator before registration.


PHYS 4621. Introduction to Plasma Physics. (3 cr; Stdnt Opt. Prereq-{4001, 4002} or equiv or #) Basic properties of collisionless, magnetized plasmas, single particle motion, plasmas as fluids, magnetohydrodynamics, waves in plasmas, equilibrium, instabilities, kinetic theory/shocks.

PHYS 4711. Introduction to Optics. (3 cr; Stdnt Opt. Prereq-4002) Modern theoretical and experimental optics broadly defined to include, for example, radio astronomy and particle accelerators. Matrix methods in geometrical optics including charged particle optics; optical detectors and noise; phenomena in intense coherent radiation including nonlinear effects.

PHYS 4950H. Senior Thesis. (1-3 cr [max 6 cr]; S-N or Aud. Prereq-#) Independent project with adviser.

PHYS 4960H. Honors Seminar. (1 cr [max 2 cr] Prereq-Upper div honors, #) Designed to prepare students for senior honors thesis projects and provide guidance in choice of future careers.

PHYS 4993. Directed Studies. (1-5 cr [max 10 cr]; Stdnt Opt. Prereq-#) Directed study in Physics in areas arranged by student and faculty member.


PHYS 5002. Quantum Mechanics II. (4 cr; Stdnt Opt. Prereq-{5001 or equiv or #} 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.


PHYS 5042. Analytical and Numerical Methods of Physics II. (4 cr; Stdnt Opt. Prereq-{5041 or #) Survey of mathematical techniques, both analytic and numerical, needed for physics. Application to physical problems.

PHYS 5072. Best Practices in College Physics Teaching. (1-3 cr [max 5 cr]; Stdnt Opt) Pedagogies for introductory physics classes. Topics from educational research/practice as applied to classroom.

PHYS 5081. Introduction to Biopolymer Physics. (3 cr; Stdnt Opt. +PHYS 4911. Prereq-working knowledge of {thermodynamics, statistical mechanics}) Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials.


PHYS 5401. Physiological Physics. (4 cr; Stdnt Opt. Prereq-{1301 or 1401) Musculoskeletal system, circulatory system/ membrane transport, biological control systems, propagation/action potential in nervous system, biomagnetism, electromagnetism at cellular level.

PHYS 5402. Radiological Physics. (4 cr; Stdnt Opt. Prereq-{1302 or 1402) Signal analysis, medical imaging, medical x-rays, tomography, radiation therapy, nuclear medicine, MRI, and similar topics.

PHYS 5701. Solid-State Physics for Engineers and Scientists. (4 cr; Stdnt Opt. Prereq-Grad or advanced undergrad in physics or engineering or the sciences) Crystal structure and binding; diffraction; phonons; thermal and dielectric properties of insulators; free electron model; band structure; semiconductors.

PHYS 5702. Solid State Physics for Engineers and Scientists. (4 cr; Stdnt Opt. Prereq-{5701 or #} Diamagnetism and paramagnetism; ferromagnetism and antiferromagnetism; optical phenomena; lasers; superconductivity; surface properties; ferroelectricity.

For a guide to course numbers, symbols, and abbreviations, see page 376.
Physiology (PHSL)
Department of Integrative Biology and Physiology

Medical School

PHSL 3051. Human Physiology. (4 cr; Stdnt Opt. Prereq-[Biol 1009 or 1 yr college biol], 1 yr college chem)
How major organ systems function (nerve, muscle, circulation, respiration, endocrine, renal, gastrointestinal, temperature regulation and energy metabolism). Three one-hour lectures, two-hour lab.

PHSL 3061. Principles of Physiology. (4 cr; Stdnt Opt. Prereq-1 year college chem and physics and math through integral calculus)
Human physiology with emphasis on quantitative aspects. Organ systems (circulation, respiration, gastrointestinal, endocrine, muscle, peripheral and central nervous systems), cellular transport processes, and scaling in biology.

PHSL 3062W. Research Paper for Physiology Majors. (1 cr; A-F or Aud. Prereq-3051, physiology major, 1 yr college chem, physics, math through integral calculus)
Students write a research paper on a topic of interest, mentored by a faculty member.

PHSL 3095. Problems in Physiology. (1-5 cr [max 20 cr]; Stdnt Opt. Prereq-[college physiology, #])
Individualized study in physiology. Students address a selected problem in physiology through library or lab research, supervised by physiology faculty.

PHSL 3701. Physiology Laboratory. (2 cr; A-F or Aud. BMEN 3701, PHSL 3063, Prereq-Physiology major)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

PHSL 4021. Advanced Physiology and Bioengineering: Bionic Human. (3 cr; A-F only. Prereq-3061 or 3043 or 5061 or #)

PHSL 4031. Physiological Discusns: Contemporary Topics. (2 cr; A-F only. Prereq-3061 or 3053 or 5061 or #)
Students read, critically evaluate, present, and discuss research in cellular and organ system physiology. Journal club setting led by faculty members.

PHSL 4095H. Honors Problems in Physiology. (2-4 cr [max 4 cr]; A-F or Aud. Prereq-3061, physiology honors candidate, approval of director of undergraduate studies in physiology)
Students pursue a selected topic in physiology through library or lab research supervised by physiology faculty.

PHSL 4900. Advanced Physiology Teaching Laboratory. (1-6 cr [max 12 cr]; A-F only. Prereq-[3051 or 3061, 3071], #)
Teaching in undergrad physiology labs. Instructional sessions, hands-on teaching experiences.

PHSL 5061. Principles of Physiology for Biomedical Engineering. (4 cr; Stdnt Opt. Prereq-Biomedical engineering grad, one yr college chem and physics and math through integral calculus)
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.

PHSL 5094. Research in Physiology. (1-5 cr [max 20 cr]; Stdnt Opt. Prereq-#)
Independent lab research project in physiology, supervised by physiology faculty.

PHSL 5095. Problems in Physiology. (1-5 cr [max 20 cr]; Stdnt Opt. Prereq-#)
Individualized study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.

PHSL 5101. Human Physiology. (5 cr; Stdnt Opt. Prereq-Grad student)

PHSL 5115. Advanced Clinical Physiology I for Nurse Anesthetists. (3 cr; A-F or Aud. Prereq-#)
Cellular mechanisms underlying systems physiology. Cellular physiology, physiology of excitable tissues, renal physiology, cardiovascular physiology.

PHSL 5201. Computational Neuroscience I: Membranes and Channels. (3 cr; Stdnt Opt. &NSC 5201, Prereq-calcium/calciu model, non-linear dynamic systems analysis, voltage and ligand-gated ion channels, ion transport theories, and impulse initiation and propagation)


PHYS 5444. Muscle. (3 cr; Stdnt Opt. &BIOC 5444. Prereq-3061 or 3071 or 5061 or BioC 3021 or BioC 4331 or #)

PHSL 5510. Advanced Cardiac Physiology and Anatomy. (2-3 cr; Stdnt Opt. Prereq-#)
Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

PHSL 5511. Advanced Neuromuscular Junction Physiology. (2-3 cr; Stdnt Opt. Prereq-#)
Fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

PHSL 5540. Advanced Exercise Medicine: Physiology and Bioenergetics. (1-2 cr [max 2 cr]; Stdnt Opt. Prereq-[Grad student or practicing health professional], #) 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.

PHSL 5701. Physiology Laboratory. (1-2 cr [max 2 cr]; A-F or Aud. Prereq-#)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

Plant Biology (PBIO)
Department of Plant Biology
College of Biological Sciences

PBIO 1212. Plants and Society. (3 cr; Stdnt Opt. Prereq-Intended for non-biological sciences majors)
Roles that plants play in human biological/cultural development.

PBIO 4321. Minnesota Flora. (3 cr; Stdnt Opt. Prereq-One semester college biology)

PBIO 4404. Developmental Plant Anatomy. (3 cr; Stdnt Opt. Prereq-BIOL 2022 or Biol 3007)
Introduction to the microscopic structure and development of plants at the cell, tissue, and organ level. Emphasis on relationships between anatomy and the ontogeny, phylogeny, and ecology of seed plants with some reference to lower vascular plants.
Plant Pathology (PLPA)


PBIO 4793W. Directed Studies: Writing Intensive. (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#) Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

PBIO 4794W. Directed Research: Writing Intensive. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#, %) Lab or field investigation of selected areas of research, including written report.


PBIO 4993. Directed Studies. (1-7 cr [max 7 cr]; S-N or Aud. Prereq-#) Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

PBIO 4994. Directed Research. (1-6 cr [max 42 cr]; S-N or Aud. Prereq-#) Lab or field investigation of selected areas of research.


PBIO 5309. Molecular Ecology And Ecological Genomics. (3 cr; Stdnt Opt. Prereq-BIOL 3407 or BIOL 3409 or BIOL 4003) 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.

PBIO 5412. Plant Physiology. (3 cr; Stdnt Opt. Prereq-BIOL 2002 or BIOL 3002 or Biol 3007, Biol/BioC 3021 or BioC 4331) Physiological and biochemical bases of plant systems with emphasis on higher plants.

PBIO 5416. Plant Morphology, Development, and Evolution. (4 cr; Stdnt Opt. Prereq-BIOL 2002 or BIOL 3002 or Biol 3007) Evolutionary history of land plants. Morphological changes in vegetative and reproductive structures. Morphology of green algal ancestors, nonvascular land plants, and spore bearing and seed bearing vascular plants are analyzed in an evolutionary framework.

PBIO 5516. Plant Cell Biology. (3 cr; Stdnt Opt. Prereq-BIOL 2002 or BIOL 3007 or Biol 3022, [Biol 3021 or BioC 3021 or Biol 4003]) 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.

Plant Pathology

Department of Plant Pathology

College of Food, Agricultural and Natural Resource Sciences


PLPA 3001. Plant Disease Biology and Management. (1 cr; Stdnt Opt. Prereq-BIOL 1009 or equiv) Introduction to organisms that cause plant diseases. Symptoms of plant diseases, economic losses due to plant diseases, and chemical and biological strategies for managing plant diseases will be discussed.

PLPA 3003. Diseases of Forest and Shade Trees. (3 cr; Stdnt Opt) Diseases of trees in urban and forested areas. Biology, ecology and control of tree diseases. Labs provide experience identifying disease agents and learning appropriate integrated control procedures.

PLPA 3090. Research in Plant Pathology. (1-4 cr [max 4 cr]; Stdnt Opt) Assignment of special problems to undergraduates desiring opportunity for independent research in plant pathology.
PLLA 5301. Plant Genomics. (3 cr; Stdnt Opt. +PBIO 5301. Prereq-Intro course in genetics or #) Introduction to genomics. Emphasizes plants and relevant model organisms. DNA marker/sequencing technology, comparative genomics, whole genome sequencing, DNA chips/microarrays, EST libraries and SAGE analysis, gene-knockout systems, genome databases, sequence comparison/clustering algorithms, visualization tools.

PLLA 5302. Genomics of Plant-Associated Microbes. (3 cr; A-F or Aud. Prereq-[BIOC 4125, course in plant pathology or microbiology], course in genetics, [lab in molecular biology, biotechnology] or equiv]) or #) Genomics research for plant-associated microbes. Journal articles, discussions, case studies. Identification/characterization of genes in plant-microbe interactions. Analysis of plant pathogens, research methodologies. Linkage/gene/physical mapping, candidate genes sequencing, gene silencing, knock-out, ESTs, microarrays, bioinformatics. Online training modules, field trips, guest lectures, individual/group projects.

PLLA 5999. Special Workshop in Plant Pathology. (1-4 cr [max 4 cr]; Stdnt Opt) Workshops on a variety of topics in plant pathology offered at locations other than the Twin Cities campus. See Class Schedule or department for current offerings.

PLSL 1101. Beginning Polish. (5 cr; Stdnt Opt. +PLSH 4101) Develop basic proficiency in listening, speaking, reading, and writing and become acquainted with Polish culture. First of four courses designed to satisfy CLA language graduation requirement.

PLSL 1102. Beginning Polish. (5 cr; Stdnt Opt. +PLSH 4102. Prereq-1101 or equiv) Develop basic proficiency in listening, speaking, reading and writing and to acquaint students with Polish culture. Second of four courses designed to satisfy CLA language graduation requirement.

PLSL 3001. Intermediate Polish. (5 cr; Stdnt Opt. +PLSH 4012. Prereq-1102 or equiv) Conversation, composition, advanced grammar, translation, and readings in appropriate literature. Third of four courses designed to satisfy CLA language graduation requirement.

PLSL 3002. Intermediate Polish. (5 cr; Stdnt Opt. +PLSH 4012. Prereq-3001 or equiv) Conversation, composition, advanced grammar, translation, and readings in appropriate literature. Fourth in a sequence of courses designed to satisfy CLA language graduation requirement.

PLSL 3601. Survey of Polish Literature: Baroque through Romanticism. (3 cr; Stdnt Opt) Reading and analysis of major works of Polish literature from Baroque through Romanticism.


PLSH 4102. Beginning Polish. (3 cr; Stdnt Opt. +PLSH 1102. Prereq-4101, [fourth sem course in another language or grad student]) Listening, speaking, reading, writing. Polish culture.

PLSH 4103. Intermediate Polish. (3 cr; Stdnt Opt. +PLSH 3001. Prereq-4102, [fourth sem course in another language or grad student]) Conversation, composition, advanced grammar, translation, readings in appropriate literature.

PLSH 4104. Intermediate Polish. (3 cr; Stdnt Opt. +PLSH 3002. Prereq-4103, [fourth sem course in another language or grad student]) Conversation, composition, advanced grammar, translation, and readings in appropriate literature.

PLSH 5900. Topics. (1-4 cr [max 3 cr]; Stdnt Opt) Topics specified in Class Schedule.

Political Science (POL)

Department of Political Science

College of Liberal Arts


POL 1015. Mass Politics in a Media Age. (3 cr; Stdnt Opt) In a world of sound bites, soft news, and ubiquitous information/images, do we make rational voting decisions? Are we politically engaged? Do politicians, the media, and political institutions promote or obstruct our efforts to be good citizens? What does responsible citizenship entail? What can be done to enhance citizenship?


POL 1025. Global Politics. (4 cr; Stdnt Opt) 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 1026. We and They: U.S. Foreign Policy. (4 cr; Stdnt Opt) Contemporary foreign policy issues; how the United States makes foreign policy in a global era; historical background. How two regions (such as the Middle East and China) affect and are affected by U.S. policy.

POL 1044. Repression and Democracy Around the World. (4 cr; Stdnt Opt) Introduction to political life in all its worldwide variety. Focus on repression, democracy, rights, corruption, gender, and political change. Guest lectures by political science professors who are experts on different parts of the world. Non-majors welcome.

POL 1054H, Honors: Repression and Democracy. (4 cr; Stdnt Opt) Introduction to political life in all its worldwide variety. Focuses on repression, democracy, rights, corruption, gender, and political change. Guest lectures by political science professors who are experts on different parts of world.

POL 1065. Government and Medicine. (3 cr; Stdnt Opt) 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 1201. Political Ideas and Ideologies. (4 cr; Stdnt Opt) 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 1903. Freshman Seminar. (3 cr; Stdnt Opt. Prereq-Fr or no more than 30 cr) Topics specified in Class Schedule.


POL 1905. Freshman Seminar. (3 cr; Stdnt Opt) Topics vary by instructor.

POL 1908W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

POL 1909W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

POL 3070. Faculty-Supervised Individual Field Work. (1-13 cr [max 13 cr]; A-F or Aud. Prereq, #) Faculty-supervised research related to work in political or governmental organizations.
POL 3080. Faculty-Supervised Individual Internships. (3-13 cr [max 15 cr]; A-F or Aud. Prereq-, %) Internship with government or community organizations arranged by the department and awarded competitively each spring semester.

POL 3085. Quantitative Analysis in Political Science. (4 cr; A-F or Aud) 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. (4 cr; Stdnt Opt. Prereq-9 cr soc sci or #) Introduction to empirical research techniques or 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.

POL 3100H. Honors Thesis Credits. (1-4 cr [max 4 cr]; A-F or Aud. Prereq-3109, pol sci, honors, %) Individual research/writing of departmental honors thesis.

POL 3210. Practicum. (2 cr [max 12 cr]; Stdnt Opt) Offers different kinds of out-of-class opportunities to complement the readings, assignments, and objectives of a parent course in political science. Opportunities vary according to demands of the parent course.

POL 3225. American Political Thought. (3 cr; Stdnt Opt) Puritans, American Revolution, Constitution, pro- and anti-slavery arguments, civil war and reconstruction, industrialism, westward expansion, Native Americans, immigration, populism, socialism, social Darwinism, women’s suffrage, red scares, Great Depression, United States as world power, free speech, pluralism and multiculturalism.

POL 3235W. Democracy and Citizenship. (3-4 cr [max 4 cr]; Stdnt Opt. Prereq-1201 recommended) Surveys models of democracy based on individual rights; pluralism; civic republicanism; community activism. Examines dilemmas of democratic government and citizenship in a race, class, and gender-stratified society; explores its possibilities in a changing world.


POL 3252. Renaissance, Reformation, and Revolution: Early Modern Political Thought. (3-4 cr [max 4 cr]; Stdnt Opt) Thinkers, themes, and discourses from the Renaissance to the French Revolution. Renaissance Humanists; Machiavelli; More; Reformation; Luther; Calvin; Natural Law; Grotius; Divine Right; Common Law; Bacon; English Revolutionaries; Hobbes; Locke; Astell; Enlightenment; Rousseau; French Revolutionaries; Hume; Burke; Wollstonecraft.

POL 3306. Presidential Leadership and American Democracy. (3 cr; Stdnt Opt. +POL 5306. Prereq-1001 or equiv, non-pol sci grad major or #) No single individual in the American political system is the subject of such high expectations as the president. Examine whether the president’s political and constitutional powers are sufficient to satisfy the high expectations that Americans have of him. Should presidents be expected to dominate American politics?

POL 3308. Congressional Politics and Institutions. (3 cr; Stdnt Opt. +POL 4308, POL 5308, Prereq-1001 or 1002 or #) Origin/development of U.S. congressional institutions, parties, committees, leaders, lobbying/elections, and relations between Congress/executive branch. Relationship of campaigning/governing, nature of representation, biases of institutional arrangements.

POL 3309. Justice in America. (3 cr; Stdnt Opt. Prereq-1001 or 1002 or #) 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.

POL 3310. Topics in American Politics. (3 cr [max 6 cr]; Stdnt Opt) Topic in American politics.

POL 3310H. Topics in American Politics. (3 cr; Stdnt Opt) Topic in American politics.

POL 3319. Education and the American Dream. (3 cr; A-F or Aud) 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; Stdnt Opt. Prereq-1001 or equiv or #) Analysis of the policies of the policy process including agenda formation, formulation, adoption, implementation, evaluation. Attention to selected policy areas.


POL 3410. Topics in Comparative Politics. (3 cr [max 9 cr]; Stdnt Opt) Topics of current analytical or policy importance to comparative politics. Topics vary.

POL 3441. Politics of Environmental Protection. (3 cr; Stdnt Opt. +POL 5441. Prereq-: 5441; jr or sr social science major) How the American political system deals with environmental issues, how third world countries deal with problems of environmental protection and economic growth, and the way the international community deals with global environmental problems.

POL 3451W. Politics and Society in the New Europe. (3 cr; Stdnt Opt) Changing politics/society of Europe. Generational change/values, political parties, welfare state, future of European integration, political stability, democratization.


POL 3491. Film and Latin American Politics. (3 cr; Stdnt Opt. Prereq-1054 recommended) Introduction to using film to study Latin American politics. Hollywood films explore how the United States “sees” Latin America, its people, and its political problems; films from Latin America explore how Latin American popular culture reflects a country’s political issues. One feature film per week. Brief readings about issues raised by each film.


POL 3739. Politics of Race, Class, and Ethnicity. (3 cr; Stdnt Opt. Prereq-6 cr in soc sci) Introduction to how race, ethnicity, and class interact in political process. Focuses on political conflict through comparative analysis of United States, South Africa, and Brazil.


POL 3766. Political Psychology of Mass Behavior. (3 cr; Stdnt Opt) 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. (3 cr; A-F or Aud) Intersections of politics, personality, and social psychology. Focuses on political leaders and

For a guide to course numbers, symbols, and abbreviations, see page 376. 599
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 3785. Persuasion and Political Propaganda. (3 cr; AF or Aud) 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 3835. International Relations. (3 cr; Stdt. Opt.) Introduction to theoretical study of international relations. How theoretical perspective shapes one’s understandings of structure/practices of global politics.

POL 3872W. Global Environmental Cooperation. (4 cr [max 5 cr]; Stdt. Opt. Prereq-credit cannot be granted if credit has been received for: 5872) Emergence of the environment as a key aspect of the global political agenda. Non-governmental and governmental international organizations. Politics of protection of the atmosphere, rainforests, seas, and other selected issues. International security and the environment.

POL 3873W. Global Citizenship and International Ethics. (3 cr; Stdt. Opt) Case studies of ethics in intervention, war, weapons, foreign aid, environmental practices, and human rights are used to examine the global ethical responsibilities of individual citizens and public officials; effectiveness of transnational social movements in influencing policy at domestic and international levels.

POL 4210. Topics in Political Theory. (3 cr [max 6 cr]; A-F or Aud) Topics in political theory.

POL 4225. Politics and Education. (3-4 cr [max 4 cr]; A-F only) Politics/education: theoretically, historically, practically. Ancient/modern theories of politics (especially democratic politics) in connection with education. Course usually has a practicum in which students work with each other or coach younger students on problems of public importance to their communities.


POL 4275. Contemporary Political Thought. (3 cr; Stdt. Opt. Prereq-1201 recommended) The 20th-century crisis of Western humanism in major works of contemporary political thought from World War II to the present. Relationships between force and freedom; ideology and truth; authority and resistance. Thinkers may include Arendt, Camus, Beauvoir, Fanon, Foucault, Habermas, Rawls, Sartre, Said. Ideas may include communitarianism, feminism, postcolonialism, postmodernism, socialism.

POL 4280. Topics in Political Theory. (3-4 cr [max 8 cr]; Stdt. Opt) Topics in historical, analytical, or normative political theory. Topics vary.

POL 4315W. State Governments: Laboratories of Democracy. (4 cr; Stdt. Opt. = POL 5315. Prereq-1001 or equiv, non-pol sci grad or #) Political behavior, governmental institutions, and public policies in American states; comparison among states, between state and national government, with special attention given to Minnesota.

POL 4322. Rethinking the Welfare State. (3-4 cr [max 4 cr]; Stdt. Opt) Discuss competing arguments about welfare states in advanced industrial countries. Are welfare states the result of sectional interests, class relations, or citizenship rights? Compare American social policy with policies in other western countries.

POL 4327. The Politics of American Cities and Suburbs. (3 cr; Stdt. Opt. Prereq-1001 or 1002, non-pol sci grad major or equiv or #) Development and role of American local government; forms and structures; relationships with states and the federal government; local politics and patterns of power and influence.


POL 4410. Topics in Comparative Politics. (3 cr [max 6 cr]; Stdt. Opt) Topics of current analytical or policy importance to comparative politics. Topics vary.

POL 4461W. European Government and Politics. (4 cr [max 8 cr]; Stdt. Opt. = POL 5461. Prereq-1054 or 3051 or non-pol sci grad or #) European political institutions in their social settings; power and responsibility; governmental stability; political decision making, government and economic order.

POL 4463. The Cuban Revolution Through the Words of Cuban Revolutionaries. (3 cr; Stdt. Opt. Prereq-1025 or 1054 or equiv or #) How the Cuban Revolution was made, why it is still in place. Emphasis role of leadership/strategy. How, in their own words, the Cubans and their leaders saw/see what they are doing.


POL 4473W. Chinese Politics. (3 cr; Stdt. Opt. = EAS 4473) 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. (4 cr; Stdt. Opt. Prereq-1054 or 3051 or non-pol sci grad or #) 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.

POL 4478W. Contemporary Politics in Africa and the Colonial Legacy. (4 cr; Stdt. Opt. = POL 5478, AFRO 4478, AFRO 5478. Prereq-1054 or 3051 or non-pol sci grad or #) 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.

POL 4481. Governments and Markets. (3-4 cr [max 4 cr]; Stdt. Opt. Prereq-1054 or 3051 or non-pol sci grad or #) Study the connection between democracy and markets with attention to the experiences of countries in North America and Europe.


POL 4489W. Citizens, Consumers, and Corporations. (3 cr; Stdt. Opt) How ordinary people can act collectively to hold corporations accountable for effects their activities have on communities/nations. Mobilizing as citizens through mass protests, lobbying politicians, and pursuing claims through court system. Mobilizing as consumers through purchasing decisions.

POL 4501W. The Supreme Court and Constitutional Interpretation. (3 cr; Stdt. Opt. = POL 5487) 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. (3 cr; Stdt. Opt) Supreme Court’s interpretation of Bill of Rights, 14th amendment. Freedom of speech, press, religion; crime/punishment; segregation/desegregation, affirmative action; abortion/privacy.

POL 4523W. Federal Indian Policy. (3 cr; A-F or Aud. = MIN 4523W) 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 4561. Comparative Legal Systems. (3 cr; Stdnt Opt. = POL 5561. Prereq-3835 or non-pol sci grad major)
Survey of the principal legal systems of the Western world. Examine the role of the legal system in relation to various political and economic systems and the contrast between the common law and civil law traditions.

POL 4737W. American Political Parties. (4 cr; Stdnt Opt. = POL 5737. Prereq-1001 or equiv or #)
The American two-party system; party influence in legislatures and executives; decline of parties and their future.

POL 4766. American Political Culture and Values. (3 cr; Stdnt Opt. Prereq-1001 or equiv or non-pol sci grad major or #)
Empirical analysis of basic political values--individualism, freedom, and equality; dominant beliefs about democratic principles, materialism, capitalism, citizenship, patriotism and heroism.

POL 4771. Racial Attitudes and Intergroup Conflict. (3 cr; Stdnt Opt)
Basic approaches, findings, and controversies in research on racial attitudes and intergroup relations, from perspective of political psychology. Approaches developed by researchers in political science, social psychology, and sociology. Contemporary issues/debates, historical development of research/theory.

POL 4810. Topics in International Politics and Foreign Policy. (3 cr [max 6 cr]; Stdnt Opt)
Analysis of selected issues in contemporary international relations. Topics vary.

POL 4835. The U.S. in the Global Economy. (3-4 cr [max 4 cr]; Stdnt Opt. Prereq-3835 recommended)
Domestic and international politics of 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 4879W. Israeli-Palestinian Situation. (4 cr; Stdnt Opt)
Situation as seen of two communities. History, politics, and respective narratives of each community. Divisions within each community that are consequential for reconciliation. Examples of reconciliation literature from both communities.

POL 4881. International Law. (3 cr; Stdnt Opt. = POL 5881. Prereq-3835 or non-pol sci grad or #)
How international law matters for world politics. Lectures, discussions, and simulations of cases examine key concepts and theories of international law. Topics include war crimes, human rights, law of the sea, environment, and international crime.

POL 4885W. Global Governance. (3 cr; Stdnt Opt. Prereq-3835 or non-pol sci grad or #)
Seminar discussions and class simulations examine the rise and role of inter-governmental organizations such as the United Nations and non-governmental organizations. Topics include peacekeeping, trade, development, human rights, security and arms control, self-determination, refugees, health, and the environment.

POL 4885W. International Conflict and Security. (4 cr; Stdnt Opt. = POL 5885)
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. (3 cr; A-F or Aud)
Survey of applications of game theory to international politics; conflict and cooperation, global environmental commons, deterrence and reputation.

POL 4889. Governments and Global Trade and Money. (3-4 cr [max 4 cr]; Stdnt Opt. = POL 5889. Prereq-3835 or non-pol sci grad or #)
Study the politics of international trade and monetary affairs including north-south and east-west relations.

POL 4900V. Honors: Senior Paper. (1 cr; A-F or Aud. Prereq-Honors, pol sr, #)
Can be attached to any 3xxx or 4xxx course. A 10-15 page paper is submitted for evaluation/advice by instructor, then revised for final submission.

POL 4900W. Senior Paper. (1 cr; A-F or Aud. Prereq-POL sr, #)
Can be attached to any 3xxx or 4xxx 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.

POL 4970. Individual Reading and Research. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#, @) Guided individual reading or study.

POL 5120. Topics in Political Theory. (3 cr [max 9 cr]; Stdnt Opt)

POL 5251. Greeks, Romans, and Christians: Ancient and Medieval Political Thought. (4 cr; Stdnt Opt. = POL 5251. Prereq grad student)


POL 5253. Modernity and its Discontents: Late Modern Political Thought. (4 cr; Stdnt Opt. = POL 5253. Prereq-#)

POL 5275. Contemporary Political Thought. (3 cr; Stdnt Opt. Prereq-# = POL 4275; grad student; 1201 recommended)
20th-century crisis of Western humanism in major works of contemporary political thought from World War II to present. Force and freedom. Ideology and truth. Authority and resistance. Thinkers may include Arendt, Camus, Beauvoir, Foucault, Habermas, Rawls, Sartre, Said. Ideas may include communitarianism, feminism, postcolonialism, postmodernism, socialism.

POL 5280. Topics in Political Theory. (3-4 cr; Stdnt Opt. Prereq-# = POL 4280; grad student)
Topics in historical, analytical, or normative political theory. Topics vary, see Class Schedule.

POL 5308. Congressional Politics and Institutions. (3 cr; Stdnt Opt. = POL 4308)

POL 5309. Justice in America. (3 cr; Stdnt Opt. = POL 4309; [1001 or 1002], [non-pol sci grad major or equiv or #])
American judiciary, selection of judges, how/why these individuals/institutions behave the way they do. What influences judicial decisions. What impact decisions have. Why people comply with them.

POL 5315. State Governments: Laboratories of Democracy. (4 cr; Stdnt Opt. = POL 4315W. Prereq-grad student or #)
Political behavior, governmental institutions, and public policies in American states. Comparison among states, between state and national government. Emphasizes Minnesota.

POL 5327. Politics of American Cities and Suburbs. (3 cr; Stdnt Opt. Prereq-# = POL 4327; [[1001 or 1002], [non-pol sci grad major or equiv or #]])

POL 5403. Comparative Constitutionalism. (3 cr; Stdnt Opt)

POL 5404. Environmental Policy. (3 cr; Stdnt Opt. = POL 5411. Prereq-grad student or #)

For a guide to course numbers, symbols, and abbreviations, see page 376. 601

POL 5465. Southeast Asian Politics. (3 cr; Stdnt Opt) U.S. involvement in region. Progress toward and resistance to democratic political systems and economic development.


POL 5501. Supreme Court and Constitutional Interpretation. (3 cr; Stdnt Opt. +LAS 4501, POL 5501. Prereq-grad student or #) Historical/analytical approaches to Court’s landmark decisions. Theory/techniques of judicial review. Court’s authority related to wider political/social context of American government.

POL 5502. Supreme Court, Civil Liberties, and Civil Rights. (3 cr; Stdnt Opt. Prereq-=: 4502; 1001 or 1002 or equiv or non-pol sci grad student or #) Supreme Court’s interpretation of Bill of Rights, 14th amendment. Freedom of speech, press, religion. Crime/punishment. Segregation/desegregation, affirmative action. Abortion/privacy.

POL 5525. Federal Indian Policy. (3 cr; A-F or Aud. Prereq-=: 4525, Amln 4525; grad student) Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance in 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 5766. American Political Culture and Values. (3-4 cr; Stdnt Opt. Prereq-=: 4766; 1001 or equiv or non-pol sci grad student or #) Individualism, freedom, equality. Dominant beliefs about democratic principles, materialism, capitalism, citizenship, patriotism/heroism.

POL 5810. Topics in International Politics and Foreign Policy. (3 cr [max 6 cr]; Stdnt Opt. Prereq-=: 4810; grad student) Selected issues in contemporary international relations. Topics vary, see Class Schedule.


POL 5889. Governments and Global Trade and Money. (3 cr; Stdnt Opt. +POL 4889. Prereq-3835 or grad student or #) Politics of international trade and monetary affairs, including north-south and east-west relations.

POL 5970. Individual Reading and Research. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#, @) Guided individual reading or study.

Portuguese (PORT)
Department of Spanish and Portuguese College of Liberal Arts

PORT 1101. Beginning Portuguese. (5 cr; Stdnt Opt) Listening, speaking, reading, writing. Cultures of Portugal, Brazil, or Portuguese-speaking Africa. Workbook assignments, paired/small group activities.

PORT 1102. Beginning Portuguese. (5 cr; Stdnt Opt. Prereq-1101 or #) Reading, writing, speaking, listening. Cultures of Portugal, Brazil, or Portuguese-speaking Africa. Workbook assignments, paired/small group activities.

PORT 1103. Intermediate Portuguese. (5 cr; Stdnt Opt. Prereq-1102 or #) Emphasizes speaking, comprehension. Reading/writing skills based on Portuguese-language materials. Cultures of Portugal, Brazil, or Lusophone Africa.


PORT 3001. Portuguese for Spanish Speakers. (4 cr; Stdnt Opt. Prereq-[SPAN 3015, [LPE or PORT LPE]) or (speaker of other Romance language, #)] Listening, reading, speaking, writing. Uses communicative approach.


PORT 3501W. Foundations of Portuguese Literature and Culture. (3 cr; Stdnt Opt. +POL 3501W. Prereq-3003) Significant expressions of Portuguese culture, from Middle Ages, Age of øDiscoveriesø and 19th century to late empire in 20th century and post-emire in 21st century. Literature, history, visual/sound culture, architecture.

PORT 3502W. Foundations of Brazilian Literature and Culture. (3 cr; Stdnt Opt. +LAS 3502W, PORT 3502V. Prereq-3003 or equiv) Significant expressions of Brazilian culture, from colonial period to present. Emphasizes 20th/21st centuries. Literature, history, visual/sound culture, architecture.

PORT 3503W. Literatures and Cultures of Lusophone Africa. (3 cr; Stdnt Opt. +PORT 3503W. Prereq-3003) Introduction to Lusophone Africa (Angola, Cape-Verde, Guinea-Bissau, Mozambique, Sao Tome/Principe). Literature, cultural/literary criticism, history, anthropology, media (film, art, music).

PORT 3603. Portuguese-Speaking Cultures in Translation. (3 cr; Stdnt Opt) Introduction to Portuguese-speaking world. Sociohistorical, geopolitical, and cultural foundations of Lusophone Africa, Brazil, and/or Portugal.

PORT 3800. Film Studies in Portuguese. (3 cr [max 6 cr]; A-F or Aud. +PORT 3800H. Prereq-3003 or (dept or #)) Films from Portuguese-speaking world in their historical, (geo)political, and socio-economic contexts. Films from Brazil, Portugal, or Lusophone Africa analyzed under interdisciplinary framework, noting aspects related to cinematography/rhetorics.
Post Secondary Teaching and Learning (PSTL)

PORT 3970. Directed Readings. (1-4 cr [max 9 cr]; Stdnt Opt. Prereq-[3501 or 3502 or 3503 or 3910], %) Guided individual reading or study.


PORT 5520. Portuguese Literary and Cultural Studies. (3 cr [max 9 cr]; Stdnt Opt) Study of origins and development of modern Portuguese nation (late 15th 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]; Stdnt Opt) 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.

PORT 5540. Literatures and Cultures of Lusophone Africa. (3 cr [max 9 cr]; Stdnt Opt. Prereq-#) Origins/development of Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, Sao Toma, Principe). Literature, cultural/literary criticism, history, sociology, media (film, art, music, Internet). Main cultural problematics pertaining to Portugal as well as fundamental literary texts.

PORT 5550. Literatures and Cultures of Lusophone Africa. (3 cr [max 9 cr]; Stdnt Opt. Prereq-#) Origins/development of Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, Sao Toma, Principe). Literature, cultural/literary criticism, history, sociology, media (film, art, music, Internet). Main cultural problematics pertaining to Brazil as well as fundamental literary texts.

PORT 5560. Literary and Cultural Studies. (3 cr [max 9 cr]; Stdnt Opt) Study of origins and development of modern Portuguese nation (late 15th 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 5570. Directed Readings. (3 cr [max 9 cr]; Stdnt Opt. Prereq-MA or PhD candidate, %, @) Lusophone studies (Portuguese-speaking Africa, Brazil, Portugal). Areas not covered in other courses. Students submit reading plans for particular topics, figures, periods, or issues.


Post Secondary Teaching and Learning (PSTL)

Department of Post Secondary Teaching and Learning

College of Education and Human Development

PSTL 722. Introductory Algebra (Computer). (0 cr; Stdnt Opt. Prereq-[4 cr equiv], General Math Placement Test) Students learn via multimedia software. Instructor helps students individually during class. Real numbers, expressions, equations, inequalities, rectangular graphs, systems, word problems, exponents, polynomials, factoring.

PSTL 732. Intermediate Algebra (Computer). (0 cr; Stdnt Opt. +PSTL 731. Prereq-[4 cr equiv or grade of at least C in (0715 or 0717 or 0721 or 0722) or General Math Placement Test) Students learn via multimedia software. Instructor helps students individually during class. Rational expressions, absolute value, roots, radicals, quadratic, exponential, and logarithmic functions, complex numbers.


PSTL 1005. Logic as Mathematical Reasoning. (3 cr; Stdnt Opt. Prereq-Three years of high school math or math placement test) Symbolic logic. Mathematical reasoning techniques for analyzing arguments/data. Set theory, Venn/Euler diagrams, truth tables, sequencing, matrices, circuits.

PSTL 1006. Mathematical Modeling and Prediction. (3 cr; Stdnt Opt. Prereq-Three yrs high school math or grade of at least C in (0731 or 0732) or placement test score or #) Construction of mathematical models from the viewpoints of theory and real data. Those models are then used to describe Real world phenomena, making predictions. Theoretical/practical development. Applications of linear, polynomial, rational, exponential, and logarithmic functions. Curve fitting, logistic equations.

PSTL 1042. Reading and Writing in the Content Areas. (3 cr [max 9 cr]; Stdnt Opt. Prereq-Non-native speaker of English, CE enrollment, %) Previewing/predicting, note-taking, summarizing, responding to text. Writing/revising essays based on content and rhetorical conventions of field.


PSTL 1076. Orientation to Self and Career. (2 cr; Stdnt Opt) How to organize what one knows about oneself to explore career paths and find a place of work. Experiential exercises, discussion. Self-reflection/analysis through writing. Papers, oral presentation, final portfolio.

PSTL 1081. Integrated Learning in the Social Sciences. (2 cr [max 4 cr]; A-F only. Prereq-Concurrent registration in social science course, adviser approval) Intensive support for developing conceptual/contextual understanding of material presented in companion social science course. Methods for critical thinking, field-specific vocabulary, core concepts, writing for social sciences.

PSTL 1082. Integrated Learning in the Humanities. (2 cr [max 6 cr]; A-F only. Prereq-Concurrent registration in science course, adviser approval) Intensive support for developing conceptual/analytic skills emphasized in companion humanities course. Critical thinking, close reading/analysis of texts, field-specific vocabulary development, writing/presentation styles.

PSTL 1084. Integrated Learning in Mathematics. (2 cr [max 4 cr]; A-F only. Prereq-Concurrent registration in mathematics adviser approval) Intensive support for mastering concepts/skills in companion mathematics course. Problem-solving techniques, application of mathematical concepts associated with disciplinary content.

PSTL 1085. Structured Accelerated Learning in Composition. (1 cr; A-F or Aud. Prereq-[1081 or 1085], specific content course, adviser approval) Methods of study in composition courses. Note taking, exam preparation, time management. Specific writing tasks, research methods, essay/presentation styles associated with disciplinary content.

PSTL 1086. The First-Year Experience. (2 cr; A-F or Aud) 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.

PSTL 1112. Nature in the City. (4 cr; Stdnt Opt) Science/politics of ecosystems within Twin Cities. Evolution, ecological competition, food production. Living organisms that have adapted to urban environment. Potential interventions to environmental problems.
PSTL 1131. Principles of Biological Science. (4 cr; Stdnt Opt)
Biodiversity/classification, genetics, evolution, ecology, and life cycles. Empirical/theoretical foundations. How scientific information and inquiry skills are relevant to daily lives.

PSTL 1132. Nature Study. (4 cr; Stdnt Opt)
Natural history. Several Twin Cities habitats are surveyed/characterized. Students spend time in the field, measuring soil/climate conditions and identifying plants/animals found in each habitat. Students collect specimens and make a scientific plant collection.

PSTL 1135. Essentials of Human Anatomy and Physiology. (4 cr; Stdnt Opt)
Fitness, disease, body systems such as muscula/cardiovascular systems. Cooperative learning groups, computer-enhanced learning, anatomical models, inquiry-based lab activities.

PSTL 1163. Physics by Inquiry. (4 cr; Stdnt Opt)
Lab-based introduction. Properties of matter, electric circuits, light/color. Performing experiments similar to the way real scientists work. Applications to real-world systems.

PSTL 1166. Principles of Chemistry. (3 cr; Stdnt Opt; Prereq-0713 or 0721 or equiv)
Problem-solving. Classification of matter, elements, atomic/molecular structure, compounds, mole calculations, chemical bonding, empirical formulas, chemical reactions, stoichiometry, bond energy, enthalpy, gas laws, solutions, solution concentrations, acids, bases, qualitative equilibrium.

PSTL 1171. Earth Systems and Environments. (4 cr; Stdnt Opt)
Interaction between natural cycles and society. Formation of continents/mountains. Geologic time, living with natural hazards (e.g., earthquakes, volcanoes). Climate changes, natural resources. Lecture, lab.

PSTL 1204. Ways of Knowing in the Social Sciences. (4 cr; A-F or Aud)
Multidisciplinary social science exploration of an international issue. Local/global dimensions of worldwide immigration from perspective of economics, political science, history, sociology, anthropology, and geography.

PSTL 1211. Multicultural Perspectives in Sociology. (4 cr; Stdnt Opt)
Sociological thinking. Methods of research from multicultural perspective. Socialization, culture, stratification (on basis of race, class, gender). Social institutions/control/change.

PSTL 1231. U.S. History: Multicultural Perspectives. (4 cr; Stdnt Opt)
Themes in historical development of the United States (e.g., creating American people, establishing republic, American slavery, fulfilling U.S. mission). Political, social, economic, and diplomatic issues.

PSTL 1235W. Multicultural Contexts: Engaging Citizenship and Democracy. (4 cr; Stdnt Opt)
Role of individuals/groups in shaping nature of citizenship/public ethics. Legal/personal responsibility. Race, class, gender. civil rights. Social science texts, historical narratives, legal cases. Formal/informal writing assignments.

PSTL 1246. Multicultural Contexts: Engaging Citizenship and Democracy. (3 cr; Stdnt Opt)
Role of individuals/groups in shaping U.S. citizenship and public ethics. Social science texts, historical narratives, and legal cases. Nature of legal/personal responsibility. Race, class, gender, civil rights.

PSTL 1251. Global History and Culture. (4 cr; Stdnt Opt)
Historical development of political, social, and diplomatic systems in cultures/nations. Growing interdependence between nations/cultures, resulting transformation of modern societies.

PSTL 1280. Psychology of Personal Development. (3 cr; Stdnt Opt)

PSTL 1281. Principles of Psychology. (4 cr; Stdnt Opt; PSY 1001H, PSY 1001. Prereq- Have not received college credit for intro psych) Terminology, theories, and results of research in sensation, perception, cognition, motivation, emotion, learning, personality, abnormal behavior, therapeutic practices, health, and social behavior.

PSTL 1289. Psychology and Self: Developing Identities. (4 cr; Stdnt Opt)
Psychology and the self. Applying psychological principles to life experience. Understanding self, one’s choices, and cultural/developmental contextual forces.

PSTL 1311. Art: General Art. (3 cr; Stdnt Opt)
Visual/performing arts produced in diverse American/international cultures. Slides, videos, galleries, performances, and music. How/ why art is created. Students discuss various artworks, formulate/evaluate ideas/attitudes about art.

PSTL 1312. Creating Identities Through Art and Performance. (4 cr; Stdnt Opt)
Creative thinking and artistic problem solving in relation to identity, community, and diverse cultures. Students work with various art forms such as visual arts, performance, and music. Discussion, reading, writing.

PSTL 1364. Literature of the American Immigrant Experience. (3 cr; Stdnt Opt)
Literature by/about immigrants. Historical/contemporary American immigrant experiences (conditions leading to emigration, adjustments to and impact on the United States, inter-generational conflict). Readings include novels, poetry, expository prose, biographies, and oral histories.

PSTL 1365W. Literatures of the United States: Multicultural Perspectives. (4 cr; Stdnt Opt)
Questions about American identity within social, historical, political, and literary contexts. Diversity of form, perspective, and style. Literary analysis, critical analysis/interpretation. Close reading of texts, class discussion, formal/informal writing assignments.

PSTL 1366. Literatures of the U.S.: Multicultural Perspectives. (3 cr; Stdnt Opt)

PSTL 1367W. Literatures of the World: International Perspectives. (4 cr; Stdnt Opt)
Comparative readings in fiction, poetry, drama, and autobiography from contemporary writing not originating in the United States. Extensive formal/informal written assignments. Lecture, discussion.

PSTL 1368. Literatures of the World: International Perspectives. (3 cr; Stdnt Opt)
Comparative readings in international fiction, poetry, drama, or memoir. Literary analysis. How to draw us into deeper understanding of world around us. Lecture, discussion.

PSTL 1371. Reading Short Stories. (3 cr; Stdnt Opt)
Current short story format from diverse communities within North America, Africa, the Caribbean, and Europe. Emphasizes written literature inspired by oral “storytelling,” storytelling as “theater,” and storytelling as communal endeavor.

PSTL 1461. Multicultural Perspectives in Public Speaking. (3 cr; Stdnt Opt)
How to confidently communicate thoughts/ideas in a public forum. Students present speeches on culturally significant topics in multicultural contexts. Focuses on ethics, citizenship, voice, and language.

PSTL 1481. Thinking Through Art. (3 cr; Stdnt Opt)
Analytic skills for interpreting/understanding film, visual art, performance, music, and poetry. How art shapes culture, and how culture influences creative expression. Critical reading, writing, discussion, lecture.

PSTL 1485. Creativity: Photography. (4 cr; Stdnt Opt; UC 1485. Prereq-Own camera [35 mm w/adjustable controls preferred], UC: $50 lab fee)
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. Lab.

PSTL 1511. Introduction to Business and Society. (4 cr; Stdnt Opt)

PSTL 1513. Small Business Fundamentals With E-Business Applications. (3 cr; Stdnt Opt)
Starting up, purchasing, owning, and operating a small business. Traditional research/developmental methods for growing a business, technology associated with the Internet. Moving toward one or more e-commerce applications in researching, starting, and operating a business.
PSTL 5105. Increasing Access and Success in Undergraduate Classrooms. (3 cr; A-F or Aud) Fundamentals and best practices for promoting student access, persistence, and retention within classroom. Focuses on traditionally under-represented/served populations.

PSTL 5106. Multicultural Teaching and Learning in Diverse College Contexts. (3 cr; A-F only. Prereq-Grad student) Theory/ pedagogy for culturally responsive teaching from perspectives of teachers/learners in postsecondary settings. Critical multicultural education, universal instructional design, integrated multicultural instructional design.

PSTL 5196. Supervised Practicum in Multicultural Postsecondary Teaching and Learning. (3 cr; S-N only. Prereq-Grad student in PSTL certificate program or admitted to PSTL master’s program) Postsecondary teaching experience in supervised settings. Weekly group supervision session. Classroom experiences, learning centers, and other postsecondary teaching venues.

PSTL 5206. Action Research Methods to Improve College Teaching and Learning. (3 cr; A-F only. Prereq-Grad student enrolled in PSTL MA program or DGS approval) Action research as method of improving teaching/learning at postsecondary level. Experience doing research in college classrooms. Relative strengths/challenges of different approaches to classroom research. Ethical issues.

PSTL 5212. Multicultural Theories of College Student Development Applied to Teaching and Learning. (3 cr; A-F only, Prereq-Grad student) Multicultural student development theories/ theorists. Implications for teaching/learning. Students reflect on The Student Personnel Point of View and Learning Reconsidered: Campus-wide Focus on the Student Experience and other collaborative efforts.

Program for Individualized Learning (PIL)

College of Continuing Education

PIL 3200. Continuing Studies. (1-2 cr [max 2 cr]; S-N or Aud. Prereq-PIL student, %) Students complete work for another PIL course in which an incomplete was received. Registration allows students to access academic advising in PIL.

PIL 3211. Degree Planning. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop individualized curricular plans for their baccalaureate degrees.

PIL 3251. Project 1 Seminar. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop project proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from project adviser/evaluator.

PIL 3252. Project 2. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from project adviser/evaluator.

PIL 3253. Project 3. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3254. Project 4. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3255. Project 5. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3256. Project 6. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3257. Project 7. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3258. Project 8. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3259. Project 9. (5 cr; S-N or Aud. Prereq-PIL student, %) Students develop a proposal, identify objectives/resources, conduct research, accomplish an outcome, secure a narrative evaluation from a project adviser/evaluator.

PIL 3260. Program Active. (1-5 cr [max 5 cr]; S-N or Aud. Prereq-PIL student) Registration maintains program activity and access to PIL advising and student service.

PIL 3281. Major Project. (5 cr; S-N or Aud. Prereq-PIL student, %) Students complete a major project as partial fulfillment of criterion for Primary Area Studies in their degree plans.

PIL 3291. Graduation Preparation. (5 cr; S-N or Aud. Prereq-PIL student, %) Students compile a graduation dossier for presentation to preliminary review committee. Dossier consists of criteria summary, introduction, transcripts, illustrative materials, project proposals, degree plan.

PIL 3292. Graduation Preparation. (4 cr [max 40 cr]; S-N or Aud. Prereq-Admitted PIL student) Students complete draft dossier.

Psychology (PSY)

Department of Psychology

College of Liberal Arts


PSY 1001H. Honors Introduction to Psychology. (4 cr; A-F only. = PSTL 1281, PSY 1001. Prereq-Honors) Scientific study of human behavior. Problems, methods, findings of modern psychology.

PSY 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

PSY 1907W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

PSY 1910W. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

PSY 3000Y. Honors Introduction to Research Methods. (5 cr; Stdnt Opt. = PSY 3000W. Prereq-[[1001 or 1001H], [2801 or 2801H]] or department consent), PSY major, honors student) Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Evaluating scientific claims.

PSY 3001W. Introduction to Research Methods. (5 cr; Stdnt Opt. = PSY 3001W. Prereq-[[1001 or 1001H], [2801 or 2801H]] or department consent) Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Evaluating scientific claims.

PSY 3011. Introduction to Learning and Behavior. (5 cr; Stdnt Opt. Prereq-1001) Methods/findings of research on learning and behavior change. Twentieth-century theoretical perspectives, including contemporary models. Emphasizes animal learning and behavioral psychology.

PSY 3031. Introduction to Sensation and Perception. (3 cr; Stdnt Opt. Prereq-1001) Psychological, biological, and physical bases of sensory experience in humans and animals. Emphasizes senses of vision/hearing.

PSY 3051. Introduction to Cognitive Psychology. (3 cr; Stdnt Opt. Prereq-1001) 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.

PSY 3101. Introduction to Personality. (3 cr; Stdnt Opt. =PSY 5101. Prereq-1001) Overview of theories, research, and methods in personality psychology. Theories of personality, and from biology and economics. Insights from cognitive, personality, and social psychology.

PSY 3115. Introduction to Individual Differences. (3 cr; Stdnt Opt. =PSY 5135. Prereq-2801 or 2801H or #) Differential methods in studying human behavior. Psychological traits. Influence of age, sex, heredity, and environment in individual/group differences in ability, personality, interests, and social attitudes.

PSY 3201. Introduction to Social Psychology. (4 cr; Stdnt Opt. Prereq-1001 or #) Overview of theories/research in social psychology. Emphasizes attitudes/persuasion, social judgment, the self, social influence, aggression, prejudice, helping, and applications.


PSY 3301. Introduction to Cultural Psychology. (3 cr; A-F or Aud. Prereq-1001) The role of culture in psychology. Cultural education/culture influences basic psychological processes (e.g., emotion, 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).

PSY 3511. Introduction to Counseling Psychology. (3 cr; Stdnt Opt. Prereq-1001) Historical, theoretical, 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.


PSY 3666. Human Sexuality. (3 cr; Stdnt Opt. Prereq-1001) Overview of theories, research, and contemporary issues in human sexual behavior from an interdisciplinary perspective. Topics include sexual anatomy and physiology, hormones and sexual differentiation, cross-cultural perspectives on sexual development, social and health issues, and sexual dysfunction and therapy.

PSY 3711. Introduction to Industrial and Organizational Psychology. (3 cr; Stdnt Opt. Prereq-1001, [2801 or equiv]) Application of psychological theory/research to recruitment, personnel selection, training/development, job design, work group design, work motivation, leadership, performance assessment, and job satisfaction measurement.

PSY 3801. Introduction to Psychological Measurement and Data Analysis. (3 cr; Stdnt Opt. =PSY 3801H. Prereq-High school algebra, [PSY 1001 or equiv]; intended for students who plan to major in psychology) 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.

PSY 3801H. Honors Introduction to Psychological Measurement and Data Analysis. (3 cr; Stdnt Opt. =PSY 3801H. Prereq-[1001 or equiv], [PSY 1001 or equiv]; intended for students who plan to major in psychology) 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.

PSY 3902W. Major Project in Psychology. (3 cr; A-F only. Prereq-[2801 or equiv], [3001W or 3005W], psy major, sr) Completion of undergraduate major project.

PSY 3960. Undergraduate Seminar in Psychology. (1-5 cr; max 45 cr; Stdnt Opt. Prereq-1001) Undergraduate seminars in subjects of current interest in psychology.

PSY 3960H. Undergraduate Honors Seminar in Psychology. (1-4 cr; max 36 cr; Stdnt Opt. Prereq-Honors) Undergraduate seminars in subjects of current interest in psychology.

PSY 3993. Directed Study. (1-6 cr; max 24 cr) Independent reading leading to paper or to oral or written exam.

PSY 3996. Undergraduate Fieldwork and Internship in Psychology. (1-6 cr; max 12 cr; Stdnt Opt. Prereq-1001, #, @) Supervised fieldwork/internship in community/industry pertinent to formal academic training in psychology.

PSY 4011. Applied Behavior Analysis. (3 cr; Stdnt Opt. Prereq-3001 or #) 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 4012. Behavior Analysis and Autism. (4 cr; A-F or Aud. Prereq-Individual auto transportation, #) 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.


PSY 4036. Perceptual Issues in Visual Impairment. (3 cr; Stdnt Opt. Prereq-1001 or #) Contemporary knowledge on visual, tactile, and auditory perception informs us about the challenges and capabilities of people who are blind or have low vision. Topics include reading, space perception, mobility, and the strengths and weaknesses of pertinent adaptive technology.

PSY 4501. Psychology of Women and Gender. (3 cr; Stdnt Opt. Prereq-[jr or sr], psych major or #) Theory/research regarding psychology of women and psychological sex differences/similarities. Issues unique to women (e.g., pregnancy). Research comparing men/women in terms of personality, abilities, and behavior.

PSY 4902V. Honors Project. (1-6 cr [max 5 cr]; A-F or Aud. Prereq-Honors, #, %) Critical literature review or empirical study.

PSY 4960. Seminar in Psychology. (1-4 cr; max 16 cr; Stdnt Opt. Prereq-1001, psych major or #) Seminars in subjects of current interest in Psychology.

PSY 4993. Directed Research: Special Areas of Psychology and Related Sciences. (1-6 cr [max 48 cr]; Stdnt Opt. Prereq-#, %) Directed research projects in psychology.


PSY 4996H. Honors Internship/Externship. (1-6 cr [max 6 cr]; A-F or Aud. Prereq-Honors, #, %) Supervised internship/externship experience in a community-service or industrial setting relevant to formal academic training/objectives.

PSY 5012. Learning and Cognition in Animals. (4 cr; Stdnt Opt. Prereq-3011 or 4011 or honors or grad student or #) Review/evaluation of key questions, methods, theories, and data about forms of learning and for a guide to course numbers, symbols, and abbreviations, see page 376. 607.
elementary cognitive processes. Emphasizes animal models. Implications for human learning/behavior.

**PSY 5014. Psychology of Human Learning and Memory.** (3 cr; Stdnt Opt. Prereq-3011 or 3051 or honors or grad student)


**PSY 5015. Cognition, Computation, and Brain.** (3 cr; Stdnt Opt. Prereq-3051 [except for honors/grad student])

Human cognitive abilities (perception, memory, attention) from different perspectives (e.g., cognitive psychological approach, cognitive neuroscience approach).

**PSY 5018H. Mathematical Models of Human Behavior.** (3 cr; Stdnt Opt. Prereq-Math 1271 or #)

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.

**PSY 5031W. Perception.** (3 cr; Stdnt Opt. +NSC 5031W. Prereq-3031 or 3051 or #)

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.

**PSY 5036W. Computational Vision.** (3 cr; Stdnt Opt. +NSC 5031W. Prereq-3031 or 3051 or #)

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.

**PSY 5037. Psychology of Hearing.** (3 cr; Stdnt Opt. +NSC 5037. Prereq-3031 or #)

Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical, and other applications.

**PSY 5038W. Introduction to Neural Networks.** (3 cr; Stdnt Opt. Prereq-[[3061 or NSC 3012], [MATH 1282 or 2245]] or #)

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.

**PSY 5051W. Psychology of Human-Machine Interaction.** (3 cr; Stdnt Opt. Prereq-3031 or 3051 or #)


**PSY 5054. Psychology of Language.** (3 cr; Stdnt Opt. Prereq-[[3001W or equiv]] or honors or grad student)

Theories/experimental evidence in past/present conceptions of psychology of language.

**PSY 5061. Neurobiology of Behavior.** (3 cr; Stdnt Opt. +PSY 5061. Prereq-[[3001W or equiv]] or BIOL 1009 or #)

Physiological/neuroanatomical mechanisms underlying behavior of animals, including humans. Neural basis of learning/memory, sleep, wakefulness, and attention processes. Effects of drugs on behavior.

**PSY 5062. Cognitive Neuropsychology.** (3 cr; Stdnt Opt. Prereq-3031 or 3051)


**PSY 5064. Brain and Emotion.** (3 cr; A-F or Aud. Prereq-3061 or 5061 or #)

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.

**PSY 5065. Functional Imaging: Hands-on Training.** (3 cr; Stdnt Opt. Prereq-[[2801 or 4801 or equiv], [3061 or NSCI 3101]] or #)

Basic neuroimaging techniques. Emphasizes functional magnetic resonance imaging (fMRI). Theory/background. Students design/execute fMRI experiment on Siemens 3 Tesla scanner, incorporating techniques that compensate for distortion and other imaging artifacts.

**PSY 5101. Personality Psychology.** (3 cr; Stdnt Opt. +PSY 5101. Prereq-[[3001W or equiv], [honors undergrad or grad student]] or #)

Theories and major issues/findings on personality functioning, personality structure, and personality assessment. Historically important and currently influential perspectives.

**PSY 5135. Psychology of Individual Differences.** (3 cr; Stdnt Opt. +PSY 5135. Prereq-[[3001W or equiv], [5862 or equiv]] or #)

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.

**PSY 5136. Human Abilities.** (3 cr; Stdnt Opt. Prereq-3135 or 5135, 5862 or equiv or #)

Theory, methods, and applications of research in human abilities. Topics include intelligence, aptitude, achievement, specific abilities, information processing/learning and intelligence, aptitude/treatment interactions, and quantitative measurement issues.

**PSY 5137. Introduction to Behavioral Genetics.** (3 cr; Stdnt Opt. Prereq-3001W or equiv or #)


**PSY 5138. Psychology of Aging.** (3 cr; Stdnt Opt. Prereq-3001W or equiv)

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.

**PSY 5202. Attitudes and Social Behavior.** (3 cr; Stdnt Opt. Prereq-3201 or #)

Theory/research on social psychology of beliefs/attitudes. Persuasion principles.

**PSY 5204. Psychology of Interpersonal Relationships.** (3 cr; A-F only. Prereq-[Honors or grad student], #)

Introduction to interpersonal relationship theory/research findings.

**PSY 5205. Applied Social Psychology.** (3 cr; Stdnt Opt. Prereq-3201 or grad student or #)

Applications of social psychology research/theory to domains such as physical/mental health, education, the media, desegregation, the legal system, energy conservation, public policy.

**PSY 5206. Social Psychology and Health Behavior.** (3 cr; A-F only. Prereq-3201 or grad student or #)

Survey of social psychological theory/research pertaining to processes by which people develop beliefs about health/illness. Relationship between these beliefs, adoption of health-relevant behavior. Effect of psychological factors on physical health.

**PSY 5207. Personality and Social Behavior.** (3 cr; A-F or Aud. Prereq-3101 or 3201 or honors or grad student or #)

Conceptual/methodological strategies for scientific study of individuals and their social worlds. Applications of theory/research to issues of self, identity, and social interaction.

**PSY 5501. Vocational and Occupational Health Psychology.** (3 cr; Stdnt Opt. Prereq-3001W or equiv or #)

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.

**PSY 5604H. Abnormal Psychology.** (3 cr; Stdnt Opt. +PSY 3604. Prereq-honors or grad student or #)

Comprehensive review of psychopathological disorders. Etiology, diagnostic criteria, clinical research findings.

**PSY 5606. Clinical Psychophysiology.** (3 cr; Stdnt Opt. Prereq-[[3001W or equiv], [3061 or #], [3604 or 5604]] or #)

How psychophysiological methods such as autonomic/central nervous system recording are used in studying major psychopathological disorders.
PSY 5701. Organizational Staffing and Decision Making. (3 cr; Stdnt Opt. Prereq:[(2801 or equiv), 3711] or #) 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).

PSY 5702. Psychology of Organizational Training and Development. (3 cr; Stdnt Opt. Prereq:[(2801 or equiv), 3711] or #) Theories, methods, and research pertaining to improving performance of individuals at work through: Training-needs analysis, instructional design, aptitude-treatment interactions, measurement of training outcomes, training evaluation, knowledge structures.


PSY 5708. Organizational Psychology. (3 cr; Stdnt Opt. +PSY 5702. PSY 5705. Prereq:[(3001W or equiv), 3711] or #) Psychological causes of behavior in work organizations. Consequences for individual fulfillment and organizational effectiveness. Individual differences, social perception, motivation, stress, job design, leadership, job satisfaction, teamwork, organizational culture.

PSY 5862. Psychological Measurement: Theory and Methods. (3 cr; Stdnt Opt. Prereq:[PSY 5801 or PSY 5801H] or equiv) Types of measurements (tests, scales, inventories) and their construction. Theory/measurement of reliability/validity.


PSY 5960. Topics in Psychology. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq:1001. [jr or sr yr grad student]) Special course or seminar. Topics listed in psychology office.

PSY 5993. Research Laboratory in Psychology. (3 cr [max 18 cr]; Stdnt Opt. Prereq: %) Laboratory instruction and seminars in faculty research areas.

Public Affairs (PA)

Hubert H. Humphrey Institute of Public Affairs


PA 1401. Public Affairs: Community Organizing Skills for Public Action. (3 cr; A-F only) 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 1490. Topics in Social Policy. (1-3 cr [max 9 cr]; Stdnt Opt) Topics in social policy.


PA 1961W. Personal Leadership in the University. (3 cr; A-F only. +EDPA 1301W) Introduction to leadership theory, personal development, interpersonal relations, leadership at University of Minnesota. Personal assessment, written/verbal presentation, resume writing, electronic communication, goal setting, coping with group dynamics.

PA 1990. General Topics in Public Policy. (1-3 cr [max 9 cr]; Stdnt Opt) General topics in public policy.


PA 3401. The Arts for Liberty: Educating for Democracy in Information Age. (3 cr; Stdnt Opt) “Hands-on” approach to education for democracy. Core concepts and their different meanings in American history, especially ideas of freedom, work, and democracy. Students participate in community projects, either through the Jane Addams School or as “democratic coaches” for teams of young people. Two essays and a journal.

PA 3911. Leadership Field Experience. (3 cr; A-F only. +EDPA 3402. Prereq:[391W or EDPA 3302W] with grade of at least C) Settings include community or educational organizations, corporations, University student organizations, and formal internships. Students identify two leadership objectives from among personal, interpersonal, and organizational development. Individual presentations, discussions, writing.

PA 3920. General Topics in Public Policy. (1-3 cr [max 9 cr]; Stdnt Opt) General topics in public policy.


PA 4190. Topics in Public and Nonprofit Leadership and Management. (3 cr [max 9 cr]; Stdnt Opt) Topics in public/nonprofit leadership/management.

PA 4200. Urban and Regional Planning. (3 cr; Stdnt Opt) 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 12 cr]; A-F or Aud) Topics in social policy.

PA 4421. Racial Inequality and Public Policy. (3 cr; Stdnt Opt) 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.

PA 4961W. Leadership for Global Citizenship. (3 cr; A-F or Aud. +EDPA 4303W. Prereq:3971 or EDPA 3402) Leadership theory, community building/social change, systems thinking. Students conduct/present research on leadership models through literature review, internships, and study groups. Student groups produce major paper describing research project. Students assemble portfolio, participate in two-day leadership retreat.


PA 5002. Introduction to Policy Analysis. (1.5 cr; A-F or Aud. Prereq:Major in public policy or #) Process of public policy analysis from problem structuring to communication of findings. Commonly used analytical methods. Alternative models of analytical problem resolution.

For a guide to course numbers, symbols, and abbreviations, see page 376.609

PA 5004. Introduction to Planning. (3 cr; A-F or Aud. Prereq-Major in urban/regional planning or #) History, institutional development of urban planning as a profession. Intellectual foundations, planning theory. Roles of urban planners in U.S./international settings. Scope, legitimacy, limitations of planning and of planning process. Issues in planning ethics and in planning in settings of diverse populations/stakeholders.

PA 5011. Leadership and Management. (3 cr; A-F or Aud. Prereq-Major in public policy or #) Challenges facing higher-level managers in public/nonprofit organizations in a mixed economy and democratic republic. Distinctive features of public/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 Aud. Prereq-Major in public policy or [sci, tech, and environ policy] or #) Stages of policy making from agenda setting to implementation. Role/behavior of political institutions (courts, legislatures, executives, bureaucracies) and citizens, social movements, and interest groups. Concepts of political philosophy. Theories of the state. Team taught, interdisciplinary course. Small discussion sections.

PA 5013. Law and Urban Land Use. (1.5 cr; A-F or Aud. Prereq-Major in urban/regional planning or #) Role of law in regulating/shaping urban development, land use, environmental quality, and local/regional governmental services. Interface between public/private sector.

PA 5021. Economics For Policy Analysis and Planning I. (3 cr; A-F or Aud. Prereq-[[Econ 1101 or equiv], Major in public policy or [sci, tech, and environ policy]] or #) Introduction to tools useful for public policy: intermediate microeconomics, macroeconomics, concepts of international trade.

PA 5022. Economics For Policy Analysis and Planning II. (1.5-5 cr [max 4.5 cr]; A-F or Aud. Prereq-[[5021 or equiv], public policy major] or #) Application of economic reasoning to various public policy issues. Cost-benefit analysis, nonmarket valuation, and tax analysis.


PA 5032. Intermediate Regression Analysis. (2 cr; A-F or Aud. Prereq-[[5031 or equiv], major in [public policy or [sci, tech, and environ policy]]] or #) Bivariate/multivariate models of regression analysis, assumptions behind them. Problems using these models when such assumptions are not met.

PA 5033. Multivariate Techniques. (2 cr; A-F or Aud. Prereq-[[5031 or equiv], major in [public policy or [sci, tech, and environ policy]]] or #; [5032 or equiv] recommended) Public affairs topics using maximum-likelihood estimation approaches.

PA 5035. Survey Research and Data Collection. (1.5 cr; A-F or Aud. Prereq-[[5031 or equiv], major in publ policy or [sci, tech, and environ policy]] or urban/regional planning] or #) Introduction to survey research methods. Emphasizes applications to policy and applied research. Research design choices (e.g., descriptive, experimental, case studies), sampling, variable specification, measurement. Conducting interviews, mailed questionnaires. Qualitative techniques.

PA 5036. Regional Economic Analysis. (1.5 cr; A-F only. Prereq-Major in public policy or [science, tech, env policy] or urban/regional planning or #) Economic data analysis techniques for practitioners in planning and economic development working at local/regional levels. Shift-share analysis, economic base model, base multipliers, location quotient analysis, minimum requirements method, economic impact analysis. Individual/group projects.

PA 5037. Regional Demographic Analysis. (1.5 cr; A-F only. Prereq-Major in public policy or [science, tech, and env policy] or urban and regional planning; or instructor consent) Demographic data analysis, population projection techniques for practitioners in planning, social service delivery, and community development at local/regional levels. Population extrapolation using curve fitting methods, demographic indicators, cohort-component method of population projection, estimation of fertility/migration rates, life tables. Individual/group projects.

PA 5038. Analytics for Leaders I. (2 cr; A-F only. Prereq-Major in public policy or [science, tech, and env policy] or urban and regional planning or #) Skills to do basic quantitative analyses, evaluate research, develop evidence-based policy, and lead data-driven organizations. Descriptive statistics, research design. Ethical issues in interpretation, analysis, and use.

PA 5039. Analytics for Leaders II. (2 cr; A-F only. Prereq-5038) Builds on 5038. Skills to do basic quantitative analyses, evaluate research, develop evidence-based policy, and lead data-driven organizations. Descriptive statistics, research design. Ethical issues in interpretation, analysis, and use.

PA 5041. Qualitative Methods for Policy Analysts. (4 cr; A-F only. Prereq-Grad or #) Qualitative analysis techniques, examples of their application, meeting with a researcher who has employed the technique, and student practice applying the technique. Hands-on experience in designing, gathering, and analyzing data.

PA 5080. Capstone Preparation Workshop. (1 cr; S-N only. Prereq-5801) Project management, qualitative research, and critical framework needed to successfully complete Capstone course. Students complete draft of client project group norms and client contract.

PA 5101. Management and Governance of Nonprofit Organizations. (5 cr; Stndt Opt. Prereq-5011 or 5941 or grad liberal studies major or grad nonprofit mgmt cert or #) Theories, concepts, and real world examples of managerial challenges. Governance systems, strategic management practices, effect of funding environments, management of multiple constituencies. Types of nonprofits using economic/behavioral approaches.


PA 5103. Leadership and Change in an Innovation Society. (3 cr; Stndt Opt. Prereq-5011 or 5941 or grad nonprofit mgmt cert or #) Models of change/leadership. How leaders can promote personal, organizational, and societal change. Case studies, action research. Framework for leadership/change in an innovation society.

PA 5104. Strategic Human Resource Management. (3 cr; A-F or Aud. Prereq-5011 or 5941 or grad nonprofit mgmt cert or #) 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.

PA 5105. Integrative Leadership Seminar. (2 cr; PA 5130. Prereq-5011 or 5941 or #) Basic concepts, practices, people, and organizations associated with “integrative leadership.” Case materials, related readings, presentations, and interactive discussion.

PA 5106. Foundations of Ethical Practice in Public Affairs. (1 cr; Prereq-Grad student or #) Links between each student’s core ethical values and formation documents that have shaped democracy in the United States or in the student’s homeland. Topics: ethics and agency; ethics in context of leadership development. Students compose a narrative of ethical practice.


PA 5113. State and Local Public Finance. (3 cr; Stdnt Opt. Prereq-Grad or #) 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.

PA 5122. Law and Public Affairs. (3 cr; Stdnt Opt. Prereq-Grad or #) 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.


PA 5132. Mediation Training. (3 cr; Stdnt Opt. Prereq-Grad or #) Creating an arena for mediation. Skills/expectations needed to mediate disputes between individuals, among groups: balanced (peer or colleague), imbalanced (power differentials). Role playing, group de briefing, critique. Cases.

PA 5190. Topics in Public and Nonprofit Leadership and Management. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-5011 or 5941 or grad nonprofit mgmt cert or #) Selected topics.

PA 5203W. Geographical Perspectives on Planning. (4 cr; Stdnt Opt. +GEOG 3605W, GEOG 5605W, GEOG 5605S, GEOG 3605W. Prereq-Grad student or #) Includes additional weekly seminar-style meeting and bibliography project on topic selected in consultation with instructor.

PA 5204. Urban Spatial and Social Dynamics. (3 cr; Stdnt Opt. Prereq-Major in urban/regional planning or #) Behavioral theories of internal spatial arrangement, functioning, and characteristics of cities at macro level and how they provoke a system of cities. Factors influencing urban spatial structure over time. Urban form, land use/rent. Spatial expression of economic, social, and political forces.

PA 5211. Land Use Planning. (3 cr; Stdnt Opt. Prereq-Grad student or #) 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.


PA 5215. Computer Applications in Land Use Planning. (3 cr; Stdnt Opt. Prereq-Grad student or #) 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.

PA 5221. Private Sector Development. (3 cr; Stdnt Opt. Prereq-Grad or #, college algebra required) Roles of various participants in land development. Investment objectives, effects of regulation. Overview of development process from private/public perspective.


PA 5232. Transportation Policy, Planning, and Deployment. (4 cr; Stdnt Opt. Prereq-Sr or grad student or #) Development of transportation policy, making of transportation plans, deployment of transportation technologies. Lectures, interactive case studies, role playing.

PA 5251. Strategic Planning and Management. (3 cr; A-F or Aud. Prereq-Grad student or #) Theory/practice of strategic planning/management for public/nonprofit organizations/networks. Strategic planning process, management systems; stakeholder analyses. Tools/techniques such as purpose expansions, SWOT analyses, oval mapping, portfolio analyses, and logic models.


PA 5261. Housing Policy. (3 cr; A-F or Aud. +HSG 5463. Prereq-Grad or #) 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.


PA 5390. Topics in Planning. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) Selected topics.


PA 5511. Program Evaluation. (3 cr; Stdnt Opt. Prereq-Grad student or #) 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.

PA 5590. Topics in Advanced Policy Analysis Methods. (1-4 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) Topics in advanced policy analysis methods.

PA 5601. Poverty, Inequality, and Public Policy. (3 cr; Stdnt Opt. Prereq-Grad or #) Nature/extent of poverty/inequality in the United States, causes/consequences, impact of government programs/policies. Extent/extent of poverty/inequality in other developed/developing countries.

PA 5605. Implementation of Social Policy. (3 cr, A-F or Aud) Theory, tools, and practice of the implementation of social policy in the United States.

PA 5612. Aging and Disability Policy. (3 cr; Stdnt Opt. Prereq-Grad or #) 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.

PA 5614. Child Labor and Education. (3 cr; Stdnt Opt. Prereq-Grad student or #) International child labor issues. Options for improving child well-being, including policies/programs that have potential to affect the lives of millions of children.

PA 5621. Racial Inequality and Public Policy. (3 cr; Stdnt Opt. Prereq-Grad or #) 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.
PA 5431. Public Policies on Work and Pay. (3 cr; Stdnt Opt. Prereq-Grad or #) 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.


PA 5442. Policy Design for Education and Human Development. (3 cr; Stdnt Opt. Prereq-Grad or #) Designing effective educational policies. Using interdisciplinary approaches to identify/understand core variables (economic, psychological, etc.) Work on policy design.

PA 5451. Immigrant Health Issues. (3-4 cr [max 4 cr]; A-F only. PUBH 6281. Prereq-Grad student or #) How to access demographic, health, background information on U.S. immigrants. Characteristics and health needs of immigrants. Designing culturally competent health programs. How to advocate for change to promote immigrant health. Community visits required. Online course.

PA 5452. Immigration and Public Policy. (3 cr; Stdnt Opt. Prereq-Grad student or #) How to employ an analytical framework to analyze a current immigration policy proposal. Topics vary (e.g., presidents/guest worker proposal, democratic alternative proposals).

PA 5480. Topics in Race, Ethnicity, and Public Policy. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-Jr or sr or grad student or #) 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.

PA 5490. Topics in Social Policy. (1-4 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) Selected topics.


PA 5590. Topics in Economic and Community Development. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) Selected topics.


PA 5621. Board Service in Women and Public Policy. (1 cr; S-N only. Prereq-#) 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.

PA 5690. Topics in Women and Public Policy. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) Selected topics.


PA 5711. Science and Technology Policy. (3 cr; Stdnt Opt. Prereq-Grad student or #) Effect of science/technology on relations among nations in such matters as autonomy, national security, economic strength, environment, cultural identity, and international cooperation. Negotiating international agreements with S&T implications.

PA 5721. Energy and Environmental Policy. (3 cr; Stdnt Opt. Prereq-Grad or #) 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 5790. Topics in Science, Technology, and Environmental Policy. (1-3 cr [max 9 cr]; Stdnt Opt. Prereq-Grad or #) Selected topics.

PA 5801. Global Public Policy. (3 cr; Stdnt Opt. Prereq-Major in public affairs or public policy or #) Creation of rules, norms, and institutions to regulate global activities. Policy making, from exclusive domain of state to including various nonstate actors. How global policy making regulates interstate, national, and transnational activities. Creation/enforcement of global rules. Applications to international security, political economy, and other topics.

PA 5802. Global Economic Policy. (3 cr; Stdnt Opt. Prereq-[Major in public affairs or public policy or #]) International trade and agreements, international finance and financial institutions, the multinationalization of business, national policy objectives, tax policy, environmental and resource governance, immigration/emigration, development challenges, economic logic of globalization.

PA 5890. Topics in Foreign Policy and International Affairs. (1-5 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) Selected topics.

PA 5910. Developing Your Public Service Career. (1 cr; S-N or Aud. Prereq-Major in [public affairs or public policy or urban/regional planning or science, technology/environmental policy] or #) Students investigate/analyze interests, skills, and abilities and combine them in a career plan. Students develop tools to demonstrate their abilities, document their experiences/knowledge, and explore public service career options.

PA 5912. Politics of Public Affairs and Civic Engagement. (3 cr; A-F only. Prereq-Grad student or #) Potential for public affairs professionals to be agents/architects of democracy in a radically changing, diverse, global landscape of governance.

PA 5920. Skills Workshop. (.5-4 cr [max 12 cr]; Stdnt Opt. Prereq-Grad student or #) Topics on public policy or planning skills. Topics specified in Class Schedule.
PA 5931. Role of the Media in Public Affairs. (3 cr; Stdnt Opt. Prereq-Grad or #) Historical/contemporary role of news media in defining/shaping public opinion/policy, primarily in the United States. Emphasizes critical research, professional skills in three forms of journalism: hard news coverage, investigative reporting, documentaries. Field experience, practice in governmental public relations.

PA 5941. Leadership for the Common Good. (4 cr; Stdnt Opt. Prereq-Major in public affairs or #) Personal, team, organizational, visionary, political, and ethical aspects of leadership. Emphasizes building/experiencing a learning community.

PA 5952. Global Commons Seminar II. (2 cr; A-F only. Prereq-HHH International fellow) Research/presentations related to professional development projects. Each week selected students assign readings, deliver a presentation on their professional development project, and distribute a summary of the talk. Presentations are developed in collaboration with at least one faculty member in the subject area.

PA 5990. Topics: Public Affairs--General Topics. (5-3 cr [max 9 cr]; Stdnt Opt. Prereq-Grad student or #) General topics in public policy.

Public Health (PUBH)

School of Public Health

PUBH 20. Community Engagement. (0 cr; No grade. Prereq-Academic faculty adviser consent) Registration for course is officially documented on transcript.

PUBH 1003. Alcohol and College Life. (1 cr Prereq-Fr or soph or PSEO) 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 and due dates for assignments.

PUBH 1005. Sleeps, Eats, and Exercises. (1 cr; Stdnt Opt. Prereq-Fr or soph or PSEO student) Living a balanced life while in college. Nutrition, sleep, physical activity. Techniques to promote self-awareness, reflection, goal setting, and action toward wellness.

PUBH 3000. Topics: Public Health. (1-4 cr [max 80 cr]; Stdnt Opt) New courses or topics of interest in public health.

PUBH 3001. Personal and Community Health. (2 cr; Stdnt Opt) Fundamental principles of health conservation and disease prevention.


PUBH 3005. Fundamentals of Alcohol and Drug Abuse for Health Professionals. (1 cr; Stdnt Opt. +PUBH 6003, PUBH 3004, PUBH 3003, Prereq-Undergrad in agricultural educ or business/marketing educ or career/technical educ or foundations of educ or [kinesthesiology, pre-PE] or technology educ or music educ) Scientific/sociocultural aspects of alcohol/drug problems. Emphasizes role of education in health conservation and drug abuse prevention.


PUBH 3050. Practicum in Peer Education I. (2 cr; A-F or Aud. Prereq-[Upper div student, demonstrated hth sci or hth ed interests], [3001 or &3001 or 3004 or &3004], #) Multiple factors that influence health. Through various health promotion strategies, students build upon or gain skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3052. Practicum in Peer Education II. (2 cr; A-F or Aud. Prereq-[Upper div student, demonstrated hth sci or hth ed interests], [3001 or &3001 or 3004 or &3004], #) Multiple factors that influence health. Through various health promotion strategies, students build upon or gain skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3093. Directed Study: Public Health. (1-4 cr [max 4 cr]; Stdnt Opt. Prereq-#) Directed study in selected public health problems or current issues.

PUBH 3100. Making Sense of Health Studies. (2 cr; Stdnt Opt) How to properly use results of health research to make informed decisions to improve health and well-being.

PUBH 3102. Issues in Environmental and Occupational Health. (3 cr; Stdnt Opt. +PUBH 6102) Scope of the field of environmental health. Concepts upon which environmental interventions are based. Consulting literature to identify appropriate interventions for community environmental health problems. Online course.


PUBH 3201. What is Public Health?. (1 cr) 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.

PUBH 3300. Topics: Clinical Research. (1-4 cr [max 8 cr]; Stdnt Opt. Prereq-Jr or sr) Topics regarding health research in humans.

PUBH 3315. Clinical Research from Lab to Bedside to Populations. (2 cr; A-F only. Prereq-General biology course, general chemistry course) Health research in humans. Methods, contemporary topics, controversies, health careers. Perspectives from dentistry, medicine, nursing, pharmacy, and public health.

PUBH 3330. Topics: Epidemiology. (1-4 cr [max 20 cr]; Stdnt Opt. Prereq-Jr or sr or #) New course offerings or topics.


PUBH 3810. Math Review for Public Health I. (1 cr; S-N or Aud. Prereq-[Jr or sr or grad student], basic calculus, linear algebra) Calculus, linear algebra. Health economic models, equilibrium, matrix algebra, general function models, exponentials/logarithms. Lecture, working mathematical problems, discussion.

PUBH 3893. Directed Study: Health Services Research and Policy. (1-4 cr [max 20 cr]; Stdnt Opt. Prereq-#)
Radiation Therapy (RTT)

College of Continuing Education


RTT 3001. Radiation Therapy: Introduction to Radiation Therapy. (1 cr; A-F or Aud) Basic overview of radiation therapy and its role in medicine.

RTT 3100. Radiation Therapy: Mathematics. (2 cr; A-F or Aud) Basic arithmetic, algebra, geometry, and trigonometry.

RTT 3110. Radiation Therapy: Basic Physics. (2 cr; A-F or Aud) Basic physics.


RTT 3121. Radiation Physics II. (3 cr; A-F or Aud. Prereq-BAS-RTT admitted (UMMC)) Electron beam therapy, radiation protection, quality assurance, 3D CRT, beam geometry, beam quality characteristics, whole body irradiation, advanced concepts, nuclear transformations.


RTT 3132. Radiation Therapy: Medical Oncology. (2 cr; A-F or Aud. Prereq-3131, %) Medical oncology principles. Basis for classification/action of cytotoxic drugs. Chemotherapy regimens, strategies, side effects, effect on radiotherapy patient.

RTT 3150. Radiation Therapy: Brachytherapy. (1 cr; A-F or Aud) Principles of radioactivity, its medical uses.


RTT 3171. Radiation Therapy: Clinical Radiation I. (6 cr (max 7 cr); A-F or Aud) Hands-on clinical experience in a working environment.

RTT 3172. Radiation Therapy: Clinical Radiation II. (5 cr; A-F or Aud) Hands-on clinical experience in a working environment.

RTT 3173. Radiation Therapy: Clinical Radiation III. (9 cr; A-F or Aud) Hands-on clinical experience in a working environment.

RTT 3174. Radiation Therapy: Clinical Radiation IV. (8 cr; A-F or Aud. Prereq-3171, 3172, 3173, %) Hands-on clinical experience in working environment. Students operate state-of-the-art radiotherapy equipment. Treatment decision-making, procedures, planning.


RTT 3696. Clinical Practicum II. (3 cr; A-F or Aud. Prereq-3596, RTT BAS student) Initial application/integration of principles of radiation therapy practice into clinical setting. Students participate in patient care procedures and perform simple/intermediate-level clinical competency exams.


RTT 3996. Practicum. (1-2 cr [max 2 cr]; A-F or Aud. Prereq-BAS RTT student, %) Supervised practicum work in radiation therapy setting.

RTT 4511. Dosimetry and Treatment Planning. (4 cr; A-F or Aud. Prereq-3551, RTT BAS student) Basic concepts, Isodose charts/distributions, treatment dose calculations, irregular fields, beam weighting, dose limiting structures, selection of optimal treatment field design and other pertinent dosimetry principles. Emerging technologies, their impact on treatment planning.


RTT 4601. Project. (1 cr; A-F or Aud. Prereq-3696, BAS RTT student) Guided independent study project. Students research a topic of their choice and present
their paper to faculty/students. Students are encouraged to submit paper for publication. Faculty provide guidance/input into development of project.

RTT 4696. Clinical Practicum IV. (3 cr; A-F or Aud. Prereq-3596, 3696, 4596, 4696) Practice of clinical competencies, completion of required advanced level clinical competency exams: methodology behind treatment technique; critical thinking. Students rotate through dosimetry and participate in radiation treatment planning.


RTT 5281. Scientific Foundations. (3 cr; A-F or Aud. +PT 6281. Prereq-Registered rehab science or PT student)

Recreation Resource Management (RRM)
Department of Forest Resources
College of Food, Agricultural and Natural Resource Sciences

RRM 1001. Orientation and Information Systems. (1 cr; A-F or Aud) Course planning for RRM majors, careers, liberal education requirements, internships, summer jobs. Mentoring/utilizing alumni contacts. Technical tools in the workplace, lab equipment, software, getting around GUIs, navigating the Internet, preparing documents. Making spreadsheet calculations. Using Lumina and periodical indexes.

RRM 1101. Recreation and the Quality of Life. (3 cr; Stdnt Opt) Conceptual foundations for understanding the role of leisure/recreation in quality of life. Social, historical, psychological, cultural, economic, and political foundations of play, leisure, and recreation.

RRM 1901. Freshman Seminar. (1 cr; Stdnt Opt. Prereq-Freshman) In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

RRM 1905. Freshman Seminar. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-Freshman) In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.


RRM 3201. Introduction to Travel and Tourism. (5 cr; A-F only. +RRM 5201) Travel/tourism is one of the world’s largest industries. Course introduces the nature, structure and complexity of the industry. Begins with overview of travel/tourism definition, evolution of travel/tourism, and magnitude globally. Examines types and functions of various sectors, tourism distribution system and role of various stakeholders in creation/delivery of tourism. Explore motivations for travel as means of understanding demand for tourism.


RRM 3480. Topics in Recreation Resource Management. (1-4 cr [max 6 cr]; Stdnt Opt) Lectures by visiting scholar or regular faculty member. Topics specified in Class Schedule.

RRM 4200H. Honors Seminar. (1 cr; A-F or Aud. Prereq-RRM upper div honors, #) Current topics presented by faculty/students. Lectures, discussions.

RRM 4232W. Managing Recreational Lands. (4 cr; A-F or Aud. +RRM 5232) Recreation management tools from a public agency perspective. Social carrying capacity, recreation opportunity spectrum, limits of acceptable change, benefits based management, visitor experience/resource protection. Various projects. Group project to develop a management plan.

RRM 4293. Directed Study. (1-5 cr [max 12 cr]; Stdnt Opt. Prereq-#) Students select/conduct a study of or project on a topic of personal interest in consultation with faculty member. Documented by initial proposal and reports of accomplishment.

RRM 4801H. Honors Research. (2 cr; A-F or Aud. Prereq-RRM upper div honors, #) First semester of independent research project supervised by faculty member.


RRM 5101. Nature and Heritage Based Tourism. (3 cr; A-F or Aud. +RRM 5101) Prereq-Grad student or #) Interaction of resource based tourism with cultural/natural environments. Impacts of tourism on environment.

RRM 5201. Introduction to Travel and Tourism. (5 cr; A-F only. +RRM 5201) Nature and structure of travel/tourism. Overview of travel/tourism definition, evolution, magnitude globally. Types/functions of various sectors, tourism distribution system, role of various stakeholders in creation/delivery of tourism. Motivations for travel as means of understanding demand for tourism.


RRM 5259. Visitor Behavior Analysis. (3 cr; Stdnt Opt. Prereq-RRM major or ENR major or ESPM major or grad student or #) Application of social science theory/methods to recreation and resource-based tourism visitor behavior. Analysis of surveys, observations, and content. Implications for sustainable resource management. Course is online or in-person, depending on semester.


RRM 5480. Topics in Recreation Resource Management. (1-4 cr [max 6 cr]; Stdnt Opt) Lectures by visiting scholar or regular faculty member. Topics specified in Class Schedule.

Recreation, Park, and Leisure Studies (REC)
School of Kinesiology
College of Education and Human Development

REC 1501. Orientation to Leisure and Recreation. (3 cr; Stdnt Opt) Introduction to the history and development of the parks and recreation movement; sociological, economical, psychological, and political considerations of leisure and recreation in contemporary society; interrelationship between professional and service organizations; orientation to the professional field.

REC 2151. Outdoor and Camp Leadership. (3 cr; A-F or Aud) Practical and theoretical study of leading groups in outdoor and camp settings. Outdoor leadership skills, expedition planning, emergency procedures and risk management, minimum impact approaches, and working with youth in a camp environment.

REC 3281. Research and Evaluation in Recreation, Park, and Leisure Studies. (4 cr; A-F or Aud. Prereq-1501 or #) Various methods, skills, materials needed for planning, developing, implementing, evaluating professional recreation programs for diverse populations in various settings.
RE 3551. Administration and Finance of Leisure Services. (4 cr; A-F or Aud. Prereq: 3541W or #, rec major)
Principles/practices of financing/managing leisure service agencies in public/private sector.

RE 3610W. Leisure and Human Development. (3 cr; Stdt Opt)
Exploration of relevant issues concerning many roles of leisure in human development from influence on healthy fetal development to viability until death. Examination of diverse, multicultural perspectives on leisure, its centrality throughout history and influence on how civilizations define themselves.

RE 3796. Senior Internship in Recreation, Park, and Leisure Studies. (9 cr; S-N only. Prereq-Rec major, completion of most core courses, sr, #)
On-the-job supervised practical experience under specialist in a field directly related to student's academic program.

RE 3993. Directed Study in Recreation, Park, and Leisure Studies. (1-9 cr [max 9 cr]; A-F only. Prereq-Rec major, #)
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.

RE 5111. Sports Facilities. (3 cr; A-F or Aud. Prereq-Kin or Rec major or #)
Steps in planning and building facilities for athletics, physical education, and sport for college, professional, and public use.

RE 5115. Event Management in Sport. (3 cr; A-F or Aud. Prereq-Kin or Rec major or #)
Techniques/principles of planning, funding, and managing sport events. Collegiate championships, non-profit events/benefit, professional events.

RE 5161. Recreation Land Policy. (3 cr; A-F or Aud. Prereq-5101 or 5101 or #)
Historical development of recreational land policy in the United States and related contemporary issues in policy, management, interpretation, and research.

RE 5271. Community Leisure Services for Persons with Disabilities. (3 cr; A-F or Aud. Prereq-5201, Rec major or #)
Exploration and application of concepts and techniques of normalization and least restrictive environment strategies to leisure service delivery in inclusive community settings for a range of individuals with disabilities.

RE 5301. Wilderness and Adventure Education. (4 cr; A-F or Aud)
Rationale for, methods in applying wilderness/adventure education programs in education, recreation, corporate, human service settings. Emphasizes adventure/wilderness program management.

RE 5311. Programming Outdoor and Environmental Education. (3 cr; A-F or Aud)
Methods, materials, and settings for developing and conducting environmental and outdoor education programs.

RE 5371. Sport and Society. (3 cr; A-F or Aud. Prereq-[3126W, grad student] or #)
Sport, sporting processes, social influences, systems, and structures that have existed and exist within/among societies, nations, and cultures. Issues concerning social differentiation. Social concerns such as violence and honesty.

RE 5421. Sport Finance. (3 cr; A-F or Aud. Prereq-Grad student or #)
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.

RE 5461. Foundations of Sport Management. (3 cr; A-F or Aud. Prereq-Kin or rec or postbac or grad student or #)
Theories/techniques in administering/managing sport enterprises. Organizational theory/policy. Practical examples of sport management skills/strategies.

RE 5511. Women in Sport and Leisure. (3 cr; A-F or Aud. +KIN 5511)
Critically examines women's involvement in/contributions to sport, physical activity, and leisure.

RE 5601. Sport Management Ethics and Policy. (3 cr; A-F or Aud. Prereq-Grad student or #)
Ethical concepts that underpin or inform sport policies. Evaluating sport policies from a normative point of view. Selected sport policy issues are used to illustrate relevance of ethical considerations in policy development, ethical implications of sport policy.

RE 5701. Positive Youth Development Programming. (3 cr; A-F only. Prereq: Upper div undergraduate or grad student or #)

RE 5801. Legal Aspects of Sport and Recreation. (4 cr; A-F or Aud. Prereq-5551 or 5461 or #)
Legal issues related to recreation, park, and sport programs/facilities with public/private sectors.

RE 5900. Special Topics: Contemporary Issues in Leisure Services. (1-12 cr [max 12 cr]; Stdt Opt)
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.

RE 5981. Research Methodology in Kinesiology, Recreation, and Sport. (3 cr; A-F or Aud. +KIN 5981. Prereq-MEd or grad student or #)
Defines/reviews various types of research in exercise and sport science, physical education, and recreation studies. Qualitative research, field studies, and introspective research strategies as alternatives to traditional scientific paradigm.

RE 5992. Readings: Recreation. (1-9 cr [max 9 cr]; A-F only. Prereq-REC major, #)
Independent study under tutorial guidance by faculty member on topic(s) not covered in regular coursework.

RE 5995. Problems in Recreation, Park, and Leisure Studies. (1-9 cr [max 9 cr]; A-F only. Prereq-REC MEd or grad student, #)
Independent study of leisure service programs, systems, facilities, or policies. Focuses on conduct of recreation programs. Scholarly projects (e.g., library or field research) or demonstration projects.

Religious Studies (RELS)

Department of Classical and Near Eastern Studies

College of Liberal Arts

RELS 1001. Introduction to the Religions of the World. (3 cr; Stdt Opt)
An introduction to the major religions of the world and the academic study of religion. Hinduism, Buddhism, Judaism, Christianity, Islam, and some pre-Christian religions of Antiquity.

RELS 1002. Introduction to the Study of Religion. (3 cr; Stdt Opt)

RELS 1003. World of the Bible: Religions, Empires, and Discourses of Power. (3 cr; Stdt Opt)

RELS 1031. Introduction to the Religions of South Asia. (3 cr; Stdt Opt)
Historical study of the three traditional religions of India: Hinduism, Buddhism, and Jainism through literature, art, and film. General topics include myth, yoga, mysticism, and the religious order of society.

RELS 1034. Introduction to Jewish History and Civilization. (3 cr; Stdt Opt. + JWST 3034), JWST 1034, RELS 3034)
Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shaped development of Jewish ideas, practices, and institutions.

RELS 1035. Introduction to Christianity. (3 cr; A-F or Aud)

RELS 1082. Jesus in History. (3 cr; Stdt Opt)
Jesus of Nazareth in his original setting. Modern approaches to the historical Jesus. Perspectives and needs of early gospel writers and effects of portrayals of Jesus. Shifting representations of Jesus in new historical and cultural situations. Meets with RELA 1182.


REL 1905. Freshman Seminar. (3 cr; Stdnt Opt) Topics specified in Class Schedule.


REL 3034. Introduction to Jewish History and Civilization. (3 cr; Stdnt Opt. JWST 3034, RELS 1034, JWST 1034) Jewish history, society, and culture from Second Temple period (5th century BCE) to modern era as illuminated by literature, philosophy, art, film, music, religious law/custom, and artifacts of daily life. Emphasizes political, social, and cultural contexts that shaped development of Jewish ideas, practices, and institutions.


REL 3070. Topics in Religious Studies. (3 cr; A-F or Aud) Topics specified in Class Schedule and Course Guide.

REL 3071G. Greek and Hellenistic Religions. (3 cr; Stdnt Opt) Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, archaeology. Homer and Olympian deities; ritual performance; prayer/sacrifice; temple architecture; death/afterlife, mystery cults, philosophical religion, Near Eastern salvation religions. Meets with 3171.

REL 3071H. Honors Course: Greek and Hellenistic Religions. (4 cr; Stdnt Opt) Greek religion from Bronze Age to Hellenistic times. Sources include literature, art, archaeology. Homer/Olympian deities, ritual performance, prayer/sacrifice, temple architecture, death/afterlife, mystery cults, philosophical religion, Near Eastern salvation religions. Meets with 3071.


REL 3076. The Apostle Paul: Life, Letters, and Legacy. (3 cr, Stdnt Opt) How/what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.


REL 3079. Muslims and Jews: Conflict and Coexistence in the Middle East and North Africa since 1700. (3 cr; Stdnt Opt) 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. Causes of conflict. Why history of Muslim-Jewish relations is so contested.


REL 3115. Mishnah and Midrash in Translation. (3 cr; Stdnt Opt) Jewish law studied as a mirror of society and as a way to actualize its value. Consideration of original socioreligious contexts and current applications. Selections include biblical interpretations addressing moral, theological, legal, and literary problems.


**RELS 3204. Dead Sea Scrolls.** (3 cr; Stdt Opt. = RELS 5204, JWST 3204, JWST 5204) 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 3251. Modern Study of the Old Testament.** (3 cr; Stdt Opt. Prereq-No knowledge of Hebrew required) Methods used in studying the Old Testament, including textual criticism, the anthropological approach, the sociological approach, the history of religion, and the use of archaeology in interpreting the text.


**RELS 3371. Buddhism.** (3 cr; Stdt Opt. = RELS 3371, ALL 5672, ALL 6672) Historical account of Buddhist religion in terms of its rise, development, various schools, and common philosophical concepts. Indian Buddhism compared with Hinduism. Buddha’s demise/revival on Indian subcontinent.


**RELS 3377. A Thousand Years of Buddhism in China: Beliefs, Practices, and Culture.** (3 cr; Stdt Opt) Buddhism in China, 4th-15th centuries. Introduction of Buddhism to China. Relevance of Buddhist teaching to indigenous thought (e.g., Taoism, Confucianism). Major “schools”: Tiantai, Huayan, Chan/Zen, etc. Cultural activities of monks, nuns, and lay believers.

**RELS 3415W. Art of India.** (4 cr; Stdt Opt. = ARTH 3014W, ALL 3014W) Indian sculpture, architecture, and painting, from prehistoric Indus Valley civilization to present.


**RELS 3502. Ancient Israel: From Conquest to Exile.** (3 cr; Stdt Opt. Prereq-Hebrew not required; 3501 recommended) Israelite history in context of what is known from Egyptian, Canaanite, Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.


**RELS 3504. Development of Israelite Religion II.** (3 cr; Stdt Opt) Ancient Judaism from the Persian restoration (520 BCE) to Roman times (second century CE). Religious, cultural, and historical developments are examined to understand Jewish life, work, and worship under a succession of foreign empires: Persian, Greek, and Roman.


**RELS 3535. Death and the Afterlife in the Ancient World.** (3 cr; Stdt Opt) 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; Stdt Opt. = CNES 3108, CLAS 1024) 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 3621. The Christian Right and Left in America: Protestant Liberals, Evangelicals, and Fundamentalists.** (3 cr; Stdt Opt. = RELS 5621) Historical, religious, 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 3712. Islam: Religion and Culture Islam.** (3 cr; Stdt Opt. = HIST 3493, ARAB 5036) 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 3714. Islam and the West.** (3 cr; Stdt Opt. = HIST 3546, CAS 3533, GLOS 3643) 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 3801. Philosophy of Religion.** (3 cr; Stdt Opt) Conceptual problems that arise from attempts to provide rational justification for religious belief.

**RELS 3970. Supplemental Discussion in Religious Studies.** (1 cr [max 3 cr]; Stdt Opt) Extra discussion section attached to a religious studies course/event.

**RELS 3993. Directed Studies.** (1-4 cr [max 10 cr]; Stdt Opt) Student works with faculty on a subject decided upon by both.
RELS 4003. Medieval Philosophy. (3 cr; Stdnt Opt. Prereq-Grad student or upper div) Major figures of medieval Christian synthesis (e.g., Augustine, Anselm, Aquinas, Scotus, Ockham).

RELS 4049. Religion and Culture. (3 cr; Stdnt Opt. Prereq-1005 or ANTH 1003 or #) Religious beliefs and world views cross-culturally. Theorizations of origins, functions, and forms (e.g. myth, ritual, symbolism) of religion.


RELS 5070. Topics in Religious Studies. (3 cr [max 16 cr]; Stdnt Opt) Topics specified in Class Schedule and Course Guide.

RELS 5071. Greek and Hellenistic Religions. (3 cr; Stdnt Opt. Prereq-#) Greek religion from the Bronze Age to Hellenistic times. Sources include literature, art, and archaeology. Homer and Olympian deities; ritual performance; prayer and sacrifice; temple architecture; death and the afterlife; mystery cults; philosophical religion; Near Eastern salvation religions. Meets with 3071.


RELS 5076. Apostle Paul: Life, Letters, and Legacy. (3 cr; Stdnt Opt) How/what can we know about Paul. What his message was, why he was fighting. How he was later understood by friends/foes.


RELS 5111. Problems in Historiography and Representation of the Holocaust. (3 cr; Stdnt Opt. Prereq-3521 or 3541 or JWST 3521 or #) Issues connected with Holocaust. Inclusiveness of other groups, Holocaust versus “Shoah,” historiographic conflicts about perpetrators. Problems of representation in literature/art. Problems of narrative theology after Auschwitz.

RELS 5112. Jewish Mysticism, Magic, and Kabbalah. (3 cr; A-F or Aud. JWST 3112, RELA 5112, JWST 5112) Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hekhalot, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar.the Bahir. Schools of Provence, Gerona, and Zohar. Tension between legal/mystical aspects, magical hermeneutic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.

RELS 5115. Mishnah and Midrash in Translation. (3 cr; Stdnt Opt) Jewish law studies as mirror of society and way to value its singular socioreligious contexts, current applications. Selections include biblical interpretations addressing moral, theological, legal, and literary problems.


RELS 5251. Archaeology of Herodian Israel. (3 cr; A-F or Aud. CNES 5251, RELA 5251. Prereq-One course in [archaeology or ancient history] or grad student or #) Archaeological sites in Israel dating to era of Herod the Great (37-4 BC). Palaces, religious edifices, and remains from Jewish/gentile settlements throughout the kingdom. Course readings consist of contemporary literary sources and excavation reports.

RELS 5371. Buddhism. (3 cr; Stdnt Opt. Prereq-3371, ALL 5672, ALL 5672) Historical account of Buddhist religion in terms of its rise, development, various schools, and common philosophical concepts.
Respiratory Care (RC)

College of Continuing Education


RC 2021. Patient Care Techniques. (2 cr; A-F or Aud. Prereq- BAS respiratory care major) Fundamental practice, attitudes, and competencies for all health care providers, including respiratory care. Communication skills, infection control, vital signs, patient assessment. General care techniques of respiratory/nursing personnel. Transfer of patients. Specialized care, including immobilized patients (e.g., mechanical ventilation).


RC 3201. Cardiopulmonary Patient Assessment. (4 cr; A-F or Aud. Prereq-[2210 or equiv], BAS RC student) Patient assessment skills to interpret patient data. Chart record, interview, physical exam, medical lab data, pulmonary function reports, electrocardiogram, hemodynamic record, ventilator flow sheet, radiographic imaging. Introduction to cardiopulmonary diseases. Lab emphasizes role playing, practice exams, and assessment.

RC 3301. Clinical Practice I. (4 cr; S-N or Aud. Prereq- BAS respiratory care major) Clinical rotations at Mayo Medical Center, Rochester. Nine intensive care units, operating room, emergency room, general floor care areas, pulmonary function labs, sleep disorders center, smoking cessation clinic, pulmonary rehabilitation program, home care, outpatient clinic. Supervised performance of procedures, diagnostic testing.

RC 3302. Clinical Practice II. (4 cr; S-N or Aud. Prereq-3301, BAS respiratory care major) Continued clinical rotations at Mayo Medical Center. Nine intensive care units, operating room, emergency room, general floor care areas, pulmonary function labs, sleep disorders center, smoking cessation clinic, pulmonary rehabilitation program, home care, outpatient clinic. Adult, perinatal, and pediatric critical resp care.

RC 3401. Seminar in Respiratory Care I: Case reports and Fundamentals of Research. (1 cr; A-F or Aud. Prereq-2210) Critical review of professional medical literature re scientific method and clear writing style. Patient cases for problem solving and critical thinking issues. Collaborative class research project leading to abstract submission. Weekly case conference (pulmonary/critical care medicine or combined critical care). Two-hour seminar.

RC 3402. Seminar in Respiratory Care II: Case reports and Fundamentals of Research. (1 cr; A-F or Aud. Prereq-3401, BAS RC student) Weekly conferences and seminar of significant respiratory care cases in professional medical literature. Case reviews from standpoint of scientific method and clear writing style. Problem solving, critical thinking strategies. Collaborative class research project leading to submission of abstract.

RC 3501. Advanced Cardiopulmonary Respiratory Physiology and Pathophysiology. (3 cr; A-F or Aud. Prereq-3201, BAS RC student) Physiology of cardiovascular/pulmonary systems. Adult, pediatric, and perinatal pulmonary and cardiac disorders. Emphasizes presenting assessment, lab evaluation, major pathology, pathophysiologic manifestations, and treatment. Lab observation/measurement of normal and simulated abnormal cardiopulmonary physiology.

RC 3601. Clinical Research Concepts and Practice. (3 cr; A-F or Aud. Prereq-RC or RTT major) Health science applications. Statistics (descriptive, inferential). Research study design, problem statement, protocol/hypothesis development, feasibility, sampling methods/instruments, data management, data analysis/interpretation, dissemination of research.


RC 4201. Subspecialization in Respiratory Care: Advanced Perinatal and Pediatric Respiratory Care. (2 cr; A-F or Aud. Prereq-3102, BAS RC student) Role of perinatal/pediatrics specialist as defined by National Board for Respiratory Care (NBRC). Literature on mechanical ventilation, monitoring applied. Emphasizes evidence-based care. Case studies of strategies for extended mechanical ventilation or other forms of long-term support.


RC 4301. Seminar: Research Project and Publication. (2 cr; A-F or Aud. Prereq-3102, BAS respiratory care major) Students prepare a research project for submission, including assembling a poster, abstract, or manuscript of original research. Research mentors are assigned to allow guided independent study.

RC 4496. Subspeciality Clinical Practicum in Advanced Respiratory Care I. (3 cr; S-N or Aud. Prereq-3302, BAS respiratory care major) Competencies in areas of advanced-level respiratory care, including clinical subspecialties and related areas important to respiratory care practitioner. A rotation is eight weeks/120 hours of directed clinical experience at facilities within Mayo Health System and UM-affiliated institutions. Maximum two rotations per semester.

RC 4596. Subspeciality Clinical Practicum in Advanced Respiratory Care II. (3 cr; S-N or Aud. Prereq-3502, BAS RC student) Competencies in areas of advanced-level respiratory care, including clinical subspecialties and related areas important to respiratory care practitioner. A rotation is eight weeks/120 hours of directed clinical experience at facilities within Mayo Health System and UM-affiliated institutions. Maximum two rotations per semester.


Retail Merchandising (RM)

DHA Retail Merchandising

College of Design

RM 1170. Topics in Retail Merchandising. (1-4 cr [max 16 cr]; A-F or Aud)
In-depth investigation of specific topic, announced in advance.

RM 1201. Clothing Design, Merchandising, and the Consumer. (3 cr; A-F only)
An orientation to the apparel business covering the multiple steps in the process of creating and merchandising apparel, and the ethical positions reflected in decision making at each step.

RM 2196. Work Experience in Retail Merchandising. (1-4 cr [max 8 cr]; S-N only.
Prereq: Plan submitted/approved by [adviser, internship supervisor], written approval of supervisor.
Supervised work experience in business, industry, or government, related to student’s area of study. Integrative paper or project.

RM 2215. Multichannel Retailing. (5 cr; A-F or Aud. Prereq: 2210)
Overview of retailing. Emphasizes issues related to multichannel options available to consumers. Features both store based (e.g., specialty store, department store) and non-store based (e.g., Internet, catalog) issues of retailing.

RM 3170. Topics in Retail Merchandising. (1-4 cr [max 32 cr]; A-F or Aud)
In-depth investigation of specific topic.

RM 3196. Field Study: National or International. (1-4 cr [max 10 cr]; A-F or Aud. Prereq: #)
Faculty-directed field study in national or international setting.

RM 3201. Strategic Career Planning. (1 cr; A-F only. Prereq: Jr or Sr or at least 60 cr., retail merchandising major)
Students 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.

RM 3242. Retail Buying. (3 cr; A-F or Aud. Prereq: 2215 or DHA 2215 or DHA 3245), [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 #
Principles/mathematics of merchandise inventory control, merchandise selection.

RM 3243. Visual Merchandising. (3 cr; A-F or Aud. Prereq: 2215, DHA major or minor or #)
Retail store environment. Physical/psychological effects that initiate/motivate consumer behavior. Merchandise display: creativity, department layout, fixtureing, lighting, cross merchandising, visual resources, signing, maintenance.

RM 4117W. Retail Environments and Human Behavior. (3 cr; A-F only. Prereq: 2215 or DHA 2215, [Jr or Sr or grad student], DHA major or minor or #)
Theory/research related to designed environments across retail channels.

RM 4160H. Honors Capstone Project. (2 cr; A-F only. Prereq: Retail merchandising honors)
Individualizes honors experience by connecting aspects of major program with special academic interests.

RM 4193. Directed Study in Retail Merchandising. (1-4 cr [max 8 cr]; A-F or Aud. Prereq: Undergrad, #)
Independent study in retail merchandising under tutorial guidance.

RM 4196. Internship in Retail Merchandising. (1-4 cr [max 4 cr]; S-N or Aud. Prereq: 4116, 4196, 4196, 4196, 4116. Prereq: Completion of at least one-half of professional sequence, plan submitted/approved in advance by [adviser, internship supervisor], written consent of faculty supervisor, #)
Supervised work experience relating activity in business, industry, or government to student’s area of study. Integrative paper or project may be required.

RM 4212W. Dress, Society, and Culture. (3 cr; A-F or Aud. Prereq: [Jr or Sr or grad student], [DHA major or minor or #])
Contemporary dress from diverse cultures within/outside USA analyzed using social science concepts. Dress as nonverbal communication system.

RM 4216. Retail Promotion and Consumer Decision Making. (4 cr; A-F or Aud. =APST 5216. Prereq: 2215, [Jr or Sr or grad student], [DHA major or minor or #])
Consumer behavior theories/concepts as related to retailing. Retail promotional strategies: advertising/promotion.

RM 4217. International Retail Markets. (3 cr; A-F or Aud. Prereq: 2215 or DHA 2215, [Jr or Sr or grad student], [DHA major or minor or #])
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.

RM 4247. Advanced Buying and Sourcing. (3 cr; A-F or Aud. Prereq: 2215 or DHA 2215, [Jr or Sr or grad student], [DHA major or minor or #])
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.

RM 5170. Topics in Retail Merchandising. (1-4 cr [max 32 cr]; A-F or Aud. Prereq: Jr or Sr or grad student)
In-depth investigation of single specific topic, announced in advance.

Russian (RUSS)

Department of Slavic Languages/Literatures

College of Liberal Arts

RUSS 1101. Beginning Russian I. (5 cr; Stdnt Opt. =RUSS 4101)
Listening, speaking, reading, writing.

RUSS 1102. Beginning Russian II. (5 cr; Stdnt Opt. =RUSS 4102. Prereq: 1101 or equiv)
Listening, speaking, reading, writing.

RUSS 1304W. Introduction to Russian Literature: 19th-Century Fiction. (3 cr; Stdnt Opt)
Introduction to the study of literature illustrated by materials drawn from Russian literature of the 19th century.

RUSS 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud)
Topics specified in Class Schedule.

RUSS 3002. Intermediate Russian II. (5 cr; Stdnt Opt. =RUSS 4104. Prereq: 3001 or #)
Expansion of experience in speaking, reading, and understanding Russian. Reading contemporary texts.

RUSS 3101. Advanced Russian I. (4 cr; Stdnt Opt. Prereq: 3002 or #)
Advanced grammar, conversation, composition, reading.

RUSS 3102. Advanced Russian II. (4 cr; Stdnt Opt. Prereq: 3101 or #)
Advanced grammar, conversation, composition, and reading.

RUSS 3104. Introduction to Literary Analysis. (3 cr; Stdnt Opt. Prereq: 3002 or equiv)
Reading and analysis of poetry and prose selections to understand rudiments of studying Russian literature. Readings in Russian.

RUSS 3211. Modern Russian Literature in Translation. (3 cr; Stdnt Opt. =RUSS 5211)
Literary, cultural, and political significance of modern Russian literary works.

RUSS 3311. Russian Major Project. (3 cr; A-F or Aud. =RUSS 3311H. Prereq: Advanced Russian major)
Directed research and writing in student’s chosen field.

RUSS 3311H. Honors Major Project in Russian. (3-4 cr [max 4 cr]; A-F or Aud. =RUSS 3311. Prereq: Advanced Russian major)
Directed research/writing in student’s chosen field.

RUSS 3404. Tolstoy in Translation. (3 cr; Stdnt Opt. =RUSS 5404)
Novels, stories, and philosophical writings of Leo Tolstoy.

RUSS 3407. Stories and Plays of Anton Chekhov in Translation. (3 cr; Stdnt Opt. =RUSS 5407)
Study of literary devices and themes in selected stories and major plays using the intrinsic approach.

RUSS 3409. 19th-Century Russian Novel. (3 cr; Stdnt Opt. =RUSS 5409)
The Russian realistic novel from origin to decline. Social, political, and intellectual circumstances that led to its emergence as the dominant genre of the “age of realism” in Russia.

RUSS 3421. Literature: Middle Ages to Dostoevsky in Translation. (3 cr; Stdnt Opt. =RUSS 5421)
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. (3 cr; Stdnt Opt. +RUSS 5422)
Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

RUSS 3512. Russian Art and Culture. (3 cr; Stdnt Opt)
Major trends in Russian visual arts in context of social, political, and ideological questions.

RUSS 3601. Methods of Translating Fiction From Russian to English. (3 cr; Stdnt Opt. +RUSS 5601. Prereq-3102 or equiv)
Learning to appreciate various literary styles through experience of translation.

RUSS 3900. Topics in Russian Language, Literature, and Culture. (1-4 cr [max 16 cr]; Stdnt Opt. Prereq-1102 for language topics)
Variable topics in Russian language, literature and culture. Consult department for details.

RUSS 4101. Beginning Russian I. (3 cr; Stdnt Opt. +RUSS 1101. Prereq-Fourth sem course in another language or grad student)
Listening, speaking, reading, writing.

RUSS 4102. Beginning Russian II. (3 cr; Stdnt Opt. +RUSS 1102. Prereq-4101, [fourth sem course in another language or grad student])
Listening, speaking, reading, writing.

RUSS 4103. Intermediate Russian I. (3 cr; Stdnt Opt. +RUSS 3001. Prereq-4102, [fourth sem course in another language or grad student])
Listening, speaking, reading, and understanding Russian. Reading contemporary texts.

RUSS 5021. Russia Study Tour. (6-18 cr [max 18 cr]; Stdnt Opt. Prereq-3002 or equiv)
Study of Russian language & culture in an accredited institution in Russia.

RUSS 5105. Russian Poetry and Prose. (3 cr; Stdnt Opt. Prereq-5001 or equiv)
Appreciation of literary values through stylistic analysis and literary interpretation; analysis of humanistic elements. Readings in Russian.

RUSS 5404. Tolstoy in Translation. (3 cr; Stdnt Opt. +RUSS 3404)
Novels, stories, and philosophical writings of Leo Tolstoy.

RUSS 5407. Stories and Plays of Anton Chekhov in Translation. (3 cr; Stdnt Opt. +RUSS 3407)
Study of literary devices and themes in selected stories and major plays using the intrinsic approach.

RUSS 5409. 19th-Century Russian Novel. (3 cr; Stdnt Opt. +RUSS 3409)
The Russian realistic novel from origin to decline; social, political, and intellectual circumstances that led to its emergence as the dominant genre of the “age of realism” in Russia.

RUSS 5411. Dostoevsky in Translation. (3 cr; Stdnt Opt. +RUSS 3411)
Novels, stories, and other writings of Fyodor Dostoevsky.

RUSS 5421. Literature: Middle Ages to Dostoevsky in Translation. (3 cr; Stdnt Opt. +RUSS 3421)
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. (3 cr; Stdnt Opt. +RUSS 3422)
Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

RUSS 5601. Methods of Translating Fiction From Russian to English. (3 cr; Stdnt Opt. +RUSS 3601. Prereq-3102 or equiv)
Learning to appreciate various literary styles through experience of translation.

RUSS 5900. Topics in Russian Language, Literature, and Culture. (1-4 cr [max 3 cr]; Stdnt Opt. Prereq-1102 for language topics)
Variable topics in Russian language, literature, and culture.

Sanskrit (SKT)
Department of Asian Languages and Literatures

College of Liberal Arts
SKT 5001. Beginning Sanskrit. (4 cr; Stdnt Opt)
Introduction to the classical language of ancient India.

SKT 5002. Beginning Sanskrit. (4 cr; Stdnt Opt. Prereq-5001 or equiv)
Introduction to the classical language of ancient India.

SKT 5201. Intermediate Sanskrit. (5 cr; Stdnt Opt. Prereq-5002 or equiv)
Readings in Sanskrit literature.

SKT 5202. Intermediate Sanskrit. (5 cr; Stdnt Opt)
Readings in Sanskrit literature.

SKT 5992. Directed Readings. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-9, ¢)
Guided individual reading or study.

Scandinavian (SCAN)
Department of German, Scandinavian, and Dutch

College of Liberal Arts
SCAN 1201. Introduction to Scandinavia. (3 cr; Stdnt Opt)
Five Scandinavian countries introduced through literature, art, and film. Historical origins, nationalism, European Union, welfare state, environment, contemporary Scandinavian identity.

SCAN 1904. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

SCAN 1905. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

SCAN 1909W. Topics: Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman)
Topics specified in Class Schedule.

SCAN 3011. Readings in Scandinavian Languages. (4 cr; Stdnt Opt. Prereq-[Dan or Nor or Swed][1004 or 4004] or #)
Reading/composition in Danish, Norwegian, and Swedish for advanced proficiency.

Introduction to differences between the three languages.

SCAN 3501W. Scandinavian Culture Past and Present. (3 cr; Stdnt Opt)
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. (3 cr; Stdnt Opt)
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. (3 cr; Stdnt Opt)
Literary and folkloristic investigation of Scandinavian folktales and legends. Readings in translation for nonmajors.

SCAN 3504. The Immigrant Experience. (3 cr; Stdnt Opt)
Issues of origin and language, immigration and settlement, traditions and values, culture and 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. (3 cr; Stdnt Opt)
Modernity’s search for new forms to represent changing historical situations. Ibsen, Strindberg, Hamsun, Selma Lagerlof, Hjalmar Bergman, Per Lagerkvist, Karen Blixen, Moa Martinson, Tarjei Vesaas, Edith Sodergran, Ingmar Bergman, Lars Gustafsson. All readings in translation.

SCAN 3601. Great Literary Works of Scandinavia. (5 cr; Stdnt Opt)
Major literary works from the Middle Ages to the present. Readings in translation.

SCAN 3602. The Literary Fairy Tale in Scandinavia. (5 cr; Stdnt Opt)
Examples of literary fairytales from Scandinavia, especially Hans Christian Andersen. Readings in translation for nonmajors.

SCAN 3605. The Scandinavian Short Story. (3 cr; Stdnt Opt)
Short stories by important 19th- and 20th-century authors from all the five Scandinavian countries. Genre theory and practical criticism. Readings in English for non-majors.
SPAN 3612. Images of Scandinavia in Art, Film, and Literature. (3 cr; Stdnt Opt) Images of Scandinavia(n)s in art, film, and literature by both Scandinavians and foreigners. Images of self-knowledge, self-revelation, and otherness. Representative photos and videos of people, locations, and styles. Readings in English.

SPAN 3634. Scandinavian Women Writers. (3 cr; Stdnt Opt) 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.

SPAN 3670. Topics in Scandinavian Studies. (3 cr or [max 9 cr]; Stdnt Opt) Topics specified in Class Schedule. Readings in English for nonmajors. May meet with 5670.

SPAN 3993. Directed Studies. (1-4 cr [max 12 cr]; Stdnt Opt, Prereq-#, %, @) Guided individual reading and study.

SPAN 4602. Fiction and Film. (5 cr; Stdnt Opt) Examines film adaptations of classical Scandinavian literary texts and explores similarities and differences between the viewer's and reader's experiences in the media of film, drama, and epic narration. Includes works by Bjønca, Hamson, Ibsen, Strindberg, Axel Bergman, Dreyer, and Losey.

SPAN 5501. Scandinavian Mythology. (3 cr; Stdnt Opt) Study of Scandinavian mythology based on primary sources represented by Saxo Grammaticus, Snorre Sturluson, Edda and Ynglinga Saga, and the Poetic Edda. Myths are analyzed using contemporary critical approaches. All readings in translation.

SPAN 5613. Contemporary Scandinavian Literature. (3 cr; Stdnt Opt) 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.

SPAN 5616. Strindberg and the Drama in Revolt and Change. (3 cr; Stdnt Opt) Strindberg as the master of naturalistic drama and the precursor of modernity in European and American theater. Close reading of plays with emphasis on dramatic structure and staging conventions in the context of modern theater. All readings in English for nonmajors.

SPAN 5701. Old Norse Language and Literature. (5 cr; Stdnt Opt) Acquisition of a reading knowledge of Old Norse; linguistic, philological and literary study of Old Norse language and literature.

SPAN 5710. Topics in Old Norse Literature. (3 cr or [max 9 cr]; Stdnt Opt, Prereq-5701 or equiv) 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.

SPAN 5993. Directed Studies. (1-4 cr [max 12 cr]; Stdnt Opt, Prereq-#, %, @) Guided individual reading and study.

Second Language Studies (SLS)

Program in Second Language Studies College of Liberal Arts

SLS 1904. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) Topics vary. See Class Schedule.

SLS 1905. Freshman Seminar. (3 cr; A-F or Aud, Prereq-Freshman) Topics specified in Class Schedule.

SLS 3001W. Basics in Teaching English as a Second Language. (4 cr; Stdnt Opt. Prereq-Have studied another language, [native speaker or [C-TOEFL score of at least 213 or equiv])

- Orientation to current theories/methods of English as a second language (ESL) instruction.
- Emphasizes methodologies for teaching/ assessing listening, speaking, pronunciation, reading, writing skills. Contexts of teaching English to adults in the U.S. and abroad.
- Internship at school or agency teaching ESL.

SLS 3401. Introduction to Pronunciation and Grammar for ESL Teachers. (4 cr; A-F only)

- Concepts/theories regarding English pronunciation/grammar. ESL textbooks, teaching activities, lesson plans, curriculum materials.

SLS 3501. Practical Language Learning for International Communication. (3 cr, Stdnt Opt)

Getting a handle on language learning. Having a sense of one's learning/language strategy preferences. Motivation to learn languages in general and a given language in particular. Study, motivation to do specific language tasks.

SLS 5401. Language Analysis for Teachers of English as a Second Language. (4 cr; Stdnt Opt, Prereq-Ling 3001 or Ling 5001 or #)

Overview of the structure of the English language geared to the needs of teachers of English to speakers of other languages. Study the structures of English from the point of view of second-language speakers as well as native speakers. Phonetics, phonology, morphology, and some aspects of the syntax of the English language. Part of a two-course sequence.


Overview of the structure of the English language geared to the needs of teachers of English to speakers of other languages. Study the structures of English from the point of view of second-language speakers as well as native speakers. More complex structures of English syntax, as well as English semantics, pragmatics, and discourse structures. Second in a two-course sequence.

SLS 5610. Research Methods in Applied Language Study. (3 cr [max 12 cr]; Stdnt Opt. Prereq-Ling 5505 or #)

- Key issues in second language acquisition/ learning research. Focuses on learning a second or foreign language in the classroom.

For a guide to course numbers, symbols, and abbreviations, see page 376.
SW 1501. Introduction to Peace Studies. (3 cr; A-F only)
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 1905. Freshman Seminar. (1-3 cr; max 6 cr; Stdnt Opt. Prereq-F)
Interdisciplinary seminar. Topics specified in Class Schedule.

SW 2501W. Introduction to Social Justice. (4 cr; A-F only)
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 3051. Cultural Diversity and the Helping Process. (3 cr; Stdnt Opt)
Ethno-cultural concepts relevant to service delivery. Cross-ethnic issues, practice considerations in human services, issues that produce barriers to services for diverse racial/cultural client groups.

SW 3101. Interventions in Community and Social Policy. (3 cr; Stdnt Opt)
Applying social work skills and values to community organization, social action, and social problems using an ecological framework.

SW 3203. Interventions with Individuals and Groups. (3 cr; Stdnt Opt)
Using an ecological framework, apply social work skills and values to work with individuals and small groups.

SW 3301. GLBT Social Movements. (3 cr; A-F only. = GLBT 3301)

SW 3501. Theories and Practices of Social Change Organizing. (4 cr; A-F only. Prereq-2501W)

SW 3701. Introduction to Child Maltreatment: Intervention and Prevention. (3 cr; Stdnt Opt)

SW 3702. Introduction to Adult Intimate Partner Violence: Intervention and Prevention. (3 cr; Stdnt Opt)
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; Stdnt Opt)
Theories/research on violence in intimate domestic relationships examined through multiple lenses. Overview of interventions in Minnesota, United States, and other societies.

SW 3810. Special Topics. (1-4 cr [max 10 cr]; A-F or Aud)
Topics specified in Class Schedule.

SW 4001. Basic Counseling and Interviewing Skills in the Social Work Helping Process. (1-3 cr; A-F or Aud)
Development/maintenance of a social worker-client helping relationship. Professional values and ethics. Interviewing skills of active listening, empathy, and authenticity. Identifying purpose, roles, and responsibilities through asking questions, reflecting, and clarifying.

SW 4501. Senior Seminar in Social Justice. (4 cr; A-F only. Prereq-2501, 5501)
Capstone course. Students complete a social justice portfolio, do service learning in a social justice organization.

SW 4693. Directed Studies. (1-10 cr [max 10 cr]; Stdnt Opt. Prereq-#)
Guided individual reading or study related to social issues, social work methods, or social work history.

SW 4694. Directed Research. (1-10 cr [max 10 cr]; Stdnt Opt. Prereq-#)
Guided research related to social issues, social work methods, or social work history.

SW 5051. Human Behavior and the Social Environment. (2-3 cr [max 3 cr]; A-F or Aud.
Prereq-Grad student or 8 cr social sciences or #)
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, cultural, and society.

SW 5052. Ecologies of Child Development Within Communities of Color. (3 cr; Stdnt Opt. Prereq-Grad or #)
Examine social, affective, and cognitive development of children of color via a life course, ecological systems framework. Family, school, peers, and community are studied as ecological contexts which influence developmental trajectories for these children and youth. Attention is given to poverty, racism, and oppression.

SW 5101. Historical Origins and Contemporary Policies and Programs in Social Welfare. (3-4 cr [max 4 cr]; A-F or Aud.
Prereq-Grad student or social sciences)
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 welfare policy. Students are exposed to programs and services. The emergence of the profession of social work is also examined.

SW 5105. Women and Public Policy. (3 cr; Stdnt Opt)
Study of feminist organizations; issues and conflicts within organizations and movements; methods and sources for studying feminism.

SW 5309. Case Management with Special Populations. (3 cr; Stdnt Opt. Prereq-Grad or non-degree seeking student or #)
Examine concepts and principles of case management practice with special populations such as older adults, persons with developmental disabilities, and persons with serious and persistent mental illness. The core functions of case management practice in a range of settings are addressed in relationship to issues of diversity, vulnerability, and empowerment.

SW 5312. Children With Sexual Behavior Issues. (1 cr; Stdnt Opt)

SW 5313. Social Work with Older Adults. (2 cr; Stdnt Opt. Prereq-Grad or non-degree seeking student or #)
The practice components of social work with older adults including assessment, intervention, and case management. Taught from the perspective of bio-psycho-social strengths and challenges and within the context of current social policy and delivery systems.

SW 5314. Social Work in the Schools. (2 cr; Stdnt Opt. Prereq-Grad or non-degree seeking student or #)
Application of social work methods in a school setting. Emphasizes assessment, diagnosis, consultation, advocacy, interdisciplinary team building, and crisis intervention.

SW 5315. Social Work Practice in Interdisciplinary Teams. (2 cr; Stdnt Opt. Prereq-Grad student or non-degree seeking student or #)
Preparation for work in interdisciplinary teams with students in medicine, nursing, pharmacy, public health, health administration, dentistry, education, social work, and psychology. Group dynamics, use of self, integrated team planning, evaluating team effectiveness.

SW 5316. Brief Treatment and the Task-Centered Approach. (2 cr; Stdnt Opt. Prereq-Grad student or non-degree seeking student or #)
Advent/prominence of brief-treatment models in work with individuals, families, and groups. Theoretical/empirical base or practice with diverse populations in managed care. Skill training, supervised practice.

SW 5317. Social Work With Involuntary Clients. (2 cr; Stdnt Opt. Prereq-Grad or non-degree seeking student or #)
Includes theory, ethics, effectiveness, and intervention methods for work with clients 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 5318. Family Centered Home Based Services. (2 cr; Stdnt Opt. =SW 8314; Prereq-#)
Grad or non-degree seeking student or #)
Ecological, multisystems approach focusing on the family system. Triadic theory, meta-
SW 5481. Child Abuse Prevention I: Research and Theory. (3 cr; Stdnt Opt. Prereq- Bachelor’s degree or #) Foundation of research/theory for level I child abuse prevention studies certificate.

SW 5482. Child Abuse Prevention II: Program Development, Evaluation, and Advocacy. (3 cr; Stdnt Opt. Prereq-5481) Design and evaluation of policies and programs of interventions to prevent child abuse. This is the second course in the Level I Child Abuse Certificate program.


SW 5512. Developing and Managing an Agency Budget. (1 cr; Stdnt Opt. Prereq-MSW student or #) Preparing/monitoring agency budgets, interpreting/utilizing financial reports. Information systems. Fiduciary responsibilities geared to ethics, organizational mission, and positive client outcomes.

SW 5513. Grant Writing and Fund-raising. (1 cr; Stdnt Opt. Prereq-MSW student or #) Procuring/managing financial resources ethically in human services settings. Designing a strategic fund-raising plan. Researching sources of support, developing relationships with grant makers, preparing/submitting grant requests.

SW 5514. Strategic Risk Management in Agencies. (1 cr; Stdnt Opt. Prereq-MSW student or #) Strategies to minimize risk to agency, its assets, and its resources. Relationship between mission, risk management, and board role. Agency internal systems, controls, and prevention strategies. Liability/insurance. Agency exposure to risk, including volunteer program management.

SW 5519. Mediation and Conflict Resolution. (3 cr; Stdnt Opt. Prereq-8519) Develop mediator skills for making informed decisions regarding the appropriateness of mediation for conflicts that frequently confront social worker practitioners such as divorce, neighborhood disputes, conflicts between parents and adolescents, conflicts between spouses, and conflicts between crime victims and offenders.

SW 5525. Global Perspectives on Social Welfare, Peace, and Justice. (3 cr; Stdnt Opt. Prereq-2001 or #) Role of international social welfare in meeting basic human needs and promoting human rights, social justice, and peace. Theories, models, and social policies in different economic and political systems with emphasis on Third World nations.


SW 5707. Interventions with Battered Women and Their Families. (2 cr; Stdnt Opt. Prereq-5705, grad student or non-degree seeking student or #) Current theories, research, and evaluation of interventions with battered women and their families. Focus on practice, e.g., direct work with social institutions, victim-survivors and their assailants and their families.

SW 5810. Seminar: Special Topics. (1-4 cr [max 10 cr]; Stdnt Opt) Topics specified in Class Schedule.

SW 5811. Social Work Ethics. (2 cr; Stdnt Opt. Prereq-5811, grad student or non-degree seeking student or #) Acquire knowledge base and develop skills required to identify ethical issues, resolve ethical dilemmas, and make ethical decisions within the context of the professional practice of social work. Values base and ethical standards of the profession and ethical decision-making models examined in-depth.

SW 5991. Independent Study in Social Work. (1-4 cr [max 4 cr]; Stdnt Opt) Independent study in areas of special interest to students and faculty.


SOC 1012W. Honors: Introduction to Sociology. (4 cr; Stdnt Opt. +SOC 1001, SOC 1012W, Prereq-honors) Scientific study of human societies/behavior. Major theories, methods, concepts, research findings. Characteristics of basic social units, their patterns of interrelation, processes of change.

SOC 1905. Freshman Seminar. (3 cr; A-F only; Prereq-Freshman or less than 30 credits) Topics specified in Class Schedule.

SOC 3003. Social Problems. (3 cr; A-F or Aud. Prereq-1001 recommended; soc majors/minors must register A-F) Analysis of major social problems, including inequality, crime, drug abuse, pollution, and racism. Proposed solutions, evaluation of policy consequences.
SOC 3322W. Social Movements, Protests, and Change. (3 cr; Stdnt Opt. Prereq-1001 or #; soc majors/minors must register A-F)


SOC 3411W. Organizations and Society. (3 cr; A-F or Aud. Prereq-1001 recommended; soc majors/minors must register A-F)

Formal organizations as major social influences in work lives, personality development, social change, and conflict. Life-course analysis of enterprises, bureaucracies, and voluntary organizations. Organizational control, conflict, coordination, and inter-organizational sets/relationships.

SOC 3415. Consumer Th! The Sociology and Politics of Consumption. (3 cr; A-F or Aud. Prereq-1001 recommended; soc majors/minors must register A-F)

How symbols are created, acquired, diffused, and used for organizing personal identity and maintaining group boundaries. Fashion. Socialization. Structure of retail trade. Role of mass media, advertising, marketing/production strategies. Implications of worldwide markets.

SOC 3421W. Sociology of Work. (3 cr; A-F or Aud. Prereq-1001 recommended; soc majors/minors must register A-F)


SOC 3451W. Cities and Social Change. (3 cr; Stdnt Opt. Prereq-Soc majors/minors must register A-F)


SOC 3452. Education and Society. (3 cr; Stdnt Opt. Prereq-Soc majors/minors must register A-F)


SOC 3501. Sociology of Families. (3 cr; Stdnt Opt. Prereq-1001 or #; soc majors/minors must register A-F)

Families in contemporary American society. Historical/cross-cultural comparisons. Interrelationships of families with other social institutions. Race, class, and gender in shaping family experiences. Topics may include marriage, divorce, childbearing, parenthood, family violence, gay/lesbian families.

SOC 3511. World Population Problems. (3 cr; Stdnt Opt. Prereq-Soc majors/minors must register A-F)

Population growth, natural resources, fertility/mortality in less developed nations, population dynamics/forecasts, policies to reduce fertility.

SOC 3613W. Food, Culture, and Society. (3 cr; A-F only. +GLOS 3612W. Prereq-Soc majors/minors must register A-F)

Food issues from a sociological perspective. Cross-cultural differences in how groups/societies think about and relate to food.

SOC 3661. Japan and the United States: Tides of Change in Race, Class, and Gender. (5 cr; A-F or Aud. Prereq-1001 or courses on or exper in East Asia or #; soc majors/minors must register A-F)

Forms of social relations and values, religion, childhood, family, community, education, work, business organization, politics, social classes, crime and deviance, police, popular culture. Status of women/minorities. Social protest movements, international relations.

SOC 3681. Gender and the Family in the Islamic World. (3 cr; A-F only. Prereq-At least soph; 1001 recommended)

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, and Islamic feminism.

SOC 3701. Social Theory. (4 cr; A-F or Aud. Prereq-1001 recommended; soc majors/minors must register A-F)

Traditions of social theory that have been basic to sociological knowledge. How they have expanded in contemporary theory. Their applications in selected areas of empirical research.

SOC 3711. Principles of Social Organization. (5 cr; A-F or Aud. Prereq-1001 recommended; soc majors/minors must register A-F)

How/why social organization is possible. Social structure, primary forms of social organization (groups, communities, networks, formal organizations). Social processes (integration, differentiation, regulation, change). How social organization evolves from individual decision making.

SOC 3721. Principles of Social Psychology. (3 cr; Stdnt Opt. Prereq-1001 recommended; soc majors/minors must register A-F)

Impact of social location on individual attitudes/behaviors. Dynamics of interpersonal relationships and small groups. Processes of social interaction.

SOC 3801. Sociological Research Methods. (4 cr; Stdnt Opt. Prereq-1001 recommended; soc majors must register A-F)

Principles/practice of research design, sampling, data collection including field observation/surveys. Data management/analysis, reporting of quantitative/nonquantitative data. Ethics/administration in sociological research. Lab.

SOC 3811. Basic Social Statistics. (4 cr; Stdnt Opt. Prereq-QC 0731 or intermediate algebra or #)

Descriptive statistics. Measures of central tendency, deviation, association. Inferential statistics focusing on probability and hypothesis testing. T-tests, Chi-square tests, variance analysis, bivariate regression. Statistical software used to analyze sociological data.

SOC 4090. Topics in Sociology. (3 cr [max 6 cr]; Stdnt Opt. Prereq-Soph or above or #; 1001 recommended; soc majors/minors must register A-F)

Topics specified in Class Schedule.

SOC 4093. Directed Study. (1-4 cr [max 12 cr]; Stdnt Opt. Prereq-#; %; @ soc majors/minors must register A-F)

Guided individual reading or study at junior or senior level.

SOC 4094W. Directed Research: Senior Project. (4 cr; A-F or Aud. Prereq-Soc majors/minors must register A-F)

Guided research experience at junior/senior level.

SOC 4101W. Sociology of Law. (3 cr; A-F or Aud. Prereq-[1001, 3101, 3102] or [3111, 3701] recommended; soc majors/minors must register A-F)


SOC 4102. Criminology. (3 cr; A-F or Aud. +SOC 4103, Prereq-[3101 or 3110 or 3111 or #; soc majors/minors must register A-F)


SOC 4103. Service-Learning in Criminology. (4 cr; Stdnt Opt. +SOC 4102. Prereq-3102 or #; soc majors/minors must register A-F)


SOC 4105. Sociology of Punishment and Corrections. (5 cr; A-F or Aud. Prereq-3101 or 3110 or 3111 or #; soc majors/minors must register A-F)

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.


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.

SOC 4109. Domestic Criminal Violence. (3 cr; Stdnt Opt. Prereq-3101 or 3102 or 3111 or #; soc majors/minors must register A-F)

SOC 4111. Deviant Behavior. (3 cr; A-F or Aud. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Definition and nature of deviant behavior. Social processes associated with deviant careers and social reintegration. Relationship of deviant behavior to social control.

SOC 4114. Social Control of Women Offenders. (3 cr; Stdnt Opt. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Historical and current explanations for female criminality. Current trends in women's participation in crime, their treatment in the legal system.

SOC 4125. Policing American Society. (3 cr; A-F or Aud. Prereq: 3101 or 3102 or 3111 or #; [4611, 4612] recommended; soc majors/minors must register A-F)
Police organizations/operations from social science perspective. Formal/informal policing: role/functions, legal bases, accountability/ constraints, community relations, use of force, illegal practices.

SOC 4135. Sociology of White-Collar Crime. (3 cr; Stdnt Opt. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Causes/consequences of white-collar crime. Control issues, including public perception, legislation, criminal law responses (enforcement, sentencing, punishment), and alternative control mechanisms.

SOC 4141. Juvenile Delinquency. (3 cr; A-F or Aud. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)

SOC 4142. Juvenile Justice and Law. (3 cr; Stdnt Opt. Prereq: 3101 or 3102 or 3111 or #), [jr or sr or grad student]; soc majors/minors must register A-F)
Evolution of juvenile court. Organizational relationships within court, police, and other agencies. Policies regarding serious/status offenders. Intake, diversion, pretrial detention, waiver to adult court, sentencing. Conflicts over due process/treatment. Movements to abolish juvenile justice system.

SOC 4148. Mental Disorder and the Legal System. (3 cr; Stdnt Opt. Prereq: Sr or grad student; soc majors/minors must register A-F)
Psychiatric/psychological aspects of antisocial/criminal behavior as related to issues faced in courts and criminal justice system.

SOC 4149. Killing. (3 cr; Stdnt Opt. Prereq: Sr or grad student; soc majors/minors must register A-F)
Sociological, legal, and 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.

SOC 4161. Criminal Law in American Society. (3 cr; Stdnt Opt. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
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.

SOC 4162. Criminal Procedure in American Society. (3 cr; Stdnt Opt. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
How constitutional democracy balances need to enforce criminal law and rights of individuals to be free of unnecessary government intrusion.

SOC 4170. Sociology of International Law. (3 cr; A-F or Aud. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Cultural values/practices in a globalized world. Role of international law. Immigration, terrorism, Americanization, structure of international legal system.

SOC 4175. Law, Politics, and Inequality. (3 cr; Stdnt Opt. Prereq: 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Critically evaluates law as a resource that defines, reinforces, and alters social relationships. Connection between law and justice. Law seen from perspective of class, race, or gender.

SOC 4190. Topics in Sociology With Law, Criminology, and Deviance Emphasis. (3 cr; Stdnt Opt. Prereq: 1001 recommended; soc majors/minors must register A-F)
Topics specified in Class Schedule.

SOC 4266. Sociology of Health and Illness. (3 cr; A-F or Aud. Prereq: One sociology course or #; soc majors/minors must register A-F)

SOC 4305. Society and the Environment: A Growing Conflict. (3 cr; A-F or Aud. Prereq: 1001 or environmental course recommended; soc majors/minors must register A-F)
How diversity/vitality of American religion shape public life. How religious groups engage in political action, foster understandings of democracy and styles of civic participation, influence volunteering/service activities, and form individual/communal views on issues such as race, poverty, the family, and sexuality.

SOC 4311. Race, Class, and the Politics of Nature. (3 cr; A-F only)
Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations.

SOC 4321. Globalize This! Understanding Globalization through Sociology. (3 cr; A-F or Aud. [GLOS 223, Prereq: Soc majors/minors must register A-F])

SOC 4411. Terrorist Networks and Counterterror Organizations. (3 cr; A-F only. Prereq: 1001 recommended)
Theories/evidence about origins, development, and consequences of terrorist networks. Efforts to prevent, investigate, and punish terrorists by use of law enforcement, security, and military forces.

SOC 4441. Work-Family Links. (3 cr; Stdnt Opt. Prereq: 1001 or #; soc majors/minors must register A-F)
Effects of spouses’ work experiences on family, organization of household work, adolescent employment, and occupational attainment. Changes in work organizations related to increasing prevalence of female employment and dual-earner families.

SOC 4451. Sport and Society. (3 cr; Stdnt Opt. Prereq: 1001 recommended, soc majors/minors must register A-F)
How sport is socially organized, what role(s) it plays in society, and what sporting practices tell us about contemporary social life in general.

SOC 4461. Sociology of Ethnicity and Racial Conflict. (3 cr; Stdnt Opt. Prereq: 1001 recommended; soc majors/minors must register A-F)

SOC 4511. Sociology of Youth: The Transition to Adulthood. (3 cr; Stdnt Opt. Prereq: 1001 or #; soc majors/minors must register A-F)

SOC 4521. Love, Sex, and Marriage. (3 cr; Stdnt Opt. Prereq: 1001 or #; soc majors/minors must register A-F)

Sexual attitudes, behaviors, and identities. Taken-for-granted beliefs about naturalness of sexual phenomena. How social forces shape sexual lives. Diversity of thought, behavior, and lived experience with regard to sexuality.

SOC 4601. Comparative Social Structure. (3 cr; A-F or Aud. Prereq: 1001 recommended)
Comparative analysis of selected societies. Differences/similarities in social structure, development, trends. Social class, status, political economy, policies, social movements, ethnic identities, multicultures, demography. Network models, Boolean analysis.

For a guide to course numbers, symbols, and abbreviations, see page 376.
SOIL 4511. Field Study of Soils. (2 cr; A-F or Aud. Prereq-2125)
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.

SOIL 5005. Lab and Field Techniques in Soil Science. (2 cr; A-F only. SOIL 4005. Prereq-2125)
Field/lab experiences for analysis of soils/landscapes. Students describe soils along a hillslope sequence, take soil samples, and perform a suite of chemical, biological, and physical soil analyses. Lab analytical techniques, safety, quality control issues.

SOIL 5111. Practicum Internship in Precision Agriculture. (2-5 cr [max 5 cr]; S or Aud)
Practical experience in precision agriculture in agri-industry/business. Content and extent of work at the internship site is jointly decided by the instructor, host business representative, and student’s principal adviser.

SOIL 5125. Soil Science for Teachers. (3 cr; Stdnt Opt. +SOIL 1125, SOIL 2125)
Basic physical, chemical, and biological properties of soil. Soil genesis classification and principles of soil fertility. WWW used for lab. Soil survey information used to make a land-use plan. Similar to 2125 with less emphasis on chemistry.

SOIL 5232. Vadose Zone Hydrology. (3 cr; Stdnt Opt. +Phys 1042 or equiv)
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.

SOIL 5311. Soil Chemistry and Mineralogy. (3 cr; Stdnt Opt. Prereq-[Phys 1022 or equiv], +Chem 1012 or equiv)

SOIL 5480. Special Topics in Land and Atmospheric Science. (1-4 cr [max 6 cr]; Stdnt Opt. Prereq-Sr or grad student)
Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

SOIL 5515. Soil Genesis and Landscape Relations. (3 cr; A-F or Aud. Prereq-2125 or #)
Basic soil morphology and soil profile descriptions; pedogenic processes and models of soil development; soil geomorphology, hydrology, and hillslope processes; digital spatial analysis; soil classification; soil surveys and land use; soil geography.

SOIL 5555. Wetland Soils. (3 cr; A-F or Aud. +ESPM 5555. Prereq-1125 or 2125 or equiv or # & 5511 recommended)
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.

SOIL 5611. Soil Biology and Fertility. (3 cr; Stdnt Opt. Prereq: 2125, Biol 1009 or equiv, Chem 1021 or equiv, sr or grad; BioC 3xxx recommended)

SOIL 5711. Forest Soils. (2 cr; Stdnt Opt. Prereq: 1125 or 2125)
Factors affecting tree growth; estimation, modification, and management effects on site productivity; regeneration.

Somali (SMLI)
Department of African American and African Studies
College of Liberal Arts

SMLI 1221. Beginning Somali. (5 cr; A-F only)
Comprehension, speaking, reading, writing.
SMLI 1222. Beginning Somali II. (5 cr; A-F only. Prereq: Somali I)
Comprehension, speaking, reading, writing.
SMLI 1225. Accelerated Beginning Somali I. (5 cr; A-F only. Prereq: Ability in basic spoken Somali)
Review of grammar/usage, practice in reading/writing. Introduction to Somali literature and formal writing. Topics in Somali culture.
SMLI 1226. Accelerated Beginning Somali II. (5 cr; A-F only. Prereq: 1225 or #)
Review of grammar/usage, practice in reading/writing. Introduction to Somali literature and formal writing. Topics in Somali culture.

Spanish (SPAN)
Department of Spanish and Portuguese
College of Liberal Arts

SPAN 144. Intermediate Medical Spanish. (0 cr; S-N or Aud. Prereq: 1st yr college-level Spanish or equiv, %)
Vocabulary of Spanish medical terms, skills in report writing, proper format for medical communications. Developing conversational fluency for medical-related topics.
SPAN 221. Reading Spanish. (0 cr; S-N or Aud)
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 Aud. Prereq: Span 0144, 2 yrs. Spanish College Level or equiv, %)
0 cr. Course designed to further develop and strengthen the language skills and cultural awareness students have been exposed to and acquired in Intermediate Span 0144, a course designed to help care professionals communicate with patients who speak Spanish.
SPAN 1001. Beginning Spanish. (5 cr; Stdnt Opt. Prereq: Less than 2 yrs of high school Spanish, %, no college-level Spanish)
Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings.
SPAN 1002. Beginning Spanish. (5 cr; Stdnt Opt. Prereq: 1001 completed at UMNTC, %)
Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings.
SPAN 1003. Intermediate Spanish. (5 cr; Stdnt Opt. Prereq: [1002 or 1022] or EPT placement)
SPAN 1004. Intermediate Spanish. (5 cr; Stdnt Opt. Prereq: 1004, 1044. Prereq: 1003 or EPT placement)
SPAN 1014. Business Spanish. (5 cr; Stdnt Opt. Prereq: 1004, 1044, 1003 or [%])
Vocabulary, report writing skills, proper format for business communications, conversational fluency on trade-related topics.
For students who have studied Spanish in high school or at a community college, or who are transfer students. Begins with an accelerated review of 1001 followed by material covered in 1002.
SPAN 1022. Beginning Medical Spanish. (4 cr; A-F or Aud)
Practical Spanish terminology, functional grammar, conversational fluency on medical-related topics.
SPAN 1054. Spanish for Heritage Students. (5 cr; Stdnt Opt. Prereq: EPT for diagnostic purposes)
Development of academic Spanish through reading/writing. Advanced grammar/orthography.
SPAN 1902. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq: Fr with no more than 30 cr)
Topics specified in Class Schedule.
SPAN 1904. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq: Fr with no more than 30 cr)
Topics specified in Class Schedule.
SPAN 1905. Freshman Seminar. (3 cr; A-F or Aud. Prereq: Fr with no more than 29 cr)
Topics specified in Class Schedule.
SPAN 1907W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq: Fr with no more than 29 cr)
Topics specified in Class Schedule.
SPAN 1910W. Freshman Seminar. (3 cr; Stdnt Opt. Prereq: Fr)
Topics specified in Course Guide.
SPAN 3015. Spanish Composition and Communication. (4 cr; Stdnt Opt. Prereq: 1004 or 1014 or 1044. LPE pass)
Comprehending written/spoken texts. Speaking, reading, writing beyond intermediate level.
Improving language skills for fluency/accuracy in Spanish.
SPAN 3022. Advanced Business Spanish. (4 cr; Stdnt Opt. Prereq: [1004 or 1014 or 1044 or equiv], LPE in Spanish or #)
Vocabulary of Spanish business terms, Skills in report writing, proper format for business/formal communications. Developing conversational fluency on trade-related topics.
SPAN 3044. Advanced Medical Spanish. (4 cr; Stdnt Opt. Prereq: [1004 or 1014 or 1044 or equiv]. LPE in Spanish or #)
How to communicate more effectively in linguistic/cultural terms with Spanish speaking patients. Students explore more advanced specific medical vocabulary, communication strategies, and related cultural aspects. Conducting patient interviews and medical history. Using vocabulary/conversation to conduct physical exams. Latin American views on health and health care.
SPAN 3104W. Introduction to the Study of Hispanic Literatures. (3 cr; A-F only. +TLDO 3104. Prereq: [3015 with grade of at least B-] or successful completion of 3021)
Structures, meaning, and social/historical function of diverse literary texts.
SPAN 3105W. Introduction to the Study of Hispanic Cultures. (3 cr; Stdnt Opt. Prereq: 3015 with grade of at least B-) or 3021)
Cultural issues pertaining to Spain or Spanish America.
SPAN 3107W. Introduction to the Study of Hispanic Linguistics. (3 cr; Stdnt Opt. +TLDO 3107. Prereq: [3015 with grade of at least B-] or 3021)
SPAN 3211. Discourses of Imperial Spain, 1492-1800. (3 cr; Stdnt Opt. +TLDO 3211. Prereq: 3104)
Novels, places, poems, aphorisms, emblems, letters, and political treatises. Questions of ethnicity, gender, class, colonization, early mass culture, and subjectivity.
SPAN 3212. Discourses of Modern and Contemporary Spain, 1800-Present. (3 cr; Stdnt Opt. Prereq: 3104)
Wide variety of texts. Questions of gender, class, subjectivity, representation, art, and politics.

For a guide to course numbers, symbols, and abbreviations, see page 376. 629

SPAN 3222. Discourses of Modern and Contemporary Latin America. (3 cr; Stdnt Opt. +TLDO 3222. Prereq-3104 or 3105) Late modern and contemporary discourses in literature, popular culture, mass media, and film.

SPAN 3401. Latino Immigration and Community Service. (3 cr; A-F only. Prereq-[3015 with grade of at least B-], LPE high pass) Service-learning. Global economic system and emigration from Latin America, human rights issues along the U.S./Mexican border, immigration reform, language issues, and Latino contributions to the United States. Societal/individual responsibility to create more inclusive/juvenile political, economic, and educational systems. 2.5 hour weekly seminar; 42 hrs of community service working with Latino immigrants, speaking mostly Spanish. Numerous interactions with Latino leaders in education, advocacy work, politics, and culture in class and visits to community organizations. Analysis of the portrayal of Latinos in the U.S. media. Two short persuasive papers. Project on immigration reform.

SPAN 3404. Medical Spanish and Community Health Service. (3 cr; Stdnt Opt. Prereq-3015 with grade of at least B- or 104,4 high pass on at least three sections of LPE) 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.

SPAN 3501. Roots of Modern Spain and Latin America. (3 cr; Stdnt Opt. +SPAN 3501H. Prereq-3105W) Historical/cultural events leading to nation building in early modern Spain and Spanish-speaking America.


SPAN 3510. Issues in Hispanic Cultures. (3 cr [max 9 cr], A-F or Aud. Prereq-3105W) Analysis of practices that have shaped cultural identity of Spanish or Portuguese-speaking areas. Topics vary.

SPAN 3512. Modern Latin America. (3 cr; A-F or Aud. Prereq-3105W) Impact of various forms of modernization on cultural production in Latin America racial, ethnic, class relations, institutional, and ideological structures.


SPAN 3653. Contemporary Latin and Latin American Drama Written in English. (3 cr; Stdnt Opt. Prereq-SPAN 1001 or equiv) Contextual, theoretical, and thematic contributions and formal dimensions of U.S. Latino theater. Issues of gender, identity, class, and cultural politics. Taught in English.

SPAN 3699. Study of Advanced Spanish Language Abroad. (1-5 cr [max 5 cr]; Stdnt Opt. Prereq-2 yrs college-level Spanish, %) Study of advanced Spanish language in a Spanish-speaking country.


SPAN 3702. Structure of Spanish: Morphology and Syntax. (3 cr; Stdnt Opt. +SPAN 3702H. Prereq-3107) Using linguistic concepts such as morpheme, flexional affix, noun phrase, subject, subordination, and coordination to identify different morphological/syntactic components of Spanish.


SPAN 3705. Semantics and Pragmatics of Spanish. (3 cr; Stdnt Opt. +SPAN 3705H. Prereq-3107) Introduction to systematic analysis of meaning. Focuses on importance that cultural/linguistic contexts have for interpretation of meaning.


SPAN 3707. Linguistic Accuracy Through Translation. (3 cr; A-F only. Prereq-3104 or 3105 or 3107) 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.

SPAN 3730. Topics in Hispanic Linguistics. (3 cr [max 9 cr]; A-F only. Prereq-3107) Topics specified in Class Schedule.

SPAN 3800. Film Studies in Spanish. (3 cr [max 9 cr]; A-F only. Prereq-3104W or 3105W) Films from Spain or Spanish-speaking world in their historical, (geo)political, and socio-economic contexts. Films analyzed under interdisciplinary frameworks, noting aspects related to cinematography/rhetorics.

SPAN 3910. Topics in Spanish Peninsular Literature. (3 cr [max 9 cr]; A-F or Aud. Prereq-3104) Focus on a central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in Class Schedule.

SPAN 3920. Topics in Spanish-American Literature. (3 cr [max 9 cr]; A-F only. +SPAN 3920H. Prereq-3104) Focuses on a central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in Class Schedule.

SPAN 3950. Figures in Spanish American Literature. (3 cr [max 9 cr]; A-F or Aud. +SPAN 3950H. Prereq-3104) One major writer or group of writers whose work has had an impact on thought, literature, or social problems. Figures are specified in Class Schedule.

SPAN 3970. Directed Studies. (1-4 cr [max 9 cr]; Stdnt Opt. Prereq-#, %, @) Guided individual reading/study in Hispanic linguistics, cultural studies, or peninsular, Latin American, or U.S. Latino theater or literatures.

SPAN 3972W. Graduation Seminar. (3 cr; A-F or Aud. +SPAN 3972W. Prereq-31 cr or 3xx, #) Completion of a research paper on cultural, literary, or artistic issue in Spanish or Portuguese speaking world or on topic related to Hispanic linguistics. In-depth research/consultation with instructor.


SPAN 5106. The Literature of the Reconquest and Feudal Spain. (3 cr; Stdnt Opt. Prereq-three 3xxx or 5xxx literature courses in Spanish)
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, social criticism, poetry, prose and novel. (exempla,” and the Celestina (1499-1502).

SPAN 5107. The Literature of the Spanish Empire and Its Decline. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Major Renaissance and Baroque works of the Spanish Golden Age (16th- and 17th-century poetry, fiction, prose, novel, drama) examined against the historical background of internal economic decline, national crisis, and ideological apparatus developed by the modern state.

SPAN 5108. Don Quixote. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Analysis of Cervantes’ Don Quixote in its sociohistorical context; focus on the novel’s reception from the romantic period to postmodern times.

SPAN 5110. Discursive Formations at the Threshold of 20th-Century Spain. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx literature courses in Spanish or #)
Theory and representative examples of the realist/naturalist novel (Galdos, Pardo Bazan) in the context of its antecedents (“costumbrismo”), opposites (the idealist/sentimental novel), and turn-of-the-century innovations of modernism and the “generation of 1898.”

SPAN 5111. Contemporary Spanish Literature. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx literature courses in Spanish or #)

SPAN 5211. Spanish Drama of the 17th Century. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Polemics surrounding public theater in 1600s. Analyses of texts in light of current approaches and methods. Specific approaches and methods. Specific approaches and methods.

SPAN 5212. Hispanic Literature of the United States. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx Spanish or Portuguese literature courses or #)
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.

SPAN 5211. The Structure of Modern Spanish Phonology. (3 cr; Stdnt Opt Prereq-3701, two 3xxx or 5xxx linguistics courses in Spanish or #)
Formulating and evaluating a phonological description of Spanish. Approaches to problems in Spanish phonology within metrical, autosegmental, and lexical phonological theories.

SPAN 5212. The Structure of Modern Spanish Syntax. (3 cr; Stdnt Opt Prereq-3702, two 3xxx or 5xxx Spanish linguistics courses or #)
Study and analysis of the principal constructions found in the syntax of Spanish.

SPAN 5215. The Structure of Modern Spanish Semantics. (3 cr; Stdnt Opt Prereq Three [3xxx or 5xxx] literature courses in Spanish or #)
Applying semantic theory to Spanish: conceptual organization and the structuring of experience; meaning and cultural values; semantic fields; categorization and prototypes; cognitive mental theory; metaphor, metonymy, and mental imagery as source and change of meaning.

SPAN 5256. Colonial Discourse in Spanish American Writing. (3 cr; Stdnt Opt Prereq-Three 3xxx or 5xxx literature courses in Spanish)
Discourse production in Spanish America between 1492 and 1700. Conquest and colonial writing/countermemory. Historical origin, evolution, and impact of cultural, political, and socioeconomic factors.

SPAN 5257. Nineteenth Century Latin America: Enlightened Thought, Nation Building, Literary Cultural Discourse. (3 cr; Stdnt Opt Prereq-Three [3xxx or 5xxx] literature courses in Spanish)

SPAN 5258. Latin American Cultural Integration in the Neocolonial Order. (3 cr; Stdnt Opt Prereq-Three 3xxx or 5xxx literature courses in Spanish or Portuguese or #)
Modernismo, historical vanguard, impact of populist politics in patterns of culture/literature/1900-50.

SPAN 5259. The Impact of Globalization in Latin American Discourses. (3 cr; Stdnt Opt Prereq -Three 3xxx or 5xxx literature courses in Spanish or #)

SPAN 5331. Hispanic Literary History of the United States. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx Spanish or Portuguese literature courses or #)
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.

SPAN 5717. Spanish Sociolinguistics. (3 cr; Stdnt Opt Prereq-Two 3xxx or 5xxx linguistics courses in Spanish or #)
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.

SPAN 5718. Spanish Language Contact. (3 cr; Stdnt Opt Prereq-Two 3xxx or 5xxx linguistics courses in Spanish or #)
Analysis of different varieties of Spanish language contact globally, taking into account varying social conditions under which contact occurs.

SPAN 5720. Topics in Spanish-American Studies. (3 cr [max 9 cr]; Stdnt Opt Prereq-Three 3xxx or 5xxx literature courses in Spanish or Portuguese)
Crucial moment or characters, works, or events marking beginning of new phase in literary/cultural landscape.

SPAN 5720. Directed Readings. (1-4 cr [max 9 cr]; Stdnt Opt. Prereq-MA or PhD candidate, #, %, @)
Students must submit reading plans for particular topics, figures, periods, or issues. Readings in Spanish and/or Spanish-American subjects.

SPAN 5785. Sociolinguistic Perspectives on Spanish in the United States. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx linguistics courses in Spanish or #)
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.

SPAN 5911. The Acquisition of Spanish as a First and Second Language. (3 cr; Stdnt Opt Prereq-three 3xxx or 5xxx linguistics courses in Spanish or #)
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.
Spanish and Portuguese (SPPT)

Department of Spanish and Portuguese

College of Liberal Arts

SPPT 5920. Selected Topics in Hispanic and Lusophone Cultural Discourse. (3 cr; max 9 cr; A-F or Aud. Prereq-Reading knowledge of Spanish and Port) 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.

SPPT 5999. The Teaching of College-Level Spanish: Theory and Practice. (3 cr; Stdtnt Opt. Prereq-Grad or #) 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.

Speech-Language-Hearing Sciences (SLHS)

Department of Speech-Language-Hearing Sciences

College of Liberal Arts

SLHS 1301V. Physics & Bio Honors. (4 cr; A-F or Aud) 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 1302. Rate Your World: Quantifying Judgments of Human Behavior. (3 cr; Stdtnt Opt) Basic quantitative methods as they apply to measuring human behavior. Mathematical principles applied to measuring behaviors such as rating personality/attention, evaluating infant speech perception, studying opinion polls, measuring voice/sound, quantifying speech recognition through cochlear implants. Lecture, hands-on activities.

SLHS 1401. Communication Differences and Disorders. (3 cr; Stdtnt Opt. & SLHS 3401) Disorders of spoken communication, their functional effect on quality of life for individuals with communication disorders. Intervention techniques for specific disorders of speech, language/hearing in context of social, cultural, linguistic diversity.

SLHS 1402. The Talking Brain. (3 cr; Stdtnt Opt) 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 1902. Freshman Seminar. (3 cr; A-F orAud. Prereq-Freshman) Topics vary. See Class Schedule.

SLHS 1905. Freshman Seminar. (3 cr; A-F or Aud)

SLHS 3301. Introduction to Acoustics. (3 cr; Stdtnt Opt) Elements of acoustics necessary to understand quantitative aspects of speech and hearing science, speech-language pathology, and audiology. Nature of sound, sound transmission, simple harmonic motion, sound intensity and pressure, complex waves, resonance and filtering, and distortion.

SLHS 3302. Anatomy and Physiology of the Speech and Hearing Mechanisms. (3 cr; Stdtnt Opt) Gross anatomy and basic physiology of the nervous, auditory, respiratory, laryngeal, velopharyngeal, and orofacial systems with emphasis on normal communication processes.

SLHS 3303. Language Acquisition and Science. (3 cr; Stdtnt Opt) Survey of typical language development, major theoretical perspectives about development. Applications of current theory to analysis of children’s language.


SLHS 3305W. Speech Science. (3 cr; Stdtnt Opt) Survey of theories, methods, and research in speech science. Speech acoustics, speech perception, speech production.


SLHS 3401. Communication Differences and Disorders. (3 cr; Stdtnt Opt. & SLHS 1401) Disorders of spoken communication, their functional effect on quality of life for individuals with communication disorders. Intervention techniques for specific disorders of speech/language/hearing in context of social, cultural, linguistic diversity.

SLHS 3402. Major Project in Speech and Hearing Science. (3 cr; S-N or Aud. Prereq-Jr or Sr CDIs or SLHS major) Seminar for completion of undergraduate major project.

SLHS 3555H. Honors Thesis. (1-2 cr [max 2 cr]; A-F or Aud. Prereq-See dir of undergraduate studies for [thesis adviser, forms]) Research/writing under direction of faculty member. Details of work are determined in consultation with faculty thesis adviser selected based on availability/topic.

SLHS 3900. Topics: Speech-Language-Hearing Sciences. (1-3 cr [max 3 cr]; Stdtnt Opt)

SLHS 3994. Directed Research. (1-12 cr [max 24 cr]; Stdtnt Opt. Prereq-Undergrad doing research)

SLHS 4301. Introduction to the Neuroscience of Human Communication. (3 cr; Stdtnt Opt) 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 Aud. Prereq-[[1401 or 3401], 3303, 3304, & 4301, 4801] or grad student or #) Introduction to clinical methods/issues in communication disorders. Professional/legal mandates, collection/analysis of clinical data, principles/models of intervention with adults/children, clinical reporting.

SLHS 4502. Atypical Speech and Language. (3 cr; Stdtnt Opt) Language conveyed through speech. Normal variation in speech/language that guides understanding of individual differences among speakers will be studied. Breakdowns in speech/language across lifespan in context of cultural/linguistic diversity.

SLHS 4602. Communication and Problem Behavior. (3 cr; Stdtnt Opt) Social/behavioral variables on young children’s propensity for problem behavior. Communication strategies that have been validated as a component in reducing problem behavior.


SLHS 5501. Fluency and Phonological Disorders. (3 cr; Stdtnt Opt. Prereq—Grad student or #) Description, nature, and treatment of fluency disorders in children/adults. Involvement in therapeutic/research activities.


SLHS 5603. Language and Cognitive Disorders in Children. (3 cr; Stdtnt Opt. Prereq—3305 or CDis 3305 or equiv or grad student or #) Language assessment, teaching procedures used with children/adolescents. Procedures apply to children who face language disabilities such as developmental delays, autism, learning disabilities.

SLHS 5605. Language and Cognitive Disorders in Adults. (3 cr; Stdtnt Opt. Prereq—[3302, 4301] or [CDis 3302, CDis 4301] or #) Neurogenic communicative and cognitive disorders in adults, including aphasia, right-hemisphere syndrome, traumatic brain injury, and dementia. Consideration of neurologic substrates, assessment and diagnosis, and clinical intervention.

SLHS 5606. Introduction to Augmentative and Alternative Communication. (3 cr; Stdtnt Opt) Description of the range of augmentative and alternative communication applications for persons with developmental and acquired disabilities.

SLHS 5607. Electronic Communication Aids. (3 cr; Stdtnt Opt. Prereq—5606 or #) SLHS 5803. Hearing Loss in Children: Diagnosis. (3 cr; Stdtnt Opt. Prereq—4801 or CDis 4801 or #) Behavioral, physiological approaches to assessment and identification, development of the auditory mechanism, etiologies of hearing losses in infants, children, selection of sensory aids, principles of case management with children and families.

SLHS 5804. Cochlear Implants. (3 cr; A-F or Aud. Prereq—[4802, 5801, 5802] or [CDis 4802, CDis 5801, CDis 5802] or #) 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 lifespan.


SLHS 5806. Auditory Processing Disorders. (2 cr; A-F or Aud. Prereq—[4802 or CDis 4802] Normal/disordered auditory processing abilities. Anatomy/physiology of central auditory pathway, assessments to evaluate auditory processing skills, techniques to address auditory processing weaknesses. Current/historical theories/controversies surrounding auditory processing assessment.


SLHS 5810. Laboratory Module in Audiology. (1-2 cr [max 5 cr]; Stdtnt Opt. Prereq—4801 or CDis 4801 or #) Intensive study of clinical methods in audiology. Supplements didactic courses in audiologic curriculum. Laboratory study, individually or in small groups.

SLHS 5820. Clinical Research and Practice: Grand Rounds. (1-6 cr [max 6 cr]; S-N or Aud. Prereq—4801 or CDis 4801 or equiv or #) Students participate in 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.

SLHS 5900. Topics: Communication Disorders. (1-3 cr [max 6 cr]; Stdtnt Opt) Topics listed in Speech-Language–Hearing Sciences office.

SLHS 5993. Directed Study. (1-12 cr [max 18 cr]; Stdtnt Opt. Prereq—#) Directed readings and preparation of reports on selected topics.

Sport Management (SMGT)

School of Kinesiology

College of Education and Human Development

SMGT 1701. Introduction to Sport Management. (2 cr; A-F or Aud) Scope/motive of the study of sport from sociological, psychological, historical, economic, and scientific perspective. Issues in sport.


SMGT 3111. Sports Facility and Event Management. (3 cr; A-F or Aud. Prereq—SMGT major or #) Aspects of managing sport facilities/events. Conceptualization of sports events. Event management process, budgeting, site selection, booking, ticketing, sponsorship.

SMGT 3143. Organization and Management of Sport. (3 cr; A-F or Aud. Prereq—SMGT major) Principles, policies, and procedures in administration/management of sports programs at interscholastic/intercollegiate levels.

SMGT 3421. Business of Sport. (3 cr; A-F or Aud. Prereq—SMGT or Kin or rec major or #) Financial aspects of sport. Revenue producing strategies, budget preparation/analysis, controlling expenses. Tax support, municipal bonds, ticket sales, concessions, merchandising. Media, fund raising.

SMGT 3501. Sport in a Diverse Society. (3 cr; A-F only) Relationship between sport and contemporary social institutions. Groups/individuals who have historically been marginalized or excluded from sport participation. Race, sex, social class, sexual orientation, physical disabilities.

SMGT 3601. Ethics and Values in Sport. (2 cr; A-F or Aud. Prereq—SMGT major or #) Violence, demonstrative behavior, sportsmanship. Ethical issues in playing of sport and in management/governance of sport industry.

SMGT 3631. Sport Marketing. (3 cr; A-F or Aud. Prereq—SMGT major or #) Fundamental theories/issues in sport marketing, grounded in traditional marketing principles. Unique applications to sport business industry.

SMGT 3632. Sport Sales and Fund-Raising. (3 cr; A-F only. Prereq—Sport Management major or #) Foundation of revenue production in sport management. Necessary skills related to revenue production and sales processes as they apply to the business of sport.
SMGT 3861. Legal Aspects of Sport. (3 cr; A-F or Aud. Prereq-SMGT major or #) U.S. legal system, its structure/terminology. Sport legal aspects of contract law, statutory law, constitutional law, intellectual property, negligence, risk management. Managerial analysis, decision making.

SMGT 3881W. Senior Seminar in Sport Management. (3 cr; A-F or Aud. Prereq-SMGT major, completion of major coursework, #) Presentations/discussions on sport-related topics of interest.

SMGT 3993. Directed Study in Sport Management. (1-3 cr; max 3 cr; A-F only. Prereq-Undergrad, #) Students work with faculty and graduate students on research, scholarly, or creative activities. Students assist with faculty scholarship or carry out projects under faculty supervision.

SMGT 3996. Practicum: The Sport Experience. (2-8 cr; max 8 cr; S-N only. Prereq-3881, SMGT major, #) Practical experience in one or more sport settings.

Statistics (STAT)

School of Statistics
College of Liberal Arts


STAT 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud) Topics specified in Class Schedule.


STAT 2022. Data Analysis. (4 cr; Stdnt Opt. Prereq-3011 or 3021) Practical survey of applied statistical inference and computing covering widely used statistical tools: multiple regression, variance analysis, experiment design, nonparametric methods, model checking and selection, variable transformation, categorical data analysis, logistic regression.


STAT 4893W. Senior Paper. (1 cr; Stdnt Opt. Prereq-Stat major) Either (1) paper on specialized area or (2) consulting project or (3) original computer program. Directed study.

STAT 4931. Topics in Statistics. (3 cr; Stdnt Opt) Topics vary according to student needs and available staff.

STAT 5021. Statistical Analysis. (4 cr; Stdnt Opt. +ESPM 3012, STAT 3011, ANSC 3011. Prereq--; 3011; College algebra or #; Stat course recommended) Intensive introduction to statistical methods for graduate students needing statistics as a research technique.

STAT 5031. Statistical Methods for Quality Improvement. (4 cr; Stdnt Opt. Prereq-[3021 or 3022 or 4102 or 5021 or 5102 or 8102], Math 1272) Random variability/sampling. Controlling statistical process. Seward/accumulative charting. Analyzing plant data, trend surface, and variance/design of experiments.


STAT 5201. Sampling Methodology in Finite Populations. (3 cr; Stdnt Opt. Prereq-3011 or 3021 or 5021 or #) Simple random, systematic, stratified, unequal probability sampling. Ratio, model based estimation. Single stage, multistage, adaptive cluster sampling. Spatial sampling.


STAT 5601. Nonparametric Methods. (3 cr; Stdnt Opt. Prereq-3022 or 4102 or 5021 or 5102 or #) Order statistics. Classical rank-based procedures (e.g., Wilcoxon, Kruskal-Wallis). Goodness of fit. Topics may include smoothing, bootstrap, and generalized linear models.

STAT 5931. Topics in Statistics. (3 cr; Stdnt Opt) Topics vary according to student needs and available staff.

STAT 5932. Topics in Statistics. (3 cr; Stdnt Opt) Topics vary according to students’ needs and available staff.

STAT 5993. Tutorial. (1-6 cr; max 12 cr; Stdnt Opt. Prereq-#) Directed study in areas not covered by regular offerings.
Comparative literature
Prereq- = CSCL 1201

Critical analysis of films, particularly as they emerge within context of mass culture. Determining discursive specificity of cinema, network of institutions that expose this discourse to other media discourses. Rudiments of film theory. Brief engagement with production.

SCMC 3001W. History of Cinema and Media Culture. (4 cr; Stdnt Opt)
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. Prereq- #)
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. Prereq-3201 or #) 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.

SCMC 3993. Directed Study. (1-3 cr [max 6 cr]; Stdnt Opt) Guided individual reading or study.

SCMC 4993. Directed Study. (1-3 cr [max 6 cr]; Stdnt Opt) Guided individual reading or study.


SCMC 5002. Advanced Film Analysis. (4 cr; A-F only) 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]; Stdnt Opt) Guided individual reading or study.

Sumerian (SUM)
Department of Classical and Near Eastern Studies


Sustainability Studies (SUST)
College of Food, Agricultural and Natural Resource Sciences

SUST 3480. Topics in Sustainability. (1-4 cr [max 24 cr]; A-F only) Topics in sustainability encompass special courses related to issues such as renewable energy, food and waste systems, sustainable planning, water and climate change.

SUST 4004. Sustainable Communities. (3 cr; A-F only. Prereq- [3003 or GLOS 3304. Prereq-Soph or jr or sr]) Introduction to interdisciplinary Sustainability Studies minor. Scientific, cultural, ethical, and economic concepts that affect environmental sustainability and global economic justice. Key topics. Participatory classroom environment.

Swahili (SWA)
Department of African American and African Studies
College of Liberal Arts

SWAH 3226. Intermediate Swahili II. (5 cr; Stdnt Opt. +SWAH 4226. Prereq-3225 or equiv) Continuation of skill development from 3225.


Swedish (SWED)
Department of German, Scandinavian, and Dutch
College of Liberal Arts

SWED 1001. Beginning Swedish. (5 cr; Stdnt Opt. +SWED 4001) 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; Stdnt Opt. +SWED 4002. Prereq-1001) Continues the presentation of all four language modalities (listening, reading, speaking, writing), with a proficiency emphasis. Topics include free-time activities, careers, and the Swedish culture.

SWED 1003. Intermediate Swedish. (5 cr; Stdnt Opt. +SWED 4003. Prereq-1002) Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.

SWED 1004. Intermediate Swedish. (5 cr; Stdnt Opt. +SWED 4004. Prereq-1003) 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.

Theatre Arts (TH)

Department of Theatre Arts and Dance

College of Liberal Arts

TH 1101V. Honors Section: Introduction to the Theatre. (4 cr; A-F only. Prereq-Honors) 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.

TH 1101W. Introduction to the Theatre. (4 cr; Stdnt Opt.) Introduction to art/craft of theatre. Appreciation/critical analysis of plays/performances. Examples of theatre’s diverse interactions with society considered from various cultural perspectives.

TH 1102. Drama and the Media. (3 cr; Stdnt Opt) Drama and cultural values implicit in media. Study of primary texts (biography, history, the novel, plays), video clips, and complete films. How the film medium shapes cultural identity.


TH 1112. Drama and the Media—Condensed Version. (3 cr; Stdnt Opt) Drama/cultural values implicit in media. Study of primary texts (biography, history, the novel, plays); video clips; complete films. How film/television shape collective cultural identity. Seven weeks.

TH 1301. Acting/Non-Majors. (3 cr; Stdnt Opt) Background/techniques of acting as viewed/practiced in theatre, society, and student’s own relationships.


TH 1322. Creating the Performance. (3 cr; Stdnt Opt. Prereq-1321 or &1321 or 1501 or &1501) 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.

TH 1361. Singing for Musical Theatre. (3 cr; A-F or Aud) Beginning singing, interpretation, part singing, phonetics, audition techniques. Solo/ensemble presentations at final class performance.

TH 1381. New Voices. (1 cr; S-N only. Prereq-[Fr or transfer] student from BFA actor training or BA or BFA dance or BA theater) Instructors lead students in four Saturday workshop intensives. Student forge interdisciplinary collaborations as they journey through their respective programs.

TH 1391. BFA Acting I. (3 cr; A-F or Aud. Prereq-Accepted into BFA acting program) Acting.

TH 1392. BFA Voice and Speech I. (2 cr; A-F or Aud. Prereq-Accepted into BFA acting program prog) Study/practice in breath centering/expansion; vocal resonance, musicality, placement; ear training; strengthening and making more flexible the muscles of speech.

TH 1393. BFA Movement I. (2 cr; A-F or Aud. Prereq-BFA-acting major) Focuses on building a foundation for further work in program.

TH 1395. BFA Acting II. (3 cr; A-F or Aud. Prereq-1391) Continuing the process of interpreting dramatic material.

TH 1397. BFA Movement II. (2 cr; A-F or Aud. Prereq-1393) 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.

TH 1904. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

TH 1905. Freshman Seminar. (3 cr [max 6 cr]; A-F or Aud. Prereq-Fr or fewer than 30 cr) Topics specified in Class Schedule.

TH 1909W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

TH 1910W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Freshman) Topics specified in Class Schedule.

TH 1911W. Freshman Seminar: Theatre, Entertainment With Attitude. (3 cr; A-F or Aud. Prereq-Fr with no more than 30 cr) Richness/diversity of live theatre as performance/text. Developing critical language/eye with which to think about live performance. Students attend performances at Twin Cities theatres. In-class discussions, talks with theatre/dance professionals.

TH 1950. Topics in Theater. (1-3 cr [max 6 cr]; Stdnt Opt) Topics specified in Class Schedule.

TH 2391. BFA Acting III. (3 cr; A-F or Aud. Prereq-BFA student in theatre arts) Applying concepts of first year of training to an ensemble performance project. Beginning of Shakespeare foundation unit.

TH 2393. BFA Movement III. (2 cr; A-F or Aud. Prereq-BFA student in theatre arts) Deepens/refines foundation laid in BFA Movement II.

TH 2396. BFA Voice and Speech IV. (2 cr; A-F or Aud. Prereq-BFA-acting, sophomore) 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.

TH 3100. Theatre Practicum. (1 cr [max 4 cr]; S-N or Aud. Prereq-1101; only two enrollments as actor may count toward a major) 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; Stdnt Opt) Study of traditional play structure, characterization, dialogue, dramatic action, and theme. Final project is a one-act play.


TH 3171. History of the Theatre: Ancient Greece Through Neo-Classicism. (3 cr; Stdnt Opt. Prereq-Th major or #) 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; Stdnt Opt. Prereq-Th major or #) Theatrical practices, staging conventions, dramatic structure of plays.

TH 3314. Text and the Actor. (3 cr; A-F or Aud. Prereq-1101, 1231, 1322) 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.


TH 3361. Introductory Musical Theater. (3 cr; A-F or Aud. Prereq-3361 or #) History of American musical theater. Videos/discussions, basic music theory, voice, dance, acting, audition techniques. Solo/ensemble presentations for public class performance.


TH 3391. BFA Acting V. (3 cr; A-F or Aud) 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 Aud) 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 Aud. Prereq-BFA student in theatre arts) Experiencing a foreign theatre culture/history, applying training to dramatic material of that culture.


TH 3398. BFA Rehearsal & Performance I. (2 cr; A-F or Aud. Prereq-BFA-acting jr) Continuing the application of process towards performance.

TH 3503. Design and Technical Production I: BFA. (3 cr; Stdnt Opt. Prereq-3513; BFA theatre arts student) Theory, process, and execution of design/technology from script to production on stage. Scenery/properties.

TH 3505. Design and Technical Production II: BFA. (3 cr; Stdnt Opt. Prereq-3515; BFA theatre arts student) Theory, process, and execution of design/technology from script to production on stage. Costumes/lighting.


TH 3531. Introduction to Theatrical Costume Design. (3 cr; Stdnt Opt. Prereq-TH 3571) Costume design process, including, researching, script analysis, the costume designer’s role throughout the production process, and design problems.


TH 3716. Stage Management. (4 cr; A-F only. Prereq-1501 or #) Production process, pre-production to maintaining/closing. Managing rehearsals, communication, conflict resolution. Individual/group projects: promptbook building, blocking notation, Cue placement/exeucation, scene breakdowns, creating/maintaining checklist, building a form library.


TH 3993. Directed Study. (1-6 cr [max 18 cr]; Stdnt Opt. Prereq-6 Th cr, #, @) Guided individual reading or study.

TH 4115. Intermediate Playwriting. (3 cr; Stdnt Opt. Prereq-3115 or (writing sample, #)) New methods of play construction. How characteristic plays from particular contemporary styles create original theatrical effects by using/breaking dramatic conventions. Writing exercises, workshoping of student plays.

TH 4177W. Survey of Dramatic Literature I: Strategic Interpretation. (3 cr; Stdnt Opt. Prereq-[[3171, 3172], [jr or sr]] or #) Basic principles of script analysis as applied to stage practice from traditional/postmodern approaches. Students read plays, critical perspectives. Discussion, critical writing, performance.

TH 4178W. Survey of Dramatic Literature II: Representation and Its Effects. (3 cr; Stdnt Opt. Prereq-[[3171, 3172], [jr or sr]] or #) In-depth look at how plays actively participate in production of social values and of society itself. Emphasizes consequences of choices theatre artists make.


TH 4391. BFA Intensive II. (2 cr; A-F or Aud. BFA-BFA student in theatre arts) Applying first three years of training toward performance. Seventh in sequence of eight. Acting, voice, and movement. Integrating the disciplines.

TH 4392. BFA Acting VIII. (7 cr; A-F or Aud. Prereq-4391) Application of first three years of training toward performance. Career preparation. Eighth in sequence of eight.


TH 4532. Makeup for the Actor. (2 cr; Stdent Opt) Topics vary. May include functions/aesthetics of stage makeup, application techniques, prosthetics, and facial hair.

TH 4550. Video Technology. (3 cr; Stdent Opt) Lighting, camera operation, audio, and recording for video/film production, using the state-of-the-art equipment in Studio B. Hands-on training in tools of video technology. Students create a final group project.


TH 4556. Digital Audio and MIDI for Performance. (3 cr; Stdent Opt) Hands-on computer/CPU-generated audio technology. Use of MIDI language protocol for performance in all aspects of the arts.


TH 4901. Senior Seminar. (2 cr; S-H or Audit. +DNCE 4901. Prereq-Sr, [Th or Dnce major]) Development of senior project, alone or in groups, under guidance of faculty members.

TH 4905H. Honors: Tutorial Seminar in Theatre Arts. (2-4 cr [max 4 cr]; A-F only. Prereq-4905; honors, theatre arts, %; limit (2 cr or [cum laude or magna cum laude]), 4 cr for summa cum laude) Independent reading/research in preparing honors thesis or selected creative project.

TH 5100. Theatre Practicum. (1-4 cr [max 20 cr]; Stdent Opt. Prereq-#; 4 cr of 3100 for undergrads) Individual creative projects in production of approved plays as an actor, director, dramaturg, or playwright. (See 5500 for design practicums.)


TH 5117. Performance and Social Change. (3 cr; A-F or Aud. Prereq-Jr or sr or grad student) 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.

TH 5179. Text and Performance. (3 cr; A-F or Aud. Prereq-[1321, [371 or 3712]] or grad student) 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.

TH 5182. Contemporary Black Theatre: 1960-Present. (3 cr; Stdent Opt. +AFRO 5182) Essays, plays, playwrights, and theatres that have contributed to contemporary Black theatre. From the beginning of the Black Arts Movement to the present.

TH 5330. Comedy: Advanced Physical Performance Studio. (3 cr; A-F only. Prereq-3331, #) 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.

TH 5340. Tragedy/Poetry: Advanced Physical Performance Studio. (3 cr [max 6 cr]; A-F only. Prereq-[3322, 3331, grad student] or #) Specific tragic/poetic paradigm in physical theater employed by Stanislavski, Grotowski, Brecht, Lecoq, etc. Psychological, emotional, technical, and physical work. Tragic action in Greek tragedy, Shakespeare, Melodrama, operatic characterization, Brecht. Original tragic/poetic work.

TH 5355. Puppetry: Techniques and Practice in Contemporary Theater. (3 cr; Stdent Opt. Prereq-[[3513 or &3513], #] or grad student) 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.

TH 5500. Theatre Design Practicum. (1-3 cr [max 20 cr]; Stdent Opt. Prereq-[Prereq 3515, #] or grad student) Individual projects in production of approved plays as a designer of scenery.properties, costumes, lighting, or sound. (See 5100 for other creative practicums.)


TH 5515. Design Composition and Collaboration. (3 cr; Stdent Opt. Prereq-grad or 3515, 3711, #) Classical composition of art and its application to stage design and directing through the collaborative process.

TH 5520. Scene Design. (3 cr [max 9 cr]; Stdent Opt. Prereq-3515 or grad or #) Conceiving/communicating design ideas in both two-dimensional sketches and three-dimensional models for theatre and allied venues. Drafting.

TH 5530. Costume Design. (3 cr [max 9 cr]; Stdent Opt. Prereq-3515 or grad or #) Theory and process of costume design for theatrical productions (e.g., dance, opera, film) through hypothetical productions.

TH 5540. Lighting Design for the Theatre. (3 cr [max 9 cr]; Stdent Opt. Prereq-3515 or grad or #) 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.

TH 5545. Stage Lighting Technology. (3 cr; Stdent Opt. Prereq-3515 or grad or #) The lighting technician’s skills and crafts: equipment, techniques, control operation, wiring, and maintenance.

TH 5550. Video Project. (3 cr [max 6 cr]; Stdent Opt. Prereq-[4550 or 4560 [preferred], #) Students participate in a video-shoot project serving in various positions, including camera operator, gaffer, grip, audio engineer, cast, and possibly director and director of photography.

TH 5553. Video Production Design and Aesthetics. (3 cr; Stdent Opt. Prereq-4553 or #) Use of technologies in video/film in making a statement or communicating an idea/emotion. Creativity, sensitivity to an audience. Students explore different creative uses of technologies/medium.

TH 5554. Audio Engineering. (3 cr; Stdent Opt. Prereq-4555, #) Miking/recording techniques specific to music/dramatic dialogue. Recording different styles of music. Hands-on recording of bands, doing final mixes to demo CD. Field trips to professional studios and club/concert recordings.

TH 5558. Audio Systems Analysis and Installation. (3 cr; Stdent Opt. Prereq-4555 or #) Analyzing, designing, developing specifications, and installing sound systems. Students work from client program lists, with given resources and given spaces, to arrive at best possible audio system. Hands-on experience.

TH 5559. Sound Design for Performance. (3 cr; Stdent Opt. Prereq-4555 or #) Audio technology/psychology, their impact on audience in a performance. Communication, design process, psychoacoustics, script analysis.


Toxicology (TXCL)

Veterinary Diagnostic Medicine

College of Veterinary Medicine

TXCL 3000. Directed Research in Toxicology. (1-4 cr [max 20 cr]; A-F or Aud. Prereq-#) Topics specified in Class Schedule.

TXCL 5011. Principles of Toxicology. (3 cr; A-F or Aud. Prereq-Grad) Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers.

TXCL 5545. Introduction to Regulatory Medicine. (2 cr; A-F or Aud. Prereq-Grad) Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market.

Translation and Interpreting (TRIN)

College of Continuing Education

TRIN 1201. Health Care Terms and Concepts for Interpreters. (3 cr; A-F or Aud) Technical vocabulary, oral discourse patterns used by healthcare providers in talking to patients, family members. Language of American health care interviews.


TRIN 3005. Principles of Translation. (3 cr; Stdnt Opt. Prereq-Fluent in English, proficient in a second language, not in CCE certificate prog in interpreting; basic knowledge of English grammar recommended) Key linguistic principles that help us understand how language makes meaning. Applying principles to translation.

TRIN 3101. Introduction to Interpreting. (3 cr; Stdnt Opt. Prereq-high level of proficiency in spoken English and another language) 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.


TRIN 4301. Interpreting in Legal Settings. (3 cr; A-F or Aud. Prereq-1301) Topics specified in Class Schedule.

TRIN 5900. Topics in Translation and Interpreting. (1-4 cr [max 16 cr]; Stdnt Opt) Topics specified in Class Schedule.

TRIN 5901. Topics in Translation and Interpreting. (1-4 cr [max 16 cr]; Stdnt Opt) Topics specified in Class Schedule.

TRIN 5903. Directed Study. (1-3 cr [max 3 cr]; Stdnt Opt) Directed study in translation/interpretation.

Turkish (TURK)

Department of Asian Languages and Literatures

College of Liberal Arts


TURK 1002. Beginning Turkish II. (5 cr; Stdnt Opt. +TURK 4002. Prereq-1001) Listening, speaking, reading, writing.
URBS 3201. Urban Studies Colloquium. (1 cr [max 4 cr]; A-F or Aud) Urban/metropolitan issues. Topics vary to reflect current concerns. In-depth reading, intensive group discussion.

URBS 3301W. American Cities As Settings for Cultural Diversity. (3 cr; Stdnt Opt) Explores cultural diversity in American cities, considering patterns of change and reasons for racial and class segregation and interaction. It foreshadows 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 Aud. Prereq-#) Links academic learning to actual urban problems/issues. Focuses on specific topic using local community as laboratory. Field work, contact with local institutions/agencies.

URBS 3751. Understanding the Urban Environment. (3 cr; A-F or Aud) 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) 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 3800. Topics in Urban Studies. (3 cr [max 6 cr]; A-F only) Topics specified in Class Schedule.

URBS 3861. Financing Cities. (3 cr; A-F only) Readings, lecture, discussion, coursework, Services/projects cities provide/finance. Ways in which developers/consumers participate in urban development through policies and financial challenges. Challenges cities face in determining budgets.

URBS 3871. A Suburban World. (3 cr; Stdnt Opt) Suburbs as sites of urban development, 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 Aud. Prereq-Sr, internship placement, %, #) Weekly seminar integrates internship experience with academic program.

URBS 3955W. Senior Paper Seminar. (2 cr; A-F or Aud. Prereq-#) Methods/resources for research. Substantial writing.

URBS 3993. Urban Studies Directed Study. (2-3 cr [max 6 cr]; A-F or Aud. Prereq-URBS majors, %, #) For students with a specific educational objective that cannot be satisfied through regular curriculum (e.g., foreign study) and for honors students to complete an honors opportunity.
URBS 5101. The City and the Metropolis: An Exploration. (3 cr; A-F only. Prereq-Grad student or [adv UrbS undergrad, #]) The City and the Metropolis as places that result from important acts of human creativity. Interdisciplinary/exploratory perspectives. Building/developing (North American) cities, Construction of "urban culture."

URBS 5861. Financing Cities. (3 cr; A-F only) Services/projects cities provide/finance. Ways in which developers/consumers participate in urban development through policies and financial tools. Challenges cities face in determining budgets.

Urdu (URDU)
Department of Asian Languages and Literatures
College of Liberal Arts

URDU 1102. Beginning Urdu. (5 cr; Stdnt Opt. Prereq-1101 or #) Basic listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

URDU 3132. Intermediate Urdu. (5 cr; Stdnt Opt. Prereq-3131 or #) Development of reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.


URDU 4003. Intermediate Urdu. (5 cr; Stdnt Opt. Prereq-4002 or 4002) Reading, writing, speaking, and listening. Grammar review, basic compositions, oral presentations.

URDU 4004. Intermediate Urdu. (5 cr; Stdnt Opt. Prereq-3131 or 4003) Reading, writing, speaking, and listening. Grammar review, basic compositions, oral presentations.

URDU 5990. Directed Research. (1-5 cr [max 10 cr]; Stdnt Opt. Prereq-#, %, @) Guided individual research.


Veterinary and Biomedical Sciences (VBS)
Veterinary Pathobiology
College of Veterinary Medicine

Veterinary Clinical Sciences (VCS)
College of Veterinary Medicine


VCS 4993. Directed Study in Veterinary Clinical Sciences. (1-6 cr [max 12 cr]; A-F only. Prereq-One-page proposal submitted to faculty member) Students expand their knowledge of a specific area. Final project evaluated by faculty member.

VCS 4994. Directed Research in Veterinary Clinical Sciences. (1-6 cr [max 12 cr]; A-F only. Prereq-One-page proposal submitted to faculty member) Students perform research in lab setting.

Veterinary Population Medicine (VPM)
Clinical and Population Sciences
College of Veterinary Medicine


Vietnamese (VIET)
Department of Asian Languages and Literatures
College of Liberal Arts


For a guide to course numbers, symbols, and abbreviations, see page 376. 641
Water Resources Science (WRS)
Water Resources Center

College of Food, Agricultural and Natural Resource Sciences

WRS 301. Water Policy. (3 cr; Stdnt Opt. Prereq-Grad student or #) Socio-cultural, legal, and economic forces that affect use of water resources by individuals/organizations. 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.


Work and Human Resource Education (WHRE)

Department of Educational Policy and Administration

College of Education and Human Development

WHRE 1301. Introduction to Career and Technical Education Teaching. (2 cr; A-F or Aud. Prereq-Occupationally certifiable individual) Entry-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.

WHRE 3015. Introduction to Strategic Planning Through Human Resources. (3 cr; A-F or Aud. Prereq) Processes organizations use when engaged in strategic planning. How to participate in planning, implementing, and evaluating strategic initiatives to improve performance.

WHRE 3120. Principles of Supervisory Management. (3 cr; Stdnt Opt) Introduction to the principles of supervision in education, business, industry, government, and service organizations.

WHRE 3121. Communication, Energy and Power, Transportation and Machinery Technologies. (3 cr; A-F or Aud) Instruction and laboratory experiences in communication, information, power, energy, and transportation technologies. Topics include power systems; transportation systems; information and communication systems; graphic communication and computer applications.


WHRE 3629. Foundations of Course Development for Business and Industry. (2 cr; A-F or Aud) Designing institutional 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.

WHRE 3661. Foundations of Instructional Methods for Business and Industry. (2 cr; A-F or Aud. +HRD 3661) Theory/practice in instructional methods/techniques for career/technical education (CTE) instructors and for human resources and development (HRD) professionals. How to deliver instruction using various teaching methodologies, select appropriate methodologies, and plan for their delivery.

WHRE 3990. Special Topics for Undergraduates in WHRE. (1-4 cr [max 12 cr]; Stdnt Opt) Course content varies by offering.

WHRE 4990. Special Topics: Professional Issues in WHRE. (1-4 cr [max 12 cr]; Stdnt Opt) Course content varies by offering.


WHRE 5031. Information Resources in Education. (3 cr; S-N or Aud) Sources of knowledge and search strategies for accessing library, electronic, institutional, and informal resources of interest to educators.

WHRE 5101. Introduction to Leadership and Administration of WHRE. (3 cr; Stdnt Opt) Finance, public relations, communications, legal aspects, leadership, personnel policies/management, program planning/development, evaluation. Inter-institutional collaboration of work and human resource education programs in school-based settings.

WHRE 5102. Leadership in WHRE. (2 cr; Stdnt Opt) Leadership, leadership roles/responsibilities. Application to work and human resource education.

WHRE 5121. Principles of Supervisory Management. (3 cr; Stdnt Opt) Introduction to the principles of supervision in education, business, industry, government, and service organizations.


WHRE 5411. Evaluation of WHRE. (3 cr; Stdnt Opt) Designing/conducting project, program, and systems evaluations in work and human resource education contexts/settings.

WHRE 5201. Family and Work Relationships. (3 cr; A-F or Aud) Examination of the interactions of work and family to prepare professionals to improve work and family relationships.


WHRE 5341. Global Program Delivery Techniques and Technology of Extension. (2 cr; A-F or Aud. +AFEE 5341) Special educational activities and teaching and communications methods and techniques for youth and adults, ranging from outreach to extension services, with an emphasis on youth and adult education programs in different global settings.

WHRE 5401. Distance Learning in Adult Education and Training. (3 cr; A-F or Aud) Distance learning concepts, theory, history, present practice, delivery systems, course design, major issues, future directions.
WHRE 5501. Organizational Learning. (3 cr; A-F or Aud)

WHRE 5511. Education for Work. (3 cr; Stdt Opt)
Examination of contextual bases underlying education for work; implications for practice.

WHRE 5522. Work-Based Learning Practices. (3 cr; Stdt Opt)

WHRE 5601. Student and Trainee Assessment. (2 cr; A-F or Aud. HRD 5601. Prereq.: BIE 5601)
Developing learning progress reporting systems and tests of knowledge, affect, and processes for programs focused on instruction of skills associated with business/industry. Evaluating instructional effectiveness. Applying tests and other evaluation instruments to assess/report learning in business/industry and career/technical education fields. Students develop each type of test and an overall evaluation plan for a course.

The theory of managing and consulting in human resource development and adult education. Includes a personal assessment of role requirements and experimentation with management and consultation processes and techniques.

WHRE 5629. Course Development for Business and Industry. (2 cr; A-F or Aud. +HRD 5629)
Designing instructional programs/courses that help learners develop desired competence. Designing instruction for performance based training and vocational/technical education. Developing course syllabus components that clarify course expectations. Developing academic/curriculum-based elements that complement course goals. Reflect on and compare performance-based instruction with other curriculum models for the field.

WHRE 5661. Instructional Methods for Business and Industry. (2 cr; Stdt Opt. Prereq-+HRD 5661 or BIE 5661)
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.

WHRE 5696. Teaching Internship: Introduction. (1 cr; S-N only. +CI 5924. Prereq-Admission to initial licensure program)
Initial experiences in teaching profession. Observation of school organization/ administration, seminars, relationships building with cooperating teachers, reflection on personal involvement as a beginning student teacher.

WHRE 5697. Teaching Internship: School and Classroom Settings. (2 cr; Stdt Opt. Prereq-5696 for initial licensure program)
Part-time supervised teaching experience in a school. Seminars on managing student’s learning in context of work and human resource education programs in contemporary schools and on becoming a reflective educator.

WHRE 5698. Teaching Internship. (3-8 cr [max 8 cr]; Stdt Opt. +AFEE 5698. Prereq-Admission to initial licensure program)
Teaching experience in a school system that provides programs for grades 5-12.

WHRE 5699. Teaching Internship: Extended. (1 cr; Stdt Opt. +CI 5927. Prereq-5698)
Extended student teaching experience in a school system that provides programs for grades 5-12.

WHRE 5771. Teaching Entrepreneurship: Small Business Management. (3 cr; Stdt Opt)
Methods, organization, curriculum development and modification, and implementation of educational programs for entrepreneurs.

Interagency planning issues/practices relating to special populations for educational, business, and human service organization personnel, family members, and advocates.

WHRE 5803. Developmental Writing and the College Student: Theory and Practice. (3 cr; Stdt Opt. Prereq-Bachelor’s degree)

Nature of diverse populations, their unique learning/training needs. Exemplary programs. Collaborative efforts among persons representing work and human resource education settings.

WHRE 5822. Diversity and Organizational Transformation in Work and Human Resource Education. (3 cr; Stdt Opt)
Developing models for understanding impact of diversity on individual, organizational, and community outcomes. Discussing organizational change in relation to diversity.

WHRE 5823. Program Planning and Improvement for Special Populations in Work and Human Resource Education. (2 cr; Stdt Opt)
Concepts, issues, and practices related to the design, implementation, and evaluation of efforts focused on developing new programs or modifying existing programs, in work and human resource education settings, for individuals with special learning needs.

WHRE 5901. Using Research in Work and Human Resource Education. (3 cr; Stdt Opt. Prereq-Grad student only)

WHRE 5990. Special Topics in Work and Human Resource Education. (1-4 cr [max 4 cr]; Stdt Opt)
Topics vary.

WHRE 5993. Directed Study in WHRE. (1-4 cr [max 4 cr]; Stdt Opt)
Self-directed study, with faculty advice, in areas not covered by regular courses.

Writing Studies (WRIT)

Department of Writing Studies
College of Liberal Arts

WRIT 1201. Writing Studio. (4 cr; A-F only. Prereq-Placement in WRIT 1201)

WRIT 1301. University Writing. (4 cr; A-F only. +ENGC 1011H, ENGC 1016, ENGC 1014, ENGC 1013, ENGC 1012, ENGC 1015, ENGC 1013H, ENGC 1014H, WRIT 1401, ENGC 1012H. Prereq-Placement in WRIT 1301)

WRIT 1401. Writing and Academic Inquiry. (4 cr; A-F only. +ENGC 1011H, ENGC 1016, ENGC 1014, ENGC 1013, ENGC 1012, ENGC 1015, WRIT 1301, ENGC 1013H, ENGC 1014H, ENGC 1012H. Prereq-Placement in WRIT 1401)
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.

WRIT 1905. Topics: Freshman Seminar. (3 cr; A-F only. Prereq-Fr)
Topics vary.

WRIT 1908W. Topics: Freshman Seminar. (3 cr; A-F or Aud. Prereq-Fr)
Topics specified in Class Schedule.

WRIT 1910W. Topics: Freshman Seminar. (3 cr; Stdt Opt. Prereq-Fr)
Topics vary.

WRIT 3001. Introduction to Scientific and Technical Communication. (2 cr; A-F or Aud)
Research origins/history. Defining technical communication in professional world. Focuses on audience, purpose, ethics, global communication, and collaboration. Journal articles, student/professional organizations, guest presentations, interviews. Career
assessment inventories, in-class/electronic discussions, oral presentations, feasibility report.

**WRIT 3029W. Business and Professional Writing.** (3 cr; Stdnt Opt. -ENGL 3029W. Prereq-Daily access to e-mail)
Practice writing for various purposes/audiences. Using styles, tones, and organizational elements. Potential genres include proposals, reports, Web content, e-mail, executive summaries, job search portfolios. Working collaboratively, issues of professional literacy.

**WRIT 3101W. Writing Arguments.** (3 cr; A-F or Aud)

**WRIT 3108. Gender and Ethnicity and the Rhetoric of Science and Technology.** (3 cr; Stdnt Opt. Prereq-soph or jr or sr or #)
How gender roles are affected by science/technology. Influence of gender roles on scientific/technological thinking (e.g., communication strategies, language, image). Values/goals of past/present scientific/technological communities.

**WRIT 3121W. Writing on Issues of Science and Technology.** (4 cr; A-F or Aud. Prereq-1301 or equiv)

**WRIT 3211W. Communication Modes and Methods.** (4 cr; Stdnt Opt. Prereq-soph or jr or sr or #)
Theories/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.** (3 cr; A-F or Aud. Prereq-soph or jr or sr)
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. Scientific and Technical Presentations.** (3 cr; Stdnt Opt. Prereq-COMM 1101 or #)
Oral presentation skills for scientific or technical topics. Visual communication, audience analysis, organizing a presentation, presenting complex material. Emphasizes use of computers.

**WRIT 3270. Special Topics.** (1-3 cr [max 3 cr]; Stdnt Opt)
See Class Schedule.

**WRIT 3291. Independent Study.** (1-3 cr [max 6 cr]; Stdnt Opt. Prereq-#, %)
Supervised reading and research on topics not covered in regularly scheduled offerings. Intended primarily for upper division undergraduate students.

**WRIT 3302. Science, Religion, and the Search for Human Nature.** (3 cr; Stdnt Opt. Prereq-Soph or jr or sr or #)
Relationship of religion and science as ways of explaining human nature/behavior. Focuses on 19th century: impact of Darwin's theory and historical study of Biblical texts. Existentialism and political ecology as modern efforts that problematize "human nature."

**WRIT 3315. Writing on Issues of Land and the Environment.** (3 cr; A-F or Aud. Prereq-Soph or jr or sr)
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 2000.** (3 cr; A-F or Aud. Prereq-Soph or jr or sr or #)
Literature (fictional, nonfictional) of social movements in the United States in last half of 20th century. Artistic truth in relation to historical truth. Roles/obligations of citizens to protest/change social structures.

**WRIT 3371. Technology, Self, and Society.** (3 cr; Stdnt Opt. Prereq-Soph or jr or sr or #)
Cultural history of American technology. Social values that technology represents in shifts from handicraft to mass production, consumption to modern transportation, communication, and bioengineering. Ethical issues in power, work, identity, and our relation to nature.

**WRIT 3381W. Writing and Modern Cultural Movements.** (3 cr; A-F or Aud)
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 3341. Editing, Critique, and Style.** (3 cr; A-F only. Prereq-Soph or jr or sr)

**WRIT 3347. Special Topics in Communication Skills.** (2 cr [max 6 cr]; Stdnt Opt)
Topics vary, see current Class Schedule.

**WRIT 3333. Roles of the Reader.** (3 cr; A-F or Aud. Prereq-Jr or sr or #)
Broad perspective on reading. Reading as a cognitive process, as strategic activity, as aesthetic experience, as central social practice. Historical, technological, social, and cultural conditions and contexts. Reciprocity between reading and writing.

**WRIT 3562W. Technical and Professional Writing.** (4 cr; A-F or Aud. Prereq-Jr or sr or #)
Written/oral communication in professional settings. Gathering information, analyzing audience, assessing conventional formats. Drafting, testing, revising documents. Oral presentation of final reports.

**WRIT 3577W. Rhetoric, Technology, and the Internet.** (3 cr; A-F or Aud. Prereq-Soph or jr or sr or #)
How the Internet is changing language, power to persuade, scientific/technical knowledge, and legal issues such as copyright, privacy, and free speech. How scientific and technical information is conveyed. Ethical issues.

**WRIT 3671. Visual Rhetoric and Document Design.** (3 cr; A-F or Aud. Prereq-Jr or sr)
Rhetorical principles applied to visual presentation of information/data in print documents. Students create examples of visual communication and design selected technical publications. Principles of technical writing.

**WRIT 3672. Project Design and Development.** (3 cr; A-F or Aud. Prereq-Jr or sr)
Studies project, plan, research, design, and develop technical communication print documents, including documentation, brochures, and newsletters. Workplace project processes. Develop production-quality documents.

**WRIT 3801. Rhetorical Theory for Writing Studies.** (4 cr; Stdnt Opt. Prereq-Soph or jr or sr or #)

**WRIT 3751W. Seminar: Theory and Practice of Writing Consultancy.** (4 cr; Stdnt Opt. Prereq-Currently working in a University writing center, instr consent)
How writers learn to write, how writing is taught in the academy, and how rhetorical conventions vary across disciplines.

**WRIT 4196. Internship in Scientific and Technical Communication.** (3 cr; S-N or Aud. Prereq-3560W, 24 cr in STC major)
Internships sites may include the University, industry, or government agencies. Internship proposal, progress report, internship journal (optional), final report with letter from internship supervisor.

**WRIT 4258. Information-Gathering Techniques in Scientific and Technical Communication.** (3 cr; A-F or Aud. Prereq-Jr or Sr or grad student or #)
Informational, employment-cycle, and problem-solving interviews. Guides, schedules, questioning techniques, communication theories. Descriptive statistics used to analyze data for various projects.

**WRIT 4320. Topics in Travel Writing.** (3 cr; A-F or Aud. Prereq-jr or sr or #)
Readings about travel, imaginary/historical, from different civilizations/periods. Colonialism, postcolonialism, aesthetics, tourism. Quality of scientific and social scientific methods/results. Topics listed in Class Schedule.

**WRIT 4431. Intersections of Scientific and Technical Communication and Law.** (3 cr; A-F only. Prereq-Jr or sr or grad student or #)
How issues in science/technology are affecting 21st century practice of law. Ownership, access, ethics, information, and technology used to frame topics. Intellectual Property, privacy, health law, research practice.
WRIT 4501. Usability and Human Factors in Technical Communication. (3 cr; Stdnt Opt. Prereq-Jr or sr or grad student or #) 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. Theory and Practice in International Business Communication. (3 cr; A-F or Aud. Prereq-3562W or equiv) Theories/practice in international/intercultural scientific, technical, and business communication. Cultural metaphors, research studies. Interviewing people from other cultures, including international business managers. Case studies.

WRIT 4573W. Writing Proposals and Grant Management. (3 cr; A-F or Aud. Prereq-[3562W or equiv], [I or sr] STC major or grad student) or #) Research funding sources. Interpreting RFP or program announcement. Letters of intent. Grant proposal development. Following guidelines of RFP or program announcement. Proposals for nonprofits or research/business. Using Microsoft Project.

WRIT 4662W. Writing With Digital Technologies. (4 cr; A-F or Aud. Prereq-Jr or sr or grad student or #) Creating multimedia, hypertext, online help, and Internet documents. Linear/nonlinear design, linking, reading/editing online. Projects in scripts, online support, and mark-up language.

WRIT 4980. Senior Seminar in Writing Studies. (3 cr; A-F only. Prereq-Major in [scientific/technical communication or writing studies], upper div) Research questions/topics in writing studies. Combines theory, history, and writing practice. Theme/problem in writing studies. Semester paper. Topics listed in Class Schedule.

WRIT 5001. Introduction to Graduate Studies in Scientific and Technical Communication. (3 cr; A-F only, Prereq-Grad student or #) History of technical communication. Different audiences, purposes, genres, and emerging trends. International/intercultural issues. Students participate within a community of technical communication professionals.


WRIT 5052. Graduate Research Presentations and Conference Writing for Non-Native Speakers of English. (3 cr; Stdnt Opt. Prereq-[Grad student, non-native speaker of English] or #) 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.

WRIT 5111. Information Design: Theory and Practice I. (3 cr; A-F or Aud. Prereq-Grad student or #) Audience analysis, media selection, message design through various theoretical perspectives, including cognitive/schema, social construction, feminist, intercultural theories. Usability testing, contextual inquiry as means to study effectiveness of messages.

WRIT 5112. Information Design: Theory and Practice II. (3 cr; A-F or Aud. Prereq-Grad student or #) Political, economic, social, and technical aspects of media selection and message design. Media analyses, scripts, budgets, treatments, project-design plans, interactive screens. Online design project.

WRIT 5196. Internship in Scientific and Technical Communication. (3-6 cr [max 6 cr], S-N or Aud. Prereq-STC grad or #) 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. (1-3 cr [max 3 cr]; A-F or Aud. Prereq-[ISTC or RSTC] [major or grad student]) #) Topics specified in Class Schedule.

WRIT 5291. Independent Study. (1-3 cr [max 3 cr]; Stdnt Opt. Prereq-9, %) Supervised reading/research on advanced projects not covered in regularly scheduled offerings.


WRIT 5531. Introduction to Writing Instruction: Composition Pedagogy. (3 cr; A-F or Aud. Prereq-Grad student) Pedagogical philosophy/methodology in composition, primarily first-year writing. Introduction to theories underlying teaching/tutoring with technology.

WRIT 5532. Writing Pedagogy Practicum. (1 cr [max 3 cr]; S-N only. Prereq-Grad student) Discussion/activities that support development of sound pedagogical practices. Practical details of classroom. Professionalization, theory/research.

WRIT 5534. Designing Technical Training for Intercultural Audiences. (3 cr; A-F or Aud) Select and research a training topic, write learning objectives and outcomes, set the conditions for learning, complete a comprehensive course outline, and one training module.

WRIT 5561. Editing and Style for Technical Communicators. (3 cr; A-F only. Prereq-[Grad student, knowledge of grammar/punctuation rules]) #) Proofreading, copyediting. Students use primarily electronic editing methods in assignments. Editors responsibilities, relationship to writer, and roles within an organization. Style guides, technical editing, ethical choices, editing in a global setting. Editing/style for visual design and online documents.

WRIT 5570. Minnesota Writing Project Directed Studies. (1-3 cr [max 9 cr]; A-F or Aud) Guided individual research into current theories/practices of writing and writing pedagogy.

WRIT 5664. Science Writing for Popular Audiences. (3 cr; A-F or Aud. Prereq-Rhet 3562 or #) How science is “translated” for popular audiences. Rhetorical theory used to critique popularized articles. Developing a heuristic for writing articles. Controversial issues surrounding movement from science as “science” to science as “popular.”

WRIT 5671. Visual Rhetoric. (3 cr; A-F only. Prereq-Jr or sr or grad student) Range/development of visuals, especially those in science/technology. Vocabulary for commenting on, criticizing, and creating visuals.

WRIT 5775. Major Figures in Rhetorical Tradition: Classical Period. (3 cr; A-F only) Classical theories of rhetoric. Epistemological status of rhetoric. Ethical implications of persuasion. Emphasizes “Aristotle’s Rhetoric” as founding document. Other figures (e.g., Plato, Isocrates, Cicero, Quintilian).


WRIT 5777. Rhetoric of Science. (3 cr; A-F only) Relationship between rhetorical theory/science. Readings typically include works by rhetoricians, sociologists, historians, and philosophers on role that rhetoric/language play in establishing scientific claims.

Youth Development and Research (YOST)

Youth Development and Research (YOST)

School of Social Work

College of Education and Human Development

YOST 1001. Seeing Youth, Thinking Youth: Media, Popular Media, and Scholarship. (3 cr; Stdnt Opt) 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 2001. The Everyday Lives of Youth. (4 cr; Stdnt Opt)

YOST 2002W. Introduction to Youth Studies: Understanding Youth, Young People, Youthood, and Youth Work. (4 cr; Stdnt Opt)
Introduces youth studies minor. Prepares students for more in-depth departmental offerings and for continued scholarship or later work with youth, directly or on their behalf.

YOST 2101. Urban Youth and Youth Issues. (4 cr; Stdnt Opt, Prereq-1001 or #)
What it is like to be a young person in a city, in the United States and worldwide.

YOST 2221. Experiential Learning. (4 cr; Stdnt Opt; YOST 5241. Prereq-[1001, 2001])
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.

YOST 3001. Introduction to History & Philosophy of Youthwork. (4 cr; Stdnt Opt; Prereq-2002W or #)
Foundations of youthwork. Where contemporary American youthwork stands, particularly in comparison with international perspectives on youth/youthwork.

YOST 3031. International Youthwork. (3 cr; A-F only; YOST 5031. Prereq-2002W or #)
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. Sociopolitical analysis of globalization, its impact on young people, youthwork, and youth policy worldwide.

YOST 3032. Adolescent and Youth Development for Youthworkers. (4 cr; Stdnt Opt; YOST 5032. Prereq-1001 or 2001 or 2002W or 2101, any [Psych or CPsy course])
Application of theory/research about children/adolescents. How findings can be used. How theories facilitate understanding of behavior.

YOST 3101. Introduction to Youthwork. (4 cr; Stdnt Opt; Prereq-One gen psy course, one gen soc course)
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.

YOST 3234. Youth Agencies, Organizations, and Youth Service Systems. (3 cr; Stdnt Opt; YOST 5234. Prereq-[Two soc/anth courses, work experience in youth [agency or org] or #)
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.

YOST 3235. Community Building, Civic Engagement, and Civic Youthwork. (4 cr; Stdnt Opt; YOST 5235. Prereq-[2001, One basic course in Pol, one basic course in Soc or #)
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.

YOST 3240. Special Topics in Youth Studies. (2-8 cr [max 10 cr]; Stdnt Opt; YOST 5240. Prereq-[Two social sci courses, exp working with youth] or #)
In-depth investigation of one area of youth studies. Teaching procedure/approach determined by specific topic and student needs. Topic announced in advance.

YOST 3291. Independent Study in Youth Studies. (1-8 cr [max 8 cr]; Stdnt Opt. Prereq-#)
Independent reading or research under faculty supervision.

YOST 4002W. Constructing Personal Models of Youth Scholarship and Youth Work. (4 cr; Stdnt Opt; Prereq-2002)

YOST 4160H. Honors Capstone Project. (2 cr; [max 4 cr]; A-F only. Prereq-YOST honors or #)
Individualizes the honors experience by connecting aspects of major program with special academic interests.

YOST 4196. Youthwork Internship. (4 cr; Stdnt Opt. Prereq-Declaration of youth studies major, #)
Supervised field learning in school-/community-based organizations/agencies. Emphasizes youthwork practice.

YOST 4301. Communicating With Adolescents About Sexuality. (3 cr; Stdnt Opt; Prereq-1001 or 2002W or #)
How to communicate sensitively/effectively with adolescents and their concerned persons about sexuality. In-depth investigation of one area of youth studies. Teaching procedure/approach determined by specific topic and student needs. Topic announced in advance.

YOST 4314. Theater Activities in Youthwork and Education. (2 cr; Stdnt Opt; YOST 5314. Prereq-1001 or 2101 or)

YOST 4315. Youthwork in Schools. (4 cr; Stdnt Opt; YOST 5315. Prereq-Introductory course in education or #)
Craft of youthwork as a framework to understand life-worlds of young people and a practice to enhance healthy development. How young people often divide their lives into artificial/harmful divide: schooll and out school.

YOST 4316. Media and Youth: Learning, Teaching, and Doing. (2 cr; Stdnt Opt; Prereq-1001 or 2101 or #)
How to use various media sources with young people to enhance their development and civic engagement.

YOST 4317. Youthwork in Contested Spaces. (3 cr; Stdnt Opt. Prereq-1001 or 2101 or #; 3101 recommended)
Consequences of ragnized violence on everyday lives/futures of youth. Violence in conflict/post-conflict societies. Role of youthwork under these circumstances.

YOST 4319. Understanding Youth Subcultures. (3 cr; Stdnt Opt. YOST 5319. Prereq-[1001, one basic course in [ANTH or SOC] or #)
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.

YOST 4321. Work with Youth: Individual. (2 cr; Stdnt Opt. YOST 5321. Prereq-1001 or 2101 or #)
Assumptions underlying individual work with youth. Issues/concerns of adolescents and of persons who work with them in one-to-one interactions.

YOST 4322. Work with Youth: Families. (2 cr; Stdnt Opt. YOST 5322. Prereq-1001 or 2002W or #)
Theories/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.

YOST 4323. Work with Youth: Groups. (2 cr; A-F only. YOST 5323. Prereq-[1001 or 2002W, 4321] or #)
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.

YOST 4324. Peer Helping: The Theory and Practice of Youth Helping Youth. (2 cr; Stdnt Opt. Prereq-1001 or 2101 or #; 4321 or 4323 recommended)
Experientially-based course. Starting/improving a peer helping program in schools or community-based organizations. Basic theory/concepts, program organizational issues, experiential student training, adult leadership skills.

Purpose, methods, and uses of program evaluation. How young people can develop/enhance programs and secure funding. Evaluation as political/moral imperative.

YOST 4401W. Young People’s Spirituality and Youthwork: An Introduction. (4 cr; Stdnt Opt; YOST 5401. Prereq-1001 or 2002W or #)
Adolescent spirituality, its relation to working with young people. Faith/spirituality as

926 Courses listed in this catalog are current as of April 2010. For up-to-date information, visit www.catalogs.umn.edu.
necessary for healthy youth development. Knowledge, attitudes, and skills to recognize spirituality in cultural, social, economic, and political worlds.

YOST 4402. Youth Policy: Enhancing Healthy Development in Everyday Life. (4 cr; Stdnt Opt. =YOST 4402. Prereq-[1001 or 2001, 2002W] or #) 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.


YOST 4411. Youth Research and Youth Program Evaluation. (5 cr; Stdnt Opt. Prereq-Basic research methods course or #) Field research practicum. Basic social science approaches to the study of youth. Evaluating youth programs. Students complete a simple youth-related research/evaluation study.

YOST 5031. International Youthwork. (3 cr; Stdnt Opt. =YOST 5031. Prereq-2222 or #) 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. Sociopolitical analysis of globalization. Its impact on young people, youthwork, and youth policy worldwide.


YOST 5101. Youth Work Practice I: Internship. (5 cr; Stdnt Opt. Prereq-3101, 5032 or equiv, &5111, #) First course of a sequential internship that includes 15 hours per week working with youth in a community youth-serving organization. Develop and enhance competence and identity as a youth worker, and reflect on and integrate knowledge about youth with on-going experience in youthwork.

YOST 5102. Youth Work Practice II: Internship. (5 cr; Stdnt Opt. Prereq-5101, &5112, #) Second course of a sequential internship that includes 15 hours per week of work with youth in a community youth-serving organization. Develop and enhance competence and identity as a youth worker, and reflect on and integrate knowledge about youth with ongoing experience in youth work.

YOST 5111. Youth Work Methods I: Seminar. (1 cr; Stdnt Opt. Prereq-5101, 5032 or equiv, &5101, #) Weekly discussion seminar taken concurrently with 5101 to integrate theory and praxis with youth work experience. Written and experiential assignments to increase knowledge, competency, and skills related to working with youth.

YOST 5112. Youth Work Methods II: Seminar. (1 cr; Stdnt Opt. Prereq-5111, &5102, #) Weekly discussion seminar taken concurrently with 5102 to integrate theory and praxis with youth work experience. Written and experiential assignments to increase knowledge, competency, and skills related to working with youth.

YOST 5234. Youth Agencies, Organizations, and Youth Service System. (3 cr; Stdnt Opt. =YOST 5234. Prereq-[Two soc/anth courses, work experience in [youth agency or org]] or #) Communities/governmental responses to young people as potential problems through agencies/programs and other organizational forms. Purpose, structure, activities of such forms. How forms are/are not integrated into youth service systems.

YOST 5235. Community Building, Civic Engagement, and Civic Youthwork. (4 cr; Stdnt Opt. =YOST 5235. Prereq-[2001, one basic course in Pol, one basic course in Soc] or #) 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.

YOST 5240. Special Topics in Youth Studies. (2 cr [max 10 cr]; Stdnt Opt. =YOST 5240. Prereq-Two social sci courses, exper working with youth or #) In-depth investigation of one area of youth studies. Teaching procedure and approach determined by topic and student needs. Topic announced in advance.

YOST 5241. Experiential Learning. (4 cr; Stdnt Opt. =YOST 2241. Prereq-[1001, 2001] or #) 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.

YOST 5291. Independent Study in Youth Studies. (1-8 cr [max 8 cr]; Stdnt Opt) Independent reading and/or research under faculty supervision.

YOST 5301. Communicating With Adolescents About Sexuality. (3 cr; Stdnt Opt. Prereq-[Upper div AdPy course, exper working with youth or #) How to communicate sensitively/efficiently 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.

YOST 5313. Direct Work with Adolescents. (2 cr; Stdnt Opt. Prereq-Two social sci courses, exper working with youth or #) Designed to give an understanding of direct work with troubled and at-risk adolescents in a wide range of settings where youth workers or social workers are typically involved. Emphasis on young people in groups in the “livespace” in everyday life, rather than in one-to-one office-based interactions.


YOST 5315. Youthwork in Schools. (4 cr; Stdnt Opt. =YOST 4315. Prereq-Introductory course in education or #) 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 schooltime and out of school.

YOST 5319. Understanding Youth Subcultures. (3 cr; Stdnt Opt. =YOST 4319. Prereq-2001 or one course each in [Anth, Soc] or #) 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.

YOST 5321. Work With Youth: Individual. (2 cr; Stdnt Opt. =YOST 4321. Prereq-1001 or 2002W or #) Basic assumptions underlying individual work with youth. Special issues/concerns of adolescents and of persons who work with them, especially those who work with youth in one-to-one interactions.


YOST 5323. Work with Youth—Groups. (2 cr; Stdnt Opt. =YOST 4323. Prereq-1001 or 2002W or #) 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.

YOST 5401. Young People’s Spirituality and Youthwork: an Introduction. (4 cr; A-F or Aud. =YOST 4401W. Prereq-[1001, one course each in [Anth, Soc, CPSy]) or #) Adolescent spirituality, its relation to working with young people. Faith/spirituality as actual/necessary aspects of healthy youth development. Research, active community-based programs. Knowledge, attitudes, and skills to meet adolescent needs/wants.

YOST 5402. Youth Policy: Enhancing Healthy Development in Everyday Life. (4 cr; Stdnt Opt. =YOST 4402. Prereq-[2001, one course each in [FSoS, PolSci, Soc]) or #) 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 are explored specific to student interests.