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, decision making, 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, 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 of chemically 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, teaching/learning styles, methods/perspectives of teaching, applications of teaching in various settings.

ADED 5101. Strategies for Teaching Adults. (3 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 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 5116. 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 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.

AHS 1101 Orientation to Health Careers (1.0 cr.; Student Option No Audit)
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 (1.0 cr.; Student Option No Audit)
Web course. Fall/spring=1cr, summer=2cr. Interest/personality assessment, health-related academic majors/professions, professionalism/ethics. Integrating self-/career-related information.
AHS 1104 Experiences in Health (2.0 cr.; Student Option; prereq AHS 1101 or AHS 1102 or AHS 1600)
Non-physician roles in health care from traditional to alternative and complementary roles. Minimum 35 hour volunteer experience with instructor approval.
AHS 1600 The Future Physician I: Medicine in the 21st Century (1.0 cr.; A-F Grade Basis; prereq #)
AHS 1601 The Future Physician II (1.0 cr.; Student Option; 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 (2.0 cr.; Student Option; prereq [1600 or 1601], #, 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 (1.0 cr.; A-F Grade Basis; 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 2400 Writing a Personal Statement (1.0 cr.; S-N Grading Basis)
Develop competitive personal statement. Designed for students in health program in coming year.
AHS 2707 Global Health Challenges for Future Health Professionals (2.0 cr.; A-F Grade Basis)
Global health issues. Challenges/opportunities in choosing a career as a health professional. Students hear from health professionals regarding their work relation to each health challenge.
AHS 2707H Global Health Challenges for Future Health Professionals (2.0 cr.; A-F Grade Basis)
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 (1.0-3.0 cr.; Student Option; 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)

ACCT 2050 Introduction to Financial Reporting (4.0 cr.; A-F or Audit; prereq Soph)
Introduction to financial accounting for U.S. organizations. Reading financial statements.
ACCT 2050H Honors: Introduction to Financial Reporting (4.0 cr.; A-F or Audit)
Introduction to financial accounting for U.S. organizations. Reading financial statements.
ACCT 3001 Introduction to Management
Accounting (3.0 cr.; A-F or Audit; 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 3150 Role of the Accountant in Today's Financial Function (1.0 cr.; S-N Grading Basis; prereq 2050, [accounting major or accounting certificate student])
How to interact with financial, tax, audit and IT personnel. How to be an accountant. Critical support role accountants play among market leading companies. Students define their vision for their accounting career.
ACCT 3199 Internship in Public Accounting (2.0 cr.; S-N or Audit; prereq 5125, #)
Full-time work for a public accounting firm plus a written report on the work experience.
ACCT 3201 Intermediate Management Accounting (2.0 cr.; A-F or Audit; 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 (2.0 cr.; S-N or Audit; 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 5101 Intermediate Accounting I (4.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; prereq 2050)
Financial/operational auditing. Standards. Managing the function.
ACCT 5135 Fundamentals of Federal Income Tax (4.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; prereq [5100/6100 or 3101], [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 (2.0 cr.; A-F or Audit; 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 5236 Introduction to Taxation of Business (2.0 cr.; A-F or Audit; 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 (2.0 cr.; S-N Grading Basis; 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 5281 Special Topics in Financial Reporting (2.0 cr.; A-F or Audit; prereq 5102, [mgmt or grad mgmt student])
Covers areas of financial reporting frequently covered on the CPA exam, including partnerships, foreign operations, and accounting for government and nonprofit organizations.

ACCT 5310 International Accounting (2.0 cr.; A-F or Audit; prereq 5101; [5102 or 5102])
Recommended Reading
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 (2.0 cr.; S-N Grading Basis)
Topics vary.

ACCT 5420 MAcc directed study (1.0-4.0 cr.; A-F or Audit; prereq MAcc student)
Internship or directed study in Master of Accountancy degree program.

Addiction Studies (ADDS)

ADDS 5007 Adolescence and Substance Abuse (2.0 cr.; A-F Grade Basis)

ADDS 5011 Foundations in Addiction Studies (2.0 cr.; A-F Grade Basis)

ADDS 5021 Introduction to Evidence Based Practices and the Helping Relationship (2.0 cr.; A-F or Audit)

ADDS 5031 Applied Psychopharmacology (2.0 cr.; A-F or Audit)
Categories of psychoactive drugs. Medicines to treat mental disorders. Substances such as alcohol, nicotine, cocaine, and marijuana. What occurs physiologically when someone takes a psychoactive drug.

ADDS 5041 Methods and Models I: Motivational Counseling (2.0 cr.; A-F or Audit; prereq 5021 or 5002 or %)
Concepts of Motivational Interviewing. Spirit of MI. Primary counseling skills. Wwrrkng with resistance. Identifying/elicitng change talk. Transitioning into change, negotiating a treatment plan. Strengths/shortcoming of MI.

ADDS 5051 Methods and Models II: Cognitive Behavioral Therapy (2.0 cr.; A-F or Audit; prereq 5021 or 5002 or %)
Components of cognitive model. Assessment, case formulation, automatic thoughts, core beliefs, cognitive restructuring, behavior change elements, therapeutic relationship. Students learn, practice and master key concepts.

ADDS 5061 Foundations of Group Work (3.0 cr.; A-F or Audit; prereq 5021 or 5002 or %)
Designing/facilitating therapy groups. Intra-/inter-personal dynamics, leadership skills, developmental aspects, ethical issues. Application to therapy of chemically addicted individuals. Lectures, discussion, experiential exercises, small groups, readings.

ADDS 5071 Foundations of Co-occurring Disorders (2.0 cr.; A-F or Audit; prereq Cannot be taken for credit by MSW students)
What is culture? How might culture, cultural practices, and history be significant in the use/abuse of substances? How is culture relevant to the attitudes/practices in the prevention/treatment of substance use/abuse? Multicultural counseling and cultural competence in addiction counseling. People as individuals. Clinician’s own cultural worldview/other cultural worldviews.

ADDS 5091 Assessment and Treatment Planning (3.0 cr.; A-F or Audit; prereq [5001 or 5011], [5002 or 5021], [5003 or 5031]) or %)
Core addictions counseling functions including clinical assessment, case management, documentation treatment planning, and ethical issues. Students begin process of securing internship.

ADDS 5101 Adolescents and Co-occurring Substance Use and Mental Health Disorders (2.0 cr.; A-F Grade Basis)
Adolescents/co-occurring substance use/mental health disorders.

ADDS 5950 Special Topics (1.0-4.0 cr.; A-F or Audit; prereq %)
Special topics in addiction studies.

ADDS 5993 Directed Study (1.0-3.0 cr.; Student Option; prereq %)
Directed study.

ADDS 5994 Directed Research (1.0-3.0 cr.; A-F Grade Basis; prereq %)
Directed research.

ADDS 5996 Internship in Substance Abuse Counseling (1.0-8.0 cr.; S-N or Audit; prereq 4001, ADDS or IBH student, #)
Supervised field work experience. Practical application of substance abuse counseling. Assessment, treatment planning, case management.

Adult Psychiatry (ADPY)
Medical School

ADPY 5515 Neuropsychology: University Hospitals (3.0-9.0 cr.; O-N or Audit)

Aerospace Engineering and Mechanics (AEM)

College of Science and Engineering

AEM 1905 Freshman Seminar: Aircraft and Spacecraft (2.0 cr.; Student Option No Audit; prereq Fr)
Topics related to air and space travel with an emphasis on hands-on projects and activities.

AEM 2011 Statics (3.0 cr.; A-F or Audit; prereq PHYS 1301W, [Math 2374 or equiv], CSE)

AEM 2012 Dynamics (3.0 cr.; A-F or Audit; prereq 2011, [Math 2373 or equiv], CSE)

AEM 2021 Statics and Dynamics (4.0 cr.; A-F or Audit; prereq Phys 1301W, [Math 2374 or equiv], CSE)

AEM 2301 Mechanics of Flight (3.0 cr.; A-F or Audit; prereq PHYS 1301W, [Math 2373 or equiv], CSE)
Standard atmospheric properties, basic aerodynamics, generation of lift/drag. Airfoils, infinite wings. Elements of aircraft performance and atmospheric flight mechanics. Introduction to MatLab and simulations for aircraft design.

AEM 3031 Deformable Body Mechanics (3.0 cr.; A-F or Audit; prereq [2011 or 2021 or BMEN 3001, BMEN major], Math 2374 or equiv, [Math 2373 or equiv], CSE)

AEM 3100 Software Applications in AEM (1.0 cr.; S-N Grading Basis; prereq [CSCI 1113 or equiv], BAEM upper division)
Topics covering software applications for problems of interest.

AEM 3101 Mathematical Modeling and Simulation in Aerospace Engineering (2.0 cr.; A-F Grade Basis; prereq [Math 2373 or equiv], AEM major)
Mathematical modeling of engineering systems/numerical methods for their solution. Use of MATLAB. Focus on systems found in aerospace engineering/mechanics.

AEM 4000H Honors Research Seminar (0.0 cr.; S-N Grading Basis; prereq Honors student,
AEM 4201 Fluid Mechanics (4.0 cr.; A-F or Audit; prereq 2012, [Math 2373 or equiv], [Math 2374 or equiv], [CSE upper div or grad student])

AEM 4202 Aerodynamics (4.0 cr.; A-F or Audit; prereq upper div CSE or grad, 4201)

AEM 4203 Aerospace Propulsion (4.0 cr.; A-F or Audit; prereq 4202, [CSE 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 4295 Problems in Fluid Mechanics (1.0-3.0 cr.; Student Option; prereq %)
Topics of current interest. Individual projects with consent of faculty sponsor.

AEM 4301 Orbital Mechanics (3.0 cr.; A-F Grade Basis; prereq [2012 or equiv], [MATH 2373 or equiv], [CSE upper div or grad student])

AEM 4303W Flight Dynamics and Control (4.0 cr.; A-F Grade Basis; prereq [2012, 2301, [WRIT 1301 or equiv], [CSE upper div or grad student]] or #)

AEM 4305 Spacecraft Attitude Dynamics and Control (3.0 cr.; A-F or Audit; prereq [4301, [4303W or ME 3281], CSE 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.

AEM 4305 Problem in Mechanics and Materials (1.0-3.0 cr.; Student Option; prereq %)
Topics of current interest. Individual projects with consent of faculty sponsor.

AEM 4311 Automatic Control Systems (3.0 cr.; A-F Grade Basis; prereq [4303 or equiv or ME 3281 OR EE 3015], [CSE upper div or grad student])

AEM 4312 Aerospace Systems Design (4.0 cr.; A-F Grade Basis; prereq [2301, 4202, AEM or #]
Multidisciplinary student teams perform conceptual designs of aerospace vehicles, components, missions, or systems that incorporate realistic constraints/applicable engineering standards. Papers on professional ethics/contemporary aerospace issues. Oral preliminary/critical design reviews.

AEM 4333 Aerodynamics Design: Special Projects (3.0 cr.; Student Option; prereq 4331 or #)
Student groups design, build, and test aerospace projects. Projects include designs from 4331 or projects such as microgravity experiments. Students keep design log/ notebook, prepare status reports, and give final oral presentation.

AEM 4371 Helicopter Aerodynamics (3.0 cr.; A-F Grade Basis; prereq 2301, 4202, 4303, [CSE upper div or grad student])
Review of basic aerodynamics, unique features of helicopters, momentum theory in axial flight and in rotor flow states, momentum theory in non-axial flight, blade-element theory, vortex theory, helicopter equations of motion. Design project.

AEM 4391 Independent Design Project (3.0 cr.; A-F Grade Basis; prereq 4331, %)
Individual design project construction and testing under the guidance of a faculty member. Projects may include designs from 4331 and group projects are allowed. Students are responsible for finding a faculty adviser for their project. Final project report (written or oral).

AEM 4495 Problems in Aerospace Systems (3.0 cr.; A-F Grade Basis; prereq CSE upper division, %)
Topics of interest or individual projects.

AEM 4501 Aerospace Structures (3.0 cr.; A-F or Audit; prereq CSE 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 (3.0 cr.; Student Option; prereq [Grade of at least C in 4501, [CSE upper div or grad student]] or #)

AEM 4511 Mechanics of Composite Materials (3.0 cr.; Student Option; prereq 3031, [CSE 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 (3.0 cr.; Student Option; prereq 3031, [Math 2373 or equiv], [Math 2374 or equiv], [CSE upper div or grad student])

AEM 4595 Problems in Mechanics and Materials (1.0-3.0 cr.; Student Option; prereq %)
Topics of current interest. Individual projects with consent of faculty sponsor.

AEM 4601 Instrumentation Laboratory (3.0 cr.; A-F or Audit; prereq CSci 1113, EE 3305, EE 3306, [upper div CSE or grad student])

AEM 4602W Aeromechanics Laboratory (4.0 cr.; A-F or Audit; prereq 4201, 4501, 4601, [WRIT 1301 or equiv], [CSE upper div or grad])

AEM 4796 Professional Experience (3.0 cr.; A-F or Audit; prereq CSE upper div, AEM major, %)
Work experience with substantive engineering component. Written report.

AEM 4894H Senior Honors Thesis (3.0 cr.; A-F Grade Basis; prereq Honors student, permission of University Honors Program, AEM major)
Writing thesis under direction of AEM faculty member.

AEM 4896 International Professional Experience (3.0 cr.; A-F Grade Basis; prereq CSE upper div. AEM major, %)
International work experience with substantive engineering component. Written report.

AEM 5245 Hypersonic Aerodynamics (3.0 cr.; A-F Grade Basis; prereq [Grad student or #])
Introduction to hypersonic flow. Importance/properties of hypersonic flow. Hypersonic shock and expansion-wave

AEM 5251 Computational Fluid Mechanics (3.0 cr.; A-F or Audit; prereq [4201 or equiv], [CSci 1113 or equiv], [CSE 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 (3.0 cr.; Student Option; prereq 4321 or EE 4231 or ME 5281 or equiv)

AEM 5333 Design-to-Flight: Small Uninhabited Aerial Vehicles (3.0 cr.; A-F Grade Basis; prereq [4202, 4303W, 4601] or equiv, #)
Designing, assembling, modeling, simulating, testing and flying of uninhabited aerial vehicles. Rapid prototyping software tools for vehicle modeling. Guidance, navigation, flight control, real-time implementations, hardware-in-the-loop simulations, flight tests.

AEM 5401 Intermediate Dynamics (3.0 cr.; A-F or Audit; prereq CSE 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 (3.0 cr.; A-F or Audit; prereq 4321 or EE 4231 or ME 5281 or equiv)

AEM 5441 Structural Dynamics (3.0 cr.; A-F or Audit; prereq 2012, 3031, [grad student or CSE upper div])
Frequency, time domain analysis of multi-degree 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 (3.0 cr.; A-F or Audit; prereq [[MATH 2243 or STAT 3021 or equiv], [4321 or EE 4231 or ME 5281 or equiv]] or #)

AEM 5495 Topics in Aerospace Systems (1.0-4.0 cr.; A-F or Audit; prereq %)
Topics of current interest. Individual projects with faculty sponsor.

AEM 5501 Continuum Mechanics (3.0 cr.; Student Option; prereq CSE 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 (3.0 cr.; A-F or Audit; prereq 4501 or equiv, Math 2263 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 5651 Aeroelasticity (3.0 cr.; A-F or Audit; prereq 4202, 4301, [grad student or CSE upper div])

Aerospace Studies (AIR)
Undergraduate Education Administration

AIR 1000 Leadership Laboratory (1.0 cr.; S-N or Audit)
Air Force customs and courtesies, drill and ceremonies, military commands, the environment of the Air Force officer, and learning about areas of opportunity available to commissioned officers. Interviews, guidance, and communication skills. Case studies.

AIR 1104 Introduction to the Air Force Today I (1.0 cr.; A-F or Audit)
Mission and organization of the Air Force, officer and noncommissioned officer core values, character development, and group leadership problems, and introduction to communication skills.

AIR 1105 Introduction to the Air Force Today II (1.0 cr.; A-F or Audit)
Structure and missions of the Air Force. Communication skills. How cadets are selected for the Professional Officer Course, categorization into specific career areas (pilot and navigator) occurs in the AFROTC junior year, and selection for specific career fields is made in a cadet's senior year.

AIR 1204 History of Airpower and Communication Skills (1.0 cr.; A-F or Audit)
Air Force heritage and leaders, Quality Air Force, and introduction to ethics, values, introduction to leadership, group leadership problems, and continuing application of communication skills.

AFRO 1023W Introduction to African World Literature (3.0 cr.; Student Option)
Literary voices from Africa, North America, and the Caribbean. Short fiction, prose, poetry, and drama that examines slavery, colonialism, and neo-colonialism. Oral narrative traditions, rites, rituals, customs. Personal/collective cultural
identities. Racial, gender, and class dynamics within cultural/social historical contexts.

AFRO 1201 Racial Formation and Transformation in the United States (3.0 cr.; Student Option)
How aggrieved racialized groups struggle over identity, culture, place, and meaning. Histories of racialization. Strategies toward rectification of historical injustices from dispossession, slavery, exploitation, and exclusion.

AFRO 1902 Freshman Seminar (3.0 cr.; Student Option; prereq Fr)
Topics specified in Class Schedule.

AFRO 1904 Freshman Seminar (3.0 cr.; A-F or Audit; prereq fewer than 30 cr)
Topics specific in Class Schedule.

AFRO 1909W Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr with no more than 30 cr)
Topics specified in Class Schedule.

AFRO 3001 West African History: Early Times to 1800 (3.0 cr.; Student Option)
West Africa from early times to establishment/ histories of states. Relations with North African, Mediterranean, Asian, and American worlds. Non-centralized political authority.

AFRO 3002 West African History: 1800 to Present (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit)

AFRO 3072 Racism: Social and Psychological Consequences for Black Americans (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 3112 In the Heart of the Beat: the Poetry of Rap (3.0 cr.; A-F or Audit)
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 3120 Social and Intellectual Movements in the African Diaspora (3.0 cr.; A-F or Audit)

AFRO 3131 Contemporary Issues in Africa (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
The history of South Africa from the Union to the present. Focus on such issues as African and Africana nationalism, structures of apartheid, forced population removals, divestment and sanctions, and the post-apartheid era.

AFRO 3251W Sociological Perspectives on Race, Class, and Gender (3.0 cr.; A-F or Audit)
Analytical overview of three major forms of inequalities in the United States today: race, class, gender. Focus on these inequalities as relatively autonomous from one another and deeply connected/intertwined with one another. Intersectionality key to critical understanding of these social forces. Social change possibilities.

AFRO 3301 The Music of Black Americans (3.0 cr.; Student Option)
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 3426 African Americans, Social Policy, and the Welfare State (3.0 cr.; Student Option)

AFRO 3431 Early Africa and Its Global Connections (4.0 cr.; Student Option)
Socioeconomic, political, and cultural development in precivilization Africa, from ancient Egypt through era of trans-Atlantic slave trade.

AFRO 3432 Modern Africa in a Changing World (4.0 cr.; Student Option)
Socioeconomic, political, and cultural development in Africa, from abolition of trans-Atlantic slave trade through postcolonial era.

AFRO 3433 General Survey of Development in Africa (3.0 cr.; Student Option; prereq APEC 1101 or ECON 1101)
Socioeconomic, political, and cultural development in Sub-Saharan Africa post-independence.

AFRO 3437 History of East Africa (3.0 cr.; A-F or Audit)
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 (3.0 cr.; Student Option)
Historical and contemporary perspectives of the relationship between the area of psychology and African Americans in research and practice.

AFRO 3591W Introduction to African American Literature (4.0 cr.; Student Option)
African American autobiography, fiction, essay, poetry, drama, and folklore from late-19th/early 20th century to present.

AFRO 3592W Introduction to Black Women Writers in the United States (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit)
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 (4.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

AFRO 3601W African Literature (3.0 cr.; Student Option)
Oral/written literature of 19th/20th centuries. Emphasizes literature written in English/French. All readings in English.

AFRO 3625W Black Women Writers in the Diaspora (3.0 cr.; Student Option)
Works of black women writers from Europe, Africa, South America, and the Caribbean.

AFRO 3626 Literature of African American Men: Sex, Family, and Relationships (3.0 cr.; A-F or Audit)
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 3628 Literature of Rebellion: the Amistad and other Revolts (3.0 cr.; A-F or Audit)
Amistad affair and other slave revolts in fictional/non-fictional texts. Nature of race/oppresion. Historical representation of these specific incidents as settled in American consciousness. Responsibilities/challenges presented to authors in terms of accuracy, commercial viability, and literary quality. Introduction to issues concerning African American slavery.
AFRO 3634 Blues: Dance & Rythm and Blues (3.0 cr.; Student Option)
Black American culture as expressed by blues and by rhythm and blues. Evolution of blues from work songs and field hollars of slavery/emanicipation 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 (4.0 cr.; Student Option)
Films by African filmmakers from West, Central, and Southern Africa. Aesthetic, theoretical, and sociocultural issues will be explored through class screenings and critical readings.
AFRO 3655 African American Cinema (3.0 cr.; Student Option)
African American cinematic achievements from silent films of Oscar Micheaux through contemporary Hollywood and independent films. Class screenings, critical readings.
AFRO 3741 People of Color and the Mass Media (3.0 cr.; A-F or Audit)
Past and present depictions of minority individuals and groups in movies, literature, radio/TV, etc., as seen against anthropological, psychological, and sociological knowledge and experience. Emphasis on personal and political effects of media depictions.
AFRO 3756 Social and Cultural History of Blacks in Sports (3.0 cr.; Student Option)
Social/cultural contexts surrounding eras of athletes such as Jack Johnson, Jackie Robinson, Joe Louis, Jesse Owens, Althea Gibson, Wilma Rudolph, Muhammad Ali, Michael Jordan, and Tiger Woods. Impact of these athletes on national/international events. Periods when it was not uncommon for black entertainers/athletes to become involved in politics and community activism.
AFRO 3864 African American History: 1619 to 1865 (4.0 cr.; Student Option)
Importance of dynamics of class, gender, region, and political ideology. Changing nature of race/racism.
AFRO 3865 African American History: 1685 to the Present (4.0 cr.; Student Option)
Internal migrations, industrialization/unionization, the Great Depression, world wars, large scale movements for social/political change.
AFRO 3866 The Civil Rights and Black Power Movement, 1954-1984 (3.0 cr.; Student Option)
AFRO 3868 Race, War, and Race Wars in American History (3.0 cr.; A-F Grade Basis) 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 African Diaspora (3.0 cr.; Student Option)
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 Environment and Society in Africa: Farmers, Food, and Famine (3.0 cr.; Student Option)
Topics specified in Class Schedule.
AFRO 3939 Directed Study (1.0-3.0 cr.; Student Option; prereq #, %, @) Guided individual research and study.
AFRO 4001 Seminar: History of Women in South Africa (3.0 cr.; Student Option) The changing role and status of women in South Africa from precolonial era to the present, and relationships to political, social, and economic development.
AFRO 4105 Ways of Knowing in Africa and the African Diaspora (3.0 cr.; A-F Grade Basis) Impact of European knowledge systems on African world. How peoples on African continent and across African diaspora have produced/defined knowledge. Continuity/change in the way African peoples have thought about and left their epistemological imprints upon the world.
AFRO 4231 The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr.; Student Option) 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 4478 Contemporary Politics in Africa and the Colonial Legacy (3.0 cr.; A-F or Audit) 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 (3.0 cr.; Student Option) Contextual readings of 19th- and 20th-century black novelists, including Chesnut, Hurston, Wright, Baldwin, Petry, Morrison, and Reed.
AFRO 4597 Seminar: Harlem Renaissance (3.0 cr.; Student Option; prereq African American & African studies major or minor) A multidisciplinary review of the Jazz Age's Harlem Renaissance: literature, popular culture, visual arts, political journalism, and major black and white figures.
AFRO 4622 Caribbean Writers: Rethinking Caribbean Literature in a World Context (3.0 cr.; Student Option) Literary/historical issues explored by Caribbean writers in English, French, and Spanish-speaking Caribbean through autobiographies, short stories, novels, poetry, and films.
AFRO 4632 Black Francophone Writers in Translation (3.0 cr.; Student Option) Exploration of ideas, particularly negritude and issues of creoleness, central to male and female writers in French from Africa and the Caribbean. Novels, essays, short stories, and plays.
AFRO 4800 African Studies Seminar (3.0 cr.; Student Option) Topics vary and reflect instructor's research interests. Topics specified in Class Schedule.
AFRO 4910 Historical Research Seminar: Sex and Colonial Power in Africa (1.0-3.0 cr.; Student Option) Topics specified in Class Schedule.
AFRO 4991W Thesis Research and Writing (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option) Racism and its effects on African Americans: definitions, determinants, and dynamics.
AFRO 5101 Seminar: Introduction to Africa and the African Diaspora (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit)

AFRO 5120 Social and Intellectual Movements in the African Diaspora (3.0 cr.; A-F or Audit)

AFRO 5181W Blacks in American Theatre (3.0 cr.; Student Option)
Historical survey of significant events in the development of African American theatre traditions. Essays, plays, playwrights, and theaters from early colonial references to the Black Arts Movement.

AFRO 5182 Contemporary Black Theatre: 1960-Present (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Ideological, political, religious, and cultural ties that have informed African American and black South African relations from late 18th century to present.

AFRO 5406 Black Feminist Thought in the American and African Diasporas (3.0 cr.; Student Option)
Critically examine spatiality of African descendant women in America/larger black diaspora. Writings from black feminist/queer geographies, history, contemporary cultural criticism. Recent black feminist theorizing.

AFRO 5437 History of East Africa (3.0 cr.; A-F or Audit)
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 5478 Contemporary Politics in Africa and the Colonial Legacy (4.0 cr.; A-F or Audit; prereq 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 5551 Methods: Use of Oral Traditions as Resources for History (3.0 cr.; Student Option)
Use of spoken information through time as a source for writing history. Use of canons of history to analyze and critique oral traditions and integrate them into written history.

AFRO 5625 Black Women Writers in the Diaspora (3.0 cr.; Student Option)
Works of black women writers from Europe, Africa, South America, and the Caribbean. Novels, drama, films, and essays.

AFRO 5701 Proseminar: Classic Works in African-American Studies (3.0 cr.; Student Option)

AFRO 5756 Social and Cultural History of Blacks in Sports (3.0 cr.; Student Option)
Social/cultural contexts surrounding eras of athletes such as Jack Johnson, Jackie Robinson, Joe Louis, Jesse Owens, Althea Gibson, Wilma Rudolph, Muhammad Ali, Michael Jordan, and Tiger Woods. Impact of these athletes on national/international events. Periods when it was not uncommon for black entertainers/athletes to become involved in politics and community activism.

AFRO 5864 Proseminar: African-American History (3.0-4.0 cr.; Student Option; 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 5865 Proseminar: African-American History (3.0-4.0 cr.; Student Option; prereq #)
Construction of a detailed research agenda, locating appropriate depositories of primary materials and secondary sources, and developing appropriate methodologies and frameworks.

AFRO 5866 The Civil Rights and Black Power Movement, 1954-1984 (3.0 cr.; A-F or Audit)

AFRO 5876 Proseminar: Approaches to African Development (3.0 cr.; Student Option)
Study, critical analysis, and comparison of primary documents relevant to African development.

AFRO 5910 Topics in African American and African Studies (3.0 cr.; Student Option)
Topics vary by instructor.

AFRO 5993 Directed Study (1.0-3.0 cr.; Student Option; prereq #)
Guided individual reading/study for qualified seniors and graduate students.

Agricultural Industries and Marketing (AIM)
College of Food, Agricultural and Natural Resource Sciences
AIM 4011 Student Project/Field Investigation (3.0 cr.; Student Option)
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)
College of Food, Agricultural and Natural Resource Sciences
AFEE 1001 Introduction to Agricultural Education and Extension (1.0 cr.; Student Option)
Historical development of the discipline of agricultural education; orientation to career opportunities; areas and expectations of specialization; issues in the field.

AFEE 1002 Principles of Career Planning for Agricultural Professionals (1.0 cr.; Student Option)
Self assessment and analysis of interests, skills, and abilities. Analyses of occupations, employment potential, employee expectations for work. Use informational interviews to examine career options and employment portfolio for career planning.

AFEE 2051 Current Technical Competencies (3.0 cr.; Student Option)
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 (1.0-3.0 cr.; A-F or Audit)
Observe schools, extension offices, and agricultural oriented businesses to learn about the work and workplaces in agricultural education.

AFEE 2221 People Skills for Leadership (3.0 cr.; A-F or Audit)
How to be an effective leader in profit/non-profit agricultural settings. Roles, responsibilities, knowledge, attitudes, and skills to hire staff, set goals, coach, mentor/manage teams, and improve communication.

AFEE 2421 Professional Communication for Agricultural, Food, and the Environment (3.0 cr.; A-F or Audit)
Speaking/writing about scientific/technical issues. Student-centered, relies on interaction/participation. Public communication.

AFEE 3096 Experiential Learning: Production and Business (1.0-8.0 cr.; Student Option; prereq AgEd major, #)
Experiential learning in agricultural production and business. Planned, organized, monitored, and evaluated based on a per-experience diagnosis of learning prerequisite to higher
level courses in technical agriculture and agricultural business.

**AFEE 5112 Building Construction Technology** (3.0 cr.; A-F or Audit)
Instructional lab exercises in light frame building construction. Site layout, foundations, framing, plumbing, insulating, sheathing, roofing. Emphasizes safety and use of modern tools, materials, and prefabricated components.

**AFEE 3361 World Development Problems** (3.0 cr.; Student Option)

**AFEE 4221 Rural Leadership Development** (3.0 cr.; Student Option)
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** (4.0 cr.; Student Option)
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** (3.0 cr.; Student Option)
Development of community school program in agriculture, agribusiness, and environmental science. Program to meet graduation outcomes and determine student needs.

**AFEE 5114 Agricultural Education Teaching Seminar** (1.0 cr.; Student Option)
Reflective learning on teacher preparation experience; identify issues and problems facing the discipline; needs for continual preparation and program adjustment.

**AFEE 5116 Coordination of SAE Programs: Work-based Learning** (2.0 cr.; A-F or Audit; prereq Agricultural education major or #)

**AFEE 5118 Strategies for Managing and Advising the FFA Organization** (2.0 cr.; A-F or Audit; prereq Agricultural education major or #)
Principles/techniques to advise an FFA organization. Philosophy, organization, and administration of instruction in agricultural education programs at the elementary, middle, and high school levels.

**AFEE 5233 Advanced Procedures in Teaching Agricultural Education** (2.0 cr.; A-F or Audit)
New developments in methodology; assessment of innovations and procedures; consideration of various levels of instruction.

**AFEE 5235 Advanced Supervised Agricultural Experience Programs** (2.0 cr.; Student Option)
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 5280 Current Issues for the Beginning Agricultural Education Teacher** (1.0-3.0 cr.; Student Option)
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 5290 Seminar: Current Issues in Agricultural Education and Extension** (1.0-3.0 cr.; Student Option)
Exploration of current issues in agricultural education and extension, strategies of response, implications of response actions, and related leadership roles.

**AGRO 3131 Student Organic Farm Planning, Rural Landscapes** (3.0 cr.; A-F or Audit)
Philosophy, organization, and administration of instruction in agricultural education programs at the elementary, middle, and high school levels.

**AGRO 51101 Biology of Plant Food Systems** (4.0 cr.; Student Option)
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 51103 Crops, Environment, and Society** (4.0 cr.; Student Option)
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/Experience in Agroecosystems Analysis** (2.0 cr.; A-F or Audit; 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 1901 Topics: Freshman Seminar** (1.0-3.0 cr.; A-F or Audit; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

**AGRO 1942 Topics: Freshman Seminar** (3.0 cr.; A-F or Audit; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

**AGRO 2501 Plant Identification for Urban and Rural Landscapes** (2.0 cr.; Student Option; prereq Biol 1003 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** (3.0 cr.; Student

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
AGRO 3203W Environment, Global Food Production, and the Citizen (3.0 cr.; Student Option)
Ecological/ethical concerns of food production systems in global agriculture: past, present, and future. Underlying ethical positions about how agroecosystems should be configured. Decision cases, discussions, videos, other media.

AGRO 3660 Plant Genetic Resources: Identification, Conservation, and Utilization (3.0 cr.; A-F Grade Basis; prereq Introductory biology)

AGRO 4005 Applied Crop Physiology and Development (4.0 cr.; Student Option; prereq [Chem 1011 or Chem 1021 or equiv], 8 cr in [biol or plant science])
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 (1.0-4.0 cr.; Student Option; 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 (1.0-3.0 cr.; S-N or Audit; 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 (1.0-6.0 cr.; A-F Grade Basis; prereq Jr or sr)
Research/thesis conducted under supervision of CFANS faculty member. Written thesis describing research results. Thesis research conducted under the supervision of a CFANS faculty member. Written thesis describing research results.

AGRO 4103 World Food Problems (3.0 cr.; Student Option; prereq Jr or sr or grad)
Multidisciplinary 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 (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 4005, [Bio 3002 or equiv], Soil 2125, [Agro 2501 or Hort 1011])
Ecology, management 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 (3.0 cr.; Student Option; prereq 3005, Soil 3416, [2501, Ent 3001, PIPa 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 (3.0 cr.; Student Option; 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 (2.0 cr.; A-F or Audit; prereq 4096)
Complexities of agricultural issues. Exercises/discussions integrating previous educational situations. Linked to undergrad internships and experiential learning opportunities such as thesis or directed studies or service learning. Written/oral assignments.

AGRO 4888 Issues in Sustainable Agriculture (2.0 cr.; Student Option; prereq 1103, Soil 1125 or 2125 or equiv) Agroecology, sustainable practices, production economics, environmental quality, holistic resource management, healthy food/water, rural communities. Meet sustainable-agriculture advocates, including farmers, faculty, and representatives of non-profit sustainable-agriculture organizations.

AGRO 5121 Applied Experimental Design (4.0 cr.; Student Option; 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.

AGRO 5131 Student Organic Farm Planning, Growing, and Marketing (3.0 cr.; Student Option; prereq [1101, 1103, BIOL 1001, BIOL 1009, HORT 1001] or #)
Students plan/implement cropping/marketing strategies for organic produce/flowers from Student Organic Farm on St. Paul campus.

AGRO 5311 Research Methods in Crop Improvement and Production (1.0 cr.; S-N or Audit; prereq applied plant sciences grad) Demonstrations and discussions of techniques in crop improvement and/or production research. Presentations integrate biotechnology with traditional breeding methods; production sessions emphasize ecologically sound cropping systems.

AGRO 5321 Ecology of Agricultural Systems (3.0 cr.; A-F or Audit; prereq [3xxx or above] course in [Agro or AnSc or Ent or Hort or PIPa or Soil] or #)
Ecological approach to problems in agricultural systems. Formal methodology of systems inquiry are developed/applied.

AGRO 5980 Publishing in Plant Science Journals (2.0 cr.; S-N Grading Basis; prereq #) Organizational/writing skills for reporting research results in a peer-reviewed journal manuscript. Publication process; choosing your journal; characteristics of good scientific writing; ethics, plagiarism, and authorship; stating your objectives; writing the different components of a manuscript; citing literature; use of tables and figures; proofreading. Written manuscript ready for submission to a plant science journal.

AGRO 5999 Special Topics: Workshop in Agronomy (1.0-6.0 cr.; Student Option; prereq Jr or sr or grad student)
Workshops on various topics in agronomy and plant genetics. Presenters/faculty may include guest lecturers/experts. Topics specified in Class Schedule.

American Indian Studies (AMIN)

AMIN 1001 American Indian Peoples in the United States (3.0 cr.; Student Option) Introduction to how voices/visions of indigenous peoples have contributed to history of cultural expression in North America. Historic contexts/varieties of this expression by region, tribal cultures. Emphasizes contributions in literature, philosophy, politics, fine arts.

AMIN 1002 Indigenous Peoples in Global Perspective (3.0 cr.; A-F or Audit)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
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<td>AMST 1906</td>
<td>Freshman Seminar</td>
<td>3.0</td>
<td>3.0</td>
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<td>The United States since September 11</td>
<td>3.0</td>
<td>3.0</td>
<td>A-F or Audit</td>
<td>prereq freshman</td>
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<tr>
<td>AMST 1908</td>
<td>Bodies and Their Discontents</td>
<td>3.0</td>
<td>3.0</td>
<td>A-F or Audit</td>
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<tr>
<td>AMST 3001</td>
<td>Contemporary Perspectives on Asian America</td>
<td>3.0</td>
<td>3.0</td>
<td>A-F or Audit</td>
<td>prereq freshman</td>
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<td>AMST 3003</td>
<td>Public History</td>
<td>3.0</td>
<td>3.0</td>
<td>A-F or Audit</td>
<td>prereq [(AMST jr or sr), #]</td>
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</table>

**American Sign Language (ASL)**

- **ASL 1701 American Sign Language I** (5.0 cr.; Student Option)
  - First of a 4-course sequence. American Sign Language (ASL), cultural values/rules of behavior of Deaf community in the United States. Receptive/expressive readiness activities, sign vocabulary, grammatical structure, receptive/expressive fingering, aspects of Deaf culture. Lab sessions.

- **ASL 1702 American Sign Language II** (5.0 cr.; Student Option; prereq 1701 with grade of at least [S or C-] or %)

- **ASL 1703 American Sign Language III** (5.0 cr.; Student Option; prereq 1702 with grade of at least [S or C-] or %)

- **ASL 1704 American Sign Language IV** (5.0 cr.; Student Option; prereq 1703 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 fingering, aspects of Deaf culture. Lab sessions.

- **ASL 3705 Cultural Perspectives of Deafness** (3.0 cr.; Student Option)
  - 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 3800 ASL Independent Study: Extended Study** (1.0-3.0 cr.; S-N Grading Basis; prereq Completion of or #3704)
  - Tutoring/supporting ASL instruction. Social/academic situations. Trained in tutoring by SMART Learning Commons.

**American Studies (AMST)**

- **AMST 1011 Religions and American Identity in the United States from World War II to the Present** (3.0 cr.; Student Option)
  - Political/cultural watersheds of last 60 years. Changing ideas about religion. Debates within/ between religious traditions/communities. How gender, race, class, and sexuality have shaped relationships between religion and politics. Tensions between secularism and religiosity and liberalism and fundamentalism. Ways in which religion has acted as both a progressive and a conservative political force.

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
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 (3.0 cr.; Student Option) 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 3117 Latinos in America's Global Cities (3.0 cr.; Student Option) Relations between Latin/o immigration and development of America's global cities. Theoretical foundation for understanding global cities. Similarities/differences among socio-political trajectories and cultural practices of Latin/o communities.

AMST 3212 Dissident Sexualities in U.S. History (3.0 cr.; A-F or Audit; prereq AmSt Jr or sr or #) History of sexuality in the United States. Emphasizes sexualities that have challenged dominant social/cultural norms. Development of transsexual, bisexual, lesbian, and gay identities/community. Politics of sex across lines of race/ethnicity. Historical debates over controversial practices, including sex work.

AMST 3252W American Popular Culture and Politics: 1900 to 1940 (4.0 cr.; Student Option) Historical analysis of how popular artists represent issues of gender, race, consumerism, and citizenship. How popular artists define boundaries of citizenship and public life: exclusions/exclusions in polity and national identity. How popular arts reinforce/alter political ideologies.


AMST 3402 American Indians and the Cinema (3.0 cr.; Student Option) 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.

AMST 3632W Jewish Women in the United States (3.0 cr.; Student Option) 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 3713 Lands and Homelands in the American Indian Great Lakes (3.0 cr.; Student Option) 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.

AMST 3920 Topics in American Studies (1.0-5.0 cr.; Student Option) Topics specified in Class Schedule.

AMST 3933 Directed Studies (1.0-9.0 cr.; Student Option; prereq #) Guided individual reading or study.

AMST 4101 Gender, Sexuality, and Politics in America (3.0 cr.; Student Option) Ways public and private life intersect through the issues of gender, sexuality, family, politics, and public life: ways in which racial, ethnic, and class divisions have been manifest in the political ideologies affecting private life.

AMST 4301 Workers and Consumers in the Global Economy (3.0 cr.; Student Option) Impact of global economy on workplaces/workers in the United States, Mexico, and Caribbean countries. Influence on consumption. Consequences for American culture/character. Effects on U.S./Mexican factory work, service sector, temporary working arrangements, offshore production jobs in Dominican Republic, and professional/managerial positions.


AMST 4962W Second Proseminar in American Studies (1.0 cr.; Student Option; prereq AmSt sr or #) Problem related to representative theme, figure, or period. Students research/write senior theses.

AMST 5402 American Indians in the Cinema (3.0 cr.; Student Option) Representations of American Indians in film, historically/contemporary. What such representations assert about Native experience and cultural viability. What they reflect about particular relationships of power.

AMST 5920 Topics in American Studies (1.0-4.0 cr.; Student Option) Topics specified in Class Schedule.

**Anatomy (ANAT)**

**Medical School**

ANAT 3001 Human Anatomy (3.0 cr.; Student Option; prereq [Biol 1002 or Biol 1009 or Biol 2002 or equiv], at least soph) Human anatomy laboratory for mortuary science students (2.0 cr.; Student Option; prereq Mortuary science student) Human anatomy laboratory for mortuary science students who have had a previous human anatomy lecture course.

ANAT 3601 Principles of Human Anatomy (3.0 cr.; Student Option; prereq [Biol 1002 or Biol 1009 or Biol 2002 or equiv], [36202 or 3612], at least soph) Anatomical relationships. Function based upon form. Clinical applications. Gross (macroscopic) anatomy, histology (microscopic anatomy). Neuroanatomy (nervous system), embryology (developmental anatomy).

ANAT 3602 Principles of Human Anatomy Laboratory (2.0 cr.; Student Option; prereq 3001 or INMD 3001 or and 3301 or 3601 or 3611) Complements 3601 or 3611.

ANAT 3608H Principles of Human Anatomy Laboratory for Honors Students (3.0 cr.; A-F Grade Basis; prereq 3601, soph, honors) Students complete lab work required for 3602 or 3612, with additional dissection of human cadavers and related projects. Supplements 3001 or 3601 or 3611.

ANAT 3611 Principles of Human Anatomy (3.0 cr.; Student Option; prereq [Biol 1002 or Biol 1009 or Biol 2002 or equiv], at least soph; [3602 or 3612] recommended) Anatomical relationships. Function based upon form. Clinical applications. Gross (macroscopic) anatomy, histology (microscopic anatomy). Neuroanatomy (nervous system), embryology (developmental anatomy).

ANAT 3612 Principles of Human Anatomy Laboratory (2.0 cr.; Student Option; prereq 3001 or INMD 3001 or 3301 or 3601 or 3611) Complements 3601 or 3611.

ANAT 4900 Directed Studies in Anatomy (1.0-6.0 cr.; S-N Grading Basis; prereq #) x

ANAT 5095 Advanced Problems in Anatomy (1.0-6.0 cr.; A-F Grade Basis; prereq one or more ANAT classes, #) Exceptional projects that do not easily fit within confines of other ANAT offerings. Examples include but not limited to individual teaching or research projects.

ANAT 5150 Human Gross Anatomy (5.0 cr.; A-F Grade Basis; prereq #) Human cadaveric dissection based on traditional preparation, lab dissection, review sections, radiographic analysis, clinical correlations. Taught by regions. Extremities, torso, head/neck. Assessment by midterm/final written/practical examinations.

ANAT 5525 Anatomy and Physiology of the Pelvis and Urinary System (1.0-2.0 cr.; A-F Grade Basis; prereq One anatomy course, one physiology course, #) Two day intensive course. Pelvis, perineum, and urinary system with cadaveric dissection. Structure/function of pelvic and urinary organs, including common dysfunction and pathophysiology. Laboratory dissections, including kidneys, ureters, urinary bladder, pelvic viscera and perineum (male or female), pelvic floor, vascular and nervous structures. Grind round sections.
ANSC 1511 Food Animal Products for Consumers (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Concepts of historical inquiry using the powerful/changing relationship between Man and horse. Students function as historians: framing questions, searching for appropriate sources, developing explanation model with reasoned arguments, and finally, write/defend interpretation.

ANSC 2011 Dairy Cattle Judging (2.0 cr.; Student Option; 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 2012 Livestock and Carcass Evaluation (3.0 cr.; Student Option) Evaluation of cattle, swine, and sheep. Breeding stock evaluated on live appraisal, performance records, and breeding values. Market animals evaluated, graded, and priced on physical appearance followed by evaluation and grading of their carcasses.

ANSC 2013 Equine Nutrition (3.0 cr.; Student Option; prereq [Soph or jr or sr], #; 2012 recommended) Visual evaluation of beef cattle, swine, and sheep for type, muscling, degree of finish, structure, and soundness. Short oral presentations. Preparation for collegiate livestock judging competition.

ANSC 2055 Horse Management (2.0 cr.; Student Option) 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, parasites 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 2056 Horse Management Pracitcum (2.0 cr.; Student Option; prereq 2055 or #2055) Best management practices. Daily care (in small groups, weekends included) of horses. Hands-on sessions develop practical skill. Applied equine management research project. Two group presentations.

ANSC 2401 Animal Nutrition (3.0 cr.; Student Option) Classification/function of nutrients. Use of nutrients for body maintenance, growth, egg production, gestation, and lactation. Comparative study of digestive systems of farm animal species.


ANSC 3301 Statistics for Animal Science (4.0 cr.; Student Option) Basic statistical concepts. Develop statistical reasoning/critical thinking skills. Descriptive statistics, probability, sampling and sampling distributions, hypothesis testing, experimental design, linear correlation, linear regression and multiple regression. How to make sound arguments/decisions based on statistics when reviewing news articles or scientific publications with statistical content. Explore/draw conclusions from data using a basic statistical software package.

ANSC 3092 Undergraduate Research in Animal Science (1.0-3.0 cr.; A-F Grade Basis) Students conduct research project under supervision of faculty member.

ANSC 3141 Advanced Dairy Judging (1.0 cr.; Student Option; 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 3142 Advanced Livestock Judging (2.0 cr.; Student Option; prereq 2013 or #) Visual evaluation of beef cattle, swine, and sheep for muscling, finish, structure, and soundness. Use of production (growth and reproduction) records in evaluation. Oral presentations. Preparation for national collegiate livestock judging contest.

ANSC 3203W Environment, Global Food Production, and the Citizen (3.0 cr.; Student Option) Ecological/ethical concerns of food production systems in global agriculture: past, present, and future. Underlying ethical positions about how agroecosystems should be configured. Interactive learning using decision cases, discussions, videos, other media.

ANSC 3221 Animal Breeding (4.0 cr.; Student Option) Application of quantitative and qualitative genetics to animal breeding. Concepts of livestock improvement through selection and mating programs.


ANSC 3302 Human and Animal Physiology Laboratory (1.0 cr.; Student Option; prereq 3301 or 83301) Companion course to 3301. Physiological principles are demonstrated using active learning approaches. Nervous system, muscles, cardiovascular, respiration, renal, endocrinology/metabolism, blood, immunology, reproduction.

ANSC 3305 Reproductive Biology in Health and Disease (4.0 cr.; Student Option; prereq Biol 1009 or equiv)
Reproductive organ functions, fertilization, estrous cycle and endocrine control, reproductive efficiency, problems/principles of artificial insemination. Anatomy, physiology, biochemistry of mammary gland. Mammary growth, initiation/maintenance of lactation, milk synthesis, factors influencing lactation curve.

ANSC 3307 Artificial Insemination Techniques (1.0 cr.; S-N or Audit; prereq #) Hands-on training/techniques of artificial insemination at an off-campus laboratory setting. Techniques of AI and semen handling. Criteria for selection of bulls.

ANSC 3403 Companion Animal Hot Button Issues (3.0 cr.; Student Option) Various issues that affect companion animals in our society. Students debate pros/cons of each issue and formalize their own opinions based on information presented by debate teams.

ANSC 3501 Farm Animal Environment (3.0 cr.; Student Option; prereq [AnSc 3301, Jr or Sr] or #) Biological/physical processes involved in adjustment of animals to ambient environments. Applications to farm animal management.

ANSC 3509 Animal Biotechnology (3.0 cr.; Student Option; prereq GCD 3022 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.

ANSC 3511 Animal Growth and Development (3.0 cr.; Student Option; prereq College-level biology course) Principles of animal growth. Interaction of nutrition, hormones, exercise, heredity, and disease in regulating growth.


ANSC 3801 Livestock Merchandising (3.0 cr.; Student Option; prereq Jr or Sr or #) 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 4009W Undergraduate Senior Thesis: Science in Agriculture (1.0-6.0 cr.; A-F or Audit; prereq [Jr or Sr] major in ScAg, #) Usually one full year. Research/thesis experience under supervision of CFANS faculty member. Written bound thesis, oral presentation of research results.

ANSC 4011 Dairy Cattle Genetics (3.0 cr.; Student Option; prereq 3221) Quantitative genetic principles of breeding dairy cattle. Evaluation of males, females. Systems of mating. Rates of genetic improvement with/without AI.

ANSC 4092 Special Problems in Animal Science (1.0-4.0 cr.; Student Option; prereq #) Independent study in an area of animal science, under supervision of faculty member.

ANSC 4093 Tutorial in Animal Science (1.0-4.0 cr.; Student Option; 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 (1.0-3.0 cr.; Student Option) 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 (1.0-3.0 cr.; S-N or Audit; 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 advisers and employers.

ANSC 4099 Special Workshop in Animal Science (1.0-4.0 cr.; Student Option) Workshops on a variety of topics in animal science. Consult Class Schedule or department for offerings. Topics may use guest lecturers/experts.

ANSC 4305 Companion & Wild Species Reproduction (2.0 cr.; A-F Grade Basis; prereq ANSC 3305) Reproductive physiology specific to domesticated companion canine and feline species as well as avian species. Management of breeding and reproductive diseases in companion species as well as conservation management in wild species.

ANSC 4401 Swine Nutrition (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 2401) Nutrient requirements of ruminants, physiology of digestion in ruminants, nutrient content of feeds, primarily forages; energy utilization, protein and nonprotein nitrogen utilization; nutritional disorders; formulation of adequate rations.


ANSC 4601 Pork Production Systems Management (4.0 cr.; Student Option; prereq 4611) Interrelationships of business, marketing, and biological performance of pigs in various types of production systems.


ANSC 4603 Beef Production Systems Management (4.0 cr.; Student Option; prereq &4613) 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 (4.0 cr.; Student Option; 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.

ANSC 4611 Advanced Pork Production Systems Management (2.0 cr.; Student Option; prereq 4601) Analysis of pork production systems. Case studies, visits to pork production operations.

ANSC 4613 Advanced Beef Production Systems Management (2.0 cr.; Student Option; prereq 4603) Half semester course. Student enterprise-analysis teams evaluate a beef cattle enterprise and solve problems in marketing, selection, reproduction, nutrition, or health management.

ANSC 4614 Advanced Dairy Production Systems Management (4.0 cr.; Student Option; prereq 4604) Practical application of electronic tools for 21st century dairy consultant. Data collection, organization, analysis, interpretation of dairy production/health data.

ANSC 5099 Special Workshop in Animal Science (1.0-6.0 cr.; A-F or Audit; prereq #) Topics vary. See Class Schedule or department. Topics may use guest lectures/experts.


ANSC 5305 Companion & Wild Species Reproduction (2.0 cr.; A-F Grade Basis; prereq #) Principles of reproductive physiology specific to domesticated companion canine and feline species as well as avian species. These principles discussed in the context of the management of breeding and reproductive
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

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<tr>
<th>CRN</th>
<th>Course Title</th>
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<tr>
<td>ANTH 1003V</td>
<td>Introduction to Cultural Diversity and the World System (4.0 cr.; A-F Grade Basis; prereq: Honor student)</td>
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<tr>
<td>ANTH 1005W</td>
<td>Introduction to Cultural Diversity and the World System (4.0 cr.; Student Option)</td>
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<td>ANTH 1902</td>
<td>Freshman Seminar (3.0 cr.; A-F or Audit; prereq: freshman)</td>
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<td>ANTH 1903</td>
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<td>ANTH 1905</td>
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<td>Freshman Seminar (3.0 cr.; A-F or Audit; prereq: freshman)</td>
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<tr>
<td>ANTH 3001</td>
<td>Introduction to Archaeology (4.0 cr.; Student Option)</td>
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<tr>
<td>ANTH 3002</td>
<td>Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr.; A-F or Audit)</td>
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<tr>
<td>ANTH 3003</td>
<td>Cultural Anthropology (3.0 cr.; Student Option)</td>
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<tr>
<td>ANTH 3004</td>
<td>Great Controversies in Anthropology (3.0 cr.; A-F or Audit)</td>
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</table>

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 3002 Topics in the Anthropology of Africa (3.0-4.0 cr.; Student Option)
Perspectives on Africa using ethnographic methods and theories. Topics such as kinship and gender; ecological adaptations; economic systems; belief systems; political organization; art and aesthetics; Islamization; colonization; liberation movements and nationalism; culture change.

ANTH 3021W Anthropology of the Middle East (3.0 cr.; A-F or Audit)
Anthropological methods of analyzing/interpreting Middle Eastern cultures/societies.

ANTH 3022W Anthropology of Dreaming and Myth (3.0 cr.; A-F or Audit)

ANTH 3023 Culture and Society of India (3.0 cr.; Student Option)
ANTH 3025 Pacific Island Societies (3.0 cr.; Student Option; prereq 1003 or 1005 or 3003 or #)

Geography, prehistory, and Western exploration of Pacific Islands from Hawaii to Papua New Guinea. Culture change as these peoples become incorporated into the modern world system. Topics in regional ethnology. Relationship of society to major issues in anthropological thought.

ANTH 3027W Archaeology of Prehistoric Europe (3.0 cr.; Student Option)

How archaeologists analyze/interpret artifacts to develop knowledge about the formation of European society, from earliest evidence of human occupation to Roman period.

ANTH 3028 Introduction to Historical Archaeology (3.0 cr.; A-F or Audit)

Emphasizes research approaches. Documentary research, oral history, probate inventories/acculturation, integration of documents/archaeological data, analysis of community patterning, social analysis of architecture, foowdyarts, artifact identification, mean ceramic dating, industrial archaeology, estimation of social status with cemetery data, sampling, report writing.

ANTH 3029 Archaeology of Native Americans (3.0 cr.; Student Option)

Pre-European contact and contact period archaeology of American Indians north of Mexico.

ANTH 3031 Altering States: After Communism (3.0 cr.; Student Option)

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 3034 Roots Music in American Culture and Society (3.0 cr.; Student Option)

Southern American vernacular music that came to public attention in the 1920s and 1930s. Issues of race, class, and historical context.

ANTH 3035 Anthropologies of Death (3.0 cr.; A-F or Audit)


ANTH 3036 The Body in Society (3.0 cr.; Student Option)

Body-related practices throughout the world. Readings, documentaries, mass media.

ANTH 3041 Ecological Anthropology (3.0 cr.; Student Option; prereq 1003 or #)


ANTH 3043 Art, Aesthetics and Anthropology (3.0 cr.; Student Option)

The relationship of art to culture from multiple perspectives including art as a cultural system; the cultural context of art production; the role of the artist in different cultures; methodological considerations in the interpretation of art across cultural boundaries.

ANTH 3046W Romance and Culture (3.0 cr.; A-F Grade Basis)

Romance, aspects of this kind of love relationships from different perspectives in social/biological sciences. Draws on cross-cultural materials.

ANTH 3047 American Indian Languages and Cultures (3.0 cr.; Student Option)

Survey of cultural developments among native peoples of North America from historic times to present.

ANTH 3211 Archaeology Field School (6.0 cr.; Student Option; prereq #)

Archaeological field excavation, survey, and research. Intensive training in excavation techniques, recordation, analysis, and interpretation of archaeological materials.

ANTH 3422W Hero, Savage, or Equal? Representations of Non-Western Peoples in the Movies (3.0 cr.; A-F Grade Basis)

Images of non-Western peoples and cultures as they have appeared in movies and in other popular media.

ANTH 3306W Medical Anthropology (3.0 cr.; A-F or Audit; prereq 1003 or 1005 or entry level soci sci course recommended)


ANTH 3310 Topics in Biological and Physical Anthropology (3.0-6.0 cr.; Student Option; prereq 1001)

Topics may include faunal analysis, the human skeletal and osteological, primate and human evolution, and forensic anthropology. Topics vary according to student and faculty interest.

ANTH 3401 The Human Fossil Record (3.0 cr.; A-F Grade Basis; prereq 1001 or #)

Fossil evidence paleoanthropologists use to reconstruct human evolutionary history. Taxonomy, phylogeny, behavior, ecology, tool use, land use, biogeography. Hands-on examination of fossil casts, readings from primary/secondary professional sources.

ANTH 3402 Zoarchaeology Laboratory (3.0 cr.; A-F Grade Basis)

How archaeologists reconstruct past societies, diets, and environments. Bones and bone fragments to skeletal element (e.g., femur, humerus,ibia), 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 3405 Human Skeletal Analysis (3.0 cr.; A-F Grade Basis; prereq 1001 or #)


ANTH 3913 Senior Project Planning (1.0 cr.; Student Option; 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 (3.0 cr.; Student Option)

Topics specified in Class Schedule.

ANTH 4001 Advanced Method and Theory in Archaeology (3.0 cr.; Student Option; prereq 3001)


ANTH 4003W Contemporary Perspectives in Cultural Anthropology (3.0 cr.; A-F or Audit; 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 (1.0-4.0 cr.; Student Option; prereq #)

Plant remains, material culture, faunal remains, human osteology. Emphasizes lab experience.

ANTH 4009W Warfare and Human Evolution (3.0 cr.; A-F or Audit)

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 4101 Senior Seminar (3.0 cr.; A-F or Audit; prereq Sr, anth major)

Research seminar. Topics/methodologies differ according to staff, student interests. Students complete substantial research paper.

ANTH 4103 Senior Project (3.0 cr.; Student Option; prereq sr major, #)

Independent research project fulfilling the senior option; directed by a faculty member.

ANTH 4103H Senior Honors Thesis Project (3.0 cr.; A-F Grade Basis; prereq Sr major, honors student, #)

Independent research project fulfilling the senior option and the honors thesis requirement; directed by a faculty member.

ANTH 4019 Symbolic Anthropology (3.0 cr.; Student Option; prereq 1003 or 1005 or grad student or #)

Pragmatic/structural aspects of social symbolism cross-culturally. Focuses on power, exchange, social boundaries, gender, and rituals of transition/reversal.

ANTH 4023W Culture Theory (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq 1003 or 1005)
Five types of explanations employed in ethnographic research: diffusionism and theory of survivals; functionalist response; British structuralists; French structuralism; interpretive turn. Problems in ethnographic practice, analysis, and writing. Focuses on several classic monographic examples and associated theoretical writing.

ANTH 4031W Anthropology and Social Justice (4.0 cr.; Student Option; prereq 1003 or 1005 or 4003 or grad student or #)
Practical application of theories/methods from social/cultural anthropology. Issues of policy, planning, implementation, and ethics as they relate to applied anthropology.

ANTH 4035 Ethnographic Research Methods (3.0 cr.; Student Option; 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 4045 Gender and Power in South Asia (3.0 cr.; Student Option)
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's speech; feminism in India; fundamentalism and postcolonial identities; gender and violence.

ANTH 4047 Anthropology of American Culture (3.0 cr.; Student Option)
Anthropological approaches to contemporary American society/culture. Tensions between market and family, Unity, diversity. Individualism, community.

ANTH 4049 Religion and Culture (3.0 cr.; Student Option; 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 4053 Economy, Culture, and Critique (3.0 cr.; Student Option)

ANTH 4065 The Anthropology of Development (3.0 cr.; Student Option)
Anthropological contributions to development practice/theory. Anthropological analysis of development institutions. Theories of development. Case studies from several parts of world explore relation of global forces and local cultures.

ANTH 4071 Race, Culture, and Vision (3.0 cr.; A-F or Audit; prereq 1003 or 1005 or 3003 or #)
Evaluation of main trends in study of racism. Psychological, sociological, symbolic, and "critical" approaches that treat racism as a sociodiscursive phenomenon. Racist discourse as a practice that defines an "other" and subjugates that other to strategies of exclusion.

ANTH 4075 Cultural Histories of Healing (3.0 cr.; A-F or Audit)
Introduction to historically informed anthropology of healing practice. Shift to biologically based medicine in Europe; colonialist disembolishment 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 (3.0 cr.; Student Option; prereq 1001 or 3001 or 3002 or #)

ANTH 4101 Archival Analysis for Anthropologists (3.0 cr.; Student Option)
Methods for anthropological archival research. Preservation, curation, and organizational bias in archives. Analytic scale, voice, historical texts as material culture. Students engage in archival research.

ANTH 4121 Business Anthropology (3.0 cr.; Student Option)
Anthropological/ethnographic understandings/research techniques.

ANTH 4329 Primate Ecology and Social Behavior (3.0 cr.; A-F or Audit; prereq 1001 or BIOL 1009 or BIOL 2002 or BIOL 3411 or #)

ANTH 4344 Europe and its Margins (3.0 cr.; A-F Grade Basis; 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. Ethnography, fiction, film.

ANTH 4980 Topics in Sociocultural Anthropology (3.0 cr.; Student Option)
Topics specified in Class Schedule.

ANTH 4990 Topics in Archaeology: Seminar (3.0 cr.; Student Option)
Discussion/review/analysis of specific current theoretical and/or methodological issues in archaeology. Topics specified in Class Schedule.

ANTH 4991 Independent Study (1.0-6.0 cr.; Student Option; 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 (1.0-6.0 cr.; Student Option; prereq #)
Allows students to pursue special interests in anthropology through reading materials under the guidance of a faculty member.

ANTH 4993 Directed Study (1.0-6.0 cr.; Student Option; prereq #)
Allows students to pursue special interests in anthropology under the guidance of a faculty member.

ANTH 4994W Directed Research (1.0-6.0 cr.; Student Option; prereq #)
Qualified students may conduct a well-defined research project under the guidance of a faculty member.

ANTH 5008 Advanced Flintknapping (3.0 cr.; A-F or Audit; 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 5009 Human Behavioral Biology (3.0 cr.; A-F or Audit)
In-depth introduction to, and critical review of, human behavioral biology, examining the approaches in anthropology and related fields. Classic texts/recent empirical studies of humans and other species. Theoretical underpinnings of this new discipline/how well theoretical predictions have been supported by subsequent research.

ANTH 5015W Biology, Evolution, and Cultural Development of Language (3.0 cr.; Student Option)

ANTH 5021W Anthropology of the Middle East (3.0 cr.; Student Option)
Anthropological field methods of analyzing/interpreting Middle Eastern cultures/societies.

ANTH 5027W Origins of European Civilization (3.0 cr.; Student Option)
How archaeologists/historians analyze/interpret artifacts to develop knowledge about formation of European society, from earliest evidence of human occupation to Roman Period. Interpreting archaeological evidence from specific sites to understand broad trends in human past.

ANTH 5031W Ethnographies of Science (3.0 cr.; A-F Grade Basis; prereq Sr or grad student or #)
Ethnographic, historical, and sociological accounts of scientific practice. How facts are constructed/negotiated. Social, cultural, and political influences on scientific methods. How scientific projects articulate with hierarchies of race/gender. International differences in scientific practice.

ANTH 5033 Feminist Anthropology (3.0 cr.; Student Option; prereq 3047 or grad or #)
Advanced introduction to the development of feminist theory in anthropology. Theoretical and methodological shifts in feminist anthropology and ethnography. Feminist ethnography within the discipline as a whole; current debates concerning the reading and writing of ethnography.

ANTH 5041 Ecological Anthropology (3.0 cr.; Student Option; prereq grad or #)
Concepts, theories, and methods of ecological anthropology (cultural ecology) show how humans interact with the biophysical environment. Compare biological and cultural interactions with the environment; examine adaptive strategies cross-culturally.

ANTH 5121 Business Anthropology (2.0 cr.; Student Option; prereq MBA student)
Anthropological/ethnographic understandings/research techniques.
ANTH 5128 Anthropology of Learning (3.0 cr.; Student Option)
Cross-cultural perspectives in examining educational patterns, and the implicit and explicit cultural assumptions underlying them; methods and approaches to cross-cultural studies in education.

ANTH 5221 Anthropology of Material Culture (3.0 cr.; A-F or Audit)
Material culture as a social creation, studied from multiple perspectives (e.g., social anthropology, archaeology, primatology). Conceptions of how humans articulate with material world they construct.

ANTH 5244 Interpreting Ancient Bone (4.0 cr.; A-F or Audit; prereq 1001)

ANTH 5255 Archaeology of Religion (3.0 cr.; Student Option)
Archaeological evidence for origins of religion and its diverse roles in human societies over millennia. What constitutes religion, why it is constantly present in human history. How archaeologists reconstruct beliefs/practices of past peoples.

ANTH 5269 Analysis of Stone Tool Technology (4.0 cr.; A-F or Audit; prereq 1001 or 3001 or 4001)
Practical lab experience. How to analyze archaeological collections of stone tools to learn about human technological behavior in past. Students analyze archaeological/experimental collections, make stone tools themselves.

ANTH 5325 The Art of the Aztec Empire (3.0 cr.; Student Option)
Art/architecture of Nahuatl-speaking Aztecs of Central Mexico, from their first appearance in archaeological record until Spanish invasion of Central Mexico in 1521. Theoretical/methodological approaches. Critical analysis of scholarly writing and what constitutes "evidence."

ANTH 5401 The Human Fossil Record (3.0 cr.; A-F or Audit; prereq 1001 or #)
Fossil evidence paleoanthropologists use to reconstruct human evolutionary history. Taxonomy, phylogeny, behavior, ecology, tool use, land use, and biogeography. Examination of fossil casts, readings from primary/secondary professional sources.

ANTH 5402 Zooarchaeology Laboratory (3.0 cr.; A-F or Audit)
How archaeologists reconstruct the past through the study of animal bones associated with artifacts at archaeological sites. Skeletal element (e.g., humerus, femur,ibia), and taxon (e.g., horse, antelope, sheep, bison, hyena) when confronted with bone. Comparative collection of bones from known taxa.

ANTH 5403 Quantitative Methods in Biological Anthropology (4.0 cr.; A-F or Audit; prereq Basic univariate statistics course or #)
Quantitative methods used by biological anthropologists. Applying these methods to real anthropometric data. Lectures, complementary sessions in computer lab.

ANTH 5405 Human Skeletal Analysis (3.0 cr.; A-F Grade Basis; prereq 1001 or #)

ANTH 5422 Anthropologies of Citizenship and Nationalism (3.0 cr.; A-F Grade Basis; prereq 3xxx course in [anthropology or related discipline])
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.

ANTH 5442 Archaeology of the British Isles (3.0 cr.; A-F Grade Basis)

ANTH 5444 Archaeological Ceramics (4.0 cr.; A-F Grade Basis; prereq 3001 or #)
Ceramics as material, technology, and cultural/social trace. Methods of assessing technology/use. Research, design, and interpretation of ceramic analyses. Students work with collections and propose/answer a research question about a ceramic assemblage.

Readings, discussion.

ANTH 5446 Archaeology of Representation as Communication (3.0 cr.; A-F Grade Basis)
Seminar. Uses of paintings, sculptures, drawings, and photographs as means of communication, from earliest representations of 30,000 years ago to present day.

ANTH 5448 Applied Heritage Management (3.0 cr.; A-F Grade Basis)
Contexts of cultural heritage applicable to federal/state protection. Approaches to planning/management. Issues of heritage/stakeholder conflict.

ANTH 5980 Topics in Anthropology (1.0-6.0 cr.; Student Option)
Topics specified in Class Schedule.

ANTH 5990 Topics in Archaeology (3.0 cr.; A-F or Audit; prereq #)
Topics specified in Class Schedule.

### Apparel Design (ADES)
**College of Design**

**ADES 1170 Topics in Apparel Design (1.0-4.0 cr.; A-F or Audit)**
In-depth investigation of specific topic, announced in advance.

**ADES 1221 Apparel Assembly Fundamentals**
(3.0 cr.; A-F or Audit; prereq Pre-apparel design major or #)
Methods/applications of apparel assembly, from micro to macro perspective.

**ADES 2196 Work Experience in Apparel Design (1.0-4.0 cr.; S-N Grading Basis; 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. Internship paper or project

**ADES 2211 Illustration for Apparel Design (3.0 cr.; A-F or Audit; prereq Pass portfolio review or #)** Illustration skills specific to garments/textiles. Traditional media/CAD applications. Critique/analysis of visual communication of apparel design concepts.

**ADES 2213 Textile Analysis (4.0 cr.; A-F or Audit; prereq DHA major or pre-major or #)** Physical, chemical, and biological characteristics of fibers, yarns, textile structures, and finishes. Their effect on performance/appearance of textile products, including apparel, interior, and industrial textiles.

**ADES 2214 Softlines Analysis (3.0 cr.; A-F or Audit; prereq DHA major or minor or #)** Physical characteristics of softline products related to function for target market. Class experiences based on methods of analysis, including visual inspection, quality, construction, costing, and fit/sizing.

**ADES 2221 Apparel Design Studio I (4.0 cr.; A-F or Audit; prereq [DHA 1201 or RM 1201], [1221 or DHA 1221], apparel design premajor)** Theories/methods in designing apparel for various user groups. Relation of two-dimensional pattern shape to three-dimensional body. Introduction to flat-pattern draping.

**ADES 2222 Apparel Design Studio II (4.0 cr.; A-F or Audit; prereq [DHA 2221] with a grade of at least C-)** Apparel Design major, pass portfolio review)
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.

**ADES 3170 Topics in Apparel Design (1.0-4.0 cr.; A-F or Audit)**
In-depth investigation of specific topic.

**ADES 3196 Field Study: National or International (1.0-10.0 cr.; A-F or Audit; prereq #)**
Faculty-directed field study in a national or international setting.

**ADES 3217 Fashion: Trends and Communication (3.0 cr.; A-F or Audit)**
Relation of fashion trends to visual analysis of apparel. Application to design/retail.

**ADES 3223 Apparel Design Studio III (3.0 cr.; A-F or Audit; prereq [DHA 2222] and grade of at least C-)** Apparel Design major, pass portfolio review)
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.

**ADES 3224 Apparel Design Studio IV (3.0 cr.; A-F or Audit; prereq [DHA 2213] and DHA 3223) with grade of at least C-)** Apparel design major)
Principles/theory of functional apparel design. Conduct/apply research in designing apparel for situations requiring thermal or impact
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ADES 4225</td>
<td>Apparel Design Studio V</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Designing for specific audience, market, user group. Applying market research to design line of apparel. Research of promotional methods for design project.</td>
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<tr>
<td>APST 5121</td>
<td>History of Costume</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Study of apparel/appearances in Western cultures, from 18th century to present. Role of gender, 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>APST 5124</td>
<td>Consumers of Design</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Analysis/interpretation of primary data about consumers today. Postmodern market. Alternatives to consumer society. How meaning is manufactured. What the lived experiences are of consumers today.</td>
</tr>
<tr>
<td>APST 5170</td>
<td>Topics in Apparel Studies</td>
<td>1.0-4.0</td>
<td>M.S. in Apparel Design</td>
<td>Independent study of special topic, announced in advance. In-depth investigation of specific topic.</td>
</tr>
<tr>
<td>APST 5196</td>
<td>Field Study: National/International</td>
<td>1.0-10.0</td>
<td>M.S. in Apparel Design</td>
<td>Independent study in apparel studies under tutorial guidance.</td>
</tr>
<tr>
<td>APUS 3065</td>
<td>Computer Security for the Business Professional</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Designing for specific audience, market, user group. Applying market research to design line of apparel. Research of promotional methods for design project.</td>
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<tr>
<td>APUS 3301</td>
<td>Introduction to Quality Management</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Principles/concepts of managing quality in business applications. Improving business processes with six sigma method. Implementing/leading process improvement.</td>
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<tr>
<td>APUS 4023</td>
<td>Communicating for Results</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Aspects of communication essential for being persuasive/influential. Organizing/presenting ideas effectively, strategies for audience analysis, choosing communication methods, making appropriate use of informal influence methods, handling dissent. Processes for intercultural communication.</td>
</tr>
<tr>
<td>APUS 4031</td>
<td>Strategic Use of Business Information Systems</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Relationship of information systems and decision making. Databases, decision management tools, customer relationship management, e-business, trends, information security. Database and web page development, case studies, final empirical project.</td>
</tr>
<tr>
<td>APUS 4041</td>
<td>Dynamics of Leadership</td>
<td>3.0</td>
<td>M.S. in Apparel Design</td>
<td>Successful leadership via flexible approach. Knowledge, skills, and abilities that leaders develop from eight leadership strategies: academic, bureaucratic, eclectic, economic, fellowship, military, political, social. Ways to lead diverse populations in a global environment.</td>
</tr>
</tbody>
</table>

ABUS 4104 Management and Human Resource Practices (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 4217 Real Estate Development and Finance (2.0 cr.; A-F or Audit; prereq 45 credits) Overview of the fundamentals of real estate development, including process(es), means to finance and acquire real estate, due diligence procedures, legal transfer and title issues, conditions precedent to closing and governmental development approvals.

ABUS 4321 Evaluating Performance Excellence in Organizations (3.0 cr.; S/N or Audit; prereq Submit MNQA evaluator application) Systematic processes for leadership, quality improvement, performance excellence. Analyze strengths/improvements using Baldridge 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 (3.0 cr.; A-F or Audit; 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 4571 Introduction to Grant Writing for Health Care and Nonprofit Organizations (3.0 cr.; A-F or Audit; prereq 45 credits) Research/write grants. Identify potential funding sources. Respond to Request for Proposal by creating needs assessment, goal statement, budget/grant funding plans. Trends in public/private health care. Social services funding.

ABUS 4701 Introduction to Marketing (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 4705 Leadership and Management for the Professional Practice (3.0 cr.; A-F or Audit; prereq 45 semester cr) Foundation needed for successful leadership or management of a professional practice including recruitment, motivation, and compensation of employees, leadership of effective teams, choosing an appropriate organizational structure, understanding and leveraging diversity, developing a healthy culture, managing change, negotiations, and business ethics. Real-world examples to highlight successful and unsuccessful practices. Apply these principles to their own specific professional interests to become more effective leaders and managers.

ABUS 4707 Financial Management for the Professional Practice (3.0 cr.; A-F or Audit; prereq 45 semester cr) Foundation knowledge to understand financial principles and apply them to investment, organizational, and operational decisions in a professional practice. Case studies using Excel to model common scenarios in practice.

ABUS 4709 Managing the Professional Practice I: Business Design (3.0 cr.; A-F or Audit; prereq 45 cr) Factors/challenges involved in designing structure of professional practice. Core values/mission, design of services, physical design, risk management, equipment/IT, partners/staffing. Exercises in applied practice development/management.

ABUS 4711 Managing the Professional Practice II: Operations (3.0 cr.; A-F or Audit; prereq 4709, 45 cr) Factors/challenges in day-to-day operations of professional practice. Marketing, human resources, finance, entrepreneurial spirit, inventory management, operational quality, transitions. Exercises in applied operations.

ABUS 4901 Special Topics in Applied Business (3.0 cr.; A-F or Audit; prereq At least 45 cr) Management issues in a changing workplace. Topics vary.

ABUS 4993 Directed Study (1.0-3.0 cr.; Student Option; prereq #, %) Specially arranged projects, trips, or field work.

APEC 1001 Orientation to Applied Economics (1.0 cr.; A-F or Audit) 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 1251 Principles of Accounting (3.0 cr.; Student Option; prereq 30 cr; not recommended for premajors in Ag Food Bus Mgmt) Fundamentals of business accounting, basic finance concepts, use of accounting data for income tax and managerial decision making.

APEC 1905 Topics: Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq Fr) Topics vary.

APEC 3001 Applied Microeconomics: Consumers, Producers, and Markets (4.0 cr.; Student Option; prereq [[1101 or ECON 1101 or 1101H or ECON 1101H], [MATH 1142 or MATH 1271]] or #; intended for undergrads in [Ag/Food Bus Mgmt, Appl Econ]) Consumer/producer decisions. Theory of supply/demand. Markets, pricing, investment, effect regulation, market failures.

ABUS 4993 Directed Study (1.0-3.0 cr.; Student Option; prereq #, %) Specially arranged projects, trips, or field work.

Applied Economics (APEC)
APEC 3002 Applied Microeconomics: Managerial Economics (4.0 cr.; Student Option; prereq [3001 or Econ 3101], [OMS 2550 or Stat 3011] 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 3006 Applied Macroeconomics: Government and the Economy (3.0 cr.; Student Option; prereq [1102 or Econ 1102], [3001 or Econ 3101] or #)


APEC 3007 Applied Macroeconomics: Policy, Trade, and Development (3.0 cr.; Student Option; prereq [1101 or Econ 1101], [1101H or Econ 1101H], [1102 or Econ 1102], [1102H or Econ 1102H]; 3001, 3006 recommended)


APEC 3081 General Survey of Development in Africa (3.0 cr.; Student Option; prereq 1101 or Econ 1101)

Socioeconomic, political, and cultural development in Sub-Saharan Africa post-independence.

APEC 3071 Agriculture and Economic Growth in Developing Countries (3.0 cr.; Student Option; prereq 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 3411 Commodity Marketing (3.0 cr.; Student Option; prereq 1101 or Econ 1101)

Economic concepts related to marketing agricultural commodities. Conditions of competitive markets, historical perspectives on market institutions/policy, structural characteristics of markets, policies/regulations affecting agricultural marketing of livestock, crop, and dairy products.

APEC 3451 Food and Agricultural Sales (3.0 cr.; Student Option; prereq 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 (3.0 cr.; Student Option; prereq [[1251 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 3551 Entrepreneurship Fundamentals for Value-Added Rural Businesses (3.0 cr.; A-F Grade Basis; prereq [APEC 1101 or 1101H, jr or sr] or #)

Process of starting a new business or organization. Creating a new value proposition in which people are willing to pay for this new product or service according to its perceived value. Students identify market niches and develop plans to exploit them. Student-run businesses may be created as well as self-standing independent businesses.

APEC 3611W Environmental and Natural Resource Economics (3.0 cr.; Student Option; prereq 1101 or Econ 1101 or 1101H or Econ 1101H)


APEC 3811 Principles of Farm Management (3.0 cr.; Student Option; prereq 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 (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq #)

Independent study and supervised reading and research on subjects and problems not covered in regularly offered courses.

APEC 4096 Professional Experience Program: Internship (1.0-3.0 cr.; S-N or Audit; prereq CFANS undergraduate, #, completed internship contract)

Professional experience in agribusiness firms or government agencies gained through supervised practical experience. Evaluative reports and consultations with faculty advisors and employers.

APEC 4103 World Food Problems (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; Student Option; prereq [3001 or Econ 3101], [AnSc 2211 or OMS 1550 or Stat 3011])


APEC 4501 Financial Modeling (3.0 cr.; A-F or Audit; prereq [3501 or FINA 3001], [1251 or ACCT 2050])


APEC 4821W Business Economics and Strategy (3.0 cr.; Student Option; prereq 3002, [3501 or FINA 3001], MGMT 3001)


APEC 5031 Methods of Economic Data Analysis (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 5031 or #)

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. Clarity of reporting and design of procedures for maintaining/updating data estimates.

APEC 5151 Applied Microeconomics: Firm and Household (3.0 cr.; Student Option; 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 5152 Applied Macroeconomics:
Income and Employment (3.0 cr.; Student Option; prereq 3006 or ECON 3102 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 (3.0 cr.; Student Option; prereq 3006 or ECON 3102 or #)
APEC 5341 Public Finance (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq grad student)
APEC 5481 Futures and Options Markets (3.0 cr.; Student Option; prereq grad student)
Economic concepts related to futures/options trading. Hedging, speculation.
APEC 5511 Labor Economics (3.0 cr.; Student Option; 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 5611 Economic Aspects of Environmental Management (3.0 cr.; A-F or Audit; 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 #)
Environmentalist 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 (3.0 cr.; Student Option; prereq [3001 or Econ 3101], [3611 or Econ 3611 or ESPM 3261] or #)
Economic analyses, including project evaluation of current natural resource/ environmental issues. 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 (3.0 cr.; Student Option; 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 future interest groups and future of American agricultural policy.
APEC 5721 Economics of Science and Technology Policy (3.0 cr.; Student Option; prereq 3001 or Econ 3101 or #)
APEC 5731 Economic Growth and International Development (3.0 cr.; Student Option; prereq 3002 or [Econ 3101, Stat 3022]; Econ 4211 recommended)
Economics of research and development. Technical change, productivity growth. Impact of technology on institutions. Science and technology policy.
APEC 5751 Global Trade and Policy (3.0 cr.; Student Option; prereq 3001 or Econ 3101 or PA 5021)
APEC 5811 Cooperative Organization (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq #)
Special classes, independent study, and supervised reading/research on subject/ problems of interest not covered in regularly offered courses.
APEC 5972 What Does It Mean to Be Green? (3.0 cr.; A-F Grade Basis; prereq AGRO 1101 or AGRO 1103 or BIOL 1001 or BIOL 1009 or HORT 1001 or HORT 6011 or #, sr or grad student, admitted to MPS in horticulture; email ccehort@umn.edu or call 612-626-8724 for permission number)
Biodiversity, ecological balance, nutrient cycling, and soil quality. Organic practices of tillage, fertility management, weed control, insect control. Specific practices compared with conventional, and integrated pest management. Economic analysis of both organic and conventional practices.
APS 5100 Topics in Applied Professional Studies (1.0-4.0 cr.; A-F or Audit; prereq %)
Topics in Applied Professional Studies.
APS 5101 Polyvoculuture Design (3.0 cr.; A-F or Audit; prereq SOIL 5125, HORT 1001, %)
Design/systems thinking with plant mechanisms.
APS 5201 Career and Job Search Preparation for Graduate Students (1.0 cr.; S-N Grading Basis; prereq %)
Job search and career development tools. Goals, networking, job search, resume/CV, interviewing. Assignments include resume/CV, informational interview, career development plan.

Arabic (ARAB)
College of Liberal Arts

ARAB 1101 Beginning Arabic I (5.0 cr.; Student Option)
Oral practice, reading, comprehension, basic grammar.
ARAB 1102 Beginning Arabic II (5.0 cr.; Student Option; prereq 1101 or equiv or #)
Comprehension, oral practice, and reading of standard Arabic.
ARAB 3101 Intermediate Arabic (5.0 cr.; Student Option; prereq 1102 or equiv or #)
Advanced grammar and conversational practice. Reading Arabic texts.
ARAB 3102 Intermediate Arabic (5.0 cr.; Student Option; prereq 3101 or #)
Advanced grammar, analyses of readings, oral comprehension.
ARAB 3290 Arabic Language Teaching Tutorial (1.0 cr.; S-N Grading Basis; prereq Grade of A in 3102/4122)
Students tutor beginning students of Arabic and are part of department's Arabic language team.
ARAB 4101 Beginning Arabic I (3.0 cr.; Student Option; prereq Grad student)
Oral practice, reading, comprehension, grammar.
ARAB 4102 Beginning Arabic II (3.0 cr.; Student Option; prereq [4101 or equiv], grad student)
Comprehension, oral practice, reading of standard Arabic. Meets with 1102.
ARAB 4121 Intermediate Arabic I (3.0 cr.; Student Option; prereq [4102 or equiv], grad student)
Advanced grammar, conversational practice. Reading Arabic texts.
ARAB 4122 Intermediate Arabic II (3.0 cr.; Student Option; prereq [4121 or equiv], grad student)
Advanced grammar, analysis of readings, oral comprehension. Meets with 3102.
ARAB 5101 Advanced Arabic I (3.0 cr.; Student Option; prereq 3102 or equiv or #)
Advanced readings in classical and modern Arabic. Compositions based on texts.

**ARAB 5102 Advanced Arabic II (3.0 cr.; Student Option; prereq 5101 or #)**

Readings of Arabic texts. Writing compositions based on texts. Continuation of 5101.

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### Architecture (ARCH)

**College of Design**

**ARCH 1281 Design Fundamentals I (4.0 cr.; A-F Grade Basis)**

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 (3.0 cr.; A-F Grade Basis)**

Examination of seminal issues in the designed environment, including relationships between place and space, and realms of the ideal and real, public/private. How architecture, landscape architecture, and urban design have explored those issues.

**ARCH 1701H Honors: The Designed Environment (3.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F Grade Basis; prereq [1301 or 2301], Arch major)**

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

**ARCH 2301 Introduction to Drawing in Architecture (4.0 cr.; A-F Grade Basis; prereq Arch major; no prereq in summer)**

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

**ARCH 3150 Topics in Architecture (1.0-6.0 cr.; Student Option)**

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

**ARCH 3250 Design Workshop (1.0-6.0 cr.; A-F Grade Basis; 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 3281 Undergraduate Architecture Studio I (6.0 cr.; A-F Grade Basis; prereq BS Arch major)**

Introduction to architectural design in relation to site.

**ARCH 3282 Undergraduate Architecture Studio II (6.0 cr.; A-F Grade Basis; prereq [3281 or 4281], BS Arch major)**

Introduction to architectural design in relation to program.

**ARCH 3301 Drawing for Design in Architecture (3.0 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 3312 Rome: Drawing (-in) the Eternal City (4.0 cr.; A-F Grade Basis; prereq jr or sr BDA or BS arch major or landscape arch major)**


**ARCH 3351 AutoCAD I (3.0 cr.; Student Option; prereq Arch major or BED major or #)**


**ARCH 3381 Introduction to Computer Aided Architectural Design (3.0 cr.; A-F or Audit; prereq Arch major or BED major or #)**

Introduction to 2-D drafting, 3-D modeling/animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management.

**ARCH 3411V Architectural History to 1750 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F or Audit; 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 behavior.

**ARCH 3412 Architectural History Since 1750 (3.0 cr.; A-F or Audit; prereq Soph or above)**

Examples of the built environment from the Enlightenment to the present are studied within a broad social, cultural, and political context. Major architectural movements and their associated forms and designs.

**ARCH 3412H Honors: Architectural History Since 1750 (3.0 cr.; A-F or Audit; prereq Soph, honors)**

Built environment from the Enlightenment to the present in a broad social, cultural, and political process. Design/construction as complex as product of a sociocultural process and expression of values, ideas, and behavioral patterns. Design/construction as complex political process.

**ARCH 3993 Directed Study (1.0-3.0 cr.; A-F Grade Basis; prereq #)**

Guided individual reading or study.

**ARCH 4150 Topics in Architecture (1.0-4.0 cr.; A-F or Audit; prereq Arch major or #)**

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

**ARCH 4194H Thesis/Capstone Project (2.0 cr.; A-F Grade Basis; prereq Arch major, sr, honors)**

Individualizes honors experience by connecting aspects of major program with special academic interests.

**ARCH 4283 Undergraduate Architecture Studio III (6.0 cr.; A-F Grade Basis; prereq [3282 or 4282], B.S. Arch major)**

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

**ARCH 4284 Undergraduate Architecture Studio IV (6.0 cr.; A-F Grade Basis; prereq 4283, BS Arch major)**

Topical design studio.

**ARCH 4313 Visual Communication Techniques in Architecture (3.0 cr.; A-F or Audit; prereq 3301 or 4301)**

Delineation, presentation, and design techniques. Various visual media, methods of investigation.

**ARCH 4321 Architecture in Watercolor (3.0 cr.; A-F or Audit; prereq 1301)**

Watercolor as tool in design process. Foundation principles, techniques, medium, tools, materials. Color relationships, mixing, composition, applications to design.

**ARCH 4361 3-D Computer Architectural Modeling and Design (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq [3411, 3412] or #) Historical/hermeneutical investigation of iconographic grotto. Twinned themes of descent into earth and ascent to light, from earliest strata of human culture to present day.
ARCH 4423 Gothic Architecture (3.0 cr.; A-F or Audit; prereq 3411 or #) History of architecture and urban design in Western Europe, from 1150 to 1400.
ARCH 4424 Renaissance Architecture (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 4432 Modern Architecture (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis) 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 4461 North American Indian Architecture (3.0 cr.; A-F Grade Basis; prereq Arch 3412, Arch or Amin 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 4511 Materials and Methods I (3.0 cr.; A-F or Audit; prereq BS Arch major) Building materials, assemblies, construction operations shaping building designs. Material properties for designing/detailing building systems, elements, components. Applications, modeling, hands-on building experiences.
ARCH 4521 Environmental Technology I (3.0 cr.; A-F or Audit; prereq BS Arch major) Issues related to environmental quality/design. Climate response. Heating, cooling, lighting design. Indoor air quality.
ARCH 4671 Historic Preservation (3.0 cr.; A-F or Audit; prereq Jr or sr or #) Philosophy, theory, origins of historic preservation. Historic archaeology, research, descriptive analysis, documentation. Government's role, standards/guidelines, building codes, neighborhood preservation, advocacy. Using primary/secondary resources.
ARCH 4674 World Heritage Conservation (3.0 cr.; A-F Grade Basis; prereq Jr or sr or #) Design/planning options for conservation of historic buildings/cultural heritage sites. Case studies link current practices, methods/solutions with expert preservationists, site conservationists, local communities in development/design of conservation proposals.
ARCH 4701W Introduction to Urban Form and Theory (3.0 cr.; A-F Grade Basis; prereq [3411, 3412] or #) Urban form, related issues of design/theory/culture. Thematic history of cities. Lectures, discussions, assignments.
ARCH 4731 Territorial City (3.0 cr.; A-F Grade Basis; prereq #) Seminar. Students research, define, and test conditions within which the territory and contemporary city coexist. Site for research is Twin Cities metropolitan area.
ARCH 4750 Introduction to Urban Form and Issues (3.0 cr.; A-F or Audit; prereq Undergrad arch major or #) Special topics in theory/practice of urban design.
ARCH 5101 Architectural Design Studies (7.0 cr.; S-N Grading Basis; prereq 3+ track for MArch) Principles/methods architecture design. Theories, history, technologies, media, and processes as foundation for critical thinking. Analytic modeling, visual thinking.
ARCH 5110 Architecture as Catalyst (1.0 cr.; S-N Grading Basis; prereq MArch) Topical workshops on design methods, theories, or emerging practices.
ARCH 5301 Conceptual Drawing (3.0 cr.; A-F Grade Basis; prereq MArch 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq M Arch major or instr consent) Delineation, presentation, and design techniques. Various visual media and methods of investigation.
ARCH 5321 Architecture in Watercolor (3.0 cr.; A-F or Audit; 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 (1.0-4.0 cr.; A-F or Audit; prereq Arch major or MArch major or #) Selected topics in architectural representation.
ARCH 5361 3-D Computer Architectural Modeling and Design (3.0 cr.; A-F or Audit; 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 5372 Computer Methods II (1.0 cr.; S-N or Audit; prereq 5371, & 8252 and M Arch major or #) Current techniques, computer programs, and their application to architectural computing and design.
ARCH 5374 Computer Methods IV (1.0 cr.; Student Option; prereq 5373, & 8254, M Arch major or #)
Advanced architectural computing applications in design, history, theory, representation, and technology.

ARCH 5381 Introduction to Computer Aided Architectural Design (3.0 cr.; A-F or Audit; prereq Arch or BED or M Arch or grad student in LA or #)
2-D drawing, 3-D modeling/animation, printing, plotting. Electronic networking/communications, database management, spreadsheet analysis, land-use analysis, project management.

ARCH 5382 Computer Aided Architectural Design (3.0 cr.; A-F or Audit; prereq 5381 or arch grad major or #)
2-D/3-D CAD, image manipulation. Advanced multimedia visualization techniques for design, including solid modeling, photo-realistic imaging, animation, video-editing/recording.

ARCH 5410 Topics in Architectural History (3.0 cr.; A-F or Audit; prereq MS Arch or M Arch major or #)
Advanced study in architectural history. Readings, research, seminar reports.

ARCH 5411 Principles of Design Theory (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq [5411, 3412] 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq MS Arch or M Arch major or #)
History of architecture and urban design in France, from 1600 to 1750. Emphasizes major figures (Bernini, Borromini, Cortona, Guarini) and evolution of major cities (Rome, Turin).

ARCH 5426 Architecture and Nature: 1500-1750 (3.0 cr.; Student Option; prereq Arch major or instr consent)

ARCH 5431 Eighteenth-Century Architecture and the Enlightenment (3.0 cr.; A-F or Audit; prereq M Arch grad student or #)
Architecture, urban planning, and garden design in Europe and America from 1650 to 1850.

ARCH 5432 Modern Architecture (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq MS Arch or M Arch major or #)
History of architectural theory, from antiquity to 20th century.

ARCH 5441 Minnesota: Architecture and Landscapes (3.0 cr.; A-F Grade Basis; prereq [3411, 3412] recommended)
History of major architectural monuments, urban phenomena, and landscape forms of Minnesota. Interrelationships between architecture, geography, and people.

ARCH 5445 Suburbia (3.0 cr.; A-F Grade Basis; prereq M Arch major or #)
Suburbanism: 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 5446 Architecture Since World War II: Postwar Experimentation: Aesthetics and Politics of Architecture (3.0 cr.; A-F Grade Basis; prereq M Arch major)
Eight-week seminar. Avant-garde architectural responses to postwar consciousness of social issues/meaning. How tenets of western avant-gardism were transformed by regional constraints when introduced to post-independent agendas of non-western world.

ARCH 5450 Topics in Architectural Theory (1.0-3.0 cr.; A-F or Audit; prereq Arch major or M Arch major or #)
Selected topics in architectural theory and criticism.

ARCH 5451 Architecture: Defining the Discipline (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq 5411, M Arch major, #)
Theoretical traditions and development of typology's role in architecture. Investigates works of Laugier, Guatremere 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 5456 Architecture and Culture (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 5461 North American Indian Architecture (3.0 cr.; Student Option; prereq M Arch major or instr consent)
Historic/contemporary principles/theories of North American Indian architecture. Culture, technology, environment, art, and craft of North American Indians in their settlements/architecture.

ARCH 5465 LeCorbusier's Search for Theory and Identity in His Formative Years (3.0 cr.; A-F Grade Basis; prereq M Arch major)

ARCH 5466 Constructing Sacred Space (4.0 cr.; A-F Grade Basis; 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 5513 Environmental Technology I: Thermal Design in Architecture (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 5515 Technology One: Building Materials and Construction Systems (3.0 cr.; A-F Grade Basis; prereq M Arch student)
ARCH 5516 Technology Two: Luminous and Thermal Design (6.0 cr.; A-F Grade Basis; 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 5517 Technology Three: Structural Systems (3.0 cr.; A-F Grade Basis; prereq M Arch student)
Structural behavior in withstanding gravity and lateral forces. Evolution, range, and applications of structural systems. Structural analysis. Graphical methods, site visits, analog/digital modeling. Case studies, problems.

ARCH 5521 Material Investigation: Concrete (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F Grade Basis; 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 5527 Material Investigations: Stone and Water (4.0 cr.; A-F Grade Basis; prereq M.Arch or M.S.)
Design projects identify common problems/improvements, investigate alternatives, and develop solutions where wood is primary building material.

ARCH 5539 Daylighting and Architecture Design (4.0 cr.; A-F Grade Basis; 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/night shading foster sustainable architectural design.

ARCH 5541 Material Strategies (3.0 cr.; A-F Grade Basis; prereq M Arch or Arch MS major)
Emergent materials in advanced building design; strategies for material approaches relevant to global resource flows, technological trajectories, and sociocultural effects. Research projects based on evaluative tools and case studies.

ARCH 5550 Topics in Technology (1.0-4.0 cr.; A-F Grade Basis; prereq M.Arch major)
Selected topics in architecture technology, e.g., construction, environmental management, energy performance, lighting, materials.

ARCH 5561 Building Production Processes (3.0 cr.; Student Option; prereq M Arch major or #)

ARCH 5571 Architectural Structures I: Wood and Steel Design (3.0 cr.; A-F or Audit; prereq M Arch or #)

ARCH 5611 Design in the Digital Age (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq M Arch major or #)
Legal subject matter relevant to the work of architects and design professionals.

ARCH 5645 Real Estate Development in Architecture (3.0 cr.; Student Option; prereq For undergrads BA Arch major; for grads M Arch major or #)
Fundamentals of real estate development and investment building. Processes and rules of specialists in development of investment projects. Topics include pro forma value and depreciation, tax shelter, feasibility, market analysis, appraisal, equity financing, design, construction, leasing, and property management.

ARCH 5650 Topics in Architectural Practice (1.0-4.0 cr.; Student Option; prereq 5621, Arch major or MS major or #)
Topics in architectural practice, methods of design production, marketing, operation, and relationships among clients, architecture, and society.

ARCH 5651 Building Stories (3.0 cr.; A-F Grade Basis)
Professional practice education by means of case study analysis.

ARCH 5670 Topics in Historic Preservation (1.0-3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 5762 Historic Building Conservation (3.0 cr.; Student Option; prereq 3412, 5671 or #)
Historic building materials, systems, and methods of conservation. Discussion of structural systems, building repair and pathology, introduction of new environmental systems in historic buildings, and conservation of historic interiors. Research on historic building materials and techniques using primary and secondary resources and on documentation of a specific historic site through large-format photography and measured drawings.

ARCH 5673 Historic Building Research and Documentation (3.0 cr.; Student Option; prereq 3412, 3641, 4671, 5671, 4672 or 5672) or #
Philosophy, theory, methods of historic building research. Descriptive analysis of buildings, building documentation, historical archaeology, architectural taxonomy.

ARCH 5771 Theory and Principles of Urban Design (3.0 cr.; A-F or Audit; prereq M Arch major or LA grad major or grad student or #)
Seminar. Debate on dominant theories/paradigms informing city design from renaissance to 21st century. Critical issues central to current debates.

ARCH 5721 Case Studies in Urban Design (3.0 cr.; A-F or Audit; prereq Grad student 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 (3.0 cr.; A-F Grade Basis)
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 (1.0-4.0 cr.; A-F or Audit; prereq Arch major)
Special topics in theory/practice of urban design.

ARCH 5770 Field Studies in Urban Design (2.0-6.0 cr.; A-F Grade Basis)
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 (3.0 cr.; A-F or Audit; prereq Enrollment in CMD prog or #)
ARCH 5893 Directed Study (1.0-4.0 cr.; A-F or Audit; prereq #)
Guided individual reading or study.
Concepts of visual art-making in contemporary and historical contexts. The media, environment, and concerns of the practicing artist. Creative process, visual expression, criteria. Aesthetic foundation for beginning studio courses. Visiting artists, museum and gallery visits, creative presentations.

**ARTS 1101 Drawing** (4.0 cr.; Student Option) Fundamental principles/processes of drawing; various drawing media.

**ARTS 1102 Painting** (4.0 cr.; Student Option; prereq 1101 or 2101) Introduction to painting with attention to understanding and applying the fundamental principles of spatial organization and color interaction.

**ARTS 1301 Sculpture** (4.0 cr.; Student Option) Introduction to sculptural practice. Materials, methods, concepts, history. Emphasizes correlation between concepts and materials. Creative work in clay, plaster, metal, and wood.

**ARTS 1490 Workshop in Art** (1.0-4.0 cr.; Student Option) Selected topics. Intensive studio activity.

**ARTS 1501 Printmaking: Intaglio and Lithography** (4.0 cr.; Student Option) Introduction to techniques of intaglio etching/lithography. Historical approaches/use through contemporary materials/concepts. Emphasizes interrelationship of process, materials, and ideas/aesthetics.

**ARTS 1502 Printmaking: Relief, Screen, and Digital Processes** (4.0 cr.; Student Option) Techniques of relief (linoleum and woodcut), screenprint, and digital printmaking. Historical approaches and use through contemporary materials, concepts, and practices. Emphasizes interrelationship of process, materials, and ideas.

**ARTS 1505 Papermaking** (4.0 cr.; Student Option) Introduction to approaches, forms, and aesthetic possibilities of paper as an expressive medium. Studio work in both Eastern and Western traditions and sculptural applications.

**ARTS 1601 Experimental and Media Arts** (4.0 cr.; Student Option) New technologies as a source for creative art making. Basic processes in digital video, sound, animation, interactive, and networked technologies. Integration of new technologies with more traditional media arts and art disciplines, including filmmaking, sculpture, painting, printmaking, photography, and ceramic arts.

**ARTS 1701 Photography** (4.0 cr.; Student Option) Presents conceptual, technical, and historical aspects of photography within the fine arts context. Emphasis on the creative process through hands-on experience in use of camera, film development, enlarging, and printing.

**ARTS 1703 Digital Photography** (4.0 cr.; Student Option) Introduction to conceptual, technical and historical aspects of photography as a creative medium using digital technology. Digital image capture, related software, digital output and studio procedures. Historical issues, contemporary practice.


**ARTS 1902 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

**ARTS 1903 Freshman Seminar** (3.0 cr.; Student Option) Topics specified in Class Schedule.

**ARTS 1904 Freshman Seminar** (3.0 cr.; Student Option; prereq Fr) Topics specified in Class Schedule.

**ARTS 1905 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

**ARTS 1910W Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

**ARTS 2101 Drawing** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) Fundamental principles/processes of drawing; various drawing media.

**ARTS 2102 Painting** (4.0 cr.; A-F Grade Basis; prereq 1101 or 2101, intended or declared art major) Introduction to painting with attention to understanding and applying the fundamental principles of spatial organization and color interaction.

**ARTS 2301 Sculpture** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) Introduction to sculptural practice. Materials, methods, concepts, history. Emphasizes correlation between concepts and materials. Creative work in clay, plaster, metal, and wood.

**ARTS 2501 Printmaking: Intaglio and Lithography** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) Introduction to techniques of intaglio etching/lithography. Historical approaches/use through contemporary materials/concepts. Emphasizes interrelationship of process, materials, and ideas/aesthetics.

**ARTS 2502 Printmaking: Relief, Screen, Digital Processes** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) Techniques of relief (linoleum and woodcut), screenprint, and digital printmaking. Historical approaches/use through contemporary materials, concepts, and practices. Emphasizes interrelationship of process, materials, and ideas.

**ARTS 2601 Experimental and Media Arts** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) New technologies as a source for creative art making. Basic processes in digital video, sound, animation, interactive, and networked technologies. Integration of new technologies with more traditional media arts and art disciplines, including filmmaking, sculpture, painting, printmaking, photography, and ceramic arts.

**ARTS 2701 Photography** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) Presents conceptual, technical, and historical aspects of photography within the fine arts context. Emphasis on the creative process through hands-on experience in use of camera, film development, enlarging, and printing.

**ARTS 2703 Digital Photography** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) Introduction to conceptual/technical/historical aspects of photography as a creative medium using digital technology. Digital image capture, related software, digital output and studio procedures. Historical issues, contemporary practice.

**ARTS 2801 Ceramics** (4.0 cr.; A-F Grade Basis; prereq Intended or declared art major or minor) An introduction to ceramic practice. Materials, methods, concepts, and history. Correlation between concepts and materials. Creative work with clay, glaze, kilns, and related procedures.

**ARTS 3101 Intermediate Drawing** (4.0 cr.; Student Option; prereq 1001, 1101 or 2101) 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 3102 Intermediate Painting** (4.0 cr.; Student Option; prereq 1001, 1101 or 2101, 1102 or 2102) Emphasizes development of visual sensibility, individual direction, critical judgment.

**ARTS 3105 Dimensional Painting** (4.0 cr.; Student Option; prereq 1001, 1101 or 2101, 1102 or 2102) Application of two-dimensional visual concerns as they relate to sculptural form. Exploration of how painting ideas affect perception of real space.

**ARTS 3106 Drawing: Interpreting the Site** (4.0 cr.; Student Option; prereq 1001, 1101 or 2101) Field trips to draw or paint in various metropolitan area locations. Site interpretations, experimentation with marks/symbols. Focuses on search for personal content as inspired by site.

**ARTS 3107 Drawing Using Digital Media as an Essential Tool** (4.0 cr.; Student Option; prereq 1001, 1101 or 2101) Possibilities of digital technology as tool/component in contemporary, creative drawing practice.

**ARTS 3111 Life Drawing I** (4.0 cr.; Student Option; prereq 1001, 1101 or 2101) Focus on the human form with an introduction to anatomy. Exploration of various concepts of representation and methods of image construction. Work from life, anatomical casts, memory, and imagination.

**ARTS 3112 Life Drawing II** (4.0 cr.; Student Option; prereq 3111 or #) The human form in pictorial structure, single, and multiple figure compositions. The creative process, work toward a personal direction. Attention to representation of the human image in cultural, historical, and contemporary context.

**ARTS 3300 Intermediate Sculpture** (4.0 cr.; Student Option; prereq [1001, 1301] or [2301, 3390]) Studio practice. Historical/contemporary methods/concepts. Personal sculptural thinking in various media platforms. Individual/collaborative modes for contemporary sculptural practice.
ARTS 3301 Sculpture: Direct Metal (4.0 cr.; Student Option; prereq 1001, 1301)
Construcive approach to sculpture through welding in steel, other metals. Studio practice, investigation of historical/contemporary methods/concepts.

ARTS 3302 Sculpture: Spatial Problems (4.0 cr.; Student Option; prereq 1001, 1301)
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 (4.0 cr.; Student Option; prereq 1001, 1301)
Metal casting of sculpture in bronze, iron, aluminum, other metals. Studio practice, investigation of historical/contemporary methods/concepts.

ARTS 3304 Sculpture: Carving and Construction (4.0 cr.; Student Option; prereq 1001, 1301)

ARTS 3305 Sculpture: Kinetics (4.0 cr.; Student Option; prereq 1001, 1301)
The exploration of movement in sculpture (wind, water, electric). Studio practice and investigation of historical and contemporary methods and concepts.

ARTS 3306 Performance Art and Installation (4.0 cr.; Student Option; prereq 1001, 1301)
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 (4.0 cr.; Student Option; 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 3390 Sculpture Methods and Practice (4.0 cr.; Student Option; prereq 1001 or 1301 or 2301)
Selected sculptural processes with intensive studio activity. Various methods to foster working knowledge of materials and techniques: wood construction, kinetics, sound art, figure modeling, mold making, metal construction and casting, installation/performance art.

ARTS 3401W Critical Theories and Their Construction From a Studio Perspective (3.0 cr.; Student Option; 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 3402 Artists' Books (4.0 cr.; Student Option; prereq 1001, one visual art course)
Study/creation of unique, handmade books using various structures, media, techniques. Critical, historical, theoretical issues surrounding contemporary book arts.

ARTS 3403 Women's Images and Images of Women (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; A-F or Audit; prereq Honors, #) Individual consultation with a faculty member on visual work, research project, presentation, paper, or thesis.

ARTS 3415H Honors Exhibition (2.0 cr.; A-F or Audit; prereq [Magna or summa honors candidate], #, %) Advanced problems in studio and research, leading to a magna or summa exhibition.

ARTS 3416H Honors Thesis: Supporting Paper (1.0 cr.; A-F or Audit; 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 (1.0 cr.; S-N Grade Basis) Guest speakers, artist presentations. Identification of themes, correlations between ideas presented by guest artists/critics and students' own creative work.

ARTS 3444 Major Project (1.0 cr.; S-N Grading Basis; prereq & upper level ARTS course in final term, #) Students develop professional skills (e.g., resume, artist's statement, gallery installation and exhibition protocols). Exhibition in Regis Center public spaces.

ARTS 3490 Workshop in Art (1.0-4.0 cr.; Student Option) Selected topics and intensive studio activity; topics vary yearly.

ARTS 3503 The Body Electric: Sensing New Domains for Creative Expression (4.0 cr.; Student Option; prereq 1001, 1601 or 2601) Cultural conceptions of the most personal of new media's hybrid domains of physical/virtual interplay. Readings of contemporary/historical conceptions of the body and the machine. Boundaries/membranes, response/reaction. The biological, the computational, the bionic. Aesthetic explorations with interactive, sensing, and programmable technologies.

ARTS 3506 Art for the People/Art on Wheels (4.0 cr.; Student Option; prereq 1001, 1601 or 2601) Introduction to the Minneapolis Art on Wheels (MAW) project and participation in a student-run public art group. Engage in creative uses of MAW's hardware and software technologies for mobile projections and current urban projection techniques that rely on bicycles. Opportunities to develop and exhibit large scale works in public spaces.

ARTS 3701 Photography: Silver Processes (4.0 cr.; Student Option; prereq 1001, 1701 or 2701) Classical photographic practice, concentrating on camera/darkroom controls. Historical overview of the medium. Conceptual/contemporary approaches to traditional themes.

ARTS 3702 Photography: The Extended Image (4.0 cr.; Student Option; prereq 1001, 1701 or 2701) Manipulation of the photo image using various camera and darkroom methods including
ARTS 5302 Advanced Sculpture: Spatial Problems (4.0 cr.; Student Option; prereq 3302 or #)
Sculptural practice outside traditional media/approaches: installation, theater, public art, architecture as topics for individual investigations into spatial organization.

ARTS 5303 Advanced Sculpture: Metal Casting (4.0 cr.; Student Option; prereq 3303 or #)
Metal casting of sculpture in bronze, iron, aluminum, other metals. Studio practice, investigation of historical/contemporary methods/concepts. Development of personal sculptural imagery.

ARTS 5304 Advanced Sculpture: Carving and Construction (4.0 cr.; Student Option; prereq 3304)

ARTS 5350 Advanced Sculpture: Kinetics (4.0 cr.; Student Option; prereq 5305 or #)

ARTS 5360 Advanced Performance Art and Installation (4.0 cr.; Student Option; prereq 3306 or #)
Studio practice in performance art and installation; investigation of historical and contemporary methods and concepts of interdisciplinary expression. Development of personal imagery.

ARTS 5370 Contemporary and Traditional Approaches to Figurative Sculpture (4.0 cr.; Student Option; prereq 3307 or #)

ARTS 5390 Advanced Sculpture Methods and Practice (4.0 cr.; Student Option; prereq 5300)
Work in selected sculptural processes with intensive studio activity. Development of innovative methods/techniques.

ARTS 5400 Seminar: Concepts and Practices in Art (3.0 cr.; Student Option; prereq BFA candidate or #)

ARTS 5402 Artists’ Books (4.0 cr.; Student Option; prereq 3402 or #)
Advanced projects in creation of unique, handmade books using various structures, media, techniques. Critical, historical, theoretical issues surrounding contemporary book arts.

ARTS 5403 Women’s Images and Images of Women (3.0 cr.; Student Option; 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 (1.0 cr.; S-N Grading Basis; prereq 5400, BFA candidate, sr)
Final solo or small group exhibition and artist’s statement developed in consultation with advisor. Visual documentation of work and statement as appropriate to media.

ARTS 5490 Workshop in Art (1.0-4.0 cr.; Student Option)
Selected topics and intensive studio activity. Topics vary yearly.

ARTS 5510 Advanced Printmaking (4.0 cr.; Student Option; prereq 3505 or #)
In-depth research of personal imagery using a broad range of historical and contemporary approaches. Development of imagery using color, photo-mechanical, digital processes. Cross-media approaches.

ARTS 5550 Advanced Papermaking (4.0 cr.; Student Option; prereq 3505 or #)
Distinct expressive qualities of handmade paper, its versatility as contemporary art form. Independent research pursued in consultation with instructor.

ARTS 5610 New Media: Making Art Interactive (4.0 cr.; Student Option; prereq 3601 or #)

ARTS 5620 Narrative Digital Video (4.0 cr.; Student Option; prereq 3602)
Individual, advanced, creative projects with narrative forms of video art. Documentarv, live action, memoir. Relationships between conceptual, aesthetic, and artistic process.

ARTS 5630 Advanced Experimental Video (4.0 cr.; Student Option; prereq 3603 or #)

ARTS 5640 Advanced Animation (4.0 cr.; Student Option; prereq 3604 or #)
Two-/three-dimensional animation with digital technologies. Individual projects. Expansion of personal voice/visual clarity within framework of animated imagery and time-based artwork.

ARTS 5650 Advanced Sound Art (4.0 cr.; Student Option; 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 5670 Interdisciplinary Media Collaborations (3.0 cr.; Student Option; prereq Upper-division undergraduate or graduate
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 with visual art, music, dance, and theater to produce interdisciplinary/collaborative art.

**ARTS 5690 Art for the People/Art on Wheels: Advanced Projects** (4.0 cr.; Student Option; prereq ArtS 3609)
Advanced work in the Minneapolis Art on Wheels (MAW) project/participation in a student-run public art group. Use MAW's hardware/software technologies for mobile projections and current urban projection techniques that rely on bicycles. Opportunities to develop/exhibit large scale works in public spaces.

**ARTS 5701 Performed Photography: Documentation of Artistic Acts and Social Interventions** (4.0 cr.; Student Option; prereq Two 3xxx [photography or video] courses)
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** (4.0 cr.; Student Option; prereq Two semesters of 3xxx photography or #)
Design/implementation of individual advanced projects. Demonstrations, lectures, critique. Reading, writing, discussion of related articles/exhibitions.

**ARTS 5810 Advanced Ceramics** (4.0 cr.; Student Option; 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** (4.0 cr.; Student Option; prereq 3801 or 3802 or #)
Ceramic materials, their interrelationships. Advanced investigation of glazes, slip formulation, clay bodies in high/low temperature ranges. Individual interests related to students' aesthetic needs.

**ARTS 5990 Independent Study in Art** (1.0-4.0 cr.; Student Option; prereq Major, completed regular course with instructor, #)
Independent study project designed by student in consultation with instructor.

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**Art History (ARTH)**
College of Liberal Arts

**ARTH 1001 Introduction to Art History:**
Prehistoric to Contemporary (3.0 cr.; Student Option)
Major monuments/trends in art, prehistoric to present. Style, subject matter, patronage. Reconstructing artworks' original settings. Religious, political, and social contexts. Western canon, occasionally in comparison with non-Western works.

**ARTH 1002W Why Art Matters** (4.0 cr.; Student Option)
Introduction to history of topics that investigate power/importance of art both globally and in its diverse forms, from architecture and painting to video and prints. Sacred space, propaganda, the museum, art/gender, art/authority, tourism.

**ARTH 1004W Introduction to Asian Art** (3.0 cr.; Student Option)
South, Southeast, East Asian art/material culture from Neolithic Age to twentieth century.

**ARTH 1005 Freshman Seminar** (3.0 cr.; Student Option; prereq Fr)
Topics specified in Class Schedule.

**ARTH 1007W Freshman Seminar** (3.0 cr.; Student Option; prereq F or fewer than 30 cr)
Topics specified in Class Schedule.

**ARTH 1090W Topics: Freshman Seminar** (3.0 cr.; Student Option; prereq freshman)
Topics specified on One Stop Course Guide.

**ARTH 1910W Topics: Freshman Seminar** (3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

**ARTH 1921W Introduction to Film Study** (4.0 cr.; Student Option)
Fundamentals of film language, major theories of cinema. Detailed analysis of several films, including John Ford's Stagecoach, Jean-Luc Godard's Breathless.

**ARTH 2182 Egypt and Western Asia: Art and Archaeology of Ancient Egypt** (3.0 cr.; Student Option)
Introduction to history of Greece/Hellenistic art, from formation of Greek city states, through conquest of last Hellenistic Kingdoms in Mediterranean (Egypt) and South Asia (Punjab).

**ARTH 2162 Roman Art and Archaeology** (3.0 cr.; Student Option)
Introduction to history of Roman art, from formation of city-state of Rome under Etruscan domination, to transformation of visual culture in late antiquity under peoples influenced by the Romans.

**ARTH 3172 Greek and Roman Art and Archaeology** (3.0 cr.; Student Option)
History of Greece, Hellenistic, Etruscan, and Roman art from the formation of the Greek city states in the Geometric period to the transformation of Roman visual culture in the fourth century AD. Changes Classical visual culture underwent as it served non-Greek peoples, including the role it played for Alexander and his successors in forging multiethnic, globally minded empires and the many peoples influenced by the Romans not to mention their own creative reinventions.

**ARTH 3182 Egypt and Western Asia: Art and Archaeology of Ancient Egypt and Western Asia** (3.0 cr.; Student Option)
Art, architecture, and archaeology of Egypt, East Africa, Asia Minor, Mesopotamia, Iran, and Trans-Asia from the Neolithic through Late Antiquity (ca. 7,000 B.C.E.-650 C.E.). Relationship between the visual material and the social, intellectual, political, and religious contexts. Evolution of, and exchanges and differences among, the visual cultures of these time periods and regions.
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 lived 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 3208 Mexico on My Mind (3.0 cr.; Student Option)
Images/issues across time and over a vast geographic territory—from art of Pre-Columbian cultures of Mesoamerica to colonial, post-Independence Mexico to modern Chicano art in the United States. How Mexico and its people have represented themselves and been represented by others. Identify, define, and solve some of the intricate problems that arise when representing and viewing images of oneself and others. Interpret/make more informed choices. Role images play in community, national, and international politics through history. How these images have come to shape modern perceptions and how these perceptions affect people in Mexico and the United States today.

ARTH 3302 Print Culture in Early Modern Europe (3.0 cr.; A-F or Audit)
Cultural history of printed images in Europe from their emergence in the 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 3309 Renaissance Art in Europe (3.0 cr.; A-F Grade Basis)
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, and the development of capitalism.

ARTH 3311 Baroque Art in Seventeenth Century Europe (3.0 cr.; Student Option)

ARTH 3312 European Art of the Eighteenth Century: Rococo to Revolution (3.0 cr.; Student Option)
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. (3.0 cr.; Student Option)
Diverse ways in which making of art and scientific knowledge intersected in early modern Europe. Connections between scientific curiosity and visual arts in major artists (e.g., da Vinci, Durer, Vermeer, Rembrandt). Artfulness of scientific imagery/diagrams, geographical maps, cabinets of curiosities, and new visual technologies, such as the telescope and microscope.

ARTH 3335 Baroque Rome: Art and Politics in the Papal Capital (3.0 cr.; Student Option)
Center of baroque culture—Rome—as city of spectacul and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

ARTH 3401 Art Now (3.0 cr.; A-F or Audit)
Analysis of visual representations in fine arts and popular media, in context of social issues. Obscurity, censorship, democracy, technology, commodity, the museum, propaganda, social role of artist. Understanding the contemporary world through analysis of dominant aesthetic values.

ARTH 3422 Off the Wall: History of Graphic Arts in Europe and America in the Modern Age (4.0 cr.; Student Option)
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. Revolutionary nature of new media.

ARTH 3434 Art and the Environment (3.0 cr.; Student Option)
Historical development of land, earth, and environmental art since 1968. Artists' engagement with environmental problems. Responses to changing aesthetic, political, biological, economic, agricultural, technological, and climatic conditions from global perspective.

ARTH 3464 Art Since 1945 (4.0 cr.; Student Option)
Broad chronological overview of U.S./international art movements since 1945. Assessment of critical writings by major theorists (e.g., Clement Greenberg) associated with those movements. Theoretical perspective of postmodernism.

ARTH 3484 The Art of Picasso and the Modern Movement (4.0 cr.; Student Option)
Works of Picasso in all media. Blue, Rose, Cubist, Classical, and later periods of Picasso's development against innovations in media; collage, utilization of found-objects, printmaking and ceramics. Autobiographical nature of imagery gives methodological basis for exploring frequently personalized themes.

ARTH 3494 East/West, West/East (3.0 cr.; Student Option)
Beginning in the early 18th century and culminating at the dawn of the First World War, Chinoiserie, Orientalism, Japonisme, and western influence in Japan during the Meiji Era. Historical and critical context of trade competition, the colonial race, and the shrinking geopolitical map as the period progresses. Paintings to prints, decorative arts to architecture, and world fair exhibitions to photography.

ARTH 3577 Photo Nation: Photography in America (3.0 cr.; Student Option)

ARTH 3600 The Renaissance (3.0 cr.; Student Option)
Relationships between the visual arts, literature, science, philosophy and politics in Europe from about 1300-1600. Works of artists, writers, and intellectuals (e.g., Michelangelo Buonarotti, Niccolo Machiavelli, Michel de Montaigne), different artistic and literary forms (e.g., portrait, sonnet, essay), and broad thematic issues, including the individual, antiquity, the state, and discovery. Team taught.

ARTH 3655 African-American Cinema (3.0 cr.; Student Option)

ARTH 3921W Art of the Film (4.0 cr.; Student Option)
History of the motion picture as an art form; major filmmakers, directors, genres, and styles. Films discussed include THE BIRTH OF A NATION, CITIZEN KANE, BICYCLE THIEF, RASHOMON, and JULES AND JIM.

ARTH 3930 Junior-Senior Seminar (3.0 cr.; A-F or Audit; prereq Jr or sr) Major art-historical theme, artist, period, or genre. Topics specified in Class Schedule.

ARTH 3940 Topics in Art History (1.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

ARTH 3971V Honors: Major Project (1.0 cr.; A-F or Audit; prereq Honors Arth major, #) Completion of research paper begun in a 5xxx course.

ARTH 3971W Major Project (1.0 cr.; A-F or Audit; prereq Arth major, #) Completion of research paper begun in a 5xxx course.

ARTH 3975 Directed Museum Experience (1.0-2.0 cr.; Student Option; prereq #) Internship or docentship in approved program, art institution, or museum.

ARTH 3993 Directed Study (1.0-4.0 cr.; A-F or Audit; prereq #) TBD

ARTH 3994 Directed Research (1.0-4.0 cr.; A-F or Audit; prereq #) TBD

ARTH 5108 Greek Architecture (3.0 cr.; Student Option; prereq 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 5112 Archaic and Classical Greek Art (3.0 cr.; Student Option; prereq Jr, Clas/ArtH 4111) 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. Focus on Periklean Athens.

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
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 5323 Art of the Italian Renaissance: 14th-16th Centuries**

(3.0 cr.; Student Option)

Chronological/thematic study of painting, sculpture, and architecture. Emphasizes major artists/commissions, but lesser schools/followers also considered.

**ARTH 5324 15th-Century Painting**

(3.0 cr.; Student Option)

The origin, character, and development of painting in Northern and Southern Europe.

**ARTH 5325 Art of the Aztec Empire**

(3.0 cr.; Student Option)

Art/architecture of Nahua-speaking Aztecs of Central Mexico, from first appearance in archaeological record until Spanish invasion in 1521. Major scholarly problems, theoretical/methodological approaches. Analysis of scholarly writing.

**ARTH 5335 Baroque Rome: Art and Politics in the Papal Capital**

(3.0 cr.; Student Option)

Center of baroque culture--Rome--as city of spectacular and pageantry. Urban development. Major works in painting, sculpture, and architecture. Emphasizes ecclesiastical/private patrons who transformed the Eternal City into one of the world's great capitals.

**ARTH 5411 Gender and Sexuality in Art Since 1863**

(3.0 cr.; Student Option)

History of art from late 19th to early 21st century. How gender/sexuality have been central to that period's artistic production, art criticism, and aesthetic theorization. How gender/sexuality are important themes for artists. How the writing of history reveals assumptions about gender/sex. Critical reading/writing.

**ARTH 5417 Twentieth Century Theory and Criticism**

(3.0 cr.; Student Option; prereq 3464 or #)

In-depth examination of development of alternative media in 20th/21st century art. Video technologies. Performance, time based art. Digital art.

**ARTH 5419 Alternative Media: Video, Performance, Digital Art**

(3.0 cr.; A-F or Audit; prereq 3464 or #)

In-depth examination of development of alternative media in 20th/21st century art. Video technologies. Performance, time based art. Digital art.

**ARTH 5422 Off the Wall: History of Graphic Arts in Europe and America in the Modern Age**

(4.0 cr.; Student Option)

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. Revolutionary nature of new media.

**ARTH 5450 Art Design Reform in the Era of Art Nouveau**

(3.0 cr.; Student Option)

History of art nouveau in France, Belgium, England, Germany, Austria, Scotland, United States. Innovations in architecture, graphics, decorative arts; continental variants of the style. Major promotors and pioneers of modern design. Critical issues of design reform; texts integrated with principal monuments.

**ARTH 5466 Contemporary Art**

(3.0 cr.; Student Option; prereq 3464 or #)

Survey of the art and important critical literature of the period after 1970. Origins and full development of postmodern and subsequent aesthetic philosophies.

**ARTH 5484 The Art of Picasso and the Modern Movement**

(4.0 cr.; Student Option)

Works of Picasso in all media. Blue, Rose, Cubist, Classical, and later periods of Picasso's development against innovations in media; collage, utilization of found-objects, printmaking and ceramics. Autobiographical nature of imagery gives methodological basis for exploring frequently personalized themes.

**ARTH 5494 East/West, West/East**

(3.0 cr.; Student Option)

Beginning in the early 18th century and culminating at the dawn of the First World War. Orientalism, Japonism, and western influence in Japan during the Meiji Era. Historical and critical context of trade competition, the colonial race, and the shrinking geopolitical map as the period progresses. Paintings to prints, decorative arts to architecture, and world fair exhibitions to photography.

**ARTH 5535 Style, Tradition, and Social Content in American Painting: Colonial Era to 1876**

(3.0 cr.; Student Option)

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 5546 American Architecture: 1840 to 1914**

(3.0 cr.; Student Option; prereq 3464 or #)

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 5565 American Art in the Gilded Age**

(3.0 cr.; Student Option)

Major artists, artistic movements, and aesthetic concerns that dominated American art history from the Civil War to the turn of the century. Nationalism and cosmopolitanism as well as masculinity and femininity, industrialization and the "incorporation of America," methods of art instruction and its social role. Place of art in civic life.

**ARTH 5575 Born to Bust: American Art from the Roaring Twenties to the Great Depression**

(3.0 cr.; Student Option)

American art/culture from 1917 to 1940. Boom of post-WWI affluence, bust of stock market crash, Midwestern Dust Bowl. How tumultuous times influenced painting, sculpture, photography, and industrial design.

**ARTH 5577 Art of the Harlem Renaissance**

(3.0 cr.; Student Option)
Visual side of Harlem Renaissance, as represented by painters, illustrators, sculptors, and photographers. How African-Americans in 1920s/30s tried to reclaim visual field for purposes of racial redefinition.

**ARTH 5655 African American Cinema (3.0 cr.; Student Option)**

African American cinematic achievements, from silent films of Oscar Micheaux through contemporary Hollywood and independent films. Class screenings, critical readings.

**ARTH 5765 Early Chinese Art (3.0 cr.; Student Option)**

Art/material culture of early China from Neolithic age (ca. 10000-2000 BCE) to early imperial period (221 BCE-906 CE).

**ARTH 5766 Chinese Painting (3.0 cr.; Student Option)**

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 (3.0 cr.; Student Option)**

Sculpture/architecture, from Indus Valley civilization through Kushana period.

**ARTH 5776 Redefining Tradition: Indian Art, 400 to 1300 (3.0 cr.; Student Option)**

India's art/architecture, from earliest free-standing temples through 13th century. Focuses on temples, associated sculpture. Mural painting, beginnings of Islamic architecture in India.

**ARTH 5777 The Diversity of Traditions: Indian Art 1200 to Present (3.0 cr.; Student Option)**

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 (3.0 cr.; Student Option)**

Artistic developments under the three most powerful Islamic empires of the 16th through 19th centuries: Ottomans of Turkey; Safavids of Iran; Mughals of India. Roles of religion and state will be considered to understand their artistic production.

**ARTH 5785 Art of Islamic Iran (3.0 cr.; Student Option)**

Architecture, painting, and related arts in Iran from the inception of Islam (7th century) through the 20th century. Understanding the nature of Islam in Persianate cultural settings and how artistic production here compares to the Islamic world.

**ARTH 5801 Spoken Word and Painted Texts in the Americas (200-1650 A.D.) (3.0 cr.; Student Option)**

Mexico, Maya region, colonial Peru (ca. A.D. 500-1600). Analyze primary sources, interpretations, major problems confronting scholars. Difference between theoretical/methodological approaches.

**ARTH 5802 The Otca and Their Ancestors (3.0 cr.; Student Option)**


**ARTH 5940 Topics: Art of the Film (3.0 cr.; Student Option)**

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 (3.0 cr.; Student Option)**

Topics specified in Class Schedule.

**ARTH 5993 Directed Study (1.0-4.0 cr.; A-F or Audit; prereq #)**

TBD

**ARTH 5994 Directed Research (1.0-4.0 cr.; A-F or Audit; prereq #)**

TBD

**Arts and Cultural Leadership (ACL)**

**ACL 5100 Topics in Arts and Cultural Leadership (1.0-4.0 cr.; A-F or Audit; prereq %)**

Topics in arts and cultural leadership.

**ACL 5200 Trends and Impacts in Arts and Cultural Leadership (3.0 cr.; A-F or Audit; prereq %)**

Seminar exploring the theoretical foundations/policies from which nonprofit arts and culturally-related organizations are built and the practical influences that affect leaders and their ability to achieve mission delivery, set strategic goals and translate strategy into successful, daily operations.

**ACL 5220 Philanthropy, Development, and Strategic Leadership (3.0 cr.; A-F or Audit; prereq %)**

Funding sources available to nonprofit organizations/strategies employed to acquire/sustain necessary resources. Investigate/discuss complexities and nuances of both earned/unearned income for nonprofits, motives/perspectives of funders and donors, role of communications strategies in support of fund-raising, importance of leadership in acquiring resources to sustain/grow a successful organization. Participants interact with leaders from the foundation and nonprofit community during most class sessions, including the State Arts Board, St. Paul Foundation, TPT, Jerome Foundation, Bush Foundation.

**ACL 5230 Ethical and Legal Issues in Arts Policy and Law (3.0 cr.; A-F or Audit; prereq %)**

Conditions/decision-making in an ethical/legal context that surround nonprofit status and mission, daily operations, artistic freedom/responsibility, private vs. public funding, and the political arena in which certain issues and conditions take place.

**ACL 5950 Special Topics (1.0-4.0 cr.; A-F or Audit; prereq %)**

Special topics.

**ACL 5993 Directed Studies (1.0-4.0 cr.; A-F Grade Basis; prereq Grad student, %)**

Guided individual reading or study for qualified graduate students.

**Asian American Studies (AAS)**

College of Liberal Arts

**AAS 1101 Imagining Asian America (3.0 cr.; Student Option)**

Issues in Asian American Studies. Historical/recent aspects of the diverse/multifaceted vision of "Asian America," using histories, films, memoirs, and other texts as illustrations.

**AAS 1201 Racial Formation and Transformation in the United States (3.0 cr.; Student Option)**

How aggrieved racialized groups struggle over identity, culture, place, and meaning. Histories of racialization. Strategies toward rectification of historical injustices from dispossession, slavery, exploitation, and exclusion.

**AAS 1902 Freshman Seminar (3.0 cr.; Student Option; prereq Fr)**

Topics specified in Class Schedule.

**AAS 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr)**

Topics specified in Class Schedule.

**AAS 3251W Sociological Perspectives on Race, Class, and Gender (3.0 cr.; A-F Grade Basis; prereq Soc 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 (2.0 cr.; Student Option; 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 3301 Asian America Through Arts and Culture (3.0 cr.; Student Option)**

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 3409W Asian American Women's Cultural Production (3.0 cr.; Student Option)**

Diversity of cultures designated "Asian American." Understanding women's lives in historical, cultural, economic, and racial contexts.

**AAS 3483 Hmong History Across the Globe (3.0 cr.; Student Option)**

Hmong interaction with lowland Southeast Asian states (Laos, Vietnam) and Western colonial powers (French, American) since 19th century. Changes to religious, social, political, and gender institutions. Aspirations for political autonomy.

**AAS 3862 American Immigration History (3.0 cr.; A-F or Audit)**

Global migrations to U.S. from Europe, Asia, Latin America, and Africa, from early 19th century to present. Causes/cultures of
migration. Migrant communities, work, and families. Xenophobia, assimilation/integration, citizenship, ethnicity, race relations. Debates over immigration. Place of immigration in America's national identity.

AAS 3875W Comparative Race and Ethnicity in U.S. History (3.0-4.0 cr.; A-F or Audit) America through its cultural diversity. Changing notions of American national identity/citizenship from 19th 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 3877 Asian American History, 1850 to Present (3.0 cr.; Student Option) Asian American history and contemporary issues, from 1850 to present. Immigration, labor, anti-Asian movements, women/families, impact of World War Two, new immigrant/refugee communities, civil rights, Asian American identity/culture.

AAS 3920 Topics in Asian American Studies (2.0-4.0 cr.; Student Option; prereq Jr or sr) Topics specified in Class Schedule.

AAS 3993 Directed Studies in Asian American Studies (1.0-9.0 cr.; Student Option; prereq #) Guided individual reading or study.

AAS 4231 The Color of Public Policy: African Americans, American Indians, and Chicanos in the United States (3.0 cr.; Student Option) Structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

AAS 4232 American Drama by Writers of Color (3.0 cr.; A-F or Audit) Selected works by Asian American, African American, American Indian, Latino, and Chicano playwrights. How racial/ethnic differences are integral to shaping different visions of American drama. History of minority/ethnic theaters, politics of casting, mainstreaming of the minority playwright.

AAS 4311 Asian American Literature and Drama (3.0 cr.; A-F or Audit) Literary/dramatic works by Asian American writers. Historical past of Asian America, through perspectives of writers such as Sui Sin Far and Carlos Bulosan. Contemporaray artists 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 (2.0-4.0 cr.; Student Option) Topics specified in Class Schedule.

AAS 5920 Topics in Asian American Studies (1.0-4.0 cr.; Student Option) Topics specified in Class Schedule.

AAS 5993 Directed Readings (1.0-4.0 cr.; Student Option) Directed reading--must be set up with individual instructor.

AAS 5996 Graduate Proseminar (1.0 cr.; S-N Grading Basis) 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.


AAS 1904 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule and Course Guide.

AAS 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule and Course Guide.

AAS 1909W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule and Course Guide.

ALL 1901W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule and Course Guide.

ALL 3001 Reading Asian Cultures (3.0 cr.; A-F or Audit) Introduction to primary Asian texts in translation. Emphasizes introducing/applying various methods of interpretation to a particular text in sequence. Close reading, methodological rigor. Practice, application.

ALL 3014W Art of India (4.0 cr.; Student Option) Indian sculpture, architecture, and painting, from prehistoric Indus Valley civilization to present.

ALL 3110 Study of an Asian Language (1.0-5.0 cr.; Student Option; prereq %) Study of an Asian language in another country or at other non-campus locations. Students study in situations complementary to regular University course offerings.

ALL 3220 Study Abroad Topics in Asian Culture (1.0-4.0 cr.; A-F or Audit) Part of University of Minnesota sponsored study abroad experience.


ALL 3261W Writing (in) East Asia: From Oracle Bones to Tattoos (3.0 cr.; Student Option; prereq One year 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 (3.0 cr.; Student Option; 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 3270 Service Learning in the Asian Community (2.0 cr.; Student Option; 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 3300 Topics in Chinese Literature (1.0-3.0 cr.; Student Option) Selected topics in Chinese literature. Topics specified in the Class Schedule.

ALL 3320 Topics in Chinese Culture (1.0-3.0 cr.; Student Option) Selected topics in Chinese culture. Topics specified in the Class Schedule.

ALL 3334 Voices from Ancient China: The Book of Songs and The Songs of the South (3.0 cr.; Student Option) Beginnings of Chinese culture in the songs, poems, and stories from two important classics, “The Book of Songs” and “Songs of the South.” “Voices” from these early texts, including love songs, prayers to the ancestors, soldier complaints, and a poet's fantasies.

ALL 3336 Revolution and Modernity in Chinese Literature and Culture (3.0 cr.; A-F Grade Basis) 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 in English translation.


ALL 3356W Chinese Film (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) 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 3371 History of Chinese Cities and Urban Life (3.0 cr.; A-F or Audit)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL 3373</td>
<td>Religion and Society in Imperial China</td>
<td>3.0</td>
<td>Introduction to religious traditions of imperial China (Buddhism, Daoism, Confucianism, &quot;popular&quot; religion), their relation 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.</td>
</tr>
<tr>
<td>ALL 3400</td>
<td>Topics in Japanese Literature</td>
<td>3.0</td>
<td>Selected topics in Japanese literature. Topics specified in the Class Schedule.</td>
</tr>
<tr>
<td>ALL 3420</td>
<td>Topics in Japanese Culture</td>
<td>1.0-3.0</td>
<td>Selected topics in Japanese culture. Topics specified in the Class Schedule.</td>
</tr>
<tr>
<td>ALL 3433W</td>
<td>Traditional Japanese Literature in Translation</td>
<td>3.0</td>
<td>Survey of texts in different genres, from 8th to early 19th centuries, with attention to issues such as &quot;national&quot; identity, gender/sexuality, authorship, and popular culture.</td>
</tr>
<tr>
<td>ALL 3436</td>
<td>Postwar Japanese Literature in Translation</td>
<td>3.0</td>
<td>Basic knowledge of modern Japanese history helpful, knowledge of Japanese language not required.</td>
</tr>
<tr>
<td>ALL 3437</td>
<td>Early 20th Century Japanese Literature in Translation</td>
<td>3.0</td>
<td>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, Kawabata Yasunari, and Tanizaki Junichiro.</td>
</tr>
<tr>
<td>ALL 3441W</td>
<td>Japanese Theater</td>
<td>3.0</td>
<td>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).</td>
</tr>
<tr>
<td>ALL 3456</td>
<td>Japanese Film</td>
<td>3.0</td>
<td>Themes, styles, and genres of Japanese cinema through work of classic directors (Kurosawa, Mizoguchi, and Ozu) and more recent filmmakers (Itami, Monta). Focuses on representations of femininity/masculinity.</td>
</tr>
<tr>
<td>ALL 3457</td>
<td>War and Peace in Japan Through Popular Culture</td>
<td>4.0</td>
<td>War-related issues in Japan. Animation films, comics from 1940s to 1990s. Mobilization of culture for WWII. Conflict between constitutional pacifism/national security. Japan's role in cold war/post-cold war worlds.</td>
</tr>
<tr>
<td>ALL 3500</td>
<td>Topics in Korean Literature</td>
<td>1.0-3.0</td>
<td>Selected topics in Korean literature. Topics specified in the Class Schedule.</td>
</tr>
<tr>
<td>ALL 3520</td>
<td>Topics in Korean Culture</td>
<td>1.0-3.0</td>
<td>Selected topics in Korean culture. Topics specified in the Class Schedule.</td>
</tr>
<tr>
<td>ALL 3536</td>
<td>Modern Korean Literature</td>
<td>3.0</td>
<td>Modern Korean literature in English translation from the colonial period until the 1990s. Read literary texts critically, using genre categories, theories of narrative voice, different understandings of modern literary subjectivity, and historical contextualization.</td>
</tr>
<tr>
<td>ALL 3556</td>
<td>Korean Film</td>
<td>3.0</td>
<td>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, Johns, magicians, and tricky secret agents.</td>
</tr>
<tr>
<td>ALL 3632</td>
<td>Roman Epics and Romance</td>
<td>3.0</td>
<td>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, Johns, magicians, and tricky secret agents.</td>
</tr>
<tr>
<td>ALL 3836</td>
<td>Persian Fiction in Translation</td>
<td>3.0</td>
<td>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, Ali Ahmad, Daneshvar, and Behrang are analyzed/interpreted.</td>
</tr>
<tr>
<td>ALL 3900</td>
<td>Topics in Asian Literature</td>
<td>3.0</td>
<td>Topics specified in Class Schedule.</td>
</tr>
<tr>
<td>ALL 3920</td>
<td>Topics in Asian Culture</td>
<td>3.0</td>
<td>Topics specified in Class Schedule.</td>
</tr>
<tr>
<td>ALL 3990</td>
<td>Directed Study</td>
<td>1.0-4.0</td>
<td>Individual reading/study, with guidance of a faculty member, on topics not covered in regular courses.</td>
</tr>
<tr>
<td>ALL 4900W</td>
<td>Major Project</td>
<td>3.0</td>
<td>Directed research/writing on topic selected according to individual interest, in consultation with faculty adviser.</td>
</tr>
<tr>
<td>ALL 5211</td>
<td>Introductory Classical Chinese</td>
<td>3.0</td>
<td>Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese and its importance in the study of East Asian cultures. Taught in English.</td>
</tr>
<tr>
<td>ALL 5212</td>
<td>Introductory Classical Chinese</td>
<td>3.0</td>
<td>Reading excerpts from canonical Chinese texts. Transnational nature of Classical Chinese and its importance in the study of East Asian cultures. Taught in English.</td>
</tr>
</tbody>
</table>
AST 1001 Exploring the Universe (4.0 cr.; Student Option) The human place in the Universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe and our relationship to it. 

AST 1005 Descriptive Astronomy (3.0 cr.; Student Option; prereq non-science major) Twentieth century astrophysics, current frontiers of astrophysical research.

AST 1011H Exploring the Universe, Honors (4.0 cr.; A-F Grade Basis; prereq High school trigonometry, [high school physics or chemistry]) Human place in universe. Earth, other planets, sun, stars, galaxies. Background/fragility of life on Earth. Scale, origin, history of universe, our relationship to it. Honors version of 1001.

AST 1901 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1905 Freshman Seminar (2.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1910W Freshman Seminar, Writing Intensive (1.0-3.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1901H Exploring the Universe, Honors (4.0 cr.; Student Option) The human place in the Universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe, our relationship to it. Honors version of 1001.

AST 1905 Freshman Seminar (2.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1910W Freshman Seminar, Writing Intensive (1.0-3.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1901H Exploring the Universe, Honors (4.0 cr.; Student Option) The human place in the Universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe, our relationship to it. Honors version of 1001.

AST 1905 Freshman Seminar (2.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1910W Freshman Seminar, Writing Intensive (1.0-3.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1901H Exploring the Universe, Honors (4.0 cr.; Student Option) The human place in the Universe. Study of Earth, other planets, sun, stars, galaxies. Background and fragility of life on Earth. Scale, origin, history of universe, our relationship to it. Honors version of 1001.

AST 1905 Freshman Seminar (2.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.

AST 1910W Freshman Seminar, Writing Intensive (1.0-3.0 cr.; Student Option; prereq freshman) Topics vary. See Class Schedule.
Lectures, discussion on current research in the department.

**BIOC 4025 Laboratory in Biochemistry**
- (2.0 cr.; Student Option; 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**
- (3.0 cr.; A-F or Audit; prereq [3021 or Biol 3021 or Biol 4003], [4025 or GCD 4015 or GCD 4025 or MicB 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**
- (3.0 cr.; A-F or Audit; prereq Enrollment in Life Sciences Summer Undergraduate Research Program)

**BIOC 4225 Laboratory in NMR Techniques**
- (1.0 cr.; S-N Grading Basis; prereq 4331, 4322, 4521 recommended; intended for biochemistry majors)
- Practical aspects of nuclear magnetic resonance (NMR) spectroscopy. 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**
- (1.0 cr.; S-N Grading Basis; 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**
- (4.0 cr.; Student Option; prereq [Biol 1002 or Biol 1009 or Biol 2003 or equiv], [CHEM 2302 or equiv] or #)
- Advanced survey of structure/catalysis, metabolism/bioenergetics.

**BIOC 4332 Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression**
- (4.0 cr.; Student Option; prereq 4331 or #)

**BIOC 4521 Introduction to Physical Biochemistry**
- (3.0 cr.; Student Option; 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 4793W Directed Studies: Writing Intensive**
- (1.0-7.0 cr.; S-N or Audit; prereq #, %)
- Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

**BIOC 4794W Directed Research: Writing Intensive**
- (1.0-6.0 cr.; S-N or Audit; prereq #, %)
- Laboratory or field investigation of selected areas of research, including written report.

**BIOC 4950 Computer Simulation and Data Analysis in Biochemistry**
- (3.0 cr.; A-F or Audit; 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 4960 Special Topics in Biochemistry**
- (3.0 cr.; A-F Grade Basis; prereq [3021 or equiv, CHEM 2301] or #)
- In-depth study of a topic in biochemistry.

**BIOC 4993 Directed Studies**
- (1.0-7.0 cr.; S-N or Audit; prereq #, %)
- Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

**BIOC 4994 Directed Research**
- (1.0-6.0 cr.; S-N or Audit; prereq #, %)
- Laboratory or field investigation of selected areas of research.

**BIOC 5001 Biochemistry, Molecular and Cellular Biology**
- (5.0 cr.; Student Option; prereq undergraduate course in biochemistry, #)
- Integrated course in biochemistry, molecular biology, cell biology, and developmental biology.

**BIOC 5213 Selected Topics in Molecular Biology**
- (3.0 cr.; A-F Grade Basis; prereq 4332 or 8002 or [3021, BIOL 4003] or #)
- Cutting edge areas in molecular biology. Topics focus on the “3 Rs” of DNA: repair, replication, and recombination. Faculty who are experts in these areas teach modules on specific topics, including discussion of their research interests.

**BIOC 5352 Biochemistry, Molecular and Cell Biology**
- (5.0 cr.; Student Option; prereq undergrad course in biochemistry, #)
- In-depth study of a topic in biochemistry.

**BIOC 5528 Spectroscopy and Kinetics**
- (4.0 cr.; Student Option; prereq [intro biochemistry, intro physics] or physical chemistry or #)
- Methods employed in modern structural biology to elucidate macromolecular structures. Primary focus on X-ray diffraction, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. Principles underlying structural biology and structure/function relationships.

**BIOC 5529 Biocatalysis and Biodegradation**
- (3.0 cr.; Student Option; prereq chemistry through organic chemistry, knowledge of wordprocessing, 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 5532 Biotechnology and Bioengineering for Biochemists**
- (3.0 cr.; A-F or Audit; 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 5533 Microbial Biochemistry and Biotechnology: Small Molecules**
- (3.0 cr.; A-F or Audit; prereq [3021 or 4331 or Biol 3021 or MicB 4111], [BIOL 3301 or MicB 3301] or #)

**BIOC 5561 Microbial Genomics and Bioinformatics**
- (3.0 cr.; Student Option; prereq College-level courses in [organic chemistry, biochemistry, microbiology])
- Introduction to genomics. Emphasizes microbial genomics. Sequencing methods, sequence analysis, genomics databases, genome mapping, prokaryotic horizontal gene transfer, genomics in biotechnology, intellectual property issues.

**BIOC 5444 Muscle**
- (3.0 cr.; Student Option; prereq 3021 or BIOL 3021 or 4331 or BIOL 4331 or PHSL 3061 or #)

**BIOC 5527 Introduction to Modern Structural Biology**
- (4.0 cr.; Student Option; prereq [intro biochemistry, intro physics] or physical chemistry or #)
- Methods employed in modern structural biology to elucidate macromolecular structures. Primary focus on X-ray diffraction, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. Principles underlying structural biology and structure/function relationships.

**BIOC 5528 Spectroscopy and Kinetics**
- (4.0 cr.; Student Option; prereq Intro physical chemistry or equiv; intro biochemistry recommended)

**BIOC 5531 Macromolecular Crystallography I: Fundamentals and Techniques**
- (1.0 cr.; S-N or Audit; prereq [[One organic chemistry or biochemistry course], [two calculus or college physics courses]] or inst approval)
BTHX 5000 Topics in Bioethics (1.0-4.0 cr.; Student Option; prereq Grad student or #)
Bioethics topics of contemporary interest.
Topics specified in Class Schedule.

BTHX 5010 Bioethics Proseminar (2.0 cr.; A-F Grade Basis; prereq Bioethics grad student or grad minor)
Introduction to topics in bioethics.

BTHX 5100 Introduction to Clinical Ethics (3.0 cr.; Student Option; prereq Jr or sr or 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 (3.0 cr.; Student Option; prereq Grad student or #)
Issues in ethics of human subjects research.

BTHX 5300 Foundations of Bioethics (3.0 cr.; Student Option; prereq Grad student or #)
Overview of major contemporary frameworks, foundational issues in bioethics.

BTHX 5325 Biomedical Ethics (3.0 cr.; Student Option; prereq Jr or sr or 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 (3.0 cr.; Student Option; 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 5411 Health Law and Policy (3.0 cr.; A-F or Audit; prereq Grad student or #)

BTHX 5453 Law, Biomedicine, and Bioethics (3.0 cr.; A-F Grade Basis; prereq Grad student or #)

BTHX 5610 Research and Publication Seminar (1.0 cr.; Student Option; prereq [Junior or Senior or grad student]; bioethics grad majors must register A-F)

BTHX 5620 Social Context of Health and Illness (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; 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.

Bioinformatics (BINF) College of Biological Sciences

BINF 5480 Bioinformatics Journal Club (1.0 cr.; S-N or Audit)
Bioinformatics Journal Club

BINF 5490 Topics in Bioinformatics (1.0-6.0 cr.; Student Option; prereq #)
Independent or group study in bioinformatics.

Biology (BIOL) College of Biological Sciences

BIOL 1001 Introductory Biology: Evolutionary and Ecological Perspectives (4.0 cr.; Student Option)
Biological diversity from genetic variation to diversity of species/ecosystems. Genetic, evolutionary, and ecological processes governing biological diversity. Genetic, evolutionary, and ecological perspectives on issues concerning human diversity, human population growth, health, agriculture, and conservation. Lab.

BIOL 1001H Introductory Biology I: Evolutionary and Ecological Perspectives (4.0 cr.; A-F Grade Basis; prereq Honors)
Biological diversity from genetic variation to diversity of species/ecosystems. Genetic, evolutionary, and ecological processes governing biological diversity. Issues of human diversity, population growth, health, agriculture, and conservation. Lab.

BIOL 1003 Evolution and Biology of Sex (4.0 cr.; Student Option)

BIOL 1009 General Biology (4.0 cr.; Student Option; prereq high school chemistry; 1 term college chemistry recommended)

BIOL 1009H Honors: General Biology (4.0 cr.; Student Option; prereq high school chemistry, honors; one term of college chemistry recommended)

BIOL 1010 Human Biology: Concepts and Current Ethical Issues (4.0 cr.; Student Option)
Concepts related to structure/function of human body. Unifying themes such as homeostasis. Impact of science on society, civic life, and ethics. Weekly debates/discussion relating to current issues in science.

BIOL 1020 Biology Colloquium (1.0 cr.; S-N or Audit)
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 1050 Our Global Environment: Science and Solutions (3.0 cr.; Student Option)
How to independently explore science behind environmental topics. Ethics of environmental science, policy, and personal choice. Environmental toxicology, biodiversity, food production, global climate change.

BIOL 1093 Biology Colloquium: Directed Study (1.0 cr.; S-N or Audit; 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 (3.0 cr.; Student Option; prereq No cr if taken after 4003 or GCB 3022)
Principles of heredity and their social and cultural implications.

BIOL 1105 Introduction to Biology, Society, and the Environment (2.0 cr.; A-F or Audit)
Social context of biology, relevance of biology to social/environmental issues. How biology shapes and is shaped by current events, legislation, ethical concerns, and history. Case studies, discussion.

BIOL 1301 Becoming a Reflective Leader (1.0 cr.; S-N Gradling Basis; prereq Dean's Scholar)

BIOL 1700 Special Topics in Biology (1.0-3.0 cr.; Student Option)
Faculty members lead students in discussion on topics of interest.

BIOL 1805 Nature of Life: Introducing New Students to the Biological Sciences (1.0 cr.; S-N or Audit; 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

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
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and Laboratories. Transportation, board, and lodging fee.
BIOL 1806 Nature of Life, Part Two (1.0 cr.; S-N Grading Basis; prereq BIOL 1805)
Second semester of Nature of Life with focus on building an intentional pathway in CBS/ student success/engagement.
BIOL 1901 Freshman Seminar for the Biological Sciences (1.0-2.0 cr.; A-F or Audit; prereq freshman)
Orientation to University environment. Special topics illustrate importance of biological issues.
BIOL 1903 Freshman Seminar for the Biological Sciences (1.0-2.0 cr.; A-F or Audit; prereq freshman)
Orientation to University environment. Special topics illustrate importance of biological issues.
BIOL 1905 Freshman Seminar for the Biological Sciences (1.0-3.0 cr.; A-F Grade Basis; prereq freshman)
Orientation to University environment. Special topics illustrate importance of biological issues.
BIOL 1910W Freshman Seminar for the Biological Sciences (2.0 cr.; A-F or Audit; prereq freshman)
Orientation to University environment. Special topics that illustrate the importance of biological topics/issues in modern society.
BIOL 2001 Career Planning for Biologists (1.0 cr.; S-N or Audit)
Introduction to career planning. Students assess their strengths, interests, values, and motivations. Decision making, campus/community resources, developing an action plan. Online modules/assessments, in-class discussions, presentations, one-to-one consultations.
BIOL 2002 Foundations of Biology for Biological Sciences Majors, Part I (6.0 cr.; A-F Grade Basis; prereq [CHEM 1021 or 1061 or equiv], CBS major) or %; calculus I or equiv recommended)
Core biological concepts, from biomolecules to ecosystems. Emphasizes evolution, organismal diversity, and genetics within context of problem solving/applications.
BIOL 2002H Foundations of Biology for Biological Sciences Majors, Part I (6.0 cr.; A-F Grade Basis; prereq [CHEM 1021 or 1061 or equiv], CBS major, honors student) or %; calculus I or equiv recommended)
Core biological concepts, from biomolecules to ecosystems. Evolution, organismal diversity, and genetics within context of problem solving/applications.
BIOL 2003 Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr.; A-F Grade Basis; prereq 2002 or 2002H or CBS major)
Second of two courses. Biological concepts, from biomolecules to ecosystems. Ecology/biochemistry concepts within problem solving/application.
BIOL 2003H Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr.; A-F Grade Basis; prereq [2002 or 2002H], honors)
Second of two courses. Biological concepts, from biomolecules to ecosystems. Ecology/biochemistry concepts within problem solving/application.
BIOL 2004 Foundations of Biology for Biological Sciences Majors, Part II Laboratory (3.0 cr.; A-F Grade Basis; prereq [2002 or 2002H or CBS major])
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.
BIOL 2004H Foundations of Biology for Biological Sciences Majors, Part II Laboratory (3.0 cr.; A-F Grade Basis; prereq [2002 or 2002H], honors)
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.
BIOL 2005 Animal Diversity Laboratory (2.0 cr.; Student Option)
Dissection, direct observation of representatives of major animal groups.
BIOL 2012 General Zoology (4.0 cr.; Student Option; prereq One semester of college biology)
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 2100 Brewing: The Biology, History, and Practice (3.0 cr.; A-F Grade Basis; prereq 1001 or 1009 or 2002 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 2301 Leadership and Service (2.0 cr.; S-N Grading Basis; prereq 1301, 2001, CBS Dean's Scholar) or #) Importance of service in leadership. How personal experiences influence perspectives on social issues. Techniques for group work. Service project with community organization related to biological sciences.
BIOL 2700 Special Topics in Biology (1.0-3.0 cr.; Student Option)
Faculty members lead students in discussion of topics of interest.
BIOL 2812 Field Zoology (4.0 cr.; A-F Grade Basis; 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 2990H Exploring Research in the Biological Sciences (1.0 cr.; A-F Grade Basis; prereq CBS, Honors program, soph, %) Explore areas of biological research. Learn where/how to access research papers. Prepare in-depth review paper.
BIOL 3002 Plant Biology: Function (2.0 cr.; Student Option; prereq [1002 or 1009 or 2003 or equiv], [CHEM 1011 or one semester chemistry with some organic content]) How plants make/use food. Mineral function/uptake. Water relations. Transport processes. Growth/development.
BIOL 3005W Plant Function Laboratory (2.0 cr.; Student Option; prereq Concurrent enrollment 3002)
Various plant processes at subcellular, organ, whole plant levels. Lab, recitation.
BIOL 3007W Plant, Algal, and Fungal Diversity and Adaptation (4.0 cr.; Student Option; prereq One semester college biology, CHEM 1021) Exploration/diversity of plants. Their adaptations for survival in varied environments. Includes lab.
BIOL 3209 Understanding the Evolution-Creationism Controversy (3.0 cr.; A-F Grade Basis; 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 3211 Physiology of Humans and Other Animals (3.0 cr.; Student Option; prereq [1009 or 2003 or equiv], [CHEM 1021 or 1061]; &2005 recommended) Ways different animals solve similar physiological problems.
BIOL 3302 Leadership For Change (1.0 cr.; S-N Grading Basis; prereq 1301, 2001, 2301, CBS dean's scholar) 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 (1.0 cr.; S-N Grading Basis; prereq 1301, 2001, CBS dean's scholar) 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 3310 Research Seminars in Biology (1.0 cr.; A-F Grade Basis; prereq One semester of college level general biology) Research seminars in Genetics, Microbiology, Plant Biology, Ecology, Biomedical Engineering, Biochemistry, Neuroscience.
BIOL 3407 Ecology (3.0 cr.; Student Option; 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.

BIOL 3408W Ecology (3.0 cr.; Student Option; 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.

BIOL 3409 Evolution (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (2.0 cr.; Student Option; prereq 1002 or 1009 or 2003 or equiv)

BIOL 3600 Directed Instruction (1.0-2.0 cr.; S-N or Audit; prereq 1020, upper div, application; #; up to 4 cr may apply to major)
Students assist with biology colloquium. Lab, field work.

BIOL 3610 Internship: Professional Experience in Biological Sciences (1.0-6.0 cr.; S-N or Audit; 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 (1.0-3.0 cr.; Student Option)
Faculty members lead students in discussions on topics of interest.

BIOL 3807 Ecology (4.0 cr.; A-F or Audit; prereq [One semester college biology], [MATH 1142 or MATH 1271 or MATH 1281 or equiv])
Population growth/interactions. 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 (4.0 cr.; A-F or Audit; prereq 1002 or 1009 or 2003 or equiv or #)
Biological study of animal behavior. Mechanism development, function, evolution. Emphasizes evolution of adaptive behavior, social behavior in natural environment. Lab, field work.

BIOL 3820 Aquatic Toxicology (2.0 cr.; A-F Grade Basis; 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 (2.0 cr.; A-F or Audit; 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 Communicating in the Biological Sciences (1.0 cr.; A-F Grade Basis; prereq CBS Honors)
Oral reports on topics of current interest to biologists. Progress reports on lab/field research by students.

BIOL 4003 Genetics (3.0 cr.; Student Option; prereq [BIOC 3021 or BIOC 4331], [any CBS major or major in [animal science or applied plant science or BA biology or BA microbiology or nutrition or physiology or biology/society/environment] or Grad MBS major]) or #) Genetic information, its transmission from parents to offspring, its expression in cells/organisms, and its course in populations.

BIOL 4004 Cell Biology (3.0 cr.; Student Option; prereq 4003, [BIOC 3021 or BIOC 4331], [CBS major or CSE major or grad MBS major])

BIOL 4035 Metagenomics Laboratory (3.0 cr.; A-F Grade Basis; prereq BIOL 2004 or equiv)
Impact of human activities on the Mississippi River through metagenomics; a new science used to determine the diversity/function of all the microbes in an environmental sample. Student data adds to a database about the microbial communities in the river/how this impacts issues of water quality.

BIOL 4121 Microbial Ecology and Applied Microbiology (3.0 cr.; A-F or Audit; prereq 3301)

BIOL 4201 Teaching in the Biology Laboratory (1.0 cr.; S-N Grade Basis; prereq Student who is teaching in CBS lab course)
Pedagogical underpinnings for teaching in lab.

BIOL 4700 Cell Physiology (3.0 cr.; A-F Grade Basis; prereq 3211 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 (1.0-6.0 cr.; S-N Grading Basis; prereq #)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature or literature on biology education.

BIOL 4794W Directed Research (1.0-6.0 cr.; S-N Grade Basis; prereq #, %)
Lab or field investigation of selected areas of research.

BIOL 4850 Special Topics in Biology (1.0-5.0 cr.; A-F Grade Basis; prereq Beginning biology)
Offered at Itasca Biological Station and Laboratories. Metagenomics, telemetry/animal behavior, aquatic botany, field evolution.

BIOL 4852 Biological Photography and Digital Imaging Techniques (3.0 cr.; A-F or Audit; prereq One semester college biology or #)
Field photography techniques for documentation of invertebrates, vertebrates, aquatic organisms, and habitats of Itasca area. Digital imaging equipment, software, related techniques. Building video files for the web.

BIOL 4894 Directed Research at Itasca (1.0-7.0 cr.; S-N or Audit; prereq #, %; max of 7 cr of [4894 or 4993 or 4994]) may count toward major requirements)
Field investigation of selected areas of research at Itasca Field Station.

BIOL 4950 Special Topics in Biology (1.0-4.0 cr.; Student Option)
In-depth study of special topic in life sciences.

BIOL 4960H Thesis Writing in the Biological Sciences: Developing the Literature Review (1.0 cr.; A-F Grade Basis; prereq Honors, [College of Biological Sciences student or interdisciplinary major with life sciences focus]) Develop/refine lit review component of honors thesis. Conceptualizing/drafting/revision process. Give/receive formative feedback. Unpack conventions of scientific writing. Develop at least one draft module of each data-related thesis section.

BIOL 4961H Thesis Writing in the Biological Sciences: Conveying and Contextualizing Results (1.0 cr.; A-F Grade Basis; prereq honors, CBS student or interdisciplinary major with life sciences focus) Continue work in Biol 4960H to develop/draft/review results/methods/discussion sections of honors thesis. Prepare/present professional research poster. Complete thesis assessed against standards outlined in CBS Thesis Assessment Rubric.

BIOL 4993 Directed Studies (1.0-6.0 cr.; S-N Grading Basis; prereq #, %)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature or literature on biology education.

BIOL 4994 Directed Research (1.0-6.0 cr.; S-N Grading Basis; prereq #, %)
Lab or field investigation of selected areas of research.

**BIOI 5272 Applied Biostatistics** (3.0 cr.; A-F Grade Basis; prereq One semester of college-level [calculus or statistics or computer programming], general biology)


**BIOI 5309 Molecular Ecology And Ecological Genomics** (3.0 cr.; Student Option; prereq BIOI 3407 or BIOI 3409 or BIOI 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.

**BIOI 5407 Ecology** (3.0 cr.; Student Option; prereq [One semester college biology, [MATH 1142 or MATH 1271 or MATH 1261 or equiv], grad student]

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

**BIOI 5409 Evolution** (3.0 cr.; Student Option; prereq One semester of college biology, grad student)

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.

**BIOI 5485 Bioinformatics: Experimental Design and Computational Analysis in Systems Biology** (3.0 cr.; A-F Grade Basis; prereq 4003 or A4003 or equiv)

Modern computational tools used in molecular biology and genomics research. When/how to use particular tools, how to interpret results. Principles, advantages/disadvantages of various methods.

**BIOI 5511 Teaching the Biological Sciences** (3.0 cr.; A-F or Audit; 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.

**BIOI 5910 Special Topics in Biology** (3.0-4.0 cr.; A-F Grade Basis; prereq BSE major)

Intellectual threads and faculty for courses in BSE major, especially social sciences. Content varies.

**BSE 3361W Geography and Public Policy** (3.0 cr.; Student Option)

Nature/effects of federal policy in United States. How documents produced as policy are crafted/implemented. Policies relating to food/agriculture, forestry, wildlife, transportation.

**BSE 3996 Senior Project Directed Research** (3.0-4.0 cr.; A-F Grade Basis; prereq #, @)

Individual guided research course taken in fulfillment of BSE senior project requirement.

**BSE 3996H Honors: Senior Project Directed Research** (3.0-4.0 cr.; A-F Grade Basis; prereq #, %, @)

Individual guided research course taken in fulfillment of BSE senior project requirement.

**BSE 3997 Senior Project** (2.0 cr.; A-F Grade Basis; prereq #, %, @)

Senior Project add-on credit. Must be taken concurrently with "BSE Core" or "BSE Theme Elective" course related to area of specialization.

**BSE 3997H Honors: Senior Project** (2.0 cr.; A-F Grade Basis; prereq %, @)

Senior Project add-on credit. Must be taken concurrently with "BSE Core" or "BSE Theme Elective" course related to area of specialization.

**College of Science and Engineering**

**BMEN 1601 Biomedical Engineering Undergraduate Seminar I** (1.0 cr.; Student Option; prereq CSE student)

Introduction to biomedical engineering from academic/industrial perspectives. Survey of current/emerging area.

**BMEN 1602 Biomedical Engineering Undergraduate Seminar II** (1.0 cr.; Student Option; prereq CSE student)

Continuation of 1601. Emphasizes biomedical engineering design and numerical analysis.

**BMEN 2101 Biomedical Thermodynamics** (3.0 cr.; A-F Grade Basis; 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 2401 Programming for Biomedical Engineers** (2.0 cr.; A-F Grade Basis; prereq MATH 1272, PHYS 1302, CSE student)


**BMEN 2501 Cellular and Molecular Biology for Biomedical Engineers** (4.0 cr.; A-F or Audit; prereq &CHEM 1022, &MATH 1372, &PHYS 1302, CSE student)


**BMEN 3001 Biomechanics** (4.0 cr.; A-F or Audit; 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 3101 Biomedical Transport Processes** (4.0 cr.; A-F or Audit; prereq Math 2374, Phys 1302, [BME upper div or %])

Principles of momentum, heat, and mass transfer illustrated with applications in physiological processes. Fluid mechanics, heat condition, mass diffusion, convection. Lecture/laboratory.

**BMEN 3201 Bioelectricity and Bioinstrumentation** (4.0 cr.; A-F or Audit; prereq [Math 2263 or Math 2374], Phys 1302, [BME upper div or %])

Principles of electrical phenomena, instruments relevant to biomedical applications. Lecture/laboratory.

**BMEN 3301 Biomatirials** (4.0 cr.; A-F or Audit; prereq [Math 2263 or Math 2374], Phys 1302, [BME upper div or %])


**BMEN 3401 Biomedical Systems Analysis** (4.0 cr.; A-F Grade Basis; prereq 3101, 3201)

Introduction to quantitative analysis of physiological/biological systems. First/second order systems, linear time-invariant systems, systems classification/identification. Introduction to linear control theory and controller synthesis. Biological examples of electrical, mechanical, thermal, and chemical/biomedical control systems.

**BMEN 4001W Biomedical Engineering Design I** (3.0 cr.; A-F or Audit; 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** (3.0 cr.; A-F or Audit; prereq 4001W)

Continuation of 4001W.

**BMEN 4710 Directed Research** (1.0-4.0 cr.; A-F or Audit; prereq #, %)

Independent laboratory research under faculty supervision.

**BMEN 4720 Directed Study** (1.0-4.0 cr.; A-F or Audit; prereq #, %)

Directed study under faculty supervision.
BMEN 4896 Industrial Assignment I: Co-op Program (2.0 cr.; A-F Grade Basis; 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 (1.0-4.0 cr.; A-F or Audit; prereq #) New or experimental special topics.

BMEN 4996 Industrial Assignment II: Co-op Program (3.0 cr.; A-F Grade Basis; prereq 4896, registration in co-op prog) Industrial Assignment in co-op program. Formal written final report on assignment. Oral presentation.

BMEN 5001 Advanced Biomaterials (3.0 cr.; A-F or Audit; prereq 3301 or MatS 3011 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 (3.0 cr.; Student Option; prereq CSE 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 (3.0 cr.; Student Option; prereq [CSE 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 5111 Biomedical Ultrasound (3.0 cr.; Student Option; prereq [[3401 or equiv], [MATH 2373 or equiv], [MATH 2374 or equiv], [CSE 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 (2.0 cr.; A-F or Audit; prereq CSE sr or grad student or medical student) Design/microfabrication of sensors, actuators, drug delivery systems, microfluidic devices, and DNA/protein microarrays. Packaging, biocompatibility, ISO 10993 standards. Applications in medicine, research, and homeland security.

BMEN 5201 Advanced Biomechanics (3.0 cr.; Student Option; prereq [[3001 or equiv], [CSE upper div or grad student]] or #) Introduction to biomechanics of musculoskeletal system. Anatomy, tissue material properties. Kinematics, dynamics, and control of joint/limb movement. Analysis of forces/motions within joints. Application to injury, disease. Treatment of specific joints, design of orthopedic devices/implants.

BMEN 5311 Advanced Biomedical Transport Processes (3.0-4.0 cr.; Student Option; prereq CSE upper div or grad student or #; [ChEn 5103 or ME 5342] recommended) Introduction to biological fluid, mass, and heat transport. Mass transfer across membranes. Fluid flow in vessels/interstitium. Heat transfer in cells, tissues, and body. Applications to blood oxygenation, respiration, drug delivery, and tissue engineering.

BMEN 5351 Cell Engineering (3.0 cr.; Student Option; prereq [[2401, 2501 or 5501], [MATH 2243 or MATH 2373]] or CSE 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 5401 Advanced Biomedical Imaging (3.0 cr.; A-F or Audit; prereq CSE 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 5411 Neural Engineering (3.0 cr.; Student Option; prereq 3401 recommended) Theoretical basics. Signal processing techniques. Modeling of nervous system, its response to stimulation. Electrode design, neural modeling, cochlear implants, deep brain stimulation. Prosthetic limbs, micrortrol control, prosthetic vision. Brain machine interface, seizure prediction, optical imaging of nervous system, place cell recordings in hippocampus.

BMEN 5412 Neuroradiology (3.0 cr.; A-F Grade Basis; prereq 5411 or #) Fundamentals of bioengineering approaches to modulate the nervous system, including bioelectricity, biomagnetism, and optogenetics. Computational modeling, design, and physiological mechanisms of neuromodulation technologies. Clinical exposure to managing neurological disorders with neuromodulation technology.

BMEN 5413 Neural Decoding and Interfacing (3.0 cr.; A-F or Audit; prereq 5411, [3201 or 3401 or equiv recommended]) Neural interface technologies currently in use in patients as well as the biophysical, neural coding, and hardware features relating to their implementation in humans. Practical and ethical considerations for implementing these devices into humans.

BMEN 5421 Introduction to Biomedical Optics (3.0 cr.; A-F or Audit; prereq CSE 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. Tors of labs.

BMEN 5444 Muscle (3.0 cr.; Student Option) Muscle structure/function: molecular mechanism by which force is generated.

BMEN 5501 Biology for Biomedical Engineers (3.0 cr.; Student Option; prereq Engineering upper div or grad student) Concepts of cell/tissue structure/function. Basic principles of cell biology. Tissue engineering, artificial organs.

BMEN 5910 Special Topics in Biomedical Engineering (3.0 cr.; Student Option) Special topics in biomedical engineering.

BMEN 5920 Special Topics in Biomedical Engineering (2.0-3.0 cr.; Student Option) Special topics in biomedical engineering.

Biophysical Sciences (BPHY) Medical School

BPHY 5138 Research Seminar (1.0-5.0 cr.; S-N or Audit) Topics introduce techniques/goals of biophysical sciences and medical physics. Lectures/demonstrations.

BPHY 5139 Seminar and Journal Club (1.0 cr.; S-N or Audit) Current research/topics related to goals/methods of biophysical sciences and medical physics. Lectures/discussions.

BPHY 5170 Basic Radiological Physics (3.0 cr.; Student Option; prereq #) Theoretical/experimental aspects of radiological physics. Physical properties of various ionizing radiations, interactions of ionizing radiations with matter, methods of radiation dose measurement.

BPHY 5171 Medical and Health Physics of Imaging I (3.0 cr.; Student Option; prereq 5170 or #) Physics of diagnostic imaging: specification/quantification of image quality, X-ray production, image receptors, magnetic resonance imaging, radiation exposure and protection. Special imaging techniques, including mammography, computed tomography, and direct digital image capture.

BPHY 5172 Radiation Biology (3.0 cr.; Student Option; prereq 5170 or #) Effects of ionizing radiation on cells, tissues, and organisms. Biochemical/physiological bases of radiation effects. Biological rationale for radiation therapy practices.

BPHY 5173 Medical and Health Physics of Radiation Therapy (3.0 cr.; Student Option; prereq 5170 or #) Measurements of radiation quality, output, and depth dose distributions for clinical use. Treatment parameter calculation. Beam modification and shaping. Treatment planning for fixed field and rotational therapy in external beam, intraoperative, and interstitial therapy. Computer applications in treatment planning. Principles/criteria for radiation protection.

BPHY 5174 Medical and Health Physics of Imaging II (3.0 cr.; Student Option; prereq 5170 or #) Physics of diagnostic imaging. Ultrasound, theoretical/experimental applications of radionuclides in medicine and biology. Counting statistics and imaging systems associated with radiopharmaceuticals, radiation dosimetry, and safety in nuclear medicine.
BPHY 5177 Radiation Therapy Physics Lab:
Radiation Physics Basics (3.0 cr.; A-F Grade Basis; prerequisite: BPHY 5170 or &5173 or #)
This course provides students hands-on experience with Hardware/software used in radiation therapy clinic for physics measurements.

Bioproducts and Biosystems Engineering (BBE)
Institute of Technology

BBE 1001 Bioproducts and Biosystems Engineering Orientation (1.0 cr.; S-N or Audit)
Academic programs/careers related to bioproducts and biosystems engineering. Required field trip.

BBE 1002 Biorenewable Resources (3.0 cr.; A-F or Audit)
Environmental/social impacts of materials used to make a product. Biorenewable resources, using wood and agriculture-based biomass. Environmental, technological, social, and economic implications of the use of these resources.

BBE 1901 Freshman Seminar (3.0 cr.; Student Option; prerequisite: freshman)
Issues/topics related to natural resources and the environment. Topics vary each semester.

BBE 1906W Freshman Seminar (3.0 cr.; Student Option; prerequisite Fr)
Issues/topics related to natural resources and the environment. Topics vary each semester.

BBE 1943W Freshman Seminar (3.0 cr.; Student Option; prerequisite Fr)
Issues/topics related to natural resources and the environment. Topics vary each semester.

BBE 2001 Mechanics and Structural Design (4.0 cr.; A-F; prerequisite: MATH 1272 or MATH 1372, PHY 1101 or PHY 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.

BBE 2002 Introduction to Engineering Design (3.0 cr.; A-F Grade Basis; prerequisite: MATH 1271 or MATH 1371, CHEM 1021, PHY 1001 or PHY 1301) Lower division (soph) or upper division (jr, senior) writing requirement. Writing, graphical, and oral presentations.

BBE 2201 Renewable Energy and the Environment (3.0 cr.; Student Option) Renewable energy technologies. Environmental, technical, social, and economic challenges/opportunities for each technology.

BBE 3012 Transport in Biological Processes I (4.0 cr.; A-F Grade Basis; prerequisite: BIOL 3001, MATH 2243 or 2373, MATH 2263 or 2374, PHYS 1302W) Introduction to fluid mechanics. Fluid statics/kinematics. Differential and finite control volume analysis with continuity, momentum, and energy equations. Bernoulli and Euler Equation. Dimensional analysis. Potential flow. Non-Newtonian fluids. Applications to biological fluids and biological systems.

BBE 3013 Engineering Principles of Molecular and Cellular Processes (3.0 cr.; A-F or Audit; prerequisite: BIOL 1009, CHEM 1022 or CHEM 1022, 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 3033 Material and Energy Balances in Biological Systems (3.0 cr.; A-F or Audit; prerequisite CHEM 1022, [MATH 1272 or MATH 1372], PHYS 1302) Basic principles of materials and energy balances, their applications in biological systems.


BBE 3093 Directed Studies (1.0-5.0 cr.; Student Option; prerequisite #) 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 (3.0 cr.; A-F or Audit; prerequisite Working knowledge of [trigonometry, geometry, algebra]) Statics, engineering wood design principles, physical properties of wood. Design techniques for non-architectural structures. Trusses, beams, columns. Using conventional lumber products, engineered wood products, and steel. Simple structures explored through examples, assignments.

BBE 3201 Sustainability of Food Systems: A Life Cycle Perspective (3.0 cr.; A-F Grade Basis) Consequences of global food system. Diversity in food systems. Current topics in food sustainability.

BBE 3293 Directed Study (1.0-3.0 cr.; Student Option; prerequisite #) 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) (1.0 cr.; A-F or Audit; prerequisite BBE cooperative ed student) Industrial work assignment in forest products cooperative education program. Evaluation based on formal report.

BBE 3480 Special Topics (1.0-4.0 cr.; Student Option) Topics specified in Class Schedule.

BBE 3503 Marketing of Bio-based Products (4.0 cr.; A-F or Audit) 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 Biomass and Biomass Conversion to Fuels and Products (4.0 cr.; A-F or Audit; prerequisite CHEM 2301 or #) Chemistry of biomass and its sustainable utilization for biofuels and bioproducts, including bio-based materials. Chemicals/energy and their environmental implications within the context of chemical principles and associated reactions underlying the structure, properties, processing, and performance of plant materials.

BBE 4013 Transport in Biological Processes II (3.0 cr.; A-F or Audit; prerequisite [MATH 3013 or MATH 3013 or CHEM 3701], CE 3502. ME 3331 or CHEM 4101, upper div CSE) 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. Handson instruction in Visual Basic.

BBE 4023W Process Control and Instrumentation (3.0 cr.; A-F or Audit; prerequisite Upper div CSE 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 4301 Applied Surface and Colloid Science (3.0 cr.; Student Option; prerequisite 3043 or BMEN 2101 or CHEM 3101 or CHEM 4501 or #) Introduction to surface/colloid science concepts. Surface tension, wetting, adsorption, capillarity. Formation/stability of soils, emulsions, and foams. Water solubility. Partition coefficients of organic species. Properties of both surfactants and water soluble polymers. Focuses on interdisciplinary applications.

BBE 4302 Biodegradation of Bioproducts (3.0 cr.; Student Option; prerequisite 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 (3.0 cr.; A-F or Audit; prerequisite 3001) Principles of materials science, their application to bio-based materials.

BBE 4305 Pulp and Paper Technology (3.0 cr.; Student Option; prerequisite Junior or senior or #) Pulping processes, fiber refining/processing, paper manufacturing, fiber/paper properties, recycling. Water requirements, effluent treatment. Chemical/mechanical pulping.
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BA 999 Immersion Core (12.0 cr.; A-F Grade Basis; prereq Microecon, macroecon, calculus, accounting, statistics, Carlson School [soph or jrf])
Includes FINA 3001, 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 1000 Career Exploration & Development (1.0 cr.; S-N Grading Basis; prereq CSOM student)
Experiential based course. Develop a plan for choosing an academic major and career path through the process of self exploration and career planning. Assignments/activities to help students learn more about themselves, their major choices, career options, campus resources, decision making and goal setting.
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CSPH 5000 Explorations in Complementary Therapies and Healing Practices (1.0-4.0 cr.; Student Option; prereq Jr or sr or grad student or #)
Research/practice on therapies, delivery of complementary therapies, regulatory issues.

CSPH 5101 Introduction to Integrative Healing Practices (3.0 cr.; Student Option; 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, naturapathy, herbalism, therapies, homeopathy, manual therapies, and nutrition.

CSPH 5102 Art of Healing: Self as Healer (1.0 cr.; Student Option; prereq Jr or sr or grad student or #)
Introduction to individual transformational journey as part of health science education. Students become aware of their responsibility/resources to facilitate development of the self. Research data, experience of self that is part psychoneuroimmunology, mind-body-spirit approaches. Lecture, scientific literature, meditation, imagery, drawing, group interaction.

CSPH 5111 Ways of Thinking about Health (2.0 cr.; S-N Grading Basis; 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 (3.0 cr.; Student Option; 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 5121 Whole Systems Healing: Health and the Environment (2.0 cr.; Student Option; prereq Jr or sr or grad student)
Selected interfaces between human health and the environment. Using complexity theory as a theoretical framework, students use phenomenological methodologies to analyze and describe the interrelated dynamics of human and natural systems. Case studies. Develop strategies to optimize the healthy functioning of human/environmental systems.

CSPH 5201 Spirituality and Resilience (2.0 cr.; Student Option; 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 (2.0-3.0 cr.; Student Option; 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 5212 Peacebuilding Through Mindfulness: Transformative Dialogue in the Global Community (3.0 cr.; Student Option; prereq Jr or sr or grad student or #)
Contemplative/mindfulness practice. Tapping into reservoir of strength, compassion, and wisdom that fosters expressions of unconditional love, reconciliation, and forgiveness. Shifting from ego centered cognitive analysis/assessment to heart centered presence and deep listening grounded in humility/compassion. Native American circle process, including use of talking piece.

CSPH 5215 Forgiveness and Healing: A Journey Toward Wholeness (3.0 cr.; Student Option; prereq Jr or sr or grad student or #)
Impact of forgiveness on process of inter-intra-personal healing. Forgiveness/healing in health care and social work settings from multiple spiritual/secular traditions.

CSPH 5221 Significant Spiritual Texts of the 20th Century (3.0 cr.; Student Option; 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 (2.0 cr.; Student Option; 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 5311 Introduction to Traditional Chinese Medicine (2.0 cr.; A-F or Audit; prereq Jr or sr or grad student or #)
Belief that illness results from imbalance 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 5313 Acupressure (1.0 cr.; Student Option)

CSPH 5315 Traditional Tibetan Medicine: Ethics, Spirituality, and Healing (2.0 cr.; Student Option; 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 5317 Yoga: Ethics, Spirituality, and Healing (2.0 cr.; Student Option)
Students test claim that systematic yoga practice leads to optimal health. Yoga's philosophy, scientific evidence, practical application. Students propose research-based programs for integrating yoga into personal/professional life.

CSPH 5318 Tibetan Medicine, Ayurveda, and Yoga in India (4.0 cr.; Student Option No Audit; prereq [5315, 5317] or #)
Students study with expert practitioners in India. Using critical thinking, philosophical knowledge, cultural practices, scientific evidence, and research-based programs to integrate these traditions into personal/professional life.

CSPH 5321 Public Health Priorities in the Developing World (2.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (2.0 cr.; S-N or Audit; prereq Jr or sr or grad student or #)
3 ½-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 5332 Global Healing Traditions: Amazonia Plant Spirit Medicine (2.0 cr.; S-N or Audit; prereq [5331, [grad student or Jr or Sr in health science or practicing health professionals or #])

Non-biomedical traditional healing paradigms as practiced in other parts of the world. Focuses on indigenous healing practices in Peru as directed by a local shaman.

CSPH 5341 Overview of Indigenous Hawaiian Healing (2.0 cr.; Student Option)
Traditional Hawaiian healing, ho'omolani (massage), la'u la'apua'au (herbal medicine) and ho'opo'ono (conflict resolution). Hawaiian healing practices, and cultural values compared with western. The science of traditional ecological knowledge for healing and self-reliance.

CSPH 5343 Ayurveda Medicine: The Science of Self-healing (2.0 cr.; Student Option)

CSPH 5401 People, Plants, and Drugs: Foundations and Practical Applications (3.0 cr.; Student Option)
Foundations and practical applications of plants. Use in health and disease. How medicinal plants are being used. How to increase positive emotions and mind states. Meditation, integrative approaches. Case examples.

CSPH 5402 People, Plants, and Drugs: Introduction to Ethnopharmacology (3.0 cr.; Student Option)
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 (4.0 cr.; Student Option; prereq Jr or Sr in grad student or #)
Twelve-day, intensive course. Introduction to ethnobotany/ethnopharmacology. Lectures, field trips, presentations by local experts.

CSPH 5411 Dietary Supplements: Regulatory, Scientific, and Cultural Perspectives (3.0 cr.; Student Option; prereq Jr or Sr in grad student or #)

CSPH 5421 Complementary Healthcare (3.0 cr.; Student Option; 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. Botanical characteristics, traditional uses, chemical properties, dosage, hazards/safety issues, quality control.

CSPH 5423 Botanical Medicines: Foundations and Practical Applications (1.0 cr.; Student Option)

CSPH 5431 Functional Nutrition: An Expanded View of Nutrition, Chronic Disease, and Optimal Health (2.0 cr.; Student Option; prereq [Jr or Sr or grad student] in Health Sciences or #)
Principles of nutrition related to metabolic function. Model attempts to reduce chronic disease by looking for underlying causes/triggers and to intervene to restore function and achieve optimal health. Emphasizes importance of nutrition as a component of self-care.

CSPH 5501 Clinical Aromatherapy: Therapeutic Use of Plant Essential Oils (3.0 cr.; Student Option; 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) Fundamentals of essential oil therapy for licensed health professionals. History, scientific basis, practice issues, use of 30 essential oils in clinical practice. Controlled use of essential plant oils for specific, measurable physiological/psychological therapeutic outcomes. Topical application, inhalation.

CSPH 5514 Natural Therapy Fundamentals (1.0 cr.; Student Option; prereq Jr or Sr or grad student)
For health professional students/practicing health professionals. Essential oil therapy and current aromatherapy practices in clinical settings. Key safety/toxicity issues. Critique scientific/historical evidence about the therapeutic qualities of six essential oils in common use by the public and in clinical settings.

CSPH 5511 Interdisciplinary Palliative Care: An Experiential Course in a Community Setting (2.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq [Jr or Sr in 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 (3.0 cr.; Student Option; 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 5523 Applications in Therapeutic Horticulture (2.0 cr.; Student Option No Audit) How to develop comprehensive program plans in therapeutic horticulture. Evidence-based principles, facilitation techniques. Documentation, assessment, program development techniques, evaluation. Leadership training, program plan components, book reviews, readings, comprehensive exam.

CSPH 5533 Introduction to Energy Healing (2.0 cr.; Student Option; 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 (1.0 cr.; S-N Grading Basis; prereq Jr or Sr or grad student or #) 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 (2.0 cr.; Student Option; prereq Sr or grad student or #)

CSPH 5545 Mind-Body Healing Therapies (2.0 cr.; A-F or Audit; 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 5555 Introduction to Body and Movement-based Therapies (2.0 cr.; Student Option; prereq Jr or Sr or grad student or #) Theories/approaches of selected somatic therapies, including dance, movement, and body-based therapies. Historic/theoretical perspectives on use of movement, dance, and somatic re-patterning. Demonstrations of techniques. Application of techniques to specific populations/settings.

CSPH 5561 Overview of the Creative Arts in Health and Healing (2.0 cr.; Student Option; 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 5601 Music, Health and Healing (2.0 cr.; Student Option; prereq Jr or Sr or grad student or #)

### CSPH 5704 Business of Health Coaching (1.0 cr.; A-F Grade Basis; prereq 5101, 5102, 5701, 5702, admitted to postbacalaureate certificate in complementary therapies/healing practices health coaching track) Applying health coaching knowledge/skills in service delivery venues or private practice. Starting a business. Business models. Student determine a structure/venue appropriate for them. Legal/ethical considerations.

### CSPH 5705 Health Coaching Professional Internship (2.0 cr.; S-N Grading Basis; prereq 5101, 5102, 5701, 5702, admitted to postbacalaureate 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 (3.0 cr.; Student Option; 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 2594 Directed Research Lower Division (1.0-4.0 cr.; Student Option No Audit; prereq #, DUGS consent) Independent lab research under faculty supervision for students not yet taking junior level CHEN courses.

### CHEN 3005 Transport Phenomena: Momentum and Heat (4.0 cr.; A-F Grade Basis; prereq [4001 or 2001 or [transfer student, %]), upper div ChEn major) Fluid statics/dynamics and their applications to chemical engineering systems, conduction, and diffusion. Principles/applications of heat transfer in chemical engineering systems.

### CHEN 3041 Industrial Assignment I (2.0 cr.; A-F Grade Basis; prereq ChEn upper Div, completion of required courses in ChEn prog through fall sem of 3rd yr, GPA of at least 2.80, registered in co-op prog) Industrial work assignment in engineering co-op program. Formal written report.

### CHEN 3045 Chemical Engineering Industrial Internship (1.0 cr.; A-F Grade Basis; prereq Prereq Program 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 (4.0 cr.; A-F Grade Basis; prereq [2001 or 4001] or [CHEM 4501, transfer student], upper div ChEn major or %) Applications of thermodynamics/chemical equilibrium to problems in chemical engineering.

### CHEN 3102 Reaction Kinetics and Reactor Engineering (4.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; prereq [2001 or 4001], [3005 or 4005], [3006 or 4006 or &3006 or &4006], [upper div ChEn major or %]) Numerical methods/applications in heat/mass transfer, advanced chemical engineering applications.

### CHEN 3401W Junior Chemical Engineering Lab (2.0 cr.; A-F Grade Basis; prereq [WRIT 1301 or equiv], 2001, 3005, &3006, 3101, &3102, 3201, [CHEM 2121 or equiv], CHEM 2311, upper div ChEn major) Efficient design, structure, measurement, planning, analysis, presentation of experiments/results. Energy balances, fluid flow, heat/mass transfer. Design of new systems using data obtained in lab. Oral/written presentations.

### CHEN 3701 Introduction to Biomolecular Engineering (3.0 cr.; A-F or Audit; 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

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Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
give rise to "processes" of life. Students apply chemical engineering principles to analysis of living systems.

**CHEN 4041 Industrial Assignment II** (2.0 cr.; A-F Grade Basis; 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** (3.0 cr.; A-F or Audit; prereq [MAT 3011, 3101 or 4101 or MAT 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.

**CHEN 422W Polymer Laboratory** (2.0 cr.; Student Option; prereq 4214 or CHEM 4214 or CHEM 4221 or MATS 4214 or #)


**CHEN 4401W Senior Chemical Engineering Lab** (3.0 cr.; A-F Grade Basis; 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 4402W Chemical Engineering Lab II** (2.0 cr.; Student Option; 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 4501W Chemical Engineering Design I** (3.0 cr.; Student Option; prereq [2001, 3005, 3006, 3101, 3102, 3201, 3401W, CHEM 2311, Chem 2121, fr writing requirement, upper div ChEn major or %)

Engineering economics of process evaluation, including time/bases for cost estimation. Engineering design through group projects. Case studies.

**CHEN 4502W Chemical Engineering Design II** (2.0 cr.; A-F or Audit; prereq 4401W, 4501W, upper div ChEn major or %)

Introduction to product design. Case studies, special topics.

**CHEN 4593 Directed study** (1.0-4.0 cr.; Student Option No Audit; prereq ChEn maj upper division, #)

Directed study under faculty supervision.

**CHEN 4594 Directed Research** (1.0-4.0 cr.; Student Option No Audit; prereq Upper div ChEn)

Independent lab research under faculty supervision.

**CHEN 4594H Directed Research - Honors** (1.0-4.0 cr.; A-F Grade Basis; prereq instr and DUGS consent, upper div ChEn major)

Independent lab research under faculty supervision for upper division students wanting honors experience.

**CHEN 4601 Process Control** (3.0 cr.; A-F Grade Basis; prereq [3102 or 4102], [upper div ChEn major or %])

Analysis of dynamic behavior/design of linear control systems for chemical processes. Dynamic response and stability of linear ODE systems, tuning of PID controllers, synthesis of feedback, feedforward/feedback controller.

**CHEN 4701 Advanced Undergraduate Applied Math I: Linear Analysis** (3.0 cr.; A-F Grade Basis; prereq [3102 or 4102], ChEn maj upper div)

Integrated approach to solving linear mathematical problems (linear algebraic equations, linear ordinary/partial differential equations) using theoretical/numerical analysis based on linear operator theory.

Undergraduate version of 8201.

**CHEN 4702 Advanced Undergraduate Rheology** (2.0 cr.; A-F Grade Basis; prereq [3005 or 4005], #)


**CHEN 4704 Advanced Undergraduate Physical Rate Processes I: Transport** (3.0 cr.; A-F Grade Basis; prereq [3005 or 4005], ChEn maj upper div)


**CHEN 4706 Advanced Undergraduate Physical and Chemical Thermodynamics** (3.0 cr.; A-F Grade Basis; prereq CHEM 3502, [3101 or 4101], [3005 or 4005], ChEn maj upper div; background in undergrad engineering or chemistry courses in thermodynamics recommended)

Principles of classical thermodynamics, introduction to nonequilibrium thermodynamics. Applications in chemical engineering, materials science.

**CHEN 4707 Advanced Undergraduate Statistical Thermodynamics and Kinetics** (3.0 cr.; A-F Grade Basis; prereq CHEM 3005 or 4005, 3101 or 4101, CHEM 3501, CHEM 3502, ChEn maj upper div)

Introduction to statistical mechanical description of equilibrium/non-equilibrium properties of matter. Emphasizes fluids, classical statistical mechanics.

**CHEN 4708 Advanced Undergraduate Chemical Rate Processes: Analysis of Chemical Reactors** (3.0 cr.; A-F Grade Basis; prereq [3102 or 4102], ChEn maj upper div)


Design of multiphase reactors.

**CHEN 4712 Rheology Laboratory Project** (1.0 cr.; A-F or Audit; prereq 3005, &4702, #)

Learn how to make rheological laboratory measurements. Students select a rheologically interesting material with help of instructor and characterize it. Lab complement to CHEN 4702.

**CHEN 5531 Electrochemical Engineering and Renewable Energy** (3.0 cr.; A-F Grade Basis; prereq [MATS 3011 or #], [upper div CSE or grad student])


**CHEN 5551 Survey of Renewable Energy Technologies** (3.0 cr.; A-F or Audit; prereq [Upper div or #], basic knowledge of chemistry, thermodynamics)


**CHEN 5595 Special Topics** (1.0-4.0 cr.; A-F Grade Basis; prereq ChEn maj upper div)

New or experimental special topics.

**CHEN 5751 Biochemical Engineering** (3.0 cr.; A-F or Audit; prereq [3005 or 4005], &3006 or &4006, &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.

**CHEN 5753 Biological Transport Processes** (3.0-4.0 cr.; A-F or Audit; prereq 3005 or 4005 or equiv)


**CHEN 5771 Colloids and Dispersions** (3.0 cr.; A-F or Audit; prereq Physical chemistry)

Preparation, stability, colloidall kinetics or colloidal solutions. DLVO theory, electrokinetic phenomena. Properties of micelles, other microstructures.
CHEM 1015 Introductory Chemistry: Lecture (3.0 cr.; Student Option; 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 (1.0 cr.; A-F Grade Basis; 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 1061 Chemical Principles I (3.0 cr.; Student Option; prereq Grade of at least C- in [1011 or 1015] or (passing placement exam, &1065); intended for science or engineering majors; &1065; registration for 1065 must precede registration for 1061) Atomic theory, periodic properties of elements. Thermochemistry, reaction stoichiometry. Behavior of gases, liquids, and solids. Molecular/ionic structure/bonding. Organic chemistry and polymers. energy sources, environmental issues related to energy use.


CHEM 1065 Chemical Principles I Laboratory (1.0 cr.; A-F Grade Basis; prereq &1061) Basic laboratory skills while investigating physical and chemical phenomena closely linked to lecture material. Experimental design, data collection and treatment, discussion of errors, and proper treatment of hazardous wastes.

CHEM 1066 Chemical Principles II Laboratory (1.0 cr.; A-F Grade Basis; prereq &1062) Basic laboratory skills while investigating physical and chemical phenomena closely linked to lecture material. Experimental design, data collection and treatment, discussion of errors, and proper treatment of hazardous wastes.


CHEM 1072H Honors Chemistry II (3.0 cr.; A-F Grade Basis; prereq 1071H, &1076H; honors student, registration for 1076H must precede registration for 1072H) Advanced introduction. Chemical kinetics/reaction mechanisms, chemical/physical equilibria, acids/bases, entropy/second law of thermodynamics, electrochemistry/corrosion; descriptive chemistry of elements; coordination chemistry; biochemistry.

CHEM 1075H Honors Chemistry I Laboratory (1.0 cr.; A-F Grade Basis; prereq &1071H, honors student, permission of University Honors Program) Develop laboratory skills while investigating physical and chemical phenomena closely linked to lecture material. Experimental design, data collection and treatment, discussion of errors, and the proper treatment of hazardous wastes.

CHEM 1076H Honors Chemistry II Laboratory (1.0 cr.; A-F Grade Basis; prereq &1072H, honors student, registration for 1076H must precede registration for 1076H) Develop laboratory skills as experiments become increasingly complex. Data collection/treatment, discussion of errors, proper treatment of hazardous wastes, experiment design.

CHEM 1905 Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq freshman) Topics vary. See freshman seminar topics.

CHEM 2101 Introductory Analytical Chemistry Lecture (3.0 cr.; Student Option; prereq 1022 or equiv) 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 (2.0 cr.; Student Option; prereq 2101 or & 2101) Lab for 2101. High precision methods, acidity 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 (3.0 cr.; A-F or Audit; prereq &2302 or &2302, &4501 or &4501, CSE student) Intensive Chemistry Lab techniques in synthesis, purification, and characterization of organic compounds.

CHEM 2301 Organic Chemistry I (3.0 cr.; Student Option; prereq Grade of at least C- in 2301; designed for life sciences majors) Conjugation, aromaticity, chemistry of carbonyls/amines, carbohydrates, amino acids, proteins. Enzyme mechanisms, lipids, nucleic acids. Focuses on biological significance of organic molecules/mechanisms.

CHEM 2311 Organic Lab (4.0 cr.; Student Option; prereq Grade of at least C- in [2302, 2304] or [2302, 2304]) Lab techniques in synthesis, purification, and characterization of typical organic compounds.

CHEM 2312H Honors Organic Lab (5.0 cr.; A-F Grade Basis; prereq [2301 or &2301], [Chem or ChemE or BioC] major, #) Honors organic chemistry lab.

CHEM 2331H Honors Elementary Organic Chemistry I (3.0 cr.; A-F Grade Basis; prereq At least B- in 1032H, UHP student) Important classes of organic compounds, their constitutions, configurations, conformations, and reactions. Relationships between molecular structure and chemical properties/reactivities. Spectroscopic methods characterization of organic molecules.

CHEM 2332H Honors Elementary Organic Chemistry II (3.0 cr.; A-F Grade Basis; prereq At least C- in 2331H, UHP student) Continuation of 2331H. Reactions, synthesis, and spectroscopic characterization of organic compounds, organic polymers, and their role in biologically important classes of organic molecules such as lipids, carbohydrates, amino acids, peptides, proteins, and nucleic acids.

CHEM 2910 Special Topics in Chemistry (1.0 cr.; S-N or Audit; prereq 1 sem 1xxx chemistry or #) Topics in chemistry. Opportunities and current research.

CHEM 2910H Special Topics in Chemistry (1.0 cr.; S-N or Audit; prereq One sem 1xxx chemistry or #) Topics in chemistry. Opportunities, current research.

CHEM 2920 Special Topics In Chemistry (1.0 cr.; S-N or Audit; prereq 1 sem 1xxx chemistry or #) Topics in chemistry. Opportunities and current research.

CHEM 3001 Chemical Literature and Information Retrieval (1.0 cr.; S-N or Audit; prereq 2302 or & 2302 or #)
CHEM 4001 Chemistry of Biomass and Biomass Conversion to Fuels and Products
CHEM 4011 Mechanisms of Chemical Reactions
CHEM 4021 Computational Chemistry
CHEM 4066 Chemistry of Industry
CHEM 4094W Directed Research
CHEM 4094V Directed Research
CHEM 4101 Modern Instrumental Methods of Chemical Analysis
CHEM 4101W Advanced Organic Chemistry Lab
CHEM 4111W Advanced Inorganic Chemistry Lab
CHEM 4121 Introduction to Polymer Chemistry
CHEM 4201 Materials Chemistry
CHEM 4201W Advanced Organic Chemistry
CHEM 4223W Polymer Laboratory
CHEM 4232W Advanced Organic Chemistry
CHEM 4232 Advanced Organic Chemistry
CHEM 4311W Advanced Organic Chemistry
CHEM 4321 Organic Synthesis
CHEM 4322 Advanced Organic Chemistry
CHEM 4322 Physical Organic Chemistry
CHEM 4361 Interpretation of Organic Spectra
CHEM 4411 Introduction to Chemical Biology
CHEM 4412 Chemical Biology of Enzymes
CHEM 4413 Nucleic Acids
CHEM 4501 Introduction to Thermodynamics, Kinetics, and Statistical Mechanics
CHEM 4502 Introduction to Quantum Mechanics and Spectroscopy
CHEM 4502 Advanced Physical Chemistry Lab
CHEM 4503 Physical Organic Chemistry
CHEM 4504 Inorganic Chemistry
CHEM 4504W Directed Research
CHEM 4511W Advanced Inorganic Chemistry Lab
CHEM 4512 Physical Organic Chemistry
CHEM 4514 Polymers
CHEM 4516 Organic Synthesis
CHEM 4518 Physical Organic Chemistry
CHEM 4519 Physical Organic Chemistry
CHEM 4520 Inorganic Chemistry
CHEM 4521 Organic Synthesis
CHEM 4522 Physical Organic Chemistry
CHEM 4522W Advanced Organic Chemistry
CHEM 4523 Physical Organic Chemistry
CHEM 4524 Physical Organic Chemistry
CHEM 4525 Physical Organic Chemistry
CHEM 4725 Organometallic Chemistry (3.0 cr.; Student Option; prereq 4701 or equiv, chem major or #)

CHEM 4745 Inorganic Chemistry (3.0 cr.; Student Option; prereq 4701, chem major, #)

CHEM 4725 Organometallic Chemistry (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 4701, chem major, #)

Topics in main group and transition metal chemistry. Emphasizes synthesis, structure, physical properties, and chemical reactivity.

CHEM 4894H Senior Honors Thesis (1.0-3.0 cr.; A-F Grade Basis; prereq Honors student, #)

Written thesis under direction of chemistry project advisor.

CHEM 5210 Materials Characterization (4.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq 2302 or equiv)

Concepts that govern design/discovery of drugs. Physical, biologic, medicinal chemical principles applied to explain rational design and mechanism of action drugs.

CHEM 5541 Dynamics (3.0 cr.; Student Option; prereq Undergrad physical chem course, #)

Hamilton's/Lagrange's equations of motion. Normal modes and molecular rotation.

Langevin equation and Brownian motion. Time correlation functions, collision theory, cross-sections, energy transfer. Molecular forces and potential energy surfaces. Classical electrostatics.

CHEM 5551 Quantum Mechanics I (3.0 cr.; Student Option; prereq Undergrad physical chem course, #)

Review of classical mechanics. Postulates of quantum mechanics, with applications to determination of single particle bound state energies and scattering cross-sections in central field potentials. Density operator formalism, with applications to description of two-level systems, two-particle systems, entanglement, and Bell inequality.

CHEM 5755 X-Ray Crystallography (4.0 cr.; A-F or Audit; 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 solution; generation of publication materials, use of Cambridge Crystallographic Structure Database.

CHIC 1102 Latinos in the United States: Culture and Citizenship (3.0 cr.; Student Option)

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 (3.0 cr.; A-F Grade Basis)

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 Chicana/o Studies: Critical Paradigms (3.0 cr.; Student Option)

Prevailing paradigms of analysis, methodologies of research, and guiding theoretical concepts that have shaped Chicano studies. Chicano history, culture, and meanings, including migration, repatriation, community formation, Chicano movement. Contemporary trends in art and culture.

CHIC 1201 Racial Formation and Transformation in the United States (3.0 cr.; Student Option)

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.

CHIC 1275 Service Learning in the Chicano/Latino Community (3.0 cr.; A-F Grade Basis)

Normative/applied ethics used to reflect on personal/societal responsibilities and to analyze U.S. educational systems. Institutional/social constraints on equitable educational opportunities for Chicano/Latino students. Models of inclusive/just education. Students tutor/mentor Chicano/Latinos, dialogue with Chicano/Latino educators.

CHIC 3323 Transnational Chicana/o Representation in Film (3.0 cr.; Student Option)

Introduction to Chicana/o and Latina/o visual representation. Depiction of Latina/o experience, history, culture, and art in culture. Analyzing independent/commercial films as texts that illuminate deeply held beliefs around race, class, ethnicity, gender, and national origin.

CHIC 3374 Migrant Farmworkers in the United States: Families, Work, and Advocacy (3.0 cr.; Student Option)

Socioeconomic/political forces that impact migrant farmworkers. Laws, legislation, and policies. Strategies of unions and advocacy groups. Role/power of consumer. How we produce, distribute, and consume food. Moral/ethical dilemma of consuming cheap food.

CHIC 6908W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)

Topics specified in Class Schedule.

CHIC 3212 Chicana Studies: La Chicana in Contemporary Society (3.0 cr.; Student Option)

Scholarly/creative work of Chicanas or politically defined women of Mexican American community. Interdisciplinary. Historical context, cultural process, and autoethnography.

CHIC 3213 Chicano Music and Art (3.0 cr.; A-F or Audit)

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 (3.0 cr.; Student Option)

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 (3.0 cr.; Student Option)

Introduction to Chicana/o and Latina/o visual representation. Depiction of Latina/o experience, history, culture, and art in culture. Analyzing independent/commercial films as texts that illuminate deeply held beliefs around race, class, ethnicity, gender, and national origin.
CHIC 3423 Central American Revolutions (3.0 cr.; A-F or Audit)
Social, political, and economic issues that have shaped Central American history for nearly two centuries. Colonial histories, capitalist development, ethnic/racial conflict, foreign intervention, Catholic Church, civil war throughout region. Readings/discussions cover events in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama.

CHIC 3444 Chicana and Chicano History: 1821-1945 (3.0 cr.; Student Option)

CHIC 3446 Chicana/o History II: WWII, El Movimiento, and the New Millennium (3.0 cr.; Student Option)
Experiences of people of Mexican descent in the U.S. Notions of citizenship from WWII. Chicano civil rights movement. Impact of immigration patterns/legislation. Cultural wars, changing demographics. Social, economic, and political changes that influenced day-to-day life of Mexican Americans. Meaning of racialized "Mexican" identity. How different groups of Mexicans have understood their relationships to other Americans and other Latino groups.

CHIC 3452 Xicana/Indigena Studies: History, Culture, and Politics (3.0 cr.; Student Option)
Historical, cultural, and political processes impacting Chicanas/os and their understanding of being indigenous to the North American continent. History, culture, and identity formation as dynamic processes intimately related to present and future constructions of Mexican American identities and sociopolitical perspectives.

CHIC 3507W Introduction to Chicana/o Literature (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Experiences of people generally defined as Chicano or Latino, living in the Midwest. Individual/group identity. Focuses on construction of Chicano-Latino experience. How identity affirmation, migration stories, immigration status, historical memory, and cultural traditions are impacted by being in the Midwest.

CHIC 3752 Chicanas and Chicanos in Contemporary Society (3.0 cr.; Student Option)
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. (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Theory/practice of Chicana/o politics through an analysis of Mexican American experience, social agency, and response to larger political systems and social conditions. Use of social science methods of inquiry. Unequal power relations, social justice, and the political economy.

CHIC 3862 American Immigration History (3.0 cr.; A-F or Audit)
Global migrations to U.S. from Europe, Asia, Latin American, and Africa, from early 19th century to present. Causes/cultures of migration. Migrant communities, work, and families. Xenophobia, assimilation/integration, citizenship, ethnicity, race relations. Debates over immigration. Place of immigration in America's national identity.

CHIC 3888 Immigration and the U.S. Latina/o Experience: Diaspora, Identity, and Community (3.0 cr.; Student Option)
Experiences of migrants from Latin America to the United States in 20th/21st century. Migrant engagements with US society. Pre-existing Latina/o and other ethnic communities. Experiences within political, economic, and social aspects of life at local/global level.

CHIC 3900 Topics in Chicano Studies (3.0 cr.; A-F Grade Basis)
Topics vary by section of course.

CHIC 3993 Directed Studies (1.0-9.0 cr.; Student Option; 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 (3.0 cr.; Student Option)
Examination of the structural or institutional conditions through which people of color have been marginalized in public policy. Critical evaluation of social theory in addressing the problem of contemporary communities of color in the United States.

CHIC 4232 Chicana/o - Latina/o Gender and Sexuality Studies (3.0 cr.; Student Option)
Critical thinking of Chicanas/os and Latinas/os around construction of gender. Politics of sexual identity. How the self is gendered in relationship to sexual, racial, class, and national identities under different social structural conditions. Way in which the "borders" that define/define sexual norms shift over time.

CHIC 4275 Theory in Action: Community Engagement in a Social Justice Framework (3.0 cr.; Student Option)
Theoretical frameworks of social justice and community engagement for work outside classroom with/in Latina/o community. Worker issues/organizing. Placements in unions, worker organizations. Policy initiatives on labor issues. Students reflect on their own identity development, social location, and position of power/privilege.

CHIC 4401 Chicana/Latina Cultural Studies (3.0 cr.; Student Option)
Diversity of cultures that are called "Hispanic"; women in these cultures; Chicanas and Latinas living in the United States or migrating from their home nations to the United States.

CHIC 4901W Senior Paper (3.0 cr.; A-F Grade Basis)
Capstone experience. Students produce original research paper or creative project on a topic determined in consultation with a faculty adviser.

CHIC 5374 Migrant Farmworkers in the U.S.: Families, Work, and Advocacy (3.0 cr.; Student Option)
Socioeconomic/political forces that impact migrant farmworkers. Effects of the laws and policies on everyday life. Theoretical assumptions/strategies of unions and advocacy groups. Role/power of consumer. How consuming cheap food occurs at expense of farmworkers.

CHIC 5920 Topics in Chicana(o) Studies (3.0 cr.; Student Option; prereq Sr or grad student)
Multidisciplinary themes in Chicano studies. Issues of current interest.

CHIC 5993 Directed Studies (1.0-3.0 cr.; Student Option; prereq #)
Guided individual reading, research, and study for completion of the requirements for a senior paper or honors thesis.

Child Psychology (CPSY)
College of Education and Human Development

CPSY 1904 Freshman Seminar: Global Perspectives (3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

CPSY 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

CPSY 1910W Freshman Seminar, Writing Intensive (1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

CPSY 2301 Introductory Child Psychology (4.0 cr.; Student Option; prereq 4 cr intro psych)
Introduction to the science of child behavior; review of theory and research.

CPSY 3308W Introduction to Research Methods in Child Psychology (4.0 cr.; A-F or Audit; prereq 2301, Psy 1001)
Techniques used in the study of child development; emphasis on collection, organization, and analysis of data.

CPSY 3360H Child Psychology Honors Seminar (2.0 cr.; A-F or Audit; 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.

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

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CPSY 4302 Infant Development (3.0 cr.; A-F or Audit; prereq 2301 or #)
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.

CPSY 4303 Adolescent Psychology (3.0 cr.; A-F or Audit; prereq Psy 1001)
Overview of development in the second decade of life. Interactions of adolescents with family, school, and society.

CPSY 4310 Special Topics in Child Development (1.0-4.0 cr.; Student Option; prereq 2301)
Topics/credits vary.

CPSY 4311 Behavioral and Emotional Problems of Children (3.0 cr.; A-F or Audit; prereq 2301 or equiv)
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.

CPSY 4313W Disabilities and Development (4.0 cr.; Student Option; prereq Psy 1001)

CPSY 4329 Biological Foundations of Development (3.0 cr.; A-F or Audit; 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.

CPSY 4331 Social and Personality Development (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; 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 4341 Perceptual Development (3.0 cr.; Student Option; prereq 2301)
Perceptual learning and the development of sensory and perceptual processes.

CPSY 4343 Cognitive Development (3.0 cr.; A-F or Audit; prereq 2301)
Cognitive processes; relevant theory, research literature, and methodology.

CPSY 4345 Language Development and Communication (3.0 cr.; A-F or Audit; prereq 2301)
Structure and function of language; factors influencing development; methodological problems, language scales, theories.

CPSY 4347W Senior Project (2.0 cr.; A-F or Audit; prereq CPsy sr)
Current literature on self-selected developmental topic. Students write a literature review.

CPSY 4993 Directed Experiences in Early Childhood Education (3.0 cr.; A-F Grade Basis; prereq ECE student)
Issues and techniques involved in the systematic observation of children. Record what is happening within the classroom. Interact/analyze research information in all developmental domains to increase understanding of child behavior.

CPSY 4994 Directed Research in Child Psychology (1.0-4.0 cr.; Student Option; 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) (1.0-6.0 cr.; Student Option; 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 (1.0-4.0 cr.; S-N or Audit; prereq 4 cr CPsy)
Independent reading. Varies depending on student's specific area of interest. Students receive credit while interning in metropolitan area.

CPSY 5187 Master's Paper in Early Childhood Education (2.0-3.0 cr.; S-N Grading Basis; prereq Students must have satisfied all licensure requirements and student teaching) Students choose an ECE topic/write a paper using primarily empirical research data/provide a follow-up activities. Students attend an early childhood policy lecture series and participate in small discussion groups and follow-up activities.

CPSY 5187 Master's Paper in Early Childhood Education (2.0-3.0 cr.; S-N Grading Basis; prereq Students must have satisfied all licensure requirements and student teaching) Students choose an ECE topic/write a paper using primarily empirical research data/provide a follow-up activities. Students attend an early childhood policy lecture series and participate in small discussion groups and follow-up activities.

CPSY 5187 Master's Paper in Early Childhood Education (2.0-3.0 cr.; S-N Grading Basis; prereq Students must have satisfied all licensure requirements and student teaching) Students choose an ECE topic/write a paper using primarily empirical research data/provide a follow-up activities. Students attend an early childhood policy lecture series and participate in small discussion groups and follow-up activities.

CPSY 5251 Social and Psychological Foundations of Early Childhood Education (2.0 cr.; A-F Grade Basis; prereq Student in ECE or ECSE) Surveys imagery, history, philosophy, and psychology of early childhood education. Trends in early education, including diversity, special needs, legislation, public policy, and educationally appropriate practice.

CPSY 5252 Facilitating Social and Emotional Learning in Early Childhood Education (3.0 cr.; A-F Grade Basis; prereq Student in ECE or ECSE) Current theoretical/empirical literature and developmental knowledge as basis for planning, implementing, and evaluating social/emotional growth/development of young children. For students obtaining ECE licensure.

CPSY 5253 Facilitating Cognitive and Language Learning in Early Childhood Education (3.0 cr.; A-F Grade Basis; prereq Student in ECE or ECSE) Overview of cognitive and language characteristics of children ages 0-8 years and of how teachers can plan curriculum to facilitate children's development in these areas.

CPSY 5254 Facilitating Creative and Motor Learning in Early Childhood Education (2.0 cr.; A-F Grade Basis; prereq Student in ECE or ECSE) Unique/diverse qualities and characteristics children possess while progressing through universal sequence of physical growth/development and creative development. Students engage in inquiry, research/planning, and reflection as they complete the action-oriented and applied assignments with small groups of children.

CPSY 5255 Research Methods in Early Childhood Education (1.0-6.0 cr.; S-N or Audit; 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 (3.0 cr.; Student Option) 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 (1.0-3.0 cr.; Student Option; 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 (3.0 cr.; A-F Grade Basis; prereq [Baccalaureate degree in an early-childhood-related field from an accredited U.S. institution or documented equiv], experience in early childhood [research or practice]) History, theory, research, concepts, and issues in infant mental health. Issues pertinent to difficulties in development. Readings, visual material. Expert guest lectures.


CPSY 5506 Infant Observation Seminar I (1.0 cr.; Student Option No Audit; 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 5507 Infant Observation Seminar II (1.0 cr.; Student Option No Audit; prereq 5506) 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 5511 Infant Observation Seminar III (1.0 cr.; Student Option No Audit; 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 5513 Assessment in Infant and Early Childhood Mental Health: DC 0-3R (2.0 cr.; Student Option; prereq [Baccalaureate degree in early-childhood-related field from accredited U.S. institution or documented equiv.], [experience in early childhood research or practice]) Infant Mental Health diagnostic manual DC 0-3R. Assessment using the manual. Lectures, discussions, cooperative learning, class exercises, case studies.

CPSY 5515 Assessment in Infant and Early Childhood Mental Health: NCAST (2.0 cr.; S-N Grading Basis; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; 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 (1.0 cr.; S-N Grading Basis; 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 (1.0 cr.; S-N Grading Basis; prereq &5518 or &5521) Principles and strategies of reflective supervision/consultation. Discussion, final assignment designated by instructor.

CAPY 5623 Assessment and Treatment Interventions: Anxiety and Depression in Children and Adolescents (1.0 cr.; Student Option) Characteristics of depression and suicidal behavior in children/adolescents. Methods of crisis intervention, treatment, and prevention.


CAPY 5660 ADHD Throughout the Life Span: Perspectives on Diagnosis, Assessment, and Developmental Course (1.0-2.0 cr.; Student Option; 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 5663 Building Friendships and Peer Relationship Skills: Interventions for Socially Rejected Children (1.0 cr.; Student Option) Basic milestones in social development. Behaviors/mechanisms leading to peer acceptance/rejection during childhood. Strategies for promoting social skill acquisition. Behavioral, social-cognitive, and emotional-regulation intervention approaches.


CAPY 5669 Attention Deficit Hyperactivity Disorder Throughout the Life Span: Current Perspectives on Treatment (1.0 cr.; Student Option) Standard medication, psychosocial, and educational interventions. Recent advances in long-acting stimulant medications. Setting up behavioral programs in home/school. Educational accommodations in school. Coaching. Cognitive-behavioral/neurobiofeedback therapies.

CAPY 5670 Preventing Violence and Antisocial Behavior in Children and Adolescents: Interventions, Practices (1.0 cr.; Student Option; 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 (1.0 cr.; Student Option) 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 (1.0 cr.; Student Option) 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 (1.0 cr.; Student Option) Early intervention to reduce antisocial and risk taking behaviors (e.g., suicide, unsafe sex) in teenagers. "Early Risers 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 (1.0 cr.; Student Option) 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 5675 Childhood Psychiatric Disorders: Case Studies and Interventions (1.0 cr.; Student Option) 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.

China Executive MBA (CHMB)

CHMB 5800 Organizational Behavior (3.0 cr.; A-F Grade Basis) Theories/frameworks for analyzing behavior of individuals, groups, and the organization itself. Emphasizes making decisions and developing action plans that enable managers to provide effective leadership. Personnel selection, reward/compensation systems, collective bargaining.

CHMB 5801 Financial Accounting (3.0 cr.; A-F Grade Basis) External accounting system used by firms to measure their economic performance and financial position. Students analyze corporate financial reports to discover impact of significant economic events. Rise of financial
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
Civil Engineering (CE)
Institute of Technology

CE 5 Refresher Course for Civil Engineers
(0.0 cr.; S-N or Audit; 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
(1.0 cr.; S-N or Audit; prereq Lower div)
Introduction to Department of Civil Engineering and civil engineering practice. Presented by faculty members and professional engineers.

CE 3101 Computer Applications in Civil Engineering I
(3.0 cr.; A-F or Audit; prereq MATH 1272, PHYS 1301, CSE)

CE 4000H Honors Research Seminar
(1.0 cr.; A-F Grade Basis; prereq Upper div CE)
Research seminars in civil and geological engineering given by faculty members and visiting scholars.

CE 4011 Special Topics
(1.0-4.0 cr.; A-F Grade Basis; prereq Upper div CE)
Topics/credits vary.

CE 4092H Honors Selected Reading
(1.0 cr.; A-F Grade Basis; prereq Upper div CE, honors) Selected readings, student presentations.

CE 4094H Senior Honors Thesis
(2.0 cr.; A-F Grade Basis; prereq Upper div CE)
Writing thesis under direction of CE faculty member.

CE 4102W Capstone Design
(4.0 cr.; A-F or Audit; 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 4111 Engineering Systems Analysis
(3.0 cr.; Student Option; prereq Upper div CSE)
"Systems" approach to problems. Operations research--decision engineering, network analysis, simulation, linear programming, and expert systems—is used to represent systems and assess trade-offs.

CE 4121 Computer Applications in Civil Engineering II
(3.0 cr.; A-F or Audit; prereq 3101, MATH 2243, MATH 2263, [CE or upper div GeoE])
Advanced application of computer tools/methods in solving ordinary/partial differential equations from civil engineering problems. Spreadsheet, Matlab programming. Methods may include finite differences, boundary element, finite element, and control volume finite element.

CE 4170 Independent Study I
(1.0-4.0 cr.; Student Option; 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
(1.0-4.0 cr.; Student Option; 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
(2.0-6.0 cr.; S-N or Audit; prereq Upper div CE, approval of department co-op director)
Formal written report of work during six-month professional assignment.

CE 4194H Senior Honors Thesis
(2.0 cr.; A-F Grade Basis; prereq Upper div CE)
Writing thesis under direction of CE faculty member.

CE 4201 Highway Design
(3.0 cr.; A-F or Audit; prereq CE or upper div GeoE or grad, 3202, 3201 or #)
Vertical and horizontal alignment, earthwork computations, roadway capacity, forecast of
traffic volume demand, impact of vehicle type on geometric design, intersection design.

CE 4211 Traffic Engineering (3.0 cr.; Student Option; prereq 3201 or Stat 3021 or equiv)
Principles of vehicle/driver performance as they apply to safe/efficient operation of highways.

CE 4251 Pavement Analysis, Design, and Rehabilitation (4.0 cr.; Student Option; prereq [3201, 3301, 3402, upper div CSE] or grad student or #)
Concepts/principles in rigid/flexible pavement design. Highways, soil considerations, material characteristics for highway/airfield pavement design. Rehabilitating flexible/rigid pavement systems.

CE 4253 Pavement Engineering and Management (3.0 cr.; Student Option; prereq [3201, 3301, 3402, upper div CSE] or grad student or #)

CE 4301 Soil Mechanics II (3.0 cr.; A-F or Audit; prereq [3301 or GEOE 3301, upper div CSE] or #)

CE 4311 Rock Mechanics (4.0 cr.; A-F or Audit; prereq 3301 or GEOE 3301 or #)

CE 4351 Groundwater Mechanics (3.0 cr.; A-F or Audit; prereq [3502, [upper div CSE or grad student]] or #)

CE 4352 Groundwater Modeling (3.0 cr.; A-F or Audit; prereq [4351, GEOE 4351, [upper div CSE or grad student]] or #)

CE 4401 Steel and Reinforced Concrete Design (4.0 cr.; A-F or Audit; prereq Grade of at least C- in 3401, & 3402, [upper div CSE 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 4411 Matrix Structural Analysis (3.0 cr.; A-F or Audit; prereq [Grade of at least C- in [3101, 3401] or in a CSci programming course, [upper div CSE or grad student]] or #)
Analysis of linear structural systems by matrix methods, stiffness, and flexibility methods. Introduction to computerized structural analysis of trusses/frames, including coding in programming language.

CE 4412 Reinforced Concrete Design II (3.0 cr.; A-F or Audit; prereq [Grade of at least C- in 4401, [upper div CSE 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 (3.0 cr.; A-F or Audit; prereq 3502)

CE 4502 Water and Wastewater Treatment (3.0 cr.; A-F or Audit; prereq 3501 or CHEN 2001)

CE 4511 Hydraulic Structures (3.0 cr.; A-F or Audit; prereq 4501)
Hydraulic design procedures for culverts, dams, spillways, outlet works, and river control works. Drop structures, water intakes, bridge crossings. Offered alt yrs.

CE 4512 Open Channel Hydraulics (4.0 cr.; A-F or Audit; prereq CSE 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 4561 Solid Hazardous Wastes (3.0 cr.; Student Option; prereq CSE or grad, Chem 1022, 3501 or #)
Solid and hazardous waste characterization; regulatory legislation; waste minimization; resource recovery; chemical, physical, and biological treatment; thermal processes; disposal practices. Analysis and design of systems for treatment and disposal.

CE 5094 Civil Engineering Research I (1.0-4.0 cr.; Student Option; prereq #)
Research or independent study in concrete structures. Thesis/dissertation work. Individual study of advanced engineering topics/areas, subject to instructor approval.

CE 5100 Special Topics (1.0-4.0 cr.; A-F or Audit; prereq #)
Topics vary depending on faculty and student interests.

CE 5211 Traffic Engineering (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq 3201 or equiv)

CE 5214 Transportation Systems Analysis (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq [3402, upper div CSE] or grad student or #)

CE 5311 Experimental Geomechanics (3.0 cr.; A-F or Audit; prereq Upper div CSE or grad, 4301, GEOE 4301 or #)

CE 5341 Wave Methods for Nondestructive Testing (4.0 cr.; A-F or Audit; prereq [AEM 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 (3.0 cr.; A-F or Audit; prereq [[Math 2263 or Math 2374 or equiv], [sr or grad student] in civil engineering] or #)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

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Emphasizes skills relevant for civil engineers. Mathematical principles explained in an engineering setting. Applications from various areas in civil engineering.

**CE 5411 Applied Structural Mechanics (3.0 cr.; A-F or Audit; prereq [Upper div CSE or grad student] or #)**
Principal stresses and failure criteria in 3 dimensions. Introduction to plane elasticity, energy methods, torsion of beams, and bending of unsymmetrical beams.

**CE 5414 Prestressed Concrete Design (3.0 cr.; A-F or Audit; prereq [Grade of at least C- in 4401, [upper div CSE or grad student]] or #)**
Design of prestressed concrete structures. Time dependent effects, behavior, flexure, shear, torsion, deflections, continuous systems.

**CE 5415 Masonry Structures (3.0 cr.; A-F or Audit; prereq [Grade of at least C- in 3401, [upper div CSE or grad student]] or #; 4401 recommended)**

**CE 5511 Urban Hydrology and Land Development (4.0 cr.; A-F or Audit; prereq CE 4501)**
Urban hydrology for small watersheds and the management of storm water quality and quantity.

**CE 5541 Environmental Water Chemistry (3.0 cr.; A-F or Audit; 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.

**CE 5542 Experimental Methods in Environmental Engineering (3.0 cr.; A-F or Audit; prereq 3501, Chem 1021, Chem 1022)**
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 5543 Introductory Environmental Fluid Mechanics (4.0 cr.; A-F or Audit; prereq 3502 or AEM 4201 or ChEn 3005)**
Divergence theorem, Convective flux, Mass conservation, Biological reactions. Random walk and diffusive flux, Receptors and channels, Momentum conservation, Navier-Stokes equations, Boundary layer, Chemotaxis, Phototaxis, Shear dispersion, Turbulent flows.

**CE 5551 Environmental Microbiology (3.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F; Grad Basis; prereq 5551 or 85551)**
Basic microbiological techniques: isolation, identification/enumeration of bacteria, BOD, biodegradable kinetics, disinfection. Lab.

**CE 5551 Air Quality Engineering (3.0 cr.; A-F Grade Basis; prereq Grad student in engineering or #)**
Introduction to air pollution problems/solutions, local to global. Quantitative analysis of chemistry and physics of atmospheric pollutants. Sources, sinks, and controls; atmospheric transport and transformation; air quality management and regulation; health impacts; global issues.

**CE 5570 Design for Sustainable Development: Discovery (1.0-3.0 cr.; A-F Grade Basis; prereq Juniors or seniors with minimum 3.0 GPA or grad student)**
Intensive, experiential learning opportunity on infrastructure, development, environment issues in Delhi, India.

**CE 5571 Design for Sustainable Development: Innovate (4.0 cr.; A-F Grade Basis; prereq #)**
Hands-on training evaluating technologies to improve health/quality of life in developing countries. Students work in teams/students in India to select technology or service. Design business serving low-income community in India.

**CE 5572 Design for Sustainable Development: Create I (2.0 cr.; A-F Grade Basis; prereq #)**
Hands-on experience regarding entrepreneurship/social entrepreneurship.

**CE 5573 Design for Sustainable Development: Create II (1.0 cr.; A-F Grade Basis; prereq #)**
Weekly discussion on social or environmental venture.

**CLCV 3015W Art of Islam (4.0 cr.; Student Option)**
Architecture, painting, and other arts, from Islam's origins to 20th century. Cultural/political settings. Themes that unify diverse artistic styles of Islamic art.

**CLCV 3081W Classical Epic in Translation (3.0 cr.; Student Option; prereq Classical Civilization major or #)**

**CLCV 3510 Great Books (3.0 cr.; Student Option; prereq Jr or sr or #)**
Intensive study of major works of classical antiquity and later (written in or translated into English), related by kind, theme, style, or perspective. Sometimes including works from non-Western cultures.

**CLCV 3711 Classics of Literary Criticism (3.0 cr.; Student Option; prereq 1 course in literature, 2nd course in literature or philosophy or #)**
Principles of criticism as expounded and employed in major critical works by writers such as Plato, Aristotle, Horace, Longinus, Sir Philip Sidney, John Dryden, Samuel Johnson, David Hume, William Wordsworth, Samuel Taylor Coleridge, and T. S. Eliot.

**CLCV 3940 Proseminar: Classical Traditions in Western Culture (3.0-4.0 cr.; Student Option; prereq CiCv major or #)**
The nature of Greco-Roman classical traditions manifested in various cultural spheres: language and literature, fine arts, history, science, philosophy, theology, and other disciplines: the political, social, educational, and religious life of society. The perspective, scope, breadth, and depth of the course will vary.

**CLCV 3950 Topics in Classical Civilization (3.0-4.0 cr.; Student Option)**
Topics specified in the Class Schedule.

**CLCV 3993 Directed Studies in Classical Civilization (1.0-4.0 cr.; Student Option; prereq #)**
Directed Studies in Classical Civilization

**CLCV 3994 Directed Research in Classical Civilization (1.0-4.0 cr.; Student Option; prereq #)**
Directed Instruction in Classical Civilization

**CLCV 3996 Directed Instruction in Classical Civilization (1.0-4.0 cr.; Student Option; prereq #)**
Directed Instruction in Classical Civilization

**CNES 1001 World of the Bible: Religions, Empires, and Discourses of Power (3.0 cr.; Student Option)**

**CNES 1002 World of Greece (3.0 cr.; Student Option)**
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 (3.0 cr.; Student Option)**
Roman civilization, from Etruscan origins to late antiquity. Cultural diversity of Mediterranean civilization. Ways of life, social, and political institutions as evidenced by literature, art/architecture, history, and material culture.

**CNES 1042 Greek and Roman Mythology (4.0 cr.; Student Option)**
Introduction to stories/study of Greek/Roman mythology.

**CNES 1042H Honors Course: Greek and Roman Mythology (4.0 cr.; A-F Grade Basis; prereq Honors or #)**
Introduction to stories/study of Greek/Roman mythology.

**CNES 1043 Introduction to Greek and Roman Archaeology (4.0 cr.; Student Option)**
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 1046 Technical Terminology for the Health Professions (3.0 cr.; Student Option; prereq =: CLAS 1148) Greek and Latin prefixes, suffixes, and roots basic to the vocabulary of health professions; taught through computer-assisted instruction.

CNES 1082 Jesus in History (3.0 cr.; Student Option) Jesus of Nazareth in his original setting. Modern approaches to the historical Jesus. Perspectives/needs of early gospel writers, effects on portrayals of Jesus. Shifting representations of Jesus in new historical/cultural situations. Meets with Clas 1082.


CNES 1903 Freshman Seminar (3.0 cr.; Student Option) Topics specified in Class Schedule.

CNES 1905 Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics specified in Class Schedule.

CNES 1909W Freshman Seminar (3.0 cr.; Student Option) Topics specified in Class Schedule.

CNES 1910W Freshman Seminar (3.0 cr.; Student Option; prereq Fr or up to 30 cr) Topics specified in Class Schedule.

CNES 3008 History of Ancient Art (4.0 cr.; Student Option) Architecture, sculpture, and painting of selected early cultures; emphasis on influences on the development of Western art.

CNES 3035 Classical Myth in Western Art (4.0 cr.; Student Option) 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 (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) How/what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.


CNES 3082W Greek Tragedy in Translation (3.0 cr.; Student Option) Origins of tragedy. Ancient theatres. Selected plays of Aeschylus, Sophocles, and Euripides.

CNES 3083W Ancient Comedy (3.0 cr.; Student Option) Greek/Roman comic drama (e.g., Aristophanes, Menander, Plautus, Terence).

CNES 3101 Ancient Greece: Poet and Hero in the Age of Homer (3.0 cr.; Student Option) Homer and his epic poetry. Trojan war. Greek lyric poets (Sappho, Pindar). Early Greek philosophy.

CNES 3102 Ancient Greece: The Golden Age of Athens (3.0 cr.; Student Option) Emergence of democracy in shadows of two brutal wars: one foreign, one civil. Democracy, war, empire through lens of tragedy, comedy, art from fifth-century Athens.


CNES 3104 Ancient Rome: Kings and Consuls (3.0 cr.; Student Option) Roman Republic, from its origins to Caesar's death.


CNES 3107 Age of Constantine the Great (3.0 cr.; Student Option) Change/continuity in Roman Empire from its 2nd-century zenith through 3rd-century crisis, first Christian emperor (306 to 337 A.D.), and beyond. Replacement of classical paganism by Christianity. Beginnings of monasticism. Superpower relations between Roman, Persian empires. Meets with 1023.

CNES 3108 Age of St. Augustine of Hippo (3.0 cr.; Student Option) Cultural diversity A.D. 363 to circa 500 A.D. Replacement of Roman Empire in Western Europe by barbarian kingdoms. consolidation of Constantinople as capital in East. Literature, art, thought resulting from new dominance of Christianity, particularly Augustine of Hippo.

CNES 3109 The Age of Justinian and Muhammad (c.500-c.700 A.D.) (3.0 cr.; Student Option) 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 3115 Midrash: Jewish Biblical Interpretation (3.0 cr.; Student Option) Jewish law as a mirror of society and as a way to actualize its value. Original socioreligious contexts and current applications. Biblical interpretations addressing moral, theological, legal, and literary problems.

CNES 3142 Art of Egypt (4.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Civilization of ancient Greece as revealed through art/material culture. Case studies of selected monuments/sites.

CNES 3156 Greek and Roman Art and Archaeology (3.0 cr.; Student Option) History of Greek, Hellenistic, Etruscan, and Roman art, from formation of Greek city states to transformation of Roman visual culture. Roles visual culture played, including for Alexander and his successors in forging multiethnic, globally minded empires. Creative inventions of peoples influenced by the Romans.

CNES 3162 Roman Art and Archaeology (3.0 cr.; Student Option) Introduction to art and material culture of Roman world: origin, change, continuity. Progress/decay in later empire, its legacy to modern world.


CNES 3182 Egypt and Western Asia: Art and Archaeology of Ancient Egypt and Western Asia (3.0 cr.; Student Option) Art, architecture, and archaeology of Egypt. East Africa, Asia Minor, Mesopotamia, Iran, and Central Asia from the Neolithic through Late Antiquity (ca. 7,000 B.C.E.-650 C.E.). Relationship between the visual material and the social, intellectual, political, and religious contexts. Evolution of, and exchanges and differences among, the visual cultures of these time periods and regions.

CNES 3201 The Bible: Context and Interpretation (3.0 cr.; Student Option; prereq Knowledge of Hebrew not required) Introduction to the modern academic study of the Old Testament/Hebrew Bible in the historical context of literature from ancient Mesopotamia. Read Babylonian Epic of Creation, Epic of Gilgamesh, Hammurabi, Genesis, Exodus, Psalms. Stories of creation, law, epic conflict, and conquest.
CINES 3202 Prophecy in Ancient Israel (3.0 cr.; Student Option; prereq 1001 or 1201 or 3201 or RELA 3201 or #) Survey of Israelite prophets. Emphasizes Amos, Hosea, Isaiah, Jeremiah, Ezekiel, and Second Isaiah. Prophetic contributions to Israelite religion. Personality of prophets. Politics, prophetic reaction. Textual analysis, biblical scholarship. Prophecy viewed cross-culturally.

CINES 3203 The Bible: Wisdom, Poetry, and Apocalyptic (3.0 cr.; Student Option) Survey of books of Psalms, Proverbs, Job, Song of Songs, Lamentations, Ecclesiastes (Qoheleth), Characteristics of biblical poetry. Conceptions of Israelite wisdom writing. Traits of early Jewish apocalyptic writing.

CINES 3204 The Dead Sea Scrolls (3.0 cr.; Student Option) 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.

CINES 3205 Ancient Israel: From Conquest to Exile (3.0 cr.; Student Option; prereq Knowledge of Hebrew not required, 3501 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.


CINES 3355 Death and the Afterlife in the Ancient World (3.0 cr.; Student Option) 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.

CINES 3601 Sexuality and Gender in Ancient Greece and Rome (3.0 cr.; Student Option) 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.

CINES 3950 Aspects of Ancient Culture (3.0 cr.; Student Option) Selected topics in the cultural history of antiquity (e.g., women in antiquity, Roman diplomacy, slavery, education). Topics specified in Class Schedule.

CINES 3951W Major Project (4.0 cr.; Student Option; prereq Three 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.

CINES 3993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #) Guided individual reading or study.

CINES 4051 Ancient Near East and Egypt: Neolithic to 1500 BCE (3.0 cr.; A-F or Audit; 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, and writing. Use of literature/art as vehicles for articulating concepts. Changing relationships among cultures/polities of ancient Near East and regions beyond.

CINES 4052 Ancient Near East and Egypt: 1500 to 323 BCE (3.0 cr.; A-F or Audit; prereq 3951 or prev coursework in ancient history recommended) Lands 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.

CINES 5013 Introduction to Roman Law (3.0 cr.; Student Option; prereq Grad student or #) Survey of Roman law from social and historical perspectives. Basic concepts of Roman private law and legal procedure.

CINES 5015 Before Herodotus: History and Historiography of Mesopotamia and the Ancient Near East (3.0 cr.; A-F or Audit; prereq Previous coursework in Ancient Near East history recommended) Seminar. Historical method/sources for Ancient Near Eastern history. Historical tradition and historiographic texts of Mesopotamia and neighboring regions of Ancient Near East/their relationship to the works of classical historians such as Herodotus. Use of these sources in modern historiography of Ancient Near East.

CINES 5070 Topics in Ancient Religion (3.0 cr.; Student Option; prereq Sr or grad student or #) Specific aspect of religion in Classical and Near Eastern antiquity, such as healing cults, magic/divination, Gnosticism, or prophecy/authority. Topics specified in Class Schedule.

CINES 5071 Geometric through Classical Examples of the Greek Comedy (3.0 cr.; Student Option) Theatrical production. Theatrical production. Aristophanes, Menander, Plautus, Terence.


CINES 5073 Roman Religion and Early Christianity (3.0 cr.; Student Option) Eastern Roman art in the Private Sphere (3.0 cr.; Student Option; 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.

CINES 5076 Apostle Paul: Life, Letters, and Legacy (3.0 cr.; Student Option) How/what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.

CINES 5078 New Testament Seminar (3.0 cr.; Student Option; 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.


CINES 5083 Ancient Comedy (3.0 cr.; Student Option) Greek/Roman comic drama (e.g., Aristophanes, Menander, Plautus, Terence).

CINES 5108 Greek Architecture (3.0 cr.; Student Option; prereq Jr. Class/ArtH 3008 or #) Architectural theory. Greek architecture from Bronze Age to Hellenistic period. Specific aspects of Greek architecture. Use of religious evidence in illuminating architectural role.

CINES 5115 Midrash: Jewish Biblical Interpretation (3.0 cr.; Student Option) Jewish law studies as mirror of society and as way to actualize its value. Original sources/religious contexts, current applications. Biblical interpretations addressing moral, theological, legal, and literary problems.

CINES 5122 House, Villa, Tomb: Roman Art in the Ancient World: Art and Architecture of Achaemenid Persia and Sassanian Persia (3.0 cr.; Student Option) Art, archaeology of ancient Persia and the wider ancient Iranian world from the rise of the Achaemenid empire in 650 BCE to the advent of Islam in the seventh century CE.

CINES 5204 The Dead Sea Scrolls (3.0 cr.; Student Option) Introduction to Dead Sea Scrolls and Qumran. Contents of Dead Sea Scrolls, significance for understanding development of the Bible. Background of Judaism and Christianity. Archaeological site of Qumran.
CNES 5502 Ancient Israel: From Conquest to Exile (3.0 cr.; Student Option; 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.


CNES 5535 Death and the Afterlife in the Ancient World (3.0 cr.; Student Option) 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.

CNES 5601 Sexuality and Gender in Ancient Greece and Rome (3.0 cr.; Student Option) SWWhat 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.


CNES 5713 Introduction to Ugaritic (3.0 cr.; Student Option) Prereq Adv Hebrew, previous 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.

CNES 5794 Introduction to Classical and Near Eastern Studies (1.0 cr.; S-N or Audit; prereq grad major or minor or #) Introduction to core research materials and reference materials in the various disciplines which make up classical studies.

CNES 5796 Classical Texts: Approaches and Methods (3.0 cr.; Student Option; prereq CNES grad student or #) Methods/approaches, from antiquity to present, for reading/interpreting Greek/Latin literary texts.

CNES 5940 Topics in Classical Literature (3.0 cr.; Student Option; prereq Two literature courses or #) Additional work for graduate credit. Topics specified in Class Schedule. Meets with 3940.

CNES 5950 Aspects of Classical Culture (1.0-3.0 cr.; Student Option) Topics specified in Class Schedule.

CNES 5993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #, %, @) Guided individual reading or study.

CNES 5994 Directed Research (1.0-12.0 cr.; Student Option; prereq #, %, @) Guided individual research.

CNES 5996 Directed Instruction (1.0-12.0 cr.; Student Option; prereq #, %, @) Guided individual research.

Clinical Laboratory Science (CLS) Medical School

CLSP 4302 Clinical Chemistry I: Lecture and Lab (3.0 cr.; A-F or Audit; prereq Two organic chem courses with lab, one biochem course, #) Examination of urine. Lecture, lab.

CLSP 4301 Diagnostic Microbiology II (2.0 cr.; A-F or Audit; prereq One microbiology course with lab, one biochem course, enrolled year 4 CLSP student, #) Techniques used in laboratory diagnosis of infectious disease. Isolating/identifying bacteria/yeast. Antimicrobial susceptibility testing. Lab.

CLSP 4502 Principles of Diagnostic Immunology (3.0 cr.; A-F or Audit; prereq One microbiology course with lab, one biochem course, enrolled year 4 CLSP student, #) Basic theory/application of molecular diagnostics in clinical laboratory. Lab.

CLSP 4503 Comparative Hemostasis (1.0 cr.; A-F or Audit) Fundamentals of blood/coagulation. Correlation of clinical lab findings. Lecture, lab.

CLSP 4504 Biochemistry of Inflammation (3.0 cr.; A-F or Audit; prereq One microbiology course with lab, one biochem course, enrolled year 4 CLSP student, #) Basic theory/application of molecular diagnostics in clinical laboratory. Lab.

CLSP 4505 Genetics and Genomics (3.0 cr.; A-F or Audit; prereq One year of CLSP student, #) Basic theory/application of molecular diagnostics in clinical laboratory. Lab.

CLSP 4506 Laboratory Safety and Management (2.0 cr.; A-F or Audit; prereq One year of CLSP student, #) Basic theory/application of molecular diagnostics in clinical laboratory. Lab.

CLSP 4507 Clinical Laboratory Science (3.0 cr.; A-F or Audit; prereq One microbiology course with lab, one biochem course, enrolled year 4 CLSP student, #) Basic theory/application of molecular diagnostics in clinical laboratory. Lab.

CLSP 4508 Clinical Laboratory Science II: Lecture and Lab (3.0 cr.; A-F or Audit; prereq [4302 or 5302], two
organic chem courses with lab, one biochem course, year 4 CLSP student.)

Principles/applications of clinical chemistry. Correlation of clinical/lab findings.

CLSP 4302 Clinical Chemistry II: Laboratory (2.0 cr.; A-F or Audit; prereq [4302 or 5302], two organic chem courses with lab, one biochem course)

Principles/applications of lab procedures in clinical chemistry.

CLSP 4401 Immunology (1.0 cr.; A-F or Audit; prereq BIOC 3021, #) Basic principles of human immune function, clinical applications, clinical techniques (including flow cytometry).

CLSP 4402 Molecular Diagnostics (2.0 cr.; A-F Grade Basis) Theory/application of molecular diagnostics in clinical lab. Lecture, lab.

CLSP 4501 Introduction to Transfusion Medicine (2.0 cr.; A-F or Audit) Principles of blood grouping, antibody identification, compatibility testing, donor testing for transfusion medicine.

CLSP 4502 Introduction to Transfusion Medicine: Laboratory (2.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F Grade Basis; 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 (1.0 cr.; A-F or Audit; prereq #) Isolation, identification, and antimicrobial susceptibility testing of clinically significant microbes from patient specimens.

CLSP 4702 Applied Clinical Hematology/ Hemostasis (2.0 cr.; S-N or Audit; prereq 4201, 4202, 4203, enrolled CLSP student, #) Application of basic methods/techniques in clinical hematology, cellular morphology, and hemostasis.

CLSP 4703 Applied Clinical Chemistry and Urinalysis (2.0 cr.; S-N or Audit; prereq 4301, 4302, 4304, 4305, enrolled CLSP student, #) Application of basic methods/techniques in clinical chemistry lab.

CLSP 4704 Applied Transfusion Medicine (2.0 cr.; S-N or Audit; prereq 4501, 4502, enrolled CLSP student, #) Application of basic methods/techniques in transfusion medicine lab.

CLSP 4801 Special Laboratory Methods (1.0-3.0 cr.; Student Option; prereq CLSP student, #) Individual assignment to special project in research lab or clinical lab.

Clinical Physiology and Movement Science (CPMS)

College of Education and Human Development

CPMS 5101 Introduction to Clinical Physiology and Movement Science (3.0 cr.; A-F or Audit) Overview of clinical physiology and clinical movement science. For students in such diverse fields as bioengineering, kinesiology, neuroscience, physical therapy, physiology, psychology, public health, occupational therapy.

CPMS 5201 Colloquium in Clinical Physiology and Movement Science (1.0 cr.; S-N or Audit; prereq Undergrad level in basic anatomy and physiology is highly recommended) Interdisciplinary course meets 1st and 3rd week of the month. Current research areas, scientific methods, and interpretation of results in the areas of clinical movement science and clinical physiology.

Collaborative Arts Interdisciplinary Program (COLA)

College of Liberal Arts

COLA 1001 Art of Collaboration (3.0 cr.; A-F Grade Basis) 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 (1.0 cr.; S-N Grading Basis) Students and IPCA faculty share works-in-progress, discuss work processes, develop new collaborations, and wrestle with the art of critique.

COLA 3011 Move to Question: A Lab for Creative Practice (3.0 cr.; Student Option) Taught by six nationally recognized choreographers/directors/writers/multidisciplinary artists. Pushing boundaries of creative practice/experience. Provoking/responding to questions. Critique, deep/wild experimentation.

COLA 3012 Crossing Boundaries to Imagine New Worlds (3.0 cr.; Student Option) Boundaries/intersections where multiple art forms/practices converge. Students collaborate to co-author/-create works for in-class/public performance.

COLA 3521 Collaboratory II: Collaborative Research Laboratory (1.0 cr.; S-N Grading Basis) 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 (1.0-4.0 cr.; Student Option; prereq #) Focuses on a single topic, listed in Class Schedule.

COLA 5950 Topics in Collaborative Arts (1.0-3.0 cr.; A-F Grade Basis; prereq #) Guided independent study.

College of Food, Agri & Natural Resource Sciences (CFAN)

College of Food, Agricultural and Natural Resource Sciences

CFAN 1101 Dean's Engaged Leaders Seminar (3.0 cr.; A-F Grade Basis; prereq Incoming 1st-yr CFANS students only) Students explore their role in building inclusive community spaces. Development of leadership skills in academic, social, and public service contexts. Hands-on learning/real-world applications in culturally diverse communities. Field trips, guest speakers, and discussions.

CFAN 1201 Discovering Majors and Careers (1.0 cr.; A-F Grade Basis) Five stages in the career discovery process: self-assessment, exploration, decision making, experiencing, and implementing. Determining next steps in academic/career process.

CFAN 1501 Biotechnology, People, and the Environment (3.0 cr.; A-F or Audit) Basic concepts in genetic engineering as a foundation for studying the impact of biotechnology on agriculture, medicine, industry, and the environment. Controversial aspects of biotechnology related to public policy issues are discussed.

CFAN 1901 Topics: Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq freshman) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1902 Topics: Freshman Seminar (3.0 cr.; Student Option; prereq freshman) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1903 Topics: Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq freshman) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1904 Topics: Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq freshman) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1905 Topics: Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq Fr) Topics vary.

CFAN 1908W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1910W Freshman Seminar: Topics (1.0-3.0 cr.; A-F Grade Basis; prereq freshman) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 1942 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr) Interdisciplinary seminar. Topics specified in Class Schedule.

CFAN 2201 Secure & Succeed in Internships (2.0 cr.; A-F Grade Basis; prereq sophomore or junior)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

Identify skills, opportunities, interests, values related internship. Network with potential employers. Apply to current openings/secure internship.

**CFAN 3000 Directed Studies in International Agriculture** (2.0-4.0 cr.; A-F or Audit; 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** (2.0-4.0 cr.; A-F or Audit; 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** (3.0 cr.; A-F or Audit; 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** (2.0-3.0 cr.; A-F Grade Basis; 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 Career and Internship Preparation** (1.0 cr.; A-F Grade Basis; 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** (1.0-4.0 cr.; Student Option)

Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

**CFAN 3500 International Field Studies Seminar** (1.0-3.0 cr.; A-F or Audit; prereq #)

Interface of agriculture with various natural resource, environmental, economic, food safety, public policy, ethical issues transcending national borders. Seminars take place in other countries/regions of world, providing global perspective. Active learning, lectures, discussion tutorials, field trips, reports, exams.

**CFAN 3501 Costa Rica--Sustainable Development** (3.0 cr.; A-F or Audit; prereq #)

Costa Rica's development strategy. Agriculture, tourism, energy, and urbanization. Show synergies and tension between economic, social, and environmental impacts. Sustainability and how organizations maximize benefits associated with sustainable development.

**CFAN 3502 Bahamas--Tropical Marine Biology and Shark Ecology** (2.0 cr.; A-F or Audit; prereq #)

Ecology of sharks and natural history of South Bimini Island. Marine ecosystems. Local flora and fauna. Local culture and development policy on the ecosystems.

**CFAN 3503 Switzerland--Mountain Agriculture** (3.0 cr.; A-F or Audit; prereq #)

Spring-time agriculture in a mountain ecosystem; management of farm enterprises to be productive in the context of Europe; how Switzerland has developed agro-tourism; interact with farmers, researchers, professionals and government officials who share expertise and interest in agricultural issues.

**CFAN 3504 Vertebrate Research Design and Field Survey Techniques** (3.0 cr.; A-F or Audit; prereq #)

Thai culture and conservation challenges. Two-day barge trip learning culture before traveling to Thailand's premier conservation research site. Camera-trapping techniques, prey assessment methods, and radio telemetry approaches to the study of large mammals.

**CFAN 3505 France: Sustainable Food Culture I** (3.0 cr.; A-F or Audit; prereq #)

French way of life, France's role in the European Union, and the rich heritage of French culture. Concentrated study in agriculture and agribusiness; horticulture; viticulture and wine making; rural tourism; and gastronomy.

**CFAN 3508 Europe--Global Environmental Leadership** (3.0 cr.; A-F or Audit; prereq #)

Decision-making on critical issues within the European Union common policy frameworks. Lectures and field settings provide background, principles, and managerial approaches embedded in EU environmental law and policy. Constructed wetlands and lake restoration.

**CFAN 3509 South Africa: One Country, Two Food Systems** (3.0 cr.; A-F or Audit; prereq #)

Food systems in the central provinces of South Africa/how food is delivered to different groups. Transforming the agricultural sector to address food security. Approaches implemented since 1994: local production systems, education/land ownership for black farmers, new markets.

**CFAN 3512 France: Sustainable Food Culture II** (3.0 cr.; A-F or Audit; prereq #)

French way of life, France's role in the European Union, and the rich heritage of French culture. Concentrated study in agriculture and agribusiness; horticulture; viticulture and wine making; rural tourism; and gastronomy.

**CFAN 3513 The Natural History of Norway** (3.0 cr.; A-F Grade Basis)

Students travel to the Nord Trøndelag region of central Norway. Physical geography, ecology, and management of natural resources, flora, and fauna. Region's rich culture/history and its close ties to Minnesota.

**CFAN 3900 Topics in International Agriculture** (1.0-4.0 cr.; A-F or Audit; prereq #)

International, on-site, classroom, and field-study of agricultural systems. Sites vary. Can include language study.

**CFAN 4293 Directed Study** (1.0-5.0 cr.; Student Option; prereq #)

Study/project on topic of personal interest in consultation with faculty member. Initial proposal, reports of accomplishments.

**CFAN 4801H Honors Thesis** (3.0 cr.; A-F Grade Basis; prereq Candidate for graduation with honors through CFANS in any major; @)

Students work closely with a faculty member to develop and complete the honors thesis. Available to all CFANS majors.

**CFAN 5000 Special topics for K-12 Educators: Agricultural, Food, and Environmental Sciences and Technologies** (1.0-3.0 cr.; Student Option; 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, foods, natural resources, and the environment for the benefit of society and our ecosystems.

**CFAN 5201 Career and Job Search Preparation for Graduate Students** (1.0 cr.; S-N Grading Basis; prereq Grad student)

Job search and career development tools. Goals, networking, job search, resume/CV, interviewing. Assignments include resume/CV, informational interview, career development plans.

**CFAN 5500 International Field Studies Seminar** (1.0-3.0 cr.; A-F or Audit; prereq #)

Interface of agriculture with natural resource, environmental, economic, food safety, public policy, ethical issues transcending national borders. Seminars take place in various countries/regions. Active learning, lectures, discussion tutorials, field trips, reports, exams.

**CLAS 1001 CLA First-Year Experience I: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLAS 1001H Honors CLA First-Year Experience I: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA, honors)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLAS 1002 CLA First-Year Experience II: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLAS 1002H Honors CLA First-Year Experience II: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA, honors)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLAS 1003 CLA First-Year Experience II: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**College of Liberal Arts (CLA)**

**CLA 1001 CLA First-Year Experience I: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLA 1001H Honors CLA First-Year Experience I: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA, honors)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLA 1002 CLA First-Year Experience II: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLA 1002H Honors CLA First-Year Experience II: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA, honors)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.

**CLA 1005 Introduction to Liberal Arts Learning** (3.0 cr.; A-F Grade Basis; prereq CLA ATS fr)

Academic/co-curricular resources. Balancing learning opportunities. Wellness/finance. Developing student-athlete)

**CLA 1005H Honors CLA First-Year Experience II: Composing Your Worlds** (1.0 cr.; S-N Grading Basis; prereq CLA, honors)

In-class/out-of-class learning experiences/reflection. Charting educational path on basis of strengths, values, life goals.
CLA 1051 CLA Freshman Research (0.0 cr.; No Grade Associated; prereq Available only to CLA freshmen receiving a CLA Research Opportunity.)
Freshman research or creative opportunity with faculty.

CLA 1052 CLA Freshman Research (1.0-2.0 cr.; Student Option; prereq Only available to CLA freshmen receiving a CLA Research Opportunity.)
Freshman research or creative opportunity with faculty.

CLA 1200 Topics (3.0 cr.; Student Option) See Course Guide for specific topic titles.

CLA 1301 SEAM First Year Seminar (2.0 cr.; A-F or Audit; prereq SEAM)
Introduction to resources that enhance academic/professional interests. Focus on multiculturalism, other skills. Small-group discussions.

CLA 1302 SEAM First-Year Colloquium (2.0 cr.; A-F or Audit; prereq SEAM)
Exploration of issues related to students’ academic/career interests. Multiculturalism, other skills. Small-group discussions.

CLA 1303 SEAM Seminar (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis)
Local civic history. Leadership. Technological/academic skill development. Sense of agency/ownership as citizens within the University community.

CLA 1901 Topics: Freshman Seminar (1.0-4.0 cr.; A-F or Audit; prereq freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CLA 1902 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CLA 1903 Topics: Freshman Seminar (1.0-4.0 cr.; A-F or Audit; prereq freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CLA 1904 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr)
Freshman seminar. Topics specified in Class Schedule.

CLA 1905 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Freshman seminar. Topics specified in Class Schedule.

CLA 1906W Topics: Freshman Seminar (1.0-4.0 cr.; A-F or Audit; prereq freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CLA 1907W Topics: Freshman Seminar (1.0-4.0 cr.; A-F or Audit; prereq freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CLA 1908W Topics: Freshman Seminar (1.0-4.0 cr.; A-F or Audit; prereq freshman)
Interdisciplinary seminar. Topics specified in Class Schedule.

CLA 1909W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

CLA 3001 Success Strategies for Transfer Students (1.0 cr.; S-N or Audit)
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 3003 Public History (3.0 cr.; A-F or Audit)
Interpretations of collective past as produced in public venues, including museum exhibitions, films, theme parks, and websites. Intellectual/political issues in history produced for public audiences. Career opportunities.

CLA 3500 Topics (1.0-4.0 cr.; Student Option) Topics specified in Class Schedule.

CLA 3600 The Renaissance (3.0 cr.; Student Option)
Relationships between the visual arts, literature, science, philosophy, and politics in Europe from about 1300-1600. Works of artists, writers and intellectuals (e.g., Michelangelo Buonarotti, Niccolo Machiavelli, Michel de Montaigne), different artistic and literary forms (e.g., the portrait, the sonnet, the essay), and broad thematic issues that include the individual, antiquity, the state, and discovery. Team taught.

CLA 5500 Topics (3.0-5.0 cr.; Student Option) Topics specified in Course Catalog.

CSE 1 Fundamentals of Engineering Review (E.I.T. Refresher) (0.0 cr.; S-N or Audit; 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, thermodynamics, electric circuits, fluid mechanics, and engineering economics.

CSE 1001 First Year Experience (1.0 cr.; A-F Grade Basis; prereq CSE, fr) Resources and strategies for college success. Majors and career opportunities offered in the physical sciences, mathematics, and engineering. Personal responsibility, academic integrity, and level of academic rigor required for success. Personal action plan for achievement in CSE.

CSE 1001H First Year Experience (1.0 cr.; A-F Grade Basis; prereq CSE, fr, honors) Resources and strategies for college success. Majors and career opportunities offered in the physical sciences, mathematics, and engineering. Personal responsibility, academic integrity, and level of academic rigor required for success. Personal action plan for achievement in CSE.

CSE 1101 Environmental Issues and Solutions (4.0 cr.; Student Option; prereq High school chemistry or equiv, one yr high school algebra)
Importance of science in understanding/solving various environmental problems. Case studies. Laboratory exercises.


CSE 1411 Exploring Careers in Science and Engineering (1.0 cr.; A-F Grade Basis) Major/career direction. Assess interests, values, skills, strengths, personality preferences to determine potential careers/ work environments. Investigate careers of interest, create goals. STEM fields. How skills may transfer to other occupations. Seven-week course.

CSE 1413 Preparing for Careers in Science and Engineering (1.0 cr.; Student Option) Research companies. Interview skills. Career goals. Resources for internship/full-time opportunities. Develop professional cover letter/resume.

CSE 1511 Introduction to Engineering Design (3.0 cr.; S-N Grading Basis) History, career opportunities, portfolios, visualization, geometry, modeling, construction, analysis, documentation. Part of Project Lead the Way curriculum.

CSE 1512 Principles of Engineering (3.0 cr.; S-N Grading Basis) Communication/documentation, design process, engineering systems, strength of materials, testing, reliability, statics/dynamics. Part of Project Lead the Way curriculum.

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
friendships, work relationship). Theories, practices.

COMM 3411 Introduction to Small Group Communication (3.0 cr.; Student Option) Cooperative thinking in task-oriented groups. Planning, preparing for, and participating in small groups in private and public contexts.

COMM 3422 Interviewing and Communication (3.0 cr.; A-F or Audit) Application of communication concepts in information interview. Planning, conducting, and evaluating informational, journalistic/elite, helping, persuasive, appraisal, and employment interviews. Class training, field experience.

COMM 3431 Persuasion Theories (3.0 cr.; Student Option; prereq Soph recommended) Sociological, psychological, and communication perspectives. Theoretical knowledge applied to persuasion problems.

COMM 3441 Introduction to Organizational Communication (3.0 cr.; Student Option) Functions of communication in work groups, in organizational hierarchies, and between the workplace and society.

COMM 3451W Intercultural Communication: Theory and Practice (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) Theoretical systems to explain/direct creation of public discourse. Traditional rhetoric to contemporary perspectives. Using theory to explain practice of public discourse.

COMM 3605W Persuasive Speaking and Speech Writing (3.0 cr.; Student Option; prereq 1101, soph) Performance/composition with critical inquiry into rhetoric theories. Writing, thinking, and speaking skills.

COMM 3615 Argumentation (3.0 cr.; Student Option; prereq Soph) Argument(s) in relation to logic, dialectics, and rhetorical performance. Structured reasoning, informal conversation, familial arguments, debates in technical professions, communication ethics, and public/social argumentation.

COMM 3625 Communication Ethics (3.0 cr.; A-F or Audit) Applying concepts/theories from philosophy and social science to ethical issues in interpersonal, group, organizational, intercultural, and media communication.

COMM 3631 Freedom of Speech (3.0 cr.; Student Option) 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 (3.0 cr.; A-F Grade Basis) Speeches that became famous because of the occasion, issue, or speaker. Students analyze texts, research the issue(s) history and the speaker's biography/opposition, and evaluate the speech's artistry, ethical principles, effects on society, and contribution to history of ideas.

COMM 3645W How Pictures Persuade (3.0 cr.; A-F Grade Basis) 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 (3.0 cr.; Student Option) Terrorism as an ethical and international problem. Different cultures' historical trajectories for terrorism. Contrasts between Algerian, Irish, and Arab terrorism.


COMM 3682W Communicating War (3.0 cr.; Student Option) 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 (1.0-3.0 cr.; Student Option; prereq One Comm course, #, @) Guided individual reading or study.

COMM 3980 Directed Instruction (3.0 cr.; S-N or Audit [two #, @]) Supervised planning/teaching of undergraduate courses.

COMM 3990 Research Practicum (1.0-3.0 cr.; Student Option) How communication research is designed, implemented, and published. Focus is on working with senior faculty on their current research projects.

COMM 3995W Minor Project (1.0-3.0 cr.; S-N or Audit [two #; @]) Individualized instruction leading to completion of senior project.

COMM 4204 Producing for Television: Theory and Practice (4.0 cr.; Student Option; prereq 3201, 3204) Producing media content based on audience, design, and story. Developing a thematic program bible. Each student completes a television program, including writing a script, preproduction planning, and considering crew and talent needs. Media producer responsibilities.

COMM 4221 Communication and Popular Music (3.0 cr.; Student Option; prereq 3211, sr, #) A critical media studies perspective on the production, distribution, consumption, circulation, and regulation of popular music.

COMM 4235 Electronic Media and Ethnic Minorities—A World View (3.0 cr.; Student Option) Representation and involvement of various ethnic groups (e.g., African-Americans, Native Americans in United States and Canada, Maori, Turks in Europe) in radio, TV, cable, Internet. Roles of government, industry, public organizations, and minority groups in regulating, managing, and financing ethnic media activities.

COMM 4245 Critical Television Studies (3.0 cr.; Student Option; prereq 3211) Television as object of criticism, as cultural institution, and as omnipresent mode of commercialized popular culture. Aesthetics, semiotics, political economics, consumer culture/ads, advertising, social representation, global television, televisionality, flow. Reception and everyday life.

COMM 4263 Feminist Media Studies (3.0 cr.; A-F Grade Basis; prereq 3211 or #) Issues, controversies, and practices of gender and their relationship to U.S. media. Ways in which gender is represented and comes into play with media texts/institutions. Histories of feminism, theories/methods/political economy, case studies.

COMM 4291 New Telecommunication Media (3.0 cr.; A-F or Audit; prereq 3211 or #) Development and current status of new telecommunication media such as cable TV, satellites, DBS, MDS, and video disk/cassettes. Technology, historical development, regulation, and programming of these media and their influence on individuals, organizations, and society.

COMM 4404 Language Borderlands (3.0 cr.; Student Option) Effect of multilingualism on self identity and community. Subjective and social dimensions of being multilingual. Experience of language loss.

COMM 4407 Communication and Conflict (3.0 cr.; A-F or Audit; 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 4471 Communication in Marriage and Family (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 1101, 3431 or #) Contemporary political speech. Ideologies in political persuasion.

COMM 4616 African American Civil Rights Rhetoric (3.0 cr.; Student Option; prereq Jr) Uses the struggle of African Americans to explore and analyze philosophical concepts, political issues, moral complexities, and discursive characteristics of civil rights rhetoric.
COMM 4621W Rhetoric of Feminism (3.0 cr.; Student Option) History/criticism of rhetoric of feminism from 19th century to present.

COMM 5110 Special Topics in Communication Theory (3.0 cr.; Student Option) Advanced theoretical problems. See department office for current offering.

COMM 5211 Critical Media Studies: Theory and Methods (3.0 cr.; A-F Grade Basis; prereq Grad student or #) Survey of theories, research methods, and scholars dominating critical media studies since late 1920s.

COMM 5220 Television Genres (3.0 cr.; Student Option) Nature, historical development, and influence on society of specific genres of television programming: drama, situation comedy, mystery, soap opera. Program genre change over time and how society, government regulation, and economics of production influence that historical process.

COMM 5221 Media, Race, and Identity (3.0 cr.; Student Option; prereq 3211, sr, #) Critical media studies perspective on social, political, and ethnic perspectives on study of language/communication. How language/communication transmit cultural knowledge, attitudes, and beliefs. Connections among language, thought, and culture. Social/ethnic perspectives on study of language/communication.

COMM 5402 Advanced Interpersonal Communication (3.0 cr.; Student Option; prereq 3401 or 3402) Social scientific approaches to interpersonal communication. Theory, research findings.

COMM 5404 Language and Culture (3.0 cr.; Student Option; prereq 3401 or #) How language/communication transmit cultural knowledge, attitudes, and beliefs. Connections among language, thought, and culture. Social/ethnic perspectives on study of language/communication.

COMM 5406 Communication and Gender (3.0 cr.; Student Option; prereq One women’s studies course, #) 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. Comparisons across languages where possible.

COMM 5411 Small Group Communication Research (3.0 cr.; A-F or Audit; prereq 3411 or #) Survey of small group communication research; theory and practice. Group decision-making and leadership.

COMM 5421 Quantitative Methods in Communication Research (3.0 cr.; A-F or Audit; prereq 3401 or #) Social scientific methods used in studying human communication. Optional data processing laboratory for additional credit.

COMM 5431 The Process of Persuasion (3.0 cr.; Student Option; prereq 3431) Communication campaigns (e.g., advertising, political) illustrating persuasive processes and theories. Research paper required.

COMM 5441 Communication in Human Organizations (3.0 cr.; Student Option) Communication in organizational settings. Organizational structure and dynamics and their effect upon the communication process. Individual projects.

COMM 5451W Intercultural Communication (3.0 cr.; Student Option) Critical media studies perspective on cultural politics of race and ethnicity. Social construction of race, politics of racism, media representations of race.

COMM 5494 Communication Research Practicum (1.0-3.0 cr.; S-N or Audit; prereq 3401 or #) Guided individual reading or study.

COMM 5615W Introduction to Rhetorical Criticism (3.0 cr.; Student Option; prereq 1101; 3601 recommended) Analysis of public discourse using various theoretical perspectives.

COMM 5617 History and Criticism of U.S. Public Discourse: 1630-1865 (3.0 cr.; Student Option; prereq Jr) How discourse has been used to establish or maintain power. Speeches and public debates used to examine American public address from 17th century (e.g., Puritan sermons) to the Civil War.

COMM 5970 Directed Study (1.0-3.0 cr.; S-N or Audit; prereq Nine 3xxx-5xxx Spch cr, #, %, @) Guided individual reading or study.

COMM 5994 Communication Research Practicum (1.0-3.0 cr.; S-N or Audit; prereq #) Students participate in research group.

CL 5311 Discourse of the Novel (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Problems of the nature of the sign; sign function; sign production; signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory. Applying semiotics to various signifying practices (e.g., literature, cinema, daily life).

CL 5910 Topics in Comparative Literature (3.0-4.0 cr.; Student Option) Topics specified in Class Schedule.

CL 5992 Directed Reading in Comparative Literature (1.0-3.0 cr.; Student Option; prereq #) Guided individual reading and study.

COMS 5102 Society, Ideology, and the Production of Art (3.0 cr.; Student Option) Recent critical theories of relation of arts to social/ideological forces. Selected artifacts from Western culture (e.g., Renaissance to 20th century; high, popular, mass culture). Music, visual art, literature.

COMS 5302 Aesthetics and the Valuation of Art (3.0 cr.; Student Option) Society, ideology, aesthetic value in light of recent critical theories of visual art, music, literature. Mediations of place, social class, gender, ideology on aesthetic judgment in post-renaissance Western culture.

COMS 5555 Introduction to Semiotics (3.0 cr.; Student Option) 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).

COMS 5910 Topics in Comparative Studies in Discourse and Society (3.0-4.0 cr.; Student Option) Themes in comparative, sociohistorical analysis of discursive practices. Individually or team taught. Topics specified in Class Schedule.

COMS 5993 Directed Study (1.0-3.0 cr.; Student Option; prereq #) Guided individual reading and study.

COMS 5994 Directed Reading in Comparative Literature (1.0-3.0 cr.; S-N or Audit; prereq #) Guided individual reading and study.

Comparative and Molecular Biosciences (CMB)

CMB 5200 Statistical Genetics and Genomics (4.0 cr.; A-F or Audit) Statistical issues in genomics. Gene detection, including statistical analysis/designs for linkage study and for mapping quantitative trait loci. Linkage analysis using pedigree data for codominant/dominant markers. Using radiation hybrid mapping and single cell typing. Design issues in linkage analysis, parentage testing, and marker polymorphism.


CMB 5335 Molecular Biotechnology Laboratory for the Novice (2.0 cr.; S-N Grading Basis) Five day course. Understanding/applying basic concepts of biotechnology. Lectures, hands-on lab experiments.

CMB 5381 Pathogenesis of Infectious Zoonotic Diseases (3.0 cr.; A-F Grade Basis; prereq [Microbiology, biochemistry] courses or #)
Introduction to mechanisms of transmission/pathogenesis for zoonotic infectious diseases. Lectures, review of current literature, student presentations, written reports.

CMB 5594 Directed Research in Comparative and Molecular Biosciences (1.0-4.0 cr.; Student Option; prereq Jr, #)

Independent study as determined by instructor. Usual activity includes conducting research in instructor's lab.

CMB 5910 Grantwriting: What Makes a Winning Proposal? (1.0 cr.; S-N or Audit)

Components of a strong proposal. Grant submission process. What reviewers look for. How to locate grant announcements that match research interests.

Computer Science (CSCI)

College of Science and Engineering

CSCI 1001 Overview of Computer Science (4.0 cr.; Student Option; prereq Non-CSci major, non-CompE major)


CSCI 1103 Introduction to Computer Programming in Java (4.0 cr.; Student Option)

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 FORTRAN Programming (1.0-3.0 cr.; Student Option; prereq Transfer student) Not taught. Credit for transfer students who have taken a freshman- or sophomore-level FORTRAN class.

CSCI 1109 C# Programming (1.0-3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 1901 Structure of Computer Programming I (4.0 cr.; Student Option; prereq Math 1271 or Math 1371 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 1901H Honors Structure of Computer Programming (4.0 cr.; A-F Grade Basis; prereq [MATH 1271 or MATH 1371 or MATH 1571H], honors student)

Key concepts in computer science: recursion, abstraction, modularity; data structures, algorithms, problem solving strategies. Programming languages Scheme and Python. More advanced computer topics as time permits.

CSCI 1902 Structure of Computer Programming II (4.0 cr.; Student Option; prereq 1901 or #)

Object-oriented programming using language such as C++ or Java. Builds on 1901, presenting additional data structures/ algorithms. Object-oriented approach to implement data structures/operations as abstract data types.

CSCI 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr) Topics vary. See Class Schedule.

CSCI 2011 Discrete Structures of Computer Science (4.0 cr.; Student Option; prereq MATH 1271 or MATH 1371 or #)

Foundations of discrete mathematics. Sets, sequences, functions, big-O, propositional/predicate logic, proof methods, counting methods, recursion/recurrences, relations, trees/quotient fundamentals.

CSCI 2021 Machine Architecture and Organization (4.0 cr.; Student Option; prereq 1902 or #)

Introduction to hardware/software components of a computer system: data representation, boolean algebra, machine-level programs, instruction set architecture, processor organization, memory hierarchy, virtual memory, compiling, linking. Programming in C.

CSCI 2033 Elementary Computational Linear Algebra (4.0 cr.; Student Option; prereq MATH 1271 or MATH 1371 or #)


CSCI 2980 Special Topics in Computer Science (1.0-4.0 cr.; A-F or Audit; #)

Special topics. Lectures, informal discussions.

CSCI 3003 Introduction to Computing in Biology (3.0 cr.; Student Option; prereq 1002H or Biol 1002 or 1009H or Biol 1009 or equiv or #)


CSCI 3061W Program Design and Development (4.0 cr.; Student Option; prereq [1902, 2021] or #)

Principles of programming design/analysis. Concepts in software development. Uses C++ language to illustrate key ideas in program design/development, data structures, debugging, files, I/O, state machines, testing, and coding standards.

CSCI 3921W Social, Legal, and Ethical Issues in Computing (3.0 cr.; Student Option; prereq At least soph or #)

Impact 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 (2.0 cr.; S-N or Audit; 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 (1.0 cr.; Student Option; 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 4011 Formal Languages and Automata Theory (4.0 cr.; Student Option; prereq [1902, 2031] or #)

Logical/mathematical foundations of computer science. Formal languages, their correspondence to machine models. Lexical analysis, string matching, parsing. Decidability, undecidability, limits of computability. Computational complexity.

CSCI 4041 Algorithms and Data Structures (4.0 cr.; Student Option; prereq 1902 and 2011 or #; cannot be taken for grad CSci cr)

Rigorous analysis of algorithms and their implementation. Algorithm analysis, sorting algorithms, binary trees, heaps, priority queues, heapsort, balanced binary search trees, AVL trees, hash tables and hashing, graphs, graph traversal, single source shortest path, minimum cost spanning trees.

CSCI 4061 Introduction to Operating Systems (4.0 cr.; Student Option; prereq 2021 or EE 2361; no cr for grad in 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 (3.0 cr.; Student Option; prereq 4041 or #; cannot be taken for grad CSci cr)

Theory/practice of computer graphics programming using C++ and OpenGL. Practical concepts in computer graphics modeling, rendering, and animation. Emphasizes effective use of graphics toolkits.

CSCI 4131 Internet Programming (3.0 cr.; Student Option; prereq 4061, 4211 recommended, cannot be taken for grad CSci cr)


Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
CSCI 4203 Computer Architecture (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 4061 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) 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 (3.0 cr.; A-F Grade Basis; 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 4970W Advanced Project Laboratory (3.0 cr.; Student Option; prereq Upper div CSci, 4061, #; cannot be taken for grad cr) Formulate and solve open-ended project: design, implement, interface, document, test. Team work strongly encouraged. Arranged with CSci faculty.

CSCI 4980 Special Topics in Computer Science for Undergraduates (1.0-3.0 cr.; A-F or Audit; prereq Undergrad, #; no cr for grads in [CSci or CompE]) Lectures and informal discussions on current topics in computer science.

CSCI 4994H Honors Thesis (1.0-3.0 cr.; A-F Grade Basis; prereq Honors student, #) Research work for an honors thesis arranged with a CS faculty member who is the adviser or coadviser.

CSCI 5013 Operating Systems (3.0 cr.; Student Option; 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 5104 System Modeling and Performance Evaluation (3.0 cr.; Student Option; prereq 5103 or #) Techniques for modeling computing 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 5105 Introduction to Distributed Systems (3.0 cr.; Student Option; prereq [5103 or equiv] or #) Distributed system design and implementation. Distributed communication and synchronization, data replication and consistency, distributed file systems, fault tolerance, and distributed scheduling.

CSCI 5106 Programming Languages (3.0 cr.; Student Option; 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 5107 Fundamentals of Computer Graphics I (3.0 cr.; Student Option; prereq [4041 or #], fluency in C/C++, mastery of basic concepts in linear algebra) Fundamental algorithms in computer graphics. Emphasizes programming projects in C/C++. Scan conversion, hidden surface removal, geometrical transformations, projection, illumination/shading, parametric cubic curves, texture mapping, antialiasing, ray tracing. Developing graphics software, graphics research.

CSCI 5108 Fundamentals of Computer Graphics II (3.0 cr.; Student Option; prereq 5107 or #) Advanced topics in image synthesis, modeling, and rendering, including image warping, global illumination, non-photorealistic rendering, texture synthesis. Parametric cubic surfaces, subdivision surfaces, acceleration techniques, advanced texture mapping. Programming is in C/C++.

CSCI 5109 Visualization (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 4041 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 5117 Developing the Interactive Web (3.0 cr.; Student Option; prereq 4131 or 5131 or #; upper div or grad in CSci recommended) Hands-on design experience using modern web development tools. Students work in teams to develop software programs using each of four toolkits. Analyze developments in forum posts and classroom discussions.

CSCI 5125 Collaborative and Social Computing (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) Planning, design, implementation, and evaluation of Internet-based public health interventions. Students work on interdisciplinary team projects. Instructors and students drawn from computer science, public health, and communications disciplines.

CSCI 5131 Advanced Internet Programming (3.0 cr.; Student Option; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; Student Option; 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 5204 Advanced Computer Architecture (3.0 cr.; Student Option; prereq 4203 or EE 4363) Instruction set architecture, processor microarchitecture, memory, I/O systems. Interactions between computer software and hardware. Methodologies of computer design.

CSCI 5211 Data Communications and Computer Networks (3.0 cr.; Student Option; 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 5221 Foundations of Advanced Networking (3.0 cr.; Student Option; prereq 4211 or 5211 or equiv; intro course in computer networks recommended)

- Design principles, protocol mechanisms.

CSCI 5231 Wireless and Sensor Networks (3.0 cr.; Student Option; prereq 4211 or 5211 or #)

- 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 (3.0 cr.; Student Option; prereq 4061 or equiv or #)

- Concepts of computer, network, and information security. Risk analysis, authentication, access control, security evaluation, audit trails, cryptography, network/database/application security, viruses, firewalls.

CSCI 5302 Analysis of Numerical Algorithms (3.0 cr.; Student Option; prereq 2031 or 2033 or #)

- Additional topics in numerical analysis. Interpolation, approximation, extrapolation, numerical integration/differentiation, numerical solutions of ordinary differential equations. Introduction to optimization techniques.

CSCI 5304 Computational Aspects of Matrix Theory (3.0 cr.; Student Option; prereq 2031 or 2033 or #)


CSCI 5403 Computational Complexity (3.0 cr.; Student Option; prereq 4041 or #)

- Computational models, complexity measures in each model, and related complexity classes.

CSCI 5421 Advanced Algorithms and Data Structures (3.0 cr.; Student Option; prereq 4041 or #)


CSCI 5451 Introduction to Parallel Computing: Architectures, Algorithms, and Programming (3.0 cr.; Student Option; prereq 4041 or #)

- Parallel architectures design, embeddings, routing. Examples of parallel computers. Fundamental communication operations. Performance metrics. Parallel algorithms for sorting, Matrix problems, graph problems, dynamic load balancing, types of parallelisms. Parallel programming paradigms. Message passing programming in MPI, Shared-address space programming in openMP or threads.

CSCI 5461 Functional Genomics, Systems Biology, and Bioinformatics (3.0 cr.; Student Option; prereq 4041 or #)


CSCI 5471 Modern Cryptography (3.0 cr.; Student Option; 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 5481 Computational Techniques for Genomics (3.0 cr.; Student Option; prereq 4041 or #)


CSCI 5511 Artificial Intelligence I (3.0 cr.; Student Option; prereq [2011 or #], grad student)


CSCI 5512 Artificial Intelligence II (3.0 cr.; Student Option; prereq [STAT 3021, 4041] or #)


CSCI 5521 Pattern Recognition (3.0 cr.; Student Option; prereq [(2031 or 2033), STAT 3021] or #)


CSCI 5523 Introduction to Data Mining (3.0 cr.; Student Option; prereq 4041 or equiv 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 5552 Machine Learning (3.0 cr.; Student Option; 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 5551 Introduction to Intelligent Robotic Systems (3.0 cr.; Student Option; prereq 2031 or 2033 or #)

- Transformations, kinematics/inverse kinematics, dynamics, control. Sensing (robot vision, force control, tactile sensing), applications of sensor-based robot control, robot programming, mobile robotics, microbotics.

CSCI 5552 Sizing and Estimation in Robotics (3.0 cr.; Student Option; prereq [5551, Stat 3021] or #)


CSCI 5561 Computer Vision (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 4707 or 5707 or #)


CSCI 5801 Software Engineering I (3.0 cr.; Student Option; prereq 1902, 2011 or #)

- Advanced introduction to software engineering. Software life cycle, development models, software requirements analysis, software design, coding, maintenance.

CSCI 5802 Software Engineering II (3.0 cr.; Student Option; prereq 5801 or #)

- Introduction to software testing, software maturity models, cost specification models, bug estimation, software reliability models,
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CMGT 4011 Construction Documents and 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 Legal, Ethical, and Risk Issues in Construction (3.0 cr.; A-F or Audit; prereq 4011 or equiv or #)
Introduces key legal, ethical, and risk frameworks that apply to construction activity and the work of the construction management professional. Case studies. Strategies to minimize/allocate legal liability and risk.

CMGT 4021 Construction Planning and Scheduling (3.0 cr.; Student Option; prereq 3001, 3011, 45 sem cr)

CMGT 4022 Construction Estimating (3.0 cr.; Student Option; prereq 3001, 3011, 45 sem cr)

CMGT 4031 Construction Safety and Loss Control (3.0 cr.; Student Option; prereq 3001, 45 sem cr)

CMGT 4041W Specifications and Technical Writing for Construction Professionals (3.0 cr.; Student Option; prereq 4011 or &4011)
Development/ enhancement 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.

CMGT 4051 Construction Materials for Managers (3.0 cr.; Student Option; prereq 3001; [AEM 2011 or BP 3001 or BP 3101], 45 sem cr)
Concepts of physical properties. Behavior mechanisms for construction materials such as concrete, aggregate, steel, and wood. Standard specifications for material properties. Lab techniques for evaluation of each material.

CMGT 4073 Building Codes for Construction Managers (1.0 cr.; Student Option; prereq 45 cr or #)

CMGT 4081 Managing Erosion and Sediment Control on Construction Sites (1.0 cr.; A-F or Audit; prereq 3011 or related experience) Best management practices relating to stormwater on and around construction site operations. Grading, culvert replacement, bridge construction, incorporating permit requirements, sample specifications, Storm Water Pollution Prevention Plan (SWPPP). Management practices to reduce or control erosion/sedimentation.

CMGT 4193 Directed Study (1.0-4.0 cr.; Student Option; prereq Admitted to CMgt major or minor or certificate)
Independent project. Topic arranged with supervised by construction management faculty.

CMGT 4196 Construction Management Internship (1.0-4.0 cr.; S-N Grading Basis; prereq [CMgt] major or minor or certificate student), [jr or sr], %
Hands-on work experiences in a construction company, applying coursework in the workplace, contributing knowledge of best practices, and participating in career development exercises.

CMGT 4201 Construction Accounting (2.0 cr.; A-F or Audit; prereq 3001, Acct 2050, ABus 4101)
Unique characteristics and dissimilarities crucial for all parties involved to understand/manage the construction process. Unique aspects of construction financial accounting, managerial accounting, tax planning, and auditing.

CMGT 4211 Facility Cost Accounting and Finance (2.0 cr.; A-F or Audit; prereq ABUS 4101 or basic accounting/finance experience) Lease types. Determination of total annual facility costs. Students apply accounting concepts within real property/facilities context. How to interpret financial statements and create capital/operating budgets. Asset depreciation, capital planning, expense management. Financial terminology for presenting to Corporate Suite.

CMGT 4213 Facility Operations and Management Intensive (3.0 cr.; A-F or Audit; prereq [2021 or &2021], [3001 or &3001], [4011 or &4011], [4562 or &4562] recommended) Managing operation/maintenance of building systems and facility management department. Operation of mechanical, electrical, and plumbing systems. Critical spaces, fire/life safety systems, utilities. Maintenance for specific building systems. Technology/resources used to support building operations/maintenance.

CMGT 4215 Facility Quality Assessment and Commissioning (2.0 cr.; A-F or Audit; prereq 3001, [4213 or &4213], 4542, 4562)

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**CMGT 4422 Advanced Construction Cost Estimating** (2.0 cr.; Student Option; prereq CMGT 4022 or #)
- Advanced estimating concepts, including procurement, productivity, and value engineering. Working in teams, students develop and deliver a competitive bid for a real project and examine strategies to meet the owner's budget and expectations through value engineering approaches.

**CMGT 4471 Sustainability for Construction Managers** (2.0 cr.; A-F or Audit)
- Building industry's impact on the environment; sustainable building initiatives; environmental principles and practices in pre-construction, construction, close-out and operations; impact on construction manager role, procurement methods, contracts, estimating and scheduling, and team structure; green adoption issues; current technologies; future trends.

**CMGT 4542 Building Energy Systems** (3.0 cr.; A-F or Audit; prereq 3001, [jr or sr] or #)
- Functions of building mechanical systems, their integration with other building components.
- Residential/commercial HVAC systems, alternative energy sources, energy efficiency, structural implications of mechanical systems, indoor air quality, environmental strategies.
- Case studies.

**CMGT 4550 Topics in Construction Management** (1.0-2.0 cr.; A-F or Audit)
- Seminar. Timely issues/themes in construction management.

**CMGT 4562 Building Envelope Design and Construction** (2.0 cr.; A-F or Audit; prereq 4542 or professional experience)

**CMGT 4572 Structural Frames and Building Design/Construction** (3.0 cr.; A-F or Audit; prereq 3001, [AEM 2011 or BP 3001 or BP 3101])
- Basic contemporary structural systems in masonry, steel, and wood framing systems. Forms/performance of systems.

**CMGT 4861 Construction Management Capstone** (2.0 cr.; A-F or Audit; prereq 4011, 4021, 4022, 4031)
- Project management/leadership. Apply coursework to industry case studies to create, solve, critically consider, effectively articulate solutions.

**Coptic (COPT)**
- **College of Liberal Arts**

**COPT 5001 Elementary Coptic** (3.0 cr.; Student Option)
- Introduction to Coptic grammar and vocabulary, chiefly in the Sahidic dialect.

**COPT 5002 Elementary Coptic** (3.0 cr.; Student Option; prereq 5001 or equiv)
- Reading a variety of Coptic literature, such as Gnostic, martyrological, or monastic texts.

**Cultural Studies and Comparative Literature (CSCL)**
- **College of Liberal Arts**

**CSCL 1001 Introduction to Cultural Studies: Rhetoric, Power, Desire** (4.0 cr.; Student Option)
- Ways of reading texts, artistic forms, everyday practices that define ongoing conflicts over meaning, value, truth. Examples from visual arts, music, film, literature, myth, ritual, built environment.

**CSCL 1101 Literature** (4.0 cr.; Student Option)
- Introduction to literature across time, national boundaries. Basic genres, including poetry, novel, drama, historical/philosophical writing.
- Key questions: What is literature? What forms does it take? Why does literature matter?

**CSCL 1201 Introduction to Cinema and Media Culture** (4.0 cr.; Student Option)
- Critical analysis of media, particularly film.

**CSCL 1301W Reading Culture: Theory and Practice** (4.0 cr.; Student Option)
- Culture and cultural conflict. Reading cultural theory/texts such as film, literature, music, fashion, commercial art, and built environment.

**CSCL 1401W Reading Literature: Theory and Practice** (4.0 cr.; Student Option)
- How can we read/understand different ways that literature is meaningful? Emphasizes practice in reading a broad spectrum of world literature, literary theory.

**CSCL 1501W Reading History: Theory and Practice** (4.0 cr.; Student Option)
- What is history? How can we understand its meanings/uses? Emphasizes practice in reading cultural texts from various historical perspectives.

**CSCL 1903 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
- Topics specified in Class Schedule.

**CSCL 1904 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
- Topics specified in Class Schedule.

**CSCL 1905 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
- Topics specified in Class Schedule.

**CSCL 1907W Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
- Topics specified in Class Schedule.

**CSCL 1909W Freshman Seminar** (3.0 cr.; A-F or Audit; prereq Fr)
- Topics specified in Class Schedule.

**CSCL 1910W Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
- Topics specified in Class Schedule.

**CSCL 1921W Introduction to Film Study** (4.0 cr.; Student Option)
- 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** (3.0 cr.; A-F Grade Basis; prereq Honors)
- Topics specified in Class Schedule.

**CSCL 3115 Cinema and Ideology** (4.0 cr.; Student Option)
- 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** (3.0 cr.; Student Option)
- 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** (3.0 cr.; Student Option)
- 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** (3.0 cr.; Student Option)
- Examines the status of "poetry" in several cultures of the Americas bringing together techniques of close reading and broad cultural inquiry.

**CSCL 3175 Comedy: Text and Theory** (3.0 cr.; Student Option)
- Comedy as a discursive/political practice.

**CSCL 3176 Oppositional Cinemas** (4.0 cr.; Student Option)
- 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** (4.0 cr.; Student Option)
- Key debates in the history, theory, and criticism of television. Focuses on critical/creative "readings" of television's past/present forms.

**CSCL 3178W Documentary Cinema: History and Politics** (4.0 cr.; Student Option)
- 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** (3.0 cr.; Student Option)
- Literary movements that emerge when groups 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** (3.0 cr.; Student Option)
- 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.

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CSCL 3331 Science and Culture (3.0 cr.; Student Option)

Science and technology engaged through historical and cultural manifestations from film, literature, and YouTube to scientific and philosophical essays. Relations among humanities, science, economics, politics, philosophy and history. Psychiatry and drugs, food and agriculture, sexuality, religion and science, climate change.

CSCL 3361 Visions of Nature: The Natural World and Political Thought (3.0 cr.; Student Option)

Scientific and cultural theory concerning the organization of nature, human nature, and their significance for development of ethics, religion, political/economic philosophy, civics, and environmentalism in Western/other civilizations.

CSCL 3412W Psychoanalysis and Literature Part I: The Essential Freud (3.0 cr.; Student Option)

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 Critical (3.0 cr.; Student Option)


CSCL 3456W Sexuality and Culture (3.0 cr.; Student Option)


CSCL 3458W The Body and the Politics of Representation (3.0 cr.; Student Option)

Western representation of the human body, 1500 to present. Body's appearance as a site and sight for production of social and cultural difference (race, ethnicity, class, gender). Visual arts, literature, music, medical treatises, courtesy literature, erotica.

CSCL 3461 Monsters, Robots, Cyborgs (3.0 cr.; Student Option)

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 (3.0 cr.; Student Option)

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 (3.0 cr.; Student Option)

The historical experience of gay men, the social construction of same-sex desire 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 (3.0 cr.; Student Option)

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 (3.0 cr.; Student Option)

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 3631 Jewish Writers and Rebels in German, Austrian, and American Culture (3.0 cr.; Student Option)

Readings in Jewish culture from the Middle Ages to the Present. Course does not engage in the reading of literature.

CSCL 3910 Topics in Cultural Studies and Comparative Literature (3.0 cr.; Student Option)

Topics specified in Class Schedule.

CSCL 3910H Topics in Cultural Studies and Comparative Literature: Honors (3.0 cr.; Student Option)

Topics specified in Class Schedule.

CSCL 3920 Topics in Cinema and Media Culture (4.0 cr.; Student Option)

Topics specified in Class Schedule.

CSCL 3979 Issues in Cultural Pluralism (3.0 cr.; Student Option)

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 (1.0-3.0 cr.; Student Option; 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.

CSCL 3997 Directed Study (1.0-3.0 cr.; Student Option)

Guided individual study.

CSCL 4944H Honors Thesis (3.0 cr.; A-F Grade Basis; prereq Candidate for honors in CSCL, consent of CSCL honors adviser) Honors thesis.

CSCL 4993 Directed Study (1.0-3.0 cr.; A-F or Audit)

Guided individual study.

CSCL 5147 Teaching as Dialogue (3.0 cr.; Student Option)

Teaching and the teacher are the subject. Entering into dialogue is the method. Issues with the politics of teaching, the means of entering into dialogue, questions of judgment, and the idea of self-teaching as the goal of teaching.

CSCL 5154W Theoretical Constructions of Space (3.0 cr.; Student Option)

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 (3.0 cr.; Student Option)

Suburbia from origins in 18th-century England to the present. Historical changes and present challenges, especially in America. Identity, myth, 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 (3.0 cr.; Student Option)

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 (3.0 cr.; Student Option)

Society, ideology, and aesthetic value considered in light of recent critical theories of visual art, music, and literature. Meditations of place, social class, gender and ideology on aesthetic judgment in post-Renaissance Western culture.

CSCL 5305 Vision and Visuality: An Intellectual History (3.0 cr.; A-F Grade Basis)

Central role of vision/visuality in modernity. Modern age as scopic regime. Ways that ideas/ideologies of perception have shaped aesthetic experience within social existence.

CSCL 5331 Discourse of the Novel (3.0 cr.; Student Option)

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 5411 Avant-Garde Cinema (4.0 cr.; A-F or Audit; prereq 1921 or ARTH 1921W or equiv)

History/theory of avant-garde cinema, from classical period (1920s) to post-WWII.

CSCL 5501 Origins of Cultural Studies (3.0 cr.; Student Option)

Intellectual map of the creation of cultural studies as a unique approach to studying social meanings. Key figures and concepts, including nineteenth- and early twentieth-century precursors.

CSCL 5555 Introduction to Semiotics (3.0 cr.; Student Option)

Problems of the nature of the sign; sign function; sign production; signifying systems as articulated in philosophy, linguistics, anthropology, psychoanalysis, and art theory.
Application of semiotics to various signifying practices (literature, cinema, daily life).

CSCL 5956 Film Music: Theory, History, Practice (0.0-4.0 cr.; A-F Grade Basis)
Role of music in American-European film from early 20th century silent cinema to near present. Narrative features, shorts, documentary, horror, thriller, science fiction, comedy, cartoon. Film music as social/cultural practice and as part of political economy within culture industry.

CSCL 5711 Sociocriticism (3.0 cr.; Student Option)
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 5810 Topics in Cultural Studies (2.0-4.0 cr.; A-F Grade Basis; prereq Honor student)
Topics on special subjects.

CSCL 5833 Marx, Freud, Nietzsche: Intellectual Foundations (3.0 cr.; Student Option)
Three thinkers who defined modernity: Marx, Freud, and Nietzsche. Central tenets of their thought/terms associated with their theories. Their careers portrayed against the background of their times; their place in intellectual history.

CSCL 5910 Topics in Cultural Studies and Comparative Literature (3.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

CSCL 5910H Topics in Cultural Studies (2.0-4.0 cr.; A-F Grade Basis)
Topics on special subjects.

CSCL 5993 Directed Study (1.0-3.0 cr.; Student Option; prereq #, %, @)
Guided individual reading or study.

Curriculum and Instruction (CI)

CI 1001 Introduction to the Elementary School (3.0 cr.; A-F or Audit)
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 1902 Freshman Seminar: Diversity and Social Justice in the United States (3.0 cr.; Student Option No Audit; prereq Fr)
Reading, discussion, critical analysis, and writing about diversity and social justice in the United States.

CI 1903 Freshman Seminar: Citizenship and Public Ethics (1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

CI 1905 Freshman Seminar (3.0 cr.; Student Option No Audit)
Reading, discussion, writing, critical analysis. Topics specified in Class Schedule.

CI 1908W Freshman Seminar: Citizenship and Public Ethics, Writing Intensive (C/PE, WI) (1.0-3.0 cr.; Student Option; prereq Fr)

CI 1910W Freshman Seminar, Writing Intensive (3.0 cr.; Student Option)
Topics specified in Class Schedule.

CI 1911 Ethics, Wealth, and Education in a Democracy (3.0 cr.; A-F or Audit)
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 1942 Freshman Seminar: Technology and Society (3.0 cr.; A-F Grade Basis)
Impact of current/future technologies. Reading, discussion, analysis, writing about technology/society.

CI 2311W Introduction to Technology and Ethics in Society (3.0 cr.; Student Option)
Values and ethical issues related to technology use in education, workplace, and family/community life.

CI 2312 Sex, Drugs, and the Internet:
Educational Perspectives (3.0 cr.; A-F Grade Basis)
Immersive exploration/critique of advantages/risks associated with society's pervasive use of the Internet. Dangers and strategies to combat them. The Internet's potential for teaching/learning.

CI 3001 Survey of Art Activities (2.0 cr.; A-F or Audit)
Introduction to pictorial expression, design, and the function of art in the social environment.

CI 3002 Introduction to Secondary Schools (3.0 cr.; A-F Grade Basis)
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 (1.0-6.0 cr.; Student Option)
Special topics, current trends regarding education and society.

CI 3151W Culture, Power, and Education (3.0 cr.; A-F Grade Basis)
Ways in which culture plays a critical role in education and student achievement. How and educator’s culture and their students’ cultures impact student learning. Focuses on social justice.

CI 3211 Introduction to Elementary Teaching (3.0 cr.; A-F Grade Basis; prereq [Elementary ed or early childhood ed foundations major], concurrent practicum experience)
Classroom management, instructional planning, working with families in elementary classroom. Assigned readings, lectures, classroom activities, assignments.

CI 3212 Practicum: Elementary Teaching (2.0 cr.; S-N Grading Basis; prereq &EDP 5111, [elementary education foundations or early childhood foundations] major)
Field-based practicum. Students apply learning from their University courses to elementary school setting, connecting theory, research, and practice.

CI 3283 Practicum: Special Education K-6 (2.0 cr.; S-N Grading Basis; prereq &EDPSY 5613, &EDPSY 5616, elementary education: foundations major)
Field-based practicum. Students apply learning from their university course in elementary school setting, linking theory, research, and practice.

CI 3401W Diversity in Children's Literature (3.0 cr.; A-F or Audit; prereq Jr or Sr 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 3610 Linguistics for Teachers (3.0 cr.; A-F Grade Basis)
For pre-K-6 pre-service teachers. Introduction to linguistics. Linguistic terminology and how to apply methods of linguistic analysis to English, focusing on educational settings and classroom instruction.

CI 3660 Special Topics in Second Languages and Cultures (3.0 cr.; Student Option)
Topic specified in Class Schedule.

CI 4311W Technology and Ethics in Society (3.0 cr.; Student Option)
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 (3.0 cr.; A-F Grade Basis)
Immersive exploration/critique of advantages/risks associated with society's pervasive use of the Internet. Dangers and strategies to combat them. The Internet's potential for teaching/learning.

CI 4413 Practicum: Working With Developing Readers (2.0 cr.; S-N Grading Basis; prereq concurrent registration with CI 5413-001 required; elementary education foundations major)
Field-based practicum. Students apply learning from their university course to working with developing readers. Instructor provides specific assignment.

CI 5008 Theory and Practice of Teaching Art in Elementary Schools (1.0-2.0 cr.; A-F or Audit)
Art concepts, skills, processes appropriate for elementary school. Methods of art instruction. Children's production of/responses to art.

CI 5045 Advanced Contemporary Crafts (2.0 cr.; A-F or Audit)
In-depth experiences in craft techniques, including ceramics, fibers, jewelry, and metal design, with emphasis on design analysis, understanding of materials, and mastery of processes.

CI 5049 Art Media Techniques (1.0-4.0 cr.; A-F or Audit)
Lectures, demonstrations, studio labs and critique session on creative processes; handling specific media. Topic varies.

CI 5050 Issues in Art Education (1.0-4.0 cr.; Student Option)
Issues/trends, current practices, recent research.

CI 5065 Improving Art Programs in the Schools (3.0 cr.; A-F or Audit; prereq Initial lic students majoring in art ed)
Issues of art instruction, including teaching methods and evaluation, philosophical
CI 5069 Curriculum Innovations in Art Education (3.0 cr.; A-F or Audit)
Study and analysis of innovations; evaluation of materials for teaching units and projects.

CI 5075 The Social and Historical Foundations of Art Education (1.0-3.0 cr.; A-F or Audit; prereq Grad student)
Issues of culture in education; examination of various forms of art as representations of knowledge, belief, and cultural capital. Epistemology, the meaning of function, and the conceptual location of visual culture in education and general culture. Seminar discussions include problems of cross-cultural and multicultural art education.

CI 5078 Application of Aesthetic Theory in Education (2.0 cr.; A-F or Audit)
Contemporary theories of art; psychological and philosophical foundations. Open to teachers, supervisors, and administrators concerned with art in general education at all levels.

CI 5096 Art Education: Practicum (1.0-6.0 cr.; A-F or Audit)
Issues of art instruction, including teaching methods and evaluation, philosophical frameworks of pedagogy, and institutional issues concerning art programs in primary and secondary schools. Practicum requiring students to work in a public school setting.

CI 5097 Student Teaching in Art Education (8.0 cr.; S-N or Audit; prereq Licensure student)
Observation of, participation in, and supervisory experiences with various types and levels of art classes.

CI 5111 Introduction to Elementary School Teaching (3.0 cr.; A-F or Audit; prereq Foundations of ed major or elem ed initial lic) Curriculum organization, instruction, management, assessment, professional decision making.

CI 5113 Classroom Management in the Elementary School (3.0 cr.; Student Option)
For teachers, administrators, and support staff working in elementary school programs. Focus on management of student behavior, instruction as it relates to student behavior, and teacher organizational tasks in the classroom.

CI 5136 History of the American Curriculum (3.0 cr.; Student Option)
Survey of formation of public school subjects and curriculum theory in United States. Social, political, and economic implications of curriculum theory.

CI 5137 Multicultural Gender-Fair Curriculum (3.0 cr.; A-F or Audit)

CI 5138 Multicultural and Moral Perspectives on Classroom Instruction (3.0 cr.; Student Option; prereq MEd or PhD student)
Factors leading to effective communication in ethnically diverse classroom, preschool to adult. Communication techniques and classroom structures that have cultural and moral implications.

CI 5141 Reflective Teaching and Professional Ethics (3.0-4.0 cr.; Student Option; prereq Teaching license and one yr teaching exp) Students develop their professional identities as educators by considering their world views and values in relation to their professional role and responsibilities in the context of a diverse society. Encourages reflective practice and critical review of research.

CI 5145 Critical Pedagogy (3.0 cr.; A-F or Audit)
Examination of critical pedagogy; critique of power relations regarding race, culture, class, gender, and age in various educational settings; consideration of improved practice in education for children, youth, and adults.

CI 5150 Curriculum Topics (1.0-6.0 cr.; Student Option)
Special topics, current trends in curriculum. Subject integration, curriculum contexts, development, implementation, evaluation.

CI 5155 Contemporary Approaches to Curriculum: Instruction and Assessment (3.0 cr.; A-F or Audit; prereq Grad students only) Current research/issues that cross disciplinary boundaries in curriculum development, instructional practices, and assessment methods. Interrelations among curriculum, instruction, and assessment within framework of constructivist learning theory. Individual classroom practices/ theories.

CI 5156 Popular Culture, Teaching, and Learning (3.0 cr.; A-F Grade Basis; prereq Grad student or sr in a program that values teaching as a component of the discipline) Approaches to the study of popular culture and education. Intersection between everyday life and broader historical contexts. Sporting events, toys, clothing, shopping malls, vampire mania, music festivals, video, and comics are the kinds of popular forms of culture we will engage as we develop teaching/learning strategies.

CI 5162 Peer Coaching for Teachers (1.0-2.0 cr.; A-F or Audit; prereq Teaching experience or #) Teachers coaching teachers; acquiring concepts, skills, and dispositions necessary for observing classroom instruction and providing constructive feedback.

CI 5177 Practical Research (3.0 cr.; A-F or Audit; prereq CI MEd student, or CI or EdPA Teacher Leadership MEd student) Preparation for identifying a research and development topic, reviewing the existing knowledge on the topic, planning and carrying out a project, further investigating the topic, and writing a report on the project.

CI 5178 Project in Teacher Leadership (3.0-6.0 cr.; Student Option; prereq CI or EdPA teacher leadership MEd student) Create, implement, evaluate, and present a leadership project designed to initiate positive change in educational environments. Review related literature, proposal development, project development, implementation/evaluation, critical reflection. Share learning outcomes.

CI 5181 Clinical Experience in Elementary School Teaching (2.0-8.0 cr.; S-N or Audit; prereq Foundations of education and elem ed initial licensure only)
Students spend full days in the elementary classroom gradually assuming responsibility for teaching the class. Students prepare a portfolio based on criteria given. One seminar per week.

CI 5183 Applying Instructional Methods in the Elementary Classroom (1.0-2.0 cr.; S-N or Audit; prereq Foundations of ed major or elem ed initial licensure only)
Supervised experience in elementary classrooms.

CI 5186 School-Related Projects (1.0-4.0 cr.; A-F or Audit; prereq MEd student) Research or evaluation project related to teaching, curriculum, or other aspect of schooling. Approved and supervised by faculty advisor.

CI 5187 Practicum: Improvement of Teaching in Elementary or PreKindergarten Schools (3.0 cr.; S-N or Audit; prereq Students in [early childhood educ M Ed or elem educ M Ed or teaching M Ed])
Elementary school classroom teaching project designed to improve specific teaching skills. Approved and directed by adviser.

CI 5190 Directed Individual Study in Curriculum and Instruction (1.0-6.0 cr.; Student Option; prereq Grad student, #) Producing/evaluating curriculum materials. Literature review of issues/problems. Assessing curriculum processes.

CI 5254 Kindergarten Methods (2.0 cr.; A-F or Audit; prereq Foundations of Education/Elementary Education or M.Ed./LP Elementary Education)
Purpose of kindergarten, its place in elementary program. Curriculum appropriate for needs of age group, including children with special needs. Assessment procedures, role of classroom teacher.

CI 5283 Practicum: Applying Instructional Methods in the Elementary Classroom (3.0 cr.; S-N Grading Basis; prereq M.Ed./Elementary education initial licensure student, enrolled in elementary education methods course)
Field-based practicum in elementary school setting. In-class discussions about application of classroom learning to school setting.

CI 5285 Clinical Experience in Elementary School Teaching (12.0 cr.; S-N Grading Basis; prereq M.Ed./Elementary education initial licensure students)
Students spend full days in elementary classroom, gradually assuming responsibility for teaching, and prepare portfolio based on criteria given. One seminar per week.

CI 5286 Student Teaching Seminar: Elementary Education (3.0 cr.; A-F Grade Basis; prereq M.Ed./Elementary education initial licensure only)
Weekly seminar supplementing student teaching experience. Class discussions, sharing of artifacts from the classroom, reflections, and readings.

CI 5287 Capstone Project: Improvement of Teaching in Elementary and Pre-
CI 5300 Teaching Introductory Computer Concepts and Skills (1.0-3.0 cr.; A-F or Audit) Pedagogical strategies for teaching keyboarding and word processing.

CI 5301 Foundations of Computer Applications for Business and Education (3.0 cr.; Student Option) Instructional uses of computers and representations of business, education, and marketing applications, including word processing, databases, spreadsheets, and graphic design.

CI 5303 Data Analysis and Information Design for Business and Education (3.0 cr.; Student Option) Using spreadsheets, information visualization, and data management to create analytical models in business, education, and research settings.

CI 5304 Data Management for Online Integration (3.0 cr.; Student Option) Using database software to organize, manage, and display online data, to create content management systems, and to integrate into existing Web sites.

CI 5305 Integrated Computer Applications in Business and Marketing Education (3.0 cr.; Student Option) Case-based authentic business computing problems requiring integration of two or more application packages. Pedagogical issues of learning/teaching advanced computer applications.

CI 5321 Foundations of Distance Education (3.0 cr.; A-F or Audit) History, philosophies, technologies, and best practices related to distance learning environments. Distance education theories. Issues in distance education.

CI 5323 Online Learning Communities (3.0 cr.; A-F or Audit) Students design/research an online learning environment that promotes community. What community is, how it fosters learning in educational learning environments. Theories of distance learning instruction. Community models. technological tools to develop online communities.

CI 5325 Designing and Developing Online Distance Learning (3.0 cr.; A-F or Audit; prereq 5351 or 5362 recommended) Students research, use, and evaluate technologies for distance learning and design their own learning environments.

CI 5327 Designing Online Adventure Learning (3.0 cr.; A-F or Audit) Designing, developing, and integrating adventure learning environments in K-16. Examples of effective adventure learning environments.

CI 5330 Topics in Learning Technology (1.0-3.0 cr.; Student Option) Topics related to needs of in-service teachers. Topics, location, credits. Duration flexible.

CI 5331 Introduction to Learning Technologies (3.0 cr.; Student Option) Orientation to examination of various issues affecting use of technology. Students identify research topics for investigation in future courses and identify key literature in preparation for masters/doctoral examinations.

CI 5336 Planning for Multimedia Design and Development (3.0 cr.; Student Option) Theory, research, practice in instructional design. Generic components of instructional design process. Applying principles to design/development of computer-based instructional materials.

CI 5337 Planning for K-12 Technology Design and Integration (3.0 cr.; A-F or Audit) Developing technology-enhanced learning (TEL) lessons/units for K-12 instructional contexts (e.g., content areas across PK-12 grades). Contemporary perspectives on instruction/learning, TEL lesson categorization techniques.

CI 5344 Facilitating Technology Integration in Classrooms I (1.0 cr.; A-F or Audit) Intersection of student learning theories and research base on effective technology practices. Video cases of technology-supported teaching, peer teaching experience.


CI 5351 Technology Tools for Educators (3.0 cr.; A-F or Audit) Develop skills in using technology applications to support teaching and learning. Internet applications, presentation software, Web 2.0 technologies, and Web site development.

CI 5361 Teaching and Learning with the Internet (3.0 cr.; Student Option) Aspects of writing/illustrating children's literature or children's own writing. May feature authors/illustrators of children's books.

CI 5362 Foundations of Interactive Design for Web-based Learning (3.0 cr.; Student Option) Processes of designing/developing interactive learning media and online applications from ground up. Focuses on usability/aesthetics in online learning.


CI 5364 Computer-Based Instruction: Games and Simulation (3.0 cr.; A-F or Audit; prereq 5363) Principles and procedures of computer simulation and game design. Types of computer simulation, the components common to simulation design, and the theory underlying educational simulation design.

CI 5365 Contemporary Software Development Issues and Tools (3.0 cr.; Student Option; prereq Familiar with standard computer/Internet operations) Software used in multimedia design/development. Uses of the software, intricacies of interfaces, relevant programming principles. Introduction to developing multimedia applications.

CI 5367 Interactive Multimedia Instruction (3.0 cr.; A-F or Audit; prereq Knowledge of principles and procedures of CBI design and one multimedia authoring system) Principles of effective computer-based design; tools in multimedia development; contemporary issues and skills used in the design, development, and implementation of interactive multimedia instruction. Use multimedia development tools, create a multimedia portfolio, and investigate the issues surrounding their effective use.

CI 5390 Learning Technologies Field Experiences (2.0 cr.; S-N Grading Basis; prereq Students in teachers of computers/keyboarding/related technology applications additional licensure program) Field-based experience for students enrolled in computers, keyboarding, and related technology applications methods classes. Apply learning from University courses to the K-12 school setting. In-class discussions about the application of classroom learning to the school setting.

CI 5401 Literature for the Elementary School (3.0 cr.; A-F or Audit; prereq Children's lit course or #) Evaluative survey of books for children. Research related to children's reading interests. Response to literature, instructional strategies.

CI 5402 Introduction to Special Collections (3.0 cr.; A-F or Audit; prereq Children's lit course) Uses Children's Literature Research Collection as research material. Study of manuscripts, original art, and letters.

CI 5403 Creative Writing For and By Children (3.0 cr.; A-F Grade Basis; prereq Children's lit course or #) Aspects of writing/illustrating children's literature or children's own writing. May feature authors/illustrators of children's books.

CI 5404 Culturally Diverse Books for Children and Adolescents (3.0 cr.; A-F or Audit; prereq MED, MA, PhD student) Reading of literature for children/adolescents about diverse cultures. Critique of literary quality and cultural depiction. Development of ways to use culturally diverse literature.

CI 5405 Middle School Language Arts Methods (2.0 cr.; A-F Grade Basis; prereq Elem ed licensure student) Introduction to the unique needs of middle school students in the language arts classroom. Language arts content and pedagogical skills. Adolescent development/psychology. Field placement in a middle school language arts classroom.

CI 5410 Special Topics in the Teaching of Literacy (1.0-3.0 cr.; Student Option) Topics related specifically to the needs of in-service teachers. Topics, location, credits, and duration will be highly flexible.
CI 5411 Teaching Reading in the Elementary School (3.0 cr.; A-F or Audit)
Aids the inservice elementary classroom teacher in the development of knowledge of theory and practice to examine the teaching of reading.

CI 5412 Reading Difficulties: Instruction and Assessment (3.0 cr.; A-F or Audit; prerequisite 5411 or 5451)
Causes, diagnosis and assessment, prevention and correction; intervention practices useful to the classroom teacher and special teacher of reading.

CI 5413 Foundations of Reading (3.0 cr.; A-F or Audit)
Reading processes, development of readers. Assessment/tutoring of individual children in reading and other literacy practices.

CI 5415 Literacy Development in the Primary Grades (3.0 cr.; A-F or Audit; prerequisite elementary education or early childhood education; minimum one year of teaching experience)

CI 5417 Elementary literacy Instruction for ESL Students (3.0 cr.; A-F or Audit; prerequisite Bachelor’s degree completed)
Teaching reading/writing in elementary grades to students from diverse languages. Second-language literacy development. Phonemic awareness, phonics, fluency, vocabulary, comprehension. Ways to connect students’ background knowledge to literacy curriculum. 

CI 5418 Whole Language Teaching and Learning in the Elementary School (3.0 cr.; A-F or Audit; prerequisite MEd or grad student, minimum one year of teaching experience)
Theory, research, and politics of whole language teaching. Applications for developing an elementary school whole language curriculum.

CI 5422 Teaching Writing in Schools (3.0 cr.; A-F or Audit)

CI 5424 Reading, Language Arts, and Literature: Primary (3.0 cr.; A-F or Audit; prerequisite Elem ed init lic)
Curricular/methodological issues of reading, language arts, and children’s literature. Evaluating children’s literature, emergent literacy, response to literature, reading/writing processes, strategy instruction for word recognition/comprehension, authentic assessment strategies, teaching diverse students.

CI 5425 Reading Instruction in the Elementary Grades (3.0 cr.; A-F Grade Basis; prerequisite Elementary or early childhood licensure student)
Curricular/methodological issues in teaching of reading. Reading/orthographic processes, strategy instruction for word recognition/comprehension, authentic assessment strategies, and teaching diverse students.

CI 5426 Language Arts Instruction in the Elementary Grades (3.0 cr.; A-F Grade Basis; prerequisite Elementary or early childhood licensure student)

CI 5431 Introduction to Instructional Leadership in K-12 Reading (3.0 cr.; A-F or Audit; prerequisite Minnesota teaching license valid for classroom teaching in pre-kindergarten, grades kindergarten through 6 or 1 through 5 or 6 through 8 or 9 through 12 or kindergarten through 12)
Instructional leadership information. Major themes: theory that motivates curriculum. Major instructional processes, alignments needed, resources available.

CI 5432 Instructional Leadership in Reading in Kindergarten and the Elementary Grades (3.0 cr.; A-F or Audit; prerequisite 5431)
Research-based instruction reading for elementary grades. How to help other teachers improve practice. Characteristics of effective schools within context of improving students’ reading achievement.

CI 5433 Professional Leadership in Reading for the Middle and Secondary Grades (3.0 cr.; A-F or Audit; prerequisite 5432)
Curriculum/teaching middle/secondary school students.

CI 5434 Professional Development and Evolving Practice in K-12 Reading (3.0 cr.; A-F or Audit; prerequisite 5433)

CI 5435 Instructional Leadership in Preventing Reading Difficulties (3.0 cr.; A-F or Audit; prerequisite 5434)

CI 5441 Teaching Literature in the Secondary School (2.0-3.0 cr.; A-F or Audit)

CI 5442 Literature for Adolescents (3.0 cr.; A-F or Audit)
Characteristics of literature written for adolescents; rationale for using adolescent literature; adolescents’ reading interests and attitudes; analysis of quality and appeal; individualized reading programs; methods of promoting reading; multicultural literature; developing teaching activities.

CI 5451 Teaching Reading in Middle and Secondary Grades (3.0 cr.; A-F or Audit)
Methods of accommodating to students’ abilities and facilitating reading in regular content classes.

CI 5461 Teaching Composition in the Secondary School (2.0 cr.; A-F or Audit)

CI 5462 Evaluating and Assessing Writing (3.0 cr.; A-F or Audit)

CI 5463 Minnesota Writing Project Annual Invitational Summer Institute (3.0 cr.; A-F Grade Basis; prerequisite Licensed teacher or administrator or [space available, faculty letter of recommendation])
Workshop. Participants reflect on their own literacy processes, participate in a writing group, discuss current reading texts, and demonstrate best practices in classroom.

CI 5469 Minnesota Writing Project Directed Studies (1.0-3.0 cr.; A-F Grade Basis; prerequisite Teaching license, [CI 5463 or enrolled in the Certificate for Teaching Writing and Critical Literacy])
Directed study for teachers involved in MWP. Capstone course for those enrolled in the Certificate in Teaching Writing and Critical Literacy. Teachers investigate current theory and practice of literacy instruction. Ongoing cohort for those enrolled in the Certificate.

CI 5472 Teaching Film, Television, and Media Studies (3.0 cr.; A-F or Audit)
Methods of teaching film, video, and media studies at the secondary and college level; methods for eliciting critical responses; analysis of film/video techniques; analysis of cultural representations and genre characteristics; connecting and comparing film/video and literature; studying documentary and television news; developing media studies units.

CI 5475 Teaching Digital Writing: Blogs, Wikis, Online Talk, Podcasting, and E-Portfolios to Teach Writing (3.0 cr.; A-F or Audit)

CI 5481 Developments in Teaching English and Speech (3.0 cr.; A-F or Audit)

CI 5482 Reading, Language Arts, and Literature: Intermediate (3.0 cr.; A-F or Audit; prerequisite Elem ed initial licensure only)
Curricular and methodological issues of reading, language arts, and children’s literature. Evaluating children’s literature, response to literature, reading/writing processes, strategy instruction for word
Cl 5496 Directed Experiences in Teaching English (8.0 cr.; S-N or Audit; prereq MEd/initial licensure students in English ed only) Student teaching/clinical experience for English post-baccalaureate students only.

Cl 5502 Science Instruction in the Elementary Grades (3.0 cr.; A-F or Audit; prereq Early Childhood or Elementary Education ILP) Methods/materials for teaching science/health at elementary school level.

Cl 5504 Elementary School Science: Materials and Resources (3.0 cr.; Student Option; prereq Elem ed licensure or #) Examination of the teacher’s role in inquiry teaching; the current science curriculum; and resources for teaching science in the elementary school.

Cl 5505 Middle School Science Methods (2.0 cr.; A-F Grade Basis; prereq Elem ed licensure student) Methods of planning/teaching inquiry-based science. Students observe, analyze, and teach inquiry-based lessons.

Cl 5530 Secondary Science Teaching: Laboratory-based Instruction (3.0 cr.; A-F Grade Basis; prereq Science ed MEd ILP student) Lab-based science teaching in secondary school setting. Research-based teaching strategies are modeled that address national/state-level standards. How to use various inquiry-based instructional techniques/methods.

Cl 5531 Teaching Middle School Science (3.0 cr.; A-F or Audit; prereq Initial licensure student in science ed) Methods of planning/teaching science to middle school students.

Cl 5532 Teaching Secondary School Science (3.0 cr.; A-F or Audit; prereq Admission to initial licensure program in science) Methods of planning/teaching science for secondary school students.

Cl 5533 Current Developments in Science Teaching (3.0 cr.; A-F or Audit; prereq [MEd, initial licensure, grad student] or #) Using curriculum standards to design science courses.

Cl 5534 Studies in Science Education (3.0 cr.; A-F or Audit; prereq M.Ed., init lic, or #) Improvement of science teaching through the application of research findings.

Cl 5535 Foundations of Science Education (3.0 cr.; A-F or Audit; prereq M.Ed., grad student, or #) Analysis of present science teaching practices in light of historical and philosophical foundations of science education.

Cl 5536 Equity, Policy, and Assessment in Science Education (3.0 cr.; A-F Grade Basis; prereq MEd or grad student or #) Nature of equity, diversity, and policy matters that influence schools/teachers involved in science teaching and scientific literacy. Classroom presentations, discussions, readings in current research.

Cl 5537 Principles of Environmental Education (3.0 cr.; A-F or Audit; prereq Undergrad in NRES or M.Ed. or grad student in education or #) Critical review of Environmental Education, its history, theories, curricula, teaching methods, and assessment practices. Development of an exemplary unit plan for teaching environmental studies.

Cl 5538 Research-based Decision-making in Science Education (3.0 cr.; A-F Grade Basis; prereq MEd or grad student or #) Nature of research and data-driven decision-making in science education. Focuses on analysis, interpretation, and impact of research on science education. Developing/conducting research to discuss, analyze, and present research.

Cl 5539 Improving Secondary Science Instruction: Surviving the First Two Years (3.0 cr.; A-F Grade Basis; prereq MEd science education student, in first three years of teaching) Students reflect on their instruction and student learning during first years of teaching. Monthly meetings, observations, online discussion. Classroom management, planning, inquiry-based teaching, assessment, equity in the classroom.

Cl 5540 Special Topics: Science Education (1.0-8.0 cr.; Student Option) Detailed examination and practice of the teaching of one area of science (e.g. geology, health, physical science) or one method of instruction (e.g. laboratories, demonstrations, Internet, simulations).

Cl 5541 Teaching History and Nature of Science (3.0 cr.; A-F or Audit; prereq MEd ILP or professional studies student in science education or #) Understanding nature of science(NOS). Integrate/reflect on NOS in secondary science classroom. Historical cases/integrating NOS with science content/scientific inquiry.

Cl 5546 Teaching World Languages and Cultures in Elementary Settings (3.0 cr.; Student Option) Methods/materials for teaching world languages in the modalities of speaking, listening, reading, and writing. Backwards design, proficiency-oriented approach, use of content-based instruction. Planning for the integration of instruction and assessment.

Cl 5561 Second Language Curriculum Development and Assessment (3.0 cr.; A-F or Audit; prereq SLC initial licensure only) Instruction/assessment of ESL and World Languages in the modalities of speaking, listening, reading, and writing. Backwards design, proficiency-oriented approach, use of content-based instruction. Planning for the integration of instruction and assessment.

Cl 5562 Literacy and Language Development in Second Language Classrooms (3.0 cr.; A-F or Audit; prereq SLC initial licensure only) Processes/instructional approaches in developing second language proficiency in the modalities of reading, writing, speaking, and listening and communicative modes.
CI 5634 Content-Based Instruction in Second Language Settings (3.0 cr.; A-F or Audit; prereq SLC initial licensure only)
Building on foundation from other courses in the sequence. Instruction/assessment of ESL and World Languages at the secondary level. Prepares students to connect language teaching with other content areas, analyze/address the linguistic and cultural needs of English learners, and advocate for second language programs and students.

CI 5635 Culture and Diversity in Second Language Classrooms (3.0 cr.; Student Option; prereq Initial licensure program only)
Teaching culture as content and including students’ home cultures in the curriculum and diverse student needs. Needs of students of various educational, social, and cultural backgrounds/ways to develop academic success through instruction in learning strategies and other approaches to differentiation.

CI 5641 Language, Culture, and Education (3.0 cr.; A-F or Audit; prereq MEd or grad student)
Applies current sociolinguistic and discourse theory/research to study of relationships between language and culture in educational settings: language curriculum and instruction; classroom language use; borders between school and home/community language use; and educational policies on literacy/second-language instruction.

CI 5642 Assessing English Learners (3.0 cr.; A-F or Audit)
Current practices concerning language and academic content assessment of English learners (ELs) at the school site, state, and national level; factors affecting academic learning needs of ELs where assessment fits into that picture.

CI 5645 Teaching English Learners in the Elementary Classroom (3.0 cr.; A-F Grade Basis; prereq Early Childhood or Elementary Education ILP)

CI 5646 English Grammar for ESL Teachers (3.0 cr.; Student Option; prereq LING 5001 or #)
English syntax from pedagogical perspective. Grammatical structures that challenge ESL learners. Analyzing learner errors. Issues/activities related to teaching grammar in ESL contexts.

CI 5647 Teaching Middle and Secondary Immigrant and Refugee Students With Limited Formal Schooling (3.0 cr.; Student Option)
Academic/social/political factors that affect students’ success in school. Strategies for teaching. Programmatic choices.

CI 5648 Advanced Practices in Teaching Academic Language (3.0 cr.; A-F Grade Basis; prereq Grad student, #)
Prepares K-12 teachers for student development of academic language proficiency. Read/discuss current research. Implement innovative teaching practices.

CI 5651 Foundations of Second Languages and Cultures Education (3.0 cr.; A-F or Audit)

CI 5656 Teaching Literacy in Second Language Classrooms (3.0 cr.; A-F or Audit)
Reading comprehension/composing processes in a second language; relationship between first and second literacy development; relationship between reading and writing; reading comprehension and writing; politics of literacy; assessment of second language literacy; using technology to enhance literacy instruction.

CI 5657 Teaching Speaking and Listening in Second Language Classrooms (3.0 cr.; A-F or Audit)
Theories/methods in teaching language as communication in oral/aural modes; planning student interaction; classroom organization for oral language learning/acquisition; using technology to enhance interaction; assessment of listening comprehension and oral communication.

CI 5658 Foreign Language Testing and Assessment (3.0 cr.; A-F or Audit)
For world language/EFL teachers. Aligning foreign language classroom instruction/assessment; language testing/assessment; classroom-based and large-scale proficiency testing/assessment; assessing proficiency in speaking, listening, reading, writing, and communicative modes (interpersonal, presentational, instructional); creation of formative/summative assessments; critique of contemporary assessment instruments.

CI 5660 Special Topics in the Teaching of Second Languages and Cultures (1.0-4.0 cr.; Student Option)
Topics related specifically to the needs of the in-service teacher. Topics, location, credits, and duration are flexible.

CI 5662 Second Language Curriculum Design (3.0 cr.; A-F or Audit)
Historical overview of curriculum development in second language education; contexts that influence curriculum development; models for curriculum development in second language settings; politics of curricular reform; national/state standards and implications for curriculum development; effects of technology on second language curriculum.

CI 5670 Foundations of Dual Language and Immersion Education (3.0 cr.; Student Option; prereq Enrollment in certificat program in dual language/immersion educ or #)
Research foundations and program principles for dual language/immersion. Second language acquisition; critical features of program design/implementation; benefits/challenges of dual language/immersion; program assessment; advocacy. Theory/research for dual language/immersion tied to practical application.

CI 5671 Curriculum Development and Assessment in Dual Language/Immersion Classrooms (3.0 cr.; Student Option; prereq #)
Content-based language instruction and curriculum development for dual language, bilingual, and immersion classrooms. Standards-based instruction; backwards design; assessment that aligns with content-based curriculum and instruction.

CI 5672 Language-Focused Instructional Practices and Strategies for Dual Language/Immersion Classrooms (3.0 cr.; Student Option; prereq #)
Counterbalancing content with integrated focus on language and literacy development for dual language, bilingual, and immersion classrooms. Materials development; proactive/reactive instructional techniques; noticing and awareness-raising strategies; structuring student language production; differentiating for content, ability, and language.

CI 5673 Immersion 101: An Introduction to Immersion Teaching (2.0 cr.; Student Option No Audit)
Research-based introduction to issues for teachers, administrators, and district personnel in K-12 immersion education. One-way (foreign language), two-way (bilingual), and indigenous programs. Principles/practices that inform language-attentive curriculum development/instruction.

CI 5674 Immersion 101: An Introduction to Immersion Teaching in Character-based Languages (2.0 cr.; Student Option No Audit)
Research-based introduction to issues for teachers, administrators, and district personnel in K-12 immersion education. One-way (foreign language) and two-way (bilingual) programs. Principles/practices that inform language-attentive curriculum development/instruction.

CI 5691 Directed Study in Second Languages and Cultures (1.0-4.0 cr.; Student Option; prereq #)
Individual or group work on curricular, instructional, or assessment problems.

CI 5692 Practicum: Teaching World Languages and Cultures in Elementary Schools (2.0-6.0 cr.; Student Option; prereq 5619, adviser approval; credits cannot be counted on a graduate degree program for endorsement candidates)
Teaching and learning experiences in Second Languages and Cultures at the elementary-school level. Requires students to work in a public school setting.

CI 5697 Practicum: ESL in the Elementary School (2.0-6.0 cr.; Student Option; prereq Adviser approval)
Teaching/learning experiences in an English as a Second Language setting at elementary school level. Requires students to work in a public school setting.

CI 5698 Student Teaching in Second Languages and Cultures (2.0-6.0 cr.; Student Option;...
Option; prereq Adviser approval; credits cannot be counted on a graduate degree program) Student teaching in Second Languages and Cultures at the secondary level for teachers already licensed in another field. Requires students to work in a public school setting.

CI 5699 Clinical Experiences in Second Languages (3.0-12.0 cr.; A-F or Audit; prereq SLC initial licensure program only) Teaching and learning experiences in elementary and secondary second language instructional settings. Includes a seminar held concurrently to support the student teaching experience.

CI 5702 Social Studies Instruction in the Elementary Grades (3.0 cr.; A-F Grade Basis; prereq Early Childhood or Elementary Education ILP) Content/organization of elementary social studies programs. Programs of understanding. Improving learning situation.

CI 5705 Middle School Social Studies Methods (2.0 cr.; A-F Grade Basis; prereq Elem ed licensure student) Introduction to the unique needs of middle school students in the social studies classroom. Social studies content and pedagogical skills. Adolescent development/psychology. Field placement in a middle school social studies classroom.

CI 5731 Social Studies for the In-Service Elementary and Middle School Teacher (3.0 cr.; A-F or Audit) Content/organization of social studies programs. Improving teaching-learning situation through analysis of trends/issues. Integration with other subject areas.

CI 5741 Introduction to Social Studies Education (3.0 cr.; A-F Grade Basis; prereq social studies initial licensure student) Broad issues and themes related to social studies education, including societal context, rationale, and scope and sequence. Analysis and evaluation of selected teaching strategies, methods, and resources.

CI 5742 Advanced Methods of Teaching the Social Studies (3.0 cr.; A-F Grade Basis; prereq Secondary social studies initial licensure student) Focus on developing a repertoire of instructional methods that support authentic pedagogy and assessment. Enhancing reading comprehension and writing skills in the social studies.

CI 5743 The Social Sciences and the Social Studies (3.0 cr.; A-F Grade Basis; prereq Secondary social studies initial licensure student) Development of instructional strategies and contexts for exploring the social sciences as disciplines at the secondary level; central concepts and generalizations; tools of inquiry; competing structures and theories; and the relative impact of multicultural and gender-fair perspectives on the nature of history and the social sciences.

CI 5744 Seminar: Reflecting on Professional Development in Social Studies Education (3.0 cr.; A-F Grade Basis; prereq Secondary social studies initial licensure student) Reflecting on teaching experience, examining social/cultural context of teaching/learning, developing a professional identity. Refining teaching and teacher research skills.

CI 5745 Engaging Youth With Social Studies Texts (3.0 cr.; A-F Grade Basis) Ways to engage students (grades 5-12) in social studies (textbooks, literature, speeches, editorials, political cartoons, tables, graphs, maps, film.). Developing middle/high school students’ disciplinary literacy.

CI 5746 Global and Multicultural Education in the Secondary Classroom (3.0 cr.; A-F Grade Basis) Issues, classroom practices, and controversies surrounding global/multicultural perspective-taking in social studies education. Strategies for helping secondary social studies students develop global/multicultural worldviews.

CI 5747 Global and Environmental Education: Content and Practice (3.0 cr.; A-F or Audit) Prepares educators for leadership responsibilities in the area of global environmental education. Focus on the knowledge and process skills necessary to carry out a leadership role in the curriculum.

CI 5760 Social Studies Education for the Inservice Middle/Secondary Teacher (3.0 cr.; A-F Grade Basis) Trends and issues in social studies education. Current developments and controversies in social studies pedagogy, curriculum, and assessment.

CI 5762 Developing Civic Discourse in the Social Studies (3.0 cr.; A-F or Audit) Philosophies, strategies, and research on developing civic discourse in secondary social studies classroom. Selecting issues. Democratic classroom climate. Relating to social/cultural contexts.

CI 5782 Clinical Experiences in Teaching Social Studies (1.0-8.0 cr.; S-N or Audit; prereq MED/initial licensure student) TBD

CI 5822 Mathematics Instruction in the Elementary Grades (3.0 cr.; A-F or Audit; prereq Early Childhood or Elementary Education ILP) Principles of learning mathematics in elementary grades. Objectives, content, philosophy, instructional materials, methods of instruction/evaluation.

CI 5922 Family and Consumer Sciences Curriculum in Grades 5-12 (3.0 cr.; A-F Grade Basis; prereq ILP student) Examining, development, and implementation of family and consumer sciences curriculum in grades 5-12.

CI 5923 Educational Strategies in Family Education (3.0 cr.; A-F Grade Basis) Examination, development, and implementation of a variety of educational strategies.

CI 5924 Family and Consumer Sciences Student Teaching I (1.0 cr.; S-N Grading Basis; prereq ILP student) Initial experiences in family/consumer sciences teaching profession. Observations of school organization/administration, seminars, relationship building with cooperating teachers, reflections on personal involvement as beginning student teachers.

CI 5925 Family and Consumer Sciences Student Teaching II (2.0 cr.; Student Option; prereq 5924) Part-time supervised teaching experience in family/consumer sciences programs. On-campus seminars emphasize reflective teaching practice and student learning in context of middle/high schools.

CI 5926 Family and Consumer Sciences Student Teaching III (8.0 cr.; Student Option; prereq 5925) Full-time supervised teaching experience in family/consumer sciences programs. On-campus seminars.

CI 5927 Family and Consumer Sciences Student Teaching IV (1.0 cr.; Student Option; prereq 5926) Full-time supervised student teaching experience in family/consumer sciences programs.

CI 5993 Directed Study in Family, Youth, and Community (1.0-3.0 cr.; A-F Grade Basis; prereq #) Self-directed study in areas not covered by regular courses. Specific program of study is jointly determined by student and advising faculty member.

CI 5996 Internship in Family, Youth, and Community (1.0-6.0 cr.; Student Option; prereq #) Involvement in work experience focused on educational competencies in family, youth, and community settings. Nature/extent of responsibilities are defined by position the student assumes.

Dakota (DAKO)
College of Liberal Arts

DAK 1121 Beginning Dakota I (5.0 cr.; Student Option) Listening, speaking, reading, writing. Oral drills, in-class participation focused on questions/answers.

DAK 1122 Beginning Dakota II (5.0 cr.; Student Option; prereq 1121) Further development of language acquisition skills. Oral drills, in-class participation focused on questions/answers.

DAK 3123 Intermediate Dakota I (5.0 cr.; Student Option; prereq 1122) Listening, speaking, reading, writing. Oral drills, in-class participation focused on questions/answers.

DAK 3124 Intermediate Dakota II (5.0 cr.; Student Option; prereq 1121, 1122, 3123) Listening, speaking, reading, writing. Oral drills, in-class participation focused on questions/answers.

DAK 3125 Introduction to Dakota Linguistics (3.0 cr.; Student Option; prereq 3124) Structure of Dakota, including phonology, morphology, syntax, and semantics.

DAK 3126 Dakota Language for the Classroom (3.0 cr.; A-F Grade Basis; prereq 1122) General/specialized language for core subjects, daily routines, and classroom discourse. Methods for teaching Dakota language.

DAK 3127 Dakota Language for Teachers (3.0 cr.; A-F Grade Basis; prereq 1121) Dakota language for teachers. Methods of teaching Dakota language in the classroom.
DNCE 1030 Men's Modern Dance Technique (1.0 cr.; Student Option) 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, performance, and how observer views dance?

DNCE 1040 Modern Dance Partnering Technique (1.0 cr.; A-F Grade Basis; prereq Dance major #) Technical demands, approaches, and skills needed for partnering in modern dance.

DNCE 1101 Ballet Technique 1 (1.0 cr.; Student Option) Principles, basic technique, and vocabulary of ballet; barre, center, and allegro.

DNCE 1102 Ballet Technique 2 (1.0 cr.; Student Option; prereq 1101 or audition or #) Continuation of 1101. Principles, basic technique, and vocabulary of ballet. Barre, center, allegro.

DNCE 1110 Ballet Technique 3 (2.0 cr.; Student Option; prereq %, audition) Continuation of ballet training. Correct placement. Line and historical development. Barre, center, allegro.


DNCE 1201 Jazz Technique 1 (1.0 cr.; Student Option) Jazz dance technique and its origins. Warm-up, center-floor work, and across-the-floor combinations.

DNCE 1202 Jazz Technique 2 (1.0 cr.; Student Option; prereq 1201 or audition or #) Continuation of 1201. Jazz dance technique, its origins. Warm-up, center-floor work, across-the-floor combinations.

DNCE 1210 Jazz Technique 3 (1.0 cr.; Student Option; prereq %, audition) Jazz technique. Body isolations, placement, and musicality.

DNCE 1220 Jazz Technique 4 (1.0 cr.; Student Option; prereq 1210, %, audition) Continuation of 1210. Jazz technique. Body isolations, placement, musicality.

DNCE 1301 Tap Technique 1 (1.0 cr.; Student Option) Learning fundamental terms, basic rhythm structures, stock steps, and standard time steps.

DNCE 1302 Tap Technique 2 (1.0 cr.; Student Option; prereq 1301 or #) Fundamental terms, basic rhythms and syncopation, stock steps, and standard time steps; clarity of sound and rhythm.

DNCE 1313 African Based Movement (1.0 cr.; Student Option) Varied movement of African diaspora, primarily but not limited to West African region and continent of Africa. Traditional movement. Movement inspired by Africa, the Caribbean, and African diaspora at large. In-class movement participation, one movement midterm, one two-page paper.

DNCE 1315 Flamenco (1.0 cr.; Student Option) Basic terminology and movement styles of Spanish Flamenco dance technique. Focuses on arm movements and footwork. Basic choreography. One class period is devoted to viewing videos of traditional Flamenco dance.

DNCE 1323 Swing Dance (1.0 cr.; Student Option) Traditional swing dances popular in the United States from 1930s through early 1960s. Each week new movements/figures are taught and previous dances reviewed. Students are expected to change partners.

DNCE 1327 Argentine Tango (1.0 cr.; Student Option No Audit) Basic rhythms emphasizing posture, axis, walking, lead/follow techniques, footwork patterns. Students listen to music to identify rhythm, communicate.

DNCE 1331 Yoga (1.0 cr.; Student Option) Theory/practice of Yoga. Standing postures, forward bends, twists, balancing, seated postures, inversions, back bends, guided relaxation/meditation. Proper alignment, weight placement, body awareness, relaxation, breathing techniques. Midterm paper, movement demonstration final.

DNCE 1335 T'ai Chi Ch'uan (1.0 cr.; Student Option) Ancient Chinese slow-motion exercise. Helping body/mind to become relaxed/centered. Natural movement patterns, deep breathing, tranquil stress-free mind. Self-defense applications of movements. Non-competitive, non-aggressive.

DNCE 1334 Hip Hop Movement (1.0 cr.; Student Option No Audit) Hip hop's forms: old school, popping, locking, breaking, contemporary choreography, social dances. History, culture, technique. Warm-up, strength/endurance applications, choreography, cool down. Lecture, demonstration, practice.

DNCE 1345 Alexander Technique for Movement Artists (1.0 cr.; Student Option No Audit) Increased kinesthetic awareness of habitual movement patterns in order to improve dance/movement technique and prevent related injuries.

DNCE 1347 Pilates Conditioning (1.0 cr.; Student Option) Essential mat work of Pilates method. Contemporary approach to mind-body system of exercise pioneered by Joseph Pilates. Neuro-muscular resistance exercises to develop strong, flexible muscles and better alignment for optimal physical/mental well-being.

DNCE 1349 Contact Improvisation (1.0 cr.; Student Option) Safe, clear introduction to principles of contact improvisation. Rolling point of contact, supporting/being supported, falling/recovering, connecting with center as source/support for movement. Classes include warm-up.

DNCE 1351 African Diasporic Movement 1 (1.0 cr.; Student Option No Audit) First of six-course sequence. Introduction to traditional West African dance technique as a foundational base to begin learning technique, body placement, movement, space, time, energy, isolations, patterns, etiquette, community building, group work and presentation.

DNCE 1352 African Diasporic Movement 2 (1.0 cr.; Student Option No Audit; 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.

DNCE 3133 African Diasporic Movement 3
(1.0 cr.; Student Option No Audit; prereq 1352 or audition or #)
Third of six-course sequence. Afro-Brazilian dance, including jumps, turns, floor work, and rhythm to develop flexibility, strength, and vocabulary in polycentric movement, moving toward body-sound harmony, illuminating dynamics of coordination, relaxation, breathing, undulation.

DNCE 3134 African Diasporic Movement 4
(1.0 cr.; Student Option No Audit; 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 Candombá. How corporal knowledge and technique fluency through the course sequence support different dance techniques.

DNCE 1401 Introduction to Dance
(3.0 cr.; Student Option No Audit)
What is dance? How does movement create meaning? Dance as action and framework for analysis of moving bodies. Movement politics of race, class, gender, sexuality, and nation through reading, writing, moving, and watching dance performances. Discussion. Dance experience not required.

DNCE 1500 Topics in Dance
(1.0-3.0 cr.; Student Option)
Topics specified in Class Schedule.

DNCE 1601 Dance Improvisation
(1.0 cr.; A-F or Audit; 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.

DNCE 1650 Movers for Dance
(3.0 cr.; Student Option; 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.

DNCE 1905 Freshman Seminar
(3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

DNCE 3010 Modern Dance Technique 5
(2.0 cr.; Student Option; 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.

DNCE 3020 Modern Dance Technique 6
(2.0 cr.; Student Option; prereq 3010, %, audition)
Continuation of 3010. Application of principles of space, time, energy. Alignment, power from pelvic center, rotation/turnout, muscular tonality, joint articulation, clarity of intent, stretch, strength, stamina.

DNCE 3110 Ballet Technique 5
(2.0 cr.; Student Option; prereq %, audition)

DNCE 3120 Ballet Technique 6
(2.0 cr.; Student Option; prereq 3110, %, audition)

DNCE 3210 Jazz Technique 5
(1.0 cr.; Student Option; prereq %, audition)
Continuation of jazz technique. Rhythm structures, longer phrases, greater physical speed, attack/control.

DNCE 3220 Jazz Technique 6
(1.0 cr.; Student Option; prereq 3210, %, audition)
Continuation of 3210. Jazz technique. Rhythm structures, longer phrases, greater physical speed, attack/control.

DNCE 3301 Tap Technique 3
(1.0 cr.; Student Option; prereq 3302 or #)
Tap techniques and creative development through improvisational studies.

DNCE 3302 Tap Technique 4
(1.0 cr.; Student Option; prereq 3301 or #)
Tap techniques and rhythm structures.

DNCE 3311 Contemporary Indian Dance 1
(1.0 cr.; Student Option No Audit; 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.

DNCE 3312 Contemporary Indian Dance 2
(1.0 cr.; Student Option No Audit; prereq 3111 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.

DNCE 3334 Introduction to Dance/Movement Therapy
(2.0 cr.; Student Option; prereq %)

DNCE 3337 Body Mind Centering
(2.0 cr.; Student Option)
Improvisational movement explorations, hands-on re-patterning work. Direct experience of the way mind (desire, attention, intention) is expressed through various body systems. Students use imagery, touch, and anatomical information to access a range of inner sensations and movement experiences. Emphasizes each individual's unique experience of the body.

DNCE 3351 African Diasporic Movement 5
(1.0 cr.; Student Option No Audit; prereq 1352 or audition or #)
Rigorous practice. West African techniques. Cardiovascular endurance of students will improve as a result. Live drummers, students can expect to learn drum parts to enhance the understanding of the rhythms.

DNCE 3352 African Diasporic Movement 6
(1.0 cr.; Student Option No Audit; prereq DNCE 3351 African Diasporic Movement 5 or audition or instructor consent)
Dances performed by dance companies of Guinea through the use of more complex and deep rhythms such as Yamama, Doundounba, Baho and Tiribah. Rigorous practice. West African techniques. Live drummers.

DNCE 3401W Dance History 1
(3.0 cr.; Student Option)
Historiography of dance, 20th century through present. Reconstruction/incorporation of dance practice in context of globalization. Artistic choices as influenced by complex history of performing arts and terrain of body/politics.

DNCE 3402W Dance History 2
(3.0 cr.; Student Option; prereq 3401W)
History/theory of dance in varied forms/aspects. From development of ballet through 20th century modern dance. Second half of year-long survey.

DNCE 3411 Dance and Popular Culture:
Choreographing Race, Class, and Gender
(3.0 cr.; Student Option; prereq Jr or Sr)

DNCE 3433 Articulate Body
(3.0 cr.; Student Option; prereq Dnce major, %)
Lectures and movement sessions in biodynamic considerations for optimal dance performance and metabolistic demands of dance.

DNCE 3434 Nutrition and Body Maintenance for Movement Artists
(2.0 cr.; Student Option No Audit)
Students learn and research ways to improve nutrition and remain injury-free throughout career and beyond. Discuss nutrition principles and apply to unique challenges, needs, interests of movement artists. Examine anatomy of movement to develop constructive injury prevention and management strategies. Stress reduction.

DNCE 3487W Dance and Citizenship: Land, Migration, and Diaspora
(3.0 cr.; Student Option)
Dance/performance as practiced/transformed by minority groups in the United States. Migration as a global phenomenon, particularly pertaining to land disputes, labor distribution, political asylum, refugee, and dislocation.

DNCE 3495 Dance and Global Tourism
(3.0 cr.; Student Option No Audit; 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.

DNCE 3500 Topics in Dance
(1.0-3.0 cr.; Student Option)
Topics specified in Class Schedule.

DNCE 3601 Dance Composition
(3.0 cr.; Student Option; 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.
DNCE 3602 Dance Composition 2 (3.0 cr.; Student Option; prereq Dance major, %, concurrent regis in a modern dance technique course) Movement, vocabulary in relation to theme, space, time, energy, and body parts. Solo, duet, and tri formation.

DNCE 3621 Dance Production I (2.0 cr.; A-F or Audit; 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.

DNCE 3622 Dance Production II (2.0 cr.; A-F or Audit; prereq 3621, dance major, %) Continuation of 3621. Students produce the spring Student Dance Concert.

DNCE 3700 Performance (1.0 cr.; Student Option; prereq Concurrent enrollment in a technique 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 (1.0-3.0 cr.; Student Option No Audit) Real-world experience with a professional dance company. Students participate in daily technique and repertory classes culminating in an informal performance. Artists are arranged year-by-year.

DNCE 3901 Survival Strategies in Dance (3.0 cr.; A-F or Audit; prereq Dance major, %) Strategies fundamental to a dancer's survival. Injury prevention/care. Development of healthy dietary and muscular/skeletal habits. Career tracks.

DNCE 4443 Theorizing Dancing Bodies (3.0 cr.; Student Option; prereq 3402W or #) Major developments in Western philosophic thought on dance and dance theory, from its beginnings to present.

DNCE 4454W (Re)Writing the Dancing Body (3.0 cr.; Student Option; prereq Jr or Sr) Modes of writing found in dance studies. Oral histories, historical documentation, performance reviews, performance ethnographies, scholarly essays. Discussion/critique of existent modes of writing. Writing/rewriting practice.

DNCE 4601 Dance Composition 3 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 4601, & modern dance technique course, %) Continuation of 4601. Movement vocabulary through improvisation, analysis of form and structure, experimentation with performance persona, and the effects of technical elements. Development of larger ensemble works.

DNCE 4901 Senior Seminar (2.0 cr.; S-N or Audit; 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 (2.0 cr.; Student Option; prereq %, audition) Continuation of technical development. Performance range/style. Students study with various guest artists.

DNCE 5020 Modern Dance Technique 8 (2.0 cr.; Student Option; prereq 5010, %, audition) Continuation 5010. Performance range/style. Students study with various guest artists.

DNCE 5110 Ballet Technique 7 (1.0 cr.; Student Option; prereq %, audition) Continuation of ballet technique. Musically, performance, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet.

DNCE 5120 Ballet Technique 8 (1.0 cr.; Student Option; prereq 5110, %, audition) Continuation of 5110. Musically, performance, stylistic differences. Practical work conducted within context of choreographic/aesthetic development of ballet.

DNCE 5334 Introduction to Dance/Movement Therapy (2.0 cr.; Student Option; prereq %) Historical/philosophical perspectives on use of movement/dance in relationship to psychology/healing. D/MT pioneers/techniques. Applications of D/MT with various populations/settings. Experimental course.

DNCE 5443 Theorizing Dancing Bodies 3 (3.0 cr.; Student Option; prereq %) Major developments in Western philosophic thought on dance and dance theory, from its beginnings to present.

DNCE 5454 (Re)Writing the Dancing Body 3.0 (3.0 cr.; Student Option; prereq Grad student) Modes of writing found in dance studies. Oral histories, historical documentation, performance reviews, performance ethnographies, scholarly essays. Discussion/critique of existent modes of writing. Writing/rewriting practice.

DNCE 5493 Corporealties, Movement, and Social Justice: Staging "Equitable" Choreographies (3.0 cr.; A-F Grade Basis; prereq Jr or Sr; 4443 recommended) Metaphoric bodily practices/intersections of performance/social justice practices. Theories/histories of intersections within communities of color across global North/South. Group project.

DNCE 5495 Dance and Global Tourism (3.0 cr.; Student Option No Audit; prereq Grad student) Politics of dance/performance for tourism industry. Ways in which dancing body produces ideas of nation-state. How this reflects stereotypes of female identity in global context.

DNCE 5500 Topics in Dance 1.0-3.0 (3.0 cr.; Student Option) Topics specified in Class Schedule.

DNCE 5601 Dance Composition 5 1.0 (1.0 cr.; Student Option; prereq 4601, 4602, %) Final part of six-semester sequence in dance composition. Exploration of movement through independently scheduled rehearsals. Choreographic concepts. Tools in dance creation, development/refinement of movement, structure of group choreography.

DNCE 5700 Performance 1.0 (1.0 cr.; Student Option; prereq & technique course, %) Technique, improvisation, choreography, music, design, and technical production as they relate to dance performance.

DNCE 5858 Teaching Dance 0.0 (4.0 cr.; Student Option; prereq 1020, %, #) Methods, principles, and techniques of teaching dance.

DNCE 5993 Directed Studies 1.0-4.0 (1.0 cr.; Student Option; prereq #, %, @) Guided individual study.

Danish (DAN)
College of Liberal Arts

DAN 1001 Beginning Danish (5.0 cr.; Student Option) 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 1003 Intermediate Danish (5.0 cr.; Student Option; 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 4001 Beginning Danish (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student) Meets concurrently with 1001 See 1001 for course description.

DAN 4003 Intermediate Danish (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student) Meets concurrently with 1003. See 1003 for description.

Dental Hygiene (DH)
School of Dentistry

DH 1191 Dental Hygiene Care Process (6.0 cr.; A-F or Audit; 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 1203 Dental Specialties (2.0 cr.; S-N or Audit; prereq DH student) Various dental specialties and the dental hygienist's role in services provided.

DH 2111 Dental Anatomy (2.0 cr.; A-F Grade Basis; 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 (5.0 cr.; A-F or Audit; 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 2132 Head and Neck Anatomy (1.0 cr.; A-F or Audit; prereq DH student) Anatomical structures of head/neck as they relate to practice of dental hygiene.

DH 2191 Independent Study (0.0-6.0 cr.; S-N Grading Basis; prereq DH student)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

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Principles of pharmacology, physical/chemical properties of drugs, modes of administration, therapeutic/adverse effects, drug actions/interactions.

Knowledge, skills, and attitudes required for providing dental hygiene care for pediatric patients.

General principles of radiology, radiation physics, dosimetry, biology, radiation protection, regulations, recent concepts of imaging.

Clinical experience in dental hygiene care.

Principles of biomaterials, restorative techniques. Lecture, preclinical experiences.

Students participate in educational/clinical experiences with diverse patient populations in community outreach clinics.

Students participate in educational/clinical experiences with migrant worker health care program.

Knowledge, skills, and attitudes required for providing dental hygiene care for the medically compromised patient, gerodontic patient, and patient with a disability.

Students participate in educational/clinical experiences with diverse patient populations in community outreach clinics.

Ethical decision making, jurisprudence.


Social justice of health/oral health care in U.S. How race/class/gender impact resources. Dental hygiene treatment to diverse patient populations.

Exposing patient radiographs, interpretation, panoramic/extraoral technique, quality assurance procedures.


Academic service-learning in various community health care settings. Assessment, planning, implementation, and evaluation of a community oral health program.

Individually arranged study, instruction, or research with faculty to meet student needs/interests.

Restorative Techniques. Clinical experiences.

Restorative Techniques II

Ethics and Jurisprudence for the Dental Hygienist

Ethical decision making, jurisprudence.

Oral and Maxillofacial Radiology: Theory, Principles, and Radiographic Analysis


Clinical Hygiene

Dental hygiene treatment to diverse patient populations.

Exposing patient radiographs, interpretation, panoramic/extraoral technique, quality assurance procedures.

Current status/trends in dentistry in relation to health care promotion, regulation, and delivery and political/legislative process.

Social justice of health/oral health care in U.S. How race/class/gender impact resources. Dental hygiene treatment to diverse patient populations.

Exposing patient radiographs, interpretation, panoramic/extraoral technique, quality assurance procedures.

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Clinic XXXXLVI

Clinic XXXXLVII

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Clinic XXXXLIX

Clinic XXXXL
Dental hygiene as leader/manager in client care. Oral health care delivery, manpower, finance mechanisms, health insurance programs, professional associations, state practice acts, legislation. Ethical, political, and legal issues.

**DH 4241 Extramural Clinical Dental Hygiene (0.0-6.0 cr.; A-F or Audit; prereq #)**
Students participate in educational/clinical experiences with diverse patient populations in community outreach clinics.

**DH 4242 Extramural Clinical Dental Hygiene (0.0-6.0 cr.; A-F or Audit; prereq #)**
Students participate in educational/clinical experiences with Jamaica Mission Program.

**DH 4250 Dental Hygiene Community Outreach Elective (0.0-8.0 cr.; S-N or Audit; prereq DH student)**
Individually arranged dental hygiene clinical experience in community outreach clinics.

**DH 4301 Dental Hygiene: Theory to Practice (4.0 cr.; A-F Grade Basis; prereq DH student)**

**DH 4302 Dental Hygiene Care: Special Needs Patients (2.0 cr.; A-F Grade Basis; prereq DH student)**
Knowledge, skills, and attitudes required for dental hygiene care for geriatric and special needs patients.

**DH 4303 Information Literacy (3.0 cr.; S-N Grading Basis)**
Use of library tools/resources to find/use quality, scholarly sources. Knowledge/skill in five components of information literacy: need, evaluate, access, use, issues.

**DH 4310 Foundations of Interprofessional, Professionalism, Communication, and Collaboration (1.0 cr.; S-N Grading Basis; prereq Dental hygiene student)**
Professionalism, communication/collaboration across health professions. Online independent/group work followed by facilitated interprofessional small group discussion of case narratives.

**DH 5201 Management Internship (5.0 cr.; S-N Grading Basis; 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 (5.0 cr.; S-N Grading Basis; 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 (3.0 cr.; A-F Grade Basis; 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 (2.0 cr.; A-F Grade Basis; 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 5405 Curriculum and Course Development (2.0 cr.; A-F Grade Basis; prereq Dental hygiene grad student)**

**DH 5407 Instructional Strategies for Effective Teaching (2.0 cr.; A-F Grade Basis; prereq Dental hygiene grad student)**

**DH 5408 Dental Hygiene Clinic Administration (2.0 cr.; A-F Grade Basis; prereq Dental hygiene grad student)**

**DH 5411 Administrative Leadership and Professional Development (2.0 cr.; A-F Grade Basis; prereq Dental hygiene grad student)**

**DH 5413 Dental Hygiene Supervised Clinic Student Teaching (3.0 cr.; A-F Grade Basis; prereq Dental hygiene grad student)**

**DH 5415 Dental Hygiene Supervised Didactic Course Student Teaching (1.0-3.0 cr.; A-F Grade Basis; 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 (0.0-5.0 cr.; S-N or Audit; prereq Enrolled master of dental hygiene student)**
Directed study with dental hygiene faculty member on selected topic.

## Dental Therapy (DT)

**School of Dentistry**

**DT 3110 Periodontology (1.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)**

**DT 3130 Preclinical Pediatric Dentistry (2.0 cr.; A-F Grade Basis)**

**DT 3140 Head and Neck Anatomy (1.0 cr.; A-F Grade Basis; prereq Accepted into undergrad dental therapy program)**
Anatomical nomenclature in head/neck anatomy as they relate to dental therapy treatment.

**DT 3211 Applied Pharmacology for the Dental Therapist (2.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)**
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 3212 Local Anesthesia and Pain Management (2.0 cr.; A-F Grade Basis)**

**DT 3230 Oral and Maxillofacial Radiology (2.0 cr.; A-F Grade Basis; 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 (1.0 cr.; A-F Grade Basis; 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 (0.0 cr.; S-N Grading Basis; prereq 2d yr dental therapy student)**
Preclinical demonstration-participation phases using mounted human skulls.

**DT 3250 Oral Histology and Embryology (2.0 cr.; A-F Grade Basis; prereq Enrolled in dental therapy program)**

**DT 3251 General and Oral Pathology (2.0 cr.; A-F Grade Basis)**
Etiology, progression, recognition, and treatment of selected general/oral pathological conditions. Relationship general pathology to
DT 3330 Clinical Application I (3.0 cr.; A-F Grade Basis; prereq Undergrad dental therapy program)
Assessment principles related to medical/oral health status. Dental therapy clinical procedures, instrument skills. Health assessment, parts of periodontium, dental deposits, toothwear, dental disease/prevention, plaque control.

DT 3331 Provider Patient Relationships (2.0 cr.; A-F Grade Basis; prereq Enrolled in dental therapy program)

DT 3332 Cariology and Applied Nutrition in Dental Therapy Care (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; prereq 2d yr 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 3334W Dental Therapy Care Process: Clinical Application II (4.0 cr.; A-F Grade Basis; prereq 2d yr dental therapist student)
Providing dental care for gerodontic patients and patients with disabilities.

DT 3336 Ethics and Jurisprudence for the Dental Therapist (1.0 cr.; A-F Grade Basis)

DT 3410 Applied Dental Biomaterials (1.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)
Application of scientific principles to selection/utilization of dental biomaterials.

DT 3429 Introduction to Psychomotor Skill Development (1.0 cr.; S-N Grading Basis; 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 (2.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; prereq Accepted in dental therapy program)
Manual dexterity skills, anatomy of human dentition.

DT 3432 Operative Dentistry I (2.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)

DT 3433 Operative Dentistry I Pre-Clinic Laboratory (2.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)

DT 3434 Operative Dentistry II for the Dental Therapist, Lecture (1.0 cr.; A-F Grade Basis)
How to surgically manage more advanced caries lesions. Transition from pre-clinic lab to clinic setting.

DT 3435 Operative Dentistry II for the Dental Therapist, Lab (1.0 cr.; A-F Grade Basis)

DT 3436 Operative Dentistry III (1.0 cr.; A-F Grade Basis)
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 3471 Prosthodontic Topics for Dental Therapy (2.0 cr.; S-N Grading Basis)
Lectures, lab projects of selected prosthodontic techniques to enable the dental therapist to provide/cement quality pre-fabricated metal or resin provisional crowns and other procedures in the scope of DT practice.

DT 3521 Foundations of Interprofessional Professionalism, Communication and Collaboration (1.0 cr.; S-N Grading Basis)
Professionalism, communication/collaboration across health professions. Online interprofessional course. Organizational, managerial, and financial systems that affect successful dental practice.

DT 3539 Team Building Within the Oral Health Care Setting (1.0 cr.; S-N Grading Basis)
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 4140 Preventive Pediatric Dentistry Clinic (1.0 cr.; A-F Grade Basis)
Students participate in oral health promotion of pediatric patients. Brushing techniques, fluoride application, dietary analysis/counseling. Students talk with parents of pediatric patients.

DT 4141 Clinical Pediatric Dentistry III (2.0 cr.; A-F Grade Basis)

DT 4142 Clinical Pediatric Dentistry II (1.0 cr.; A-F Grade Basis; prereq Foundation competence in clinical dentistry)
Early childhood development, care for children.

DT 4240 Oral Radiology Clinic (1.0 cr.; A-F Grade Basis)
Clinical instruction in oral radiography. Intraoral/extraoral radiographic procedures, quality evaluations.

DT 4241 Oral Radiology Clinic II (1.0 cr.; A-F Grade Basis)
Clinical instruction in oral radiography. Intraoral/extraoral radiographic procedures, evaluations.

DT 4320 Comprehensive Care Clinic (4.0 cr.; S-N Grading Basis; prereq 3d yr dental therapy student)
Assessment, treatment, and management of patients. Concepts/principles of evidence-based dentistry as applied to clinical practice.

DT 4321 Dental Auxiliary Utilization (1.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)
Clinic rotation. Advanced diagnostic/treatment technologies. Techniques of four-handed dentistry.

DT 4323 Comprehensive Care Clinic II (1.0 cr.; A-F Grade Basis)
Mission of School of Dentistry. Application of principles to the comprehensive assessment, treatment, and management of patients. Evidence-based dentistry.

DT 4324W Research Methods in Dental Therapy (3.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)
Application of principles to comprehensive assessment, treatment, and management of patients. Evidence-based Dentistry.

DT 4335 Dental Practice Management (2.0 cr.; A-F Grade Basis; prereq 2nd yr dental therapy student)
Interprofessional course. Organizational, managerial, and financial systems that affect successful dental practice.

DT 4337 Dental Public Health and Service Learning II (2.0 cr.; A-F Grade Basis; prereq 2d yr dental therapy student)
How to assess, plan, implement, obtain funding for, and evaluate a public health program.

DT 4338W Research Methods in Dental Therapy (3.0 cr.; A-F Grade Basis; prereq 3d 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 4339 Oral Health Care Setting (1.0 cr.; S-N Grading Basis)
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 4359 Introduction to Outreach Experiences (0.0 cr.; S-N Grading Basis)
Provide patients with dental care in various clinical settings throughout Minnesota.

DT 4360 Outreach Experiences in Dental Therapy (1.0 cr.; A-F Grade Basis)
Students complete six-eight weeks of outreach service at combination of following: Hibbing Community College Dental Clinic; Mobile Dental Unit; NorthPoint Health/Wellness Center; Prairie Winds Dental Clinic; Rice Regional Dental Clinic, or Walker Dental Clinic.

DT 4361 Outreach Experiences II (2.0 cr.; S-N Grading Basis)
Experiences that reinforce principles of delivering dental health care/services to
courses listed in this catalog are current as of january 1, 2012. for up-to-date information, visit www.catalogs.umn.edu.

DT 4440 Operative Dentistry Clinic (2.0 cr.; A-F Grade Basis)
Placing restorations. Student clinicians place single tooth restorations on patients, with direction/oversight of instructor.

DT 4441 Operative Clinic II (0.0 cr.; A-F Grade Basis)
How to place restorations. Students place single-tooth restorations on patients.

DT 4443 Operative Clinic III (4.0 cr.; A-F Grade Basis)
How to place restorations. Student clinicians place single-tooth restorations on patients.

DT 4460 Essentials of Clinical Care I for the Dental Therapist (1.0-12.0 cr.; S-N Grading Basis)
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 4960 Essentials of Clinical Care II for Dental Therapists (5.0-10.0 cr.; S-N Grading Basis)
Comprehensive clinical care of assigned patients that may include treatment encompassing periodontics, operative, prosthodontics and endodontics, health promotion disciplines.

DT 5110 Periodontology I (1.0 cr.; A-F Grade Basis; prereq 2nd yr dental therapy masters student)


DT 5140 Preventive Pediatric Dental Clinic (1.0 cr.; A-F Grade Basis)
Oral health promotion of pediatric patients. Brushing techniques, fluoride application, dietary analysis/counseling. Students interact with parents of pediatric patients.

DT 5141 Clinical Pediatric Dentistry III (2.0 cr.; A-F Grade Basis; prereq Must be in dental therapy program, passed basic foundation competencies)
Early childhood development, dental care for children.

DT 5210 Head and Neck Anatomy (1.0 cr.; A-F Grade Basis; 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 (2.0 cr.; A-F Grade Basis)
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 (2.0 cr.; A-F or Aud; prereq DT grad program)

DT 5230 Oral and Maxillofacial Radiology (2.0 cr.; A-F Grade Basis; 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 5231 Oral and Maxillofacial Radiology II (1.0 cr.; A-F Grade Basis) Use 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 5232 Oral and Maxillofacial Radiology Preclinical Laboratory (0.0 cr.; S-N Grading Basis) Preclinical demonstration-participation phases using mounted human skulls.

DT 5241 Oral Radiology Clinic II (1.0 cr.; A-F Grade Basis; prereq Must be in dental therapy masters program) Clinical instruction in oral radiography. Clinical, extraradicular radiographic procedures, evaluations.


DT 5251 General and Oral Pathology (1.0 cr.; A-F Grade Basis) Principles of general and oral pathology with focus on etiology, progression, recognition, and treatment. Overview of diagnostic process and normal clinical findings.

DT 5320 Comprehensive Care Clinic (4.0 cr.; S-N Grading Basis) Assessment, treatment, and management of patients. Concepts/principles of evidence-based dentistry as applied to clinical practice.

DT 5330 Clinical Application I (3.0 cr.; A-F Grade Basis; 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 5332 Cariology and Applied Nutrition in Dental Therapy Care (3.0 cr.; A-F Grade Basis) Dental caries etiology, pathology/prevention. Applying principles of diet/nutrition to dental therapy patient care/counseling.


DT 5334W Dental Therapy Care Process: Clinical Application II (4.0 cr.; A-F Grade Basis)
Providing dental care for gerodontic patients and patients with disabilities.

DT 5335 Dental Practice Management (2.0 cr.; A-F Grade Basis; prereq 2nd yr dental therapy student) Interprofessional course. Organizational, managerial, and financial systems that affect successful dental practice.


DT 5337 Dental Public Health and Service Learning II (2.0 cr.; A-F Grade Basis) How to assess, plan, implement, obtain funding for, and evaluate a public health program.

DT 5338W Research Methods in Dental Therapy (3.0 cr.; A-F Grade Basis; prereq Dental therapy student) Types of research. Problem selection, hypothesis writing, research planning/design. Data Collection, measuring techniques. Analysis/interpretation of data. Ethics. Research proposal.

DT 5359 Introduction to Outreach Experiences (0.0 cr.; S-N Grading Basis) Provide dental care to underserved populations in various clinical settings throughout Minnesota.

DT 5360 Outreach Experiences I (1.0 cr.; S-N Grading Basis) Students work in clinics outside of U of M with underserved patients.

DT 5361 Outreach Experiences II (2.0 cr.; S-N Grading Basis) Experiences that reinforce principles of delivering dental health care/services to patients, including underserved patient populations, in contemporary off-site clinical settings.

DT 5410 Applied Dental Biomaterials (1.0 cr.; A-F Grade Basis; prereq 2nd yr DT student) Application of scientific principles to selection/ utilization of dental materials.

DT 5429 Introduction to Psychomotor Skill Development (1.0 cr.; S-N Grading Basis; 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 (2.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; prereq Accepted into masters in dental therapy program) Manual dexterity skills, anatomy of human dentition.


DT 5433 Operative Dentistry I Pre-Clinic Laboratory (2.0 cr.; A-F Grade Basis; prereq 2nd yr masters in dental therapy student) How to treat dental caries. Therapeutic treatment of underlying pathology. Surgical treatment of early caries lesion. Hands-on projects working with models simulating teeth and surrounding structures.

DT 5434 Operative Dentistry II Lecture (1.0 cr.; A-F Grade Basis; prereq Enrolled in master’s in dental therapy program) How to surgically manage more advanced caries lesions. Transition from pre-clinic lab to clinic setting.

DT 5435 Operative Dentistry II for the Dental Therapist, Lab (1.0 cr.; A-F Grade Basis) More advanced caries lesions: diagnosis, structural preparation, decay removal and restoration.

DT 5436 Operative Dentistry III (1.0 cr.; A-F Grade Basis) Transition of students from the pre-clinic laboratory to the clinic setting. Demonstrate competency in the surgical treatment of dental caries prior to being certified ready for patient care.

DT 5443 Operative Clinic III (4.0 cr.; A-F Grade Basis) How to place restorations. Students place single-tooth restorations on patients.

DT 5460 Essentials of Clinical Care I For the Dental Therapist (1.0-12.0 cr.; S-N Grading Basis) Students provide comprehensive care under direction of clinical faculty. May include periodontics, operative, pediatric care, and health promotion. Limited care may be given on rotations to oral surgery clinics.

DT 5471 Prostodontic Topics for Dental Therapy (2.0 cr.; S-N Grading Basis) Lectures, lab projects of selected prostodontic techniques to enable the dental therapist to provide/cement quality pre-fabricated metal or resin provisional crowns and other prostodontic procedures in the scope of DT practice.

DT 5521 Foundations of Interprofessional Professionalism, Communication, and Collaboration (1.0 cr.; S-N Grading Basis) Professionalism, communication/collaboration across health professions. Online independent/group work followed by facilitated interprofessional small group discussions of case narratives.

DT 5560 Essentials of Clinical Care II for the Dental Therapist (5.0-10.0 cr.; S-N Grading Basis) 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.

Design (DES)

DES 1000 D@MN: Design@Minnesota (3.0 cr.; A-F Grade Basis) Applications of design thinking/design process. Understanding design as consumers, customers, possible future clients.

DES 1101H Honors: Introduction to Design Thinking (4.0 cr.; A-F Grade Basis; 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 1101W Introduction to Design Thinking (4.0 cr.; A-F or Audit) 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 3131 User Experience in Design (1.0 cr.; A-F Grade Basis) Career goals based on skills/interests, and identify job search skills to secure internships and implement transition from college to employment.

DES 3132 Career and Internship Preparation for Design (1.0 cr.; A-F Grade Basis; prereq Soph or Jr or 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 3170 Topics in Design (1.0-4.0 cr.; A-F Grade Basis) Introduction to theories/principles of human interaction with designed objects. Focuses on affect/emotional quality of designs. Objects, interfaces, environments. Digitally mediated experiences.

DES 3196 Field Study: National or International (1.0-10.0 cr.; A-F or Audit) Faculty-directed field study in national or international setting.

DES 3201 Career and Internship Preparation for Design (1.0 cr.; A-F Grade Basis; prereq Soph or Jr or 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 (3.0 cr.; A-F or Audit) 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 typography, calligraphy, and letterpress printing.

DES 3321 Furniture Design: Exploration (3.0 cr.; A-F or Audit) Furniture design as discipline, not as method. Material. Objects that mediate our environment. History, design criteria, technology, craft. Group case study, research presentation, individual making/presenting of concept prototype.

DES 3331 Street Life Urban Design Seminar (3.0 cr.; A-F Grade Basis) 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.

DESI 3341 (un)Wrapping It Up: New Materials for Design, Design for New Materials (3.0 cr.; A-F or Audit)
New high-tech fabrics, foils, electrotexs, and intelligent textiles 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/connected projects.

DESI 3351 Phenomenon of Everyday Design (3.0 cr.; A-F or Audit)
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.

DESI 3361 History of Modern Design (3.0 cr.; A-F or Audit)
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.

DESI 4160 Topics in Design (1.0-4.0 cr.; A-F Grade Basis)
In-depth investigation of a single specific topic, announced in advance.

DESI 4165 Design and Globalization (3.0 cr.; A-F or Audit; prereq Grad student or Sr or Jr)
Movement of people, products, and ideas. Challenges brought by differences among us.

DESI 4193 Directed Study in Design (1.0-6.0 cr.; A-F Grade Basis; prereq %)
Directed Study in Design

DESI 4301 Metaphor and Design (3.0 cr.; A-F or Audit; prereq Grad student minor)
Students share ideas/conclusions/create summary statement (e.g., document, multimedia display, designed object) of significant learning insight.

DESI 5160 Topics in Design (1.0-4.0 cr.; A-F Grade Basis)
Topics in design

DESI 5165 Design and Globalization (3.0 cr.; A-F or Audit; prereq Grad student or Sr or Jr)
Movement of people, products, and ideas. Challenges brought by differences among us.

DESI 5168 Evidence-Based Design (3.0 cr.; A-F or Audit; prereq CDES grad student or #)
Origins of evidence-based design/possible benefits and detractors. Students learn various components as a process/ explore methods of integrating process via application to a design project in their area of expertise. Process, impact, influences, and anticipated outcomes are documented/ analyzed as compared to a typical design process approach.

DESI 5170 Topics in Design (1.0-4.0 cr.; A-F or Audit)
In-depth investigation of single specific topic, announced in advance.

DESI 5180 Split Rock Arts Topics (1.0-2.0 cr.; A-F or Audit)
In-depth investigation of a specific topic, announced in advance.

DESI 5185 Human Factors in Design (3.0 cr.; A-F or Audit; prereq Grad student or Sr or #)
Theories/methods that influence the assessment of physical, social, and psychological human factors. Development of user needs with application to designed products that interact with human body.

DESI 5193 Directed Study in Design (1.0-6.0 cr.; A-F Grade Basis; prereq %)
Directed Study in Design

DESI 5196 Field Study: National/International (1.0-10.0 cr.; A-F or Audit)
Faculty-directed field study in a national or international setting.

Doctor of Dental Surgery (DDS)
School of Dentistry

DDS 3111 Introduction to Oral Health and Oral Health Disparity (2.0 cr.; A-F Grade Basis; prereq Students must be part of the SEAM program)
Role of oral health in achieving general health, common oral diseases, oral health disparities, and dentistry as a career option.

Dutch (DTC)
College of Liberal Arts

DTC 1001 Beginning Dutch (5.0 cr.; Student Option)
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.).

DTC 1002 Beginning Dutch (5.0 cr.; Student Option; 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.

DTC 1003 Intermediate Dutch (5.0 cr.; Student Option; 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.

DTC 1004 Intermediate Dutch (5.0 cr.; Student Option; 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.

DTC 3011W Conversation and Composition (3.0 cr.; Student Option; prereq 1004 or 4004 or #)
Practice/refinement of spoken/written Dutch. Composition, vocabulary. Reading, viewing, and discussion of Dutch/Flemish media reports. Grammar review, critical corrective grammatical skills.

DTC 3012 Conversation and Composition (3.0 cr.; Student Option; prereq 3011 or 4011)
Practice/refinement of spoken/written Dutch. Compositional skills, vocabulary. Reading, viewing, and discussion of Dutch/Flemish media reports. Grammar review, development of critical corrective grammatical skills.

DTC 3310 Studies in Dutch Literature (3.0 cr.; Student Option; 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.

DTC 3510 Topics in Dutch Culture (3.0 cr.; Student Option; 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.

DTC 3610 Dutch Literature in Translation (3.0 cr.; Student Option; 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.

DTC 3993 Directed Studies (1.0-5.0 cr.; Student Option; prereq #, %, @)
Guided reading in or study of Dutch literature, culture, or advanced language skills.

DTC 4001 Beginning Dutch (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1001. See Dtc 1001 for description.

DTC 4002 Beginning Dutch (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1002. See 1002 for description.

DTC 4003 Intermediate Dutch (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1003. See 1003 for description.

DTC 4004 Intermediate Dutch (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student)
Meets concurrently with 1004. See 1004 for description.

DTC 4011 Conversation and Composition (2.0 cr.; Student Option; prereq Grad student)
Meets with 3011W. See 3011W for description.

DTC 4012 Conversation and Composition (2.0 cr.; Student Option; prereq Grad student)
Meets with 3012. See 3012 for description.

DTC 5993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #, %, @)
Guided individual reading or study.

Earth Sciences (ESCI)
Institute of Technology

ESCI 1001 Earth and Its Environments (4.0 cr.; Student Option)

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
ESCI 1003 Dinosaur Evolution, Ecology, and Extinction: Introduction to the Mesozoic World (3.0 cr.; Student Option)
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.

ESCI 1005 Geology and Cinema (4.0 cr.; Student Option)
Physical processes shaping the Earth, materials it comprises, its nearly five billion year history as told spectacularly, but often wrongly, by Hollywood movies.

ESCI 1006 Oceanography (4.0 cr.; Student Option)
How various processes in the ocean interact. Marine biology, waves, tides, chemical oceanography, marine geology, human interaction with sea.

ESCI 1901 Freshman Seminar: Environment (1.0-3.0 cr.; A-F or Audit; prereq freshman)
Topics vary. See Class Schedule.

ESCI 1905 Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq freshman)
Topics vary; see Class Schedule.

ESCI 1906W Freshman Seminar: Writing Intensive and Environmental Theme (1.0-3.0 cr.; A-F or Audit; prereq freshman)
Topics vary; see freshman seminar topics.

ESCI 2201 Solid Earth Dynamics (4.0 cr.; A-F or Audit; prereq &PHYS 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.

ESCI 2202 Earth History (4.0 cr.; A-F Grade Basis; prereq [2201, 2301] or #)

ESCI 2203 Earth Surface Dynamics (4.0 cr.; A-F or Audit)
Earth's surface processes, drivers, and implications. Interactions between atmosphere, lithosphere, hydrosphere, and biosphere.

ESCI 2206 Marine Geology (4.0 cr.; A-F or Audit)

ESCI 2301 Mineralogy (3.0 cr.; Student Option; prereq [CHEM 1061, &CHEM 1065, &MATH 1271] or #)
Crystallography, crystal chemistry, physics. Physical/chemical properties, crystal structures, chemical equilibria of major mineral groups. Lab includes crystallographic, polarizing microscope, X-ray powder diffraction exercises, and hand specimen mineral identification.

ESCI 2302 Petrology (3.0 cr.; Student Option; prereq 2201 or #)
Magmatic and metamorphic processes, with an emphasis on plate tectonic interpretation of rock sequences.

ESCI 3001 Earth Materials (3.0 cr.; Student Option)
Common rocks/minerals and their geologic settings. Properties of these materials as basis for identification/use in industry/society.

ESCI 3002 Climate Change and Human History (3.0 cr.; A-F or Audit)
Causes of long-/short-term climate change. Frequency/magnitude of past climate changes; their geologic records. Relationship of past climate changes to development of agrarian societies and to shifts in power among kingdoms/city-states. Emphasizes last 10,000 years.

ESCI 3005 Earth Resources (3.0 cr.; Student Option)

ESCI 3006 Planets of the Solar System (3.0 cr.; Student Option)

ESCI 3093 Problems in Earth Sciences: Junior (1.0-4.0 cr.; Student Option; prereq #)
Problems in earth sciences studied independently under the direction of a faculty member.

ESCI 3202 Fluid Earth Dynamics (4.0 cr.; Student Option; prereq &2201)
Dynamics of fluid Earth, mainly surface processes and convection.

ESCI 3303W Geochemical Principles (4.0 cr.; Student Option; prereq [CHEM 1061, &CHEM 1065] or #)

ESCI 3402 Science and Politics of Global Warming (3.0 cr.; Student Option)

ESCI 3425 Atmospheric Composition and Chemistry (3.0 cr.; A-F or Audit; prereq [CHEM 1062, &CHEM 1066, &MATH 1271 or equiv), PHYS 1101] or #; ESM 1425/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, water; greenhouse effect; aerosols; ozone hole; oxidizing power of the atmosphere; smog.

ESCI 3870 Modeling Workshop (1.0 cr.; Student Option; prereq Geo or Geophys or GeoEng major or #)
Modeling of geologic or geophysical systems.

ESCI 3880 Laboratory Workshop (1.0 cr.; Student Option; prereq Geo or ESci or GeoEng major or #)
Geologic or geophysical lab study.

ESCI 3890 Field Workshop (1.0 cr.; Student Option; prereq [Geo or ESci or GeoEng] major or #)
Earth sciences field study.

ESCI 3891 Field Methods (1.0 cr.; A-F Grade Basis)
Methods in geologic field mapping.

ESCI 3911 Introductory Field Geology (4.0 cr.; A-F or Audit; prereq 2201, 3891, #)
ESCI 4010 Undergraduate Seminar: Current Topics in Earth Sciences (1.0-4.0 cr.; Student Option; prereq #)
Topics in earth sciences investigated in a seminar format.

ESCI 4093 Problems in Earth Sciences:
Senior (1.0-4.0 cr.; Student Option; prereq #)
Seniors engage in independent research under faculty supervision.

ESCI 4094 Senior Thesis (2.0 cr.; Student Option; prereq Sr, Geo or ESci major, #)
Senior-level majors engage in independent research under faculty supervision. Select problems according to individual interests and in consultation with faculty committee. Thesis and oral defense.

ESCI 4102W Vertebrate Paleontology: Evolutionary History and Fossil Records of Vertebrates (3.0 cr.; A-F or Audit; prereq 1001 or 1002 or Biol 1001 or Biol 1002 or Biol 1009 or #)
Vertebrate evolution (exclusive of mammals) in phylogenetic, temporal, functional, and paleoecological contexts. Vertebrate anatomy. Methods in reconstructing phylogenetic relationships and origin/history of major vertebrate groups, from Cambrian Explosion to modern diversity of vertebrate animals.

ESCI 4103W Fossil Record of Mammals (3.0 cr.; A-F or Audit)

ESCI 4203 Principles of Geophysical Exploration (3.0 cr.; Student Option; prereq Phys 1302)
Seismic exploration (reflection and refraction); potential techniques (gravity and magnetics) and electrical techniques of geophysical exploration.

ESCI 4204 Geomagnetism and Paleomagnetism (3.0 cr.; Student Option; prereq 2201, Phys 1302, Math 1272 or #)
Present geomagnetic field at the Earth's surface, secular variation, geomagnetic field reversals. Physical and chemical basis of paleomagnetism: origin of natural remanent magnetization, mineralogy of magnetic minerals, magnetic polarity stratigraphy, apparent polar wander, and environmental magnetism.

ESCI 4211 Solid Earth Geophysics I (3.0 cr.; A-F or Audit; prereq 2201, Phys 1302)
Basic elasticity, basic seismology, and physical structure of the Earth's crust and deep interior.

ESCI 4212 Solid Earth Geophysics II (3.0 cr.; A-F or Audit; prereq 2201, Phys 1302)
Dynamics of the solid Earth, mostly mantle and core; seismic tomography, geothermal measurements, gravity, time-dependent deformation of the Earth, computer modeling.

ESCI 4401 Aqueous Environmental Geochemistry (3.0 cr.; Student Option; prereq Chem 3501 or #)

ESCI 4402 Biogeochemical Cycles in the Ocean (3.0 cr.; Student Option; prereq [CHEM 1002, CHEM 1003 or #]
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.

ESCI 4403 Atmosphere, Oceans, and the Climate System (3.0 cr.; Student Option; prereq CHEM 1022, MATH 1372, PHYS 1302)
Dynamics/biogeochemistry. Modern processes that determine transport of water, energy, and trace materials within/between atmosphere and oceans. Climate models, their sensitivity to natural/anthropogenic forcings.

ESCI 4501 Structural Geology (3.0 cr.; Student Option; prereq 2201, 2302)
Fundamental concepts related to deformation of the Earth's crust. Processes associated with deformation, faulting, folding, fabric development. Lab/recitation include solving problems, conducting physical/numerical experiments. Field trips.

ESCI 4502 Tectonic Styles (3.0 cr.; Student Option; 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.

ESCI 4503 Neotectonics (3.0 cr.; Student Option; prereq 4501 or #)
Integration of diverse elements of geology, geodesy, and geophysics to examine recent and active tectonics of the Earth's lithosphere; extensional, compressional and wrench tectonic regimes with case studies around the world; modern global plate motions, geodetic techniques, seismic anisotropy, climatically driven tectonics.

ESCI 4602 Sedimentology and Stratigraphy (3.0 cr.; Student Option; prereq [2203, 2301] or #)
Interpretation of origin of sedimentary rocks through application of basic physical/chemical principles. Modern depositional environments, petrographic microscopy, basin dynamics, stratigraphy.

ESCI 4701 Geomorphology (3.0-4.0 cr.; Student Option; prereq 1001, Math 1031 or #)
Origin, development, and continuing evolution of landforms in various environments. Environmental implications. Weathering, slope and shore processes, fluvial erosion and deposition, and region processes, glacial processes.

ESCI 4702 General Hydrogeology (3.0 cr.; Student Option; prereq [CHEM 1062, CHEM 1066, MATH 1271, PHYS 1201] or #)

ESCI 4703 Glacial Geology (4.0 cr.; Student Option; prereq 1001 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.

ESCI 4801 Geomicrobiology (3.0 cr.; Student Option; prereq One semester college level biology)
Geosphere/biosphere interactions over temporal/spatial scales. Global biogeochemical cycling, microbe-metal interactions, microbial paleobiology, environmental geomicrobiology, life detection, habitability of planets.

ESCI 4911 Advanced Field Geology (4.0 cr.; A-F or Audit; prereq 3911, #)
Geologic mapping; study of igneous, metamorphic, and sedimentary rocks; structures and surficial features; problem solving. Paper required.

ESCI 4971W Field Hydrogeology (4.0 cr.; Student Option; prereq #)

ESCI 5102 Climate Change and Human History (3.0 cr.; Student Option; 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.

ESCI 5201 Time-Series Analysis of Geological Phenomena (3.0 cr.; A-F or Audit; prereq Math 2263 or #)
Time-series analysis of linear and nonlinear geological 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.

ESCI 5203 Mineral and Rock Physics (3.0 cr.; Student Option; prereq 2201, Phys 1302)
Physical properties of minerals and rocks as related to the composition and dynamics of the Earth's crust, mantle, and core.

ESCI 5204 Geostatistics and Inverse Theory (3.0 cr.; Student Option; prereq Stat 3011 or #)
ESCI 5205 Fluid Mechanics in Earth and Environmental Sciences (3.0 cr.; Student Option; prereq MATH 2263 or #)

ESCI 5302 Isotope Geology (3.0 cr.; A-F or Audit; prereq 3303W or #)
Theory and uses of radiogenic, radiogenic, and stable isotopes in geology. Radiocative dating, geochronometry, and tracer techniques in geologic processes.

ESCI 5351 Geochemical Modeling of Aqueous Systems (3.0 cr.; Student Option; prereq 4401)
Using mass transfer reaction path models to assess chemical evolution of natural fluids, hydrothermal alteration processes, and formation of hydrothermal ore deposits.

ESCI 5353 Electron Microprobe Theory and Practice (3.0 cr.; Student Option; prereq [One yr chem, one yr physics] or #)
Characterizing solid materials with electron beam instrumentation, including reduction of X-ray data to chemical compositions.

ESCI 5402 Science and Politics of Global Warming (3.0 cr.; Student Option)

ESCI 5502 Advanced Structural Geology (3.0 cr.; Student Option; prereq 4501 or #)

ESCI 5503 Advanced Petrology (3.0 cr.; Student Option; prereq 2302, CHEM 1061, CHEM 1065, [MATH 1372 or MATH 1272 or MATH 1572])
Quantitative approach to modern igneous/metamorphic petrology. Emphasizes thermodynamics of minerals/melts and with applications to phase diagrams, thermobarometry, melting relationships, and energetics of petrologic mass transfer.

ESCI 5601 Advanced Sedimentology (4.0 cr.; Student Option; prereq 4602 or #)
Modern techniques of sedimentary basin analysis focusing on interactions among the lithosphere, atmosphere, and hydrosphere. Sedimentary facies of modern and ancient systems, petrology of clastic and carbonate deposits, tectonic and paleoclimatic interpretations, palaeocurrent analysis, diagenetic effects on subsurface fluid flow, and volcanic sedimentation.

ESCI 5705 Limnogeology and Paleoenvironment (3.0 cr.; Student Option; 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.

ESCI 5713 Tracers and Karst Hydrogeology (3.0 cr.; Student Option; prereq 5701, #)
Karst hydrogeology and application of tracers to determine source, age, and mixing parameters of water in various natural reservoirs. Physical and chemical principles and processes operating in karst hydrogeology; use of natural and synthetic chemical and isotopic labels or tracers to follow movement and mixing of water through hydrologic cycle.

ESCI 5791 Field Hydrogeology (2.0 cr.; Student Option)

ESCI 5980 Seminar: Current Topics in Earth Sciences (1.0-4.0 cr.; S-N or Audit)
Topics in earth sciences investigated in a seminar format.

**East Asian Studies (EAS)**
College of Liberal Arts

EAS 3013 Introduction to East Asian Art (3.0 cr.; Student Option)
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 3211 East Asia (3.0 cr.; Student Option)
Physical and human geography of Japan, mainland China and Taiwan, North and South Korea; population pressure, economic and urban development, and international relations.

EAS 3461 Introduction to East Asia I: The Imperial Age (3.0-4.0 cr.; Student Option)
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 (3.0-4.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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) (3.0 cr.; Student Option)

EAS 3473 Family, School, and Work in Modern Japanese History (3.0 cr.; Student Option)
Impact of economic, social, and cultural change on males and females in the family, the education system, the employment system from the 17th through 20th centuries.

EAS 3479 History of Chinese Cities and Urban Life (3.0-4.0 cr.; A-F or Audit)
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.

EAS 3940 Topics in Asian History (1.0-4.0 cr.; Student Option; prereq Jr or sr or #)
Selected topics in Asian history not covered in regular courses.

EAS 3970 Supplemental Discussion in East Asian Studies (1.0 cr.; Student Option; prereq 3xxx course)
Extra discussion session with T.A.

EAS 4473 Chinese Politics (3.0 cr.; Student Option)
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.

EAS 5940 Topics in Asian History (1.0-4.0 cr.; Student Option; prereq Advanced undergrad or grad or #)
Selected topics such as cultural, economic, intellectual, political, and social history.

**Ecology, Evolution, and Behavior (EEB)**
College of Biological Sciences

EEB 3001 Ecology and Society (3.0 cr.; A-F or Audit; prereq [Jr or sr] recommended; biological sciences students may not apply cr toward major)

EEB 3002 Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr.; A-F or Audit)
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 developmental theory. How physiology, development, behavior, and ecology coordinate/coevolve in humans.

EEB 3603 Science, Protection, and Management of Aquatic Environments (3.0 cr.; Student Option; 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.

EEB 3963 Modeling Nature and the Nature of Modeling (3.0 cr.; Student Option; prereq [Math 1281, Math 1282] or equiv or #)
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 running the models.

EEB 4068 Plant Physiological Ecology (3.0 cr.; Student Option No Audit; 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 (4.0 cr.; A-F or Audit; prereq Biol 1001 or Biol 2012)
Evolutionary and biogeographic history of mammals. Recognize, identify, and study natural history of mammals at the ordinal level, North American mammals at familial level, and mammals north of Mexico at generic level.

EEB 4134 Introduction to Ornithology (4.0 cr.; Student Option; prereq Biol 1001 or Biol 2012)
Structure, evolution, classification, distribution, migration, ecology, habitats, identification of birds. Lecture, lab, weekly field walks. One weekend field trip.

EEB 4329 Primate Ecology and Social Behavior (3.0 cr.; A-F or Audit; prereq BIOL 1009 or BIOL 2002 or BIOL 3411 or ANTH 1001 or #)

Mechanisms of signal production and perception, signal propagation, whether and how signals can convey information, and how signalers, their signals, and receivers are adapted for communication by natural and sexual selection.

EEB 4609W Ecosystem Ecology (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 4793W Directed Studies: Writing Intensive (1.0-7.0 cr.; S-N or Audit; prereq #, %)
Individual study on selected topics or problems. Emphasizes readings, use of scientific literature. Written report.

EEB 4794W Directed Research: Writing Intensive (1.0-6.0 cr.; S-N or Audit; prereq #, %)
Laboratory or field investigation of selected areas of research, including written report.

EEB 4811 Biogeochemical Processes (4.0 cr.; A-F or Audit; prereq CHEM 2301, [PHYS 1201 or #])
Application of biochemistry, ecology, chemistry, physics to global biogeochemical cycles. Human impacts on biogeochemical cycles.

EEB 4817 Vertebrate Ecology (4.0 cr.; A-F Grade Basis; prereq Beginning biology)
Field studies on vertebrate populations, their relationships to local environments, habitat analysis, and ecological research methods. Students work individually or in teams to investigate behavioral/ecological aspects of selected vertebrates. Lectures, field trips.

EEB 4839 Field Studies in Mammalogy (4.0 cr.; A-F or Audit; prereq College-level biology course that includes study of animals or #)
Techniques for studying small mammals. Lectures/field projects emphasize identification, distributions, community interactions, ecophysiology, population ecology.

EEB 4842 Arctic Field Ecology (4.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; prereq One semester college biology or #)
Biology of breeding birds through use of field techniques at Itasca Biological Station/Laboratories. Daily fieldwork emphasizes identification, behavioral observations, netting/censusing.

EEB 4993 Directed Studies (1.0-7.0 cr.; S-N or Audit; prereq #, %)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature.

EEB 4994 Directed Research (1.0-6.0 cr.; S-N Grading Basis; prereq #, %)
Laboratory or field investigation of selected areas of research.

EEB 5042 Quantitative Genetics (3.0 cr.; A-F Grade Basis; 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.

EEB 5053 Ecology: Theory and Concepts (4.0 cr.; Student Option; prereq Biol 3407 or #)
Classical and modern mathematical theories of population growth, interspecific interactions, ecosystem dynamics and functioning, with emphasis on underlying assumptions and on effects of added biological reality on robustness of predictions, stability, interspecific interactions, ecosystem structure and functioning.

EEB 5068 Plant Physiological Ecology (3.0 cr.; Student Option No Audit; prereq BIOL 2022 or BIOL 3002 or BIOL 3407 or BIOL 3408W or #)
Plant function, its plasticity/diversity in ecological context. Impact of environmental stresses on major physiological processes of plants, including photosynthesis, respiration, water uptake/transport, and nutrient uptake/assimilation. Lab, field trip to Cedar Creek.

EEB 5146 Science and Policy of Global Environmental Change (3.0 cr.; A-F or Audit; prereq Biol 3407 or BIOL 3408W or #)

EEB 5221 Molecular Evolution (3.0 cr.; A-F or Audit; prereq [BIOL 4003 or GCD 3022], grad student! or #)
Molecular basis of evolutionary change. Selection, neutral evolutionary processes at molecular level. Evolution from gene to genome level: protein structure/function, multigene families, organelle genomes, genome organization. Lectures, current literature, workshops.

EEB 5322 Evolution and Animal Cognition (3.0 cr.; Student Option; prereq Biol 3411 or Psy 3061 or #)
of data. Controversial topics such as animal intelligence, animal language and whether non-human animals have a “theory of mind.”

EEB 5323 Neural and Endocrine Mechanisms Underlying Vertebrate Behavior (2.0 cr.; A-F or Audit; prereq Biol 3411 or Biol 3101 or NSE 3101 or Phyl 3101 or #) Selected aspects of the physiological basis of vertebrate behavior with emphasis on neural and endocrine integration and the effects of evolutionary pressures on it. Hormones and sex behavior, sensory perception, neuroethology of communication.

EEB 5371 Principles of Systematics (3.0 cr.; Student Option; prereq Grad student or #) Theoretical/practical procedures of biological systematics. Phylogeny reconstruction. Computer-assisted analyses, morphological and molecular approaches, species concepts/speciation, comparative methods, classification, historical biogeography, nomenclature, use/value of museums.

EEB 5601 Limnology (3.0 cr.; Student Option; prereq Grad student or #) Advanced introduction to description/analysis of interaction of physical, chemical, and biological factors that control functioning of life in lakes and other freshwater aquatic environments.

EEB 5605 Limnology Laboratory (2.0 cr.; A-F or Audit; prereq 3603 or #) Field/lab methods to obtain information on environmental conditions in aquatic environments and measure abundance of aquatic organisms, especially plankton. Field/lab instruments, sampling devices, microscopy, water chemistry, data analysis.

EEB 5609 Ecosystem Ecology (3.0 cr.; Student Option; prereq [Biol 3407 or Biol 5407] 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 5963 Modeling Nature and the Nature of Modeling (3.0 cr.; Student Option; prereq [Math 1281, Math 1282] or equiv or #) 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.


ECON 1902 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

ECON 1903 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

ECON 1904 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

ECON 1905 Freshman Seminar (3.0 cr.; A-F Grade Basis; prereq freshman) Topics specified in Class Schedule.

ECON 1910W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

ECON 3101 Intermediate Microeconomics (4.0 cr.; Student Option; prereq [[1101, 1102] or equiv], [MATH 1271 or equiv]) Behavior of households, firms, and industries under competitive/monopolistic conditions. Factors influencing production, price, and other decisions. Applications of theory. Economic efficiency. Distribution of well-being.

ECON 3101H Honors Course: Intermediate Microeconomics (4.0 cr.; A-F Grade Basis; 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 3102 Intermediate Macroeconomics (4.0 cr.; Student Option; prereq 3101 or equiv) Determinants of national income, employment, and price level; effects of monetary and fiscal policies; emphasis on a general equilibrium approach. Applications of the theory, especially to current macroeconomic policy issues.

ECON 3701 Money and Banking (3.0 cr.; Student Option; 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 3801 Elements of Public Economics (3.0 cr.; Student Option; prereq [1102 or equiv]; not open to Econ majors) Competing views on proper role of government in economy. Effects of tax/spending policies. Private agents’ response to government actions. Optimal policies. Applications primarily to U.S. federal government.

ECON 3951 Major Project Seminar (2.0 cr.; A-F Grade Basis; prereq 3101, 3102, STAT 3011, [STAT 3022 or equiv], two [3xxx or 4xxx ECON courses at least one 4xxx ECON writing intensive course, freshman writing requirement satisfied]) 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 (3.0 cr.; Student Option; prereq [1101, 1102] or equiv) Topics specified in Class Schedule.

ECON 3991 Independent Study (1.0-3.0 cr.; A-F or Audit; prereq 3101, 3102, %) Students confirm topic of study with faculty supervisor or with director of undergraduate studies before beginning (otherwise no credit).

ECON 3993 Directed Studies (1.0-3.0 cr.; Student Option; prereq 3101, 3102, 4261, two semesters of statistics) Guided individual reading or study in areas not available in regular course offerings.

ECON 4033 Current Economic Issues (3.0 cr.; Student Option; prereq 3101, 3102 or equiv) Current controversies over economic policies used deal with some economic problems. Students focus in part on a specific issue. Different economic issues are discussed every time the course is offered (every three years).

ECON 4100W Undergraduate Writing in Economics (1.0 cr.; A-F or Audit; prereq 3101, [34831 or & economics honors course], freshman writing practice completed, #) Research essay.

ECON 4109H Honors Course: Game Theory and Applications (4.0 cr.; A-F Grade Basis; prereq [3101, 3102] or equiv), [MATH 1271, MATH 1272] or equiv) Games. Normal form, extensive form. Wars of attrition. Games of timing. Bargaining applications in industrial organization, macroeconomics, and international economics.

ECON 4113 Introduction to Mathematical Economics (4.0 cr.; Student Option; prereq [[3101, 3102] or equiv], [[MATH 1271, MATH 1272, MATH 2243] or equiv]) Development of selected models of economic behavior in mathematical terms. Topics selected to illustrate advantages of mathematical formulation.

ECON 4161 Microeconomic Analysis (2.0 cr.; Student Option; prereq 3101, 3102, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], %) Theories of consumer demand, producer supply, and market equilibrium. General equilibrium and welfare. May include topics such as externalities, economics of information/uncertainty. Seven-week course. Meets with 8001.

ECON 4162 Microeconomic Analysis (2.0 cr.; A-F or Audit; prereq 3101, 3102, 4161, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], %) 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 8002.

ECON 4163 Microeconomic Analysis (2.0 cr.; Student Option; prereq 3101, 3102, 4162, MATH 2243, MATH 2263, [[STAT 4101, STAT 4102] or equiv], %) 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** (2.0 cr.; Student Option; prereq 3101, 3102, 4163, MATH 2243, MATH 2263, [STAT 4101, STAT 4102] or equiv), %

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 4165 Macroeconomic Theory** (2.0 cr.; Student Option; prereq 3101, 3102, 4165, MATH 2243, MATH 2263, [STAT 4101, STAT 4102] or equiv), %

Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, and prices. Seven-week course. Meets with 8105.

**ECON 4166 Macroeconomic Theory** (2.0 cr.; Student Option; prereq 3101, 3102, 4166, MATH 2243, MATH 2263, [STAT 4101, STAT 4102] or equiv), %

Dynamic general equilibrium models: solving for paths of interest rates, consumption, investment, and prices. Seven-week course. Meets with 8106.

**ECON 4167 Macroeconomic Theory** (2.0 cr.; Student Option; prereq 3101, 3102, 4167, MATH 2243, MATH 2263, [STAT 4101, STAT 4102] or equiv), %


**ECON 4168 Macroeconomic Theory** (2.0 cr.; Student Option; prereq 3101, 3102, 4168, MATH 2243, MATH 2263, [STAT 4101, STAT 4102] or equiv), %


**ECON 4171 History of Economic Thought** (3.0 cr.; Student Option; prereq [3101, 3102] or equiv), %


**ECON 4211 Principles of Econometrics** (4.0 cr.; Student Option; prereq [[1101, 1102] or equiv], [MATH 2243 or equiv], [STAT 3021, STAT 3022] or equiv), familiarity with computers


**ECON 4261 Introduction to Econometrics** (4.0 cr.; A-F or Audit; 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 models. Material may include panel data, censored/truncated regressions, discrete choice models.

**ECON 4301 Economic Development** (3.0 cr.; Student Option; prereq [[1101, 1102] or equiv], non-econ major)


**ECON 4307 Comparative Economic Systems** (3.0 cr.; Student Option; prereq 1101, 1102 or equiv; not open to Econ majors)

Functions of economic systems; market economy vs. centrally planned economy. Post-socialist transitions in Eastern Europe, Russia, and China and reforms undertaken. Initial conditions, targeted strategies for reforms; results of reforms in terms of key economic indicators.

**ECON 4311 Economic Theory of Latin America** (3.0 cr.; Student Option; prereq [1101, 1102] 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** (3.0 cr.; Student Option; prereq [1101, 1102] or equiv)


**ECON 4315 The Japanese Economy** (3.0 cr.; Student Option; prereq [1101, 1102] or equiv)


**ECON 4331W Economic Development** (3.0 cr.; Student Option; prereq [3101, 3102] or equiv)

Completion of freshman writing practice.

**ECON 4337 Comparative Economic Systems** (3.0 cr.; Student Option; prereq 3101, 3102 or equiv)


**ECON 4338W Economic Integration of the Americas** (3.0 cr.; Student Option; 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 4339 International Trade** (4.0 cr.; Student Option; prereq 3101, 3102 or equiv, Math 1271, completion of freshman writing practice)


**ECON 4341W International Finance** (3.0 cr.; Student Option; 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 macroeconomics.

**ECON 4351 Labor Economics** (3.0 cr.; Student Option; prereq 3101, 3102 or equiv)

Economic analysis of labor markets and their operations; population and labor force; labor market institutions; wage and employment theories; unions and collective bargaining; public policy.

**ECON 4362 Urban Economics** (3.0 cr.; Student Option; prereq [3101, 3102] or equiv or [3101, 3102] or equiv)


**ECON 4363 Industrial Organization and Antitrust Policy** (3.0 cr.; Student Option; prereq 3101 or equiv)

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

ECON 4741H Honors Course: Industrial Organization and Antitrust Policy (4.0 cr.; Student Option; prereq 3101 or equiv)

ECON 4721 Money and Banking (3.0 cr.; Student Option; prereq [3101, 3102] 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 (4.0 cr.; Student Option; 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 Federal Reserve system. Monetary policy.

ECON 4731 Macroeconomic Policy (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq [3101, 3102] or equiv; Math 1271; honors) Monetary vs. fiscal policy debate in context of the underlying macroeconomic theory controversy. Comparison of Keynesian, Monetarist, and Classical theories. Rational expectations, policy ineffectiveness, time inconsistency, rules versus discretion, budget deficits. Unemployment and inflation.

ECON 4741 Quantitative Analysis of the Macroeconomy (3.0 cr.; A-F Grade Basis; prereq [[3101, 3102] or equiv], [Stat 3011 or equiv])

ECON 4741H Honors: Quantitative Analysis of the Macroeconomy (4.0 cr.; Student Option; prereq [3101, 3102] or equiv), [Stat 3011 or equiv])

ECON 4751 Financial Economics (3.0 cr.; Student Option; prereq [3101 or equiv], [MATH 2171 or equiv], one sem statistics)

ECON 4751H Honors Course: Financial Economics (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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; optimal policies. Applications primarily to U.S. government.

ECON 4851 Cost-Benefit Analysis (3.0 cr.; Student Option; prereq 3101 or equiv)

ECON 4960 Topics in Economics (3.0 cr.; A-F Grade Basis; prereq [3101, 3102 or equiv, MATH 1271])
Topics specified in Class Schedule.

ECON 4960H Advanced Topics in Economics Honors (4.0 cr.; A-F Grade Basis; prereq [[3101, 3102] or equiv], MATH 1271; may change based on topic)
Topics specified in Class Schedule.

ECON 4993 Directed Study (1.0-4.0 cr.; Student Option; prereq %)
Guided individual reading or study in areas not available in regular course offerings.

ECON 5109 Game Theory for Engineers (3.0 cr.; A-F Grade Basis; prereq [Math 2283, 2373, 2374, 3283] or Math 4606, [M.S./Ph.D. student in engineering or comp sci or info tech or operations mgmt] or #)

ECON 5109H Game Theory for Engineers (4.0 cr.; A-F or Audit; 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 #; not for econ undergrads or PhD students])

ECON 5890 Economics of the Health-Care System (3.0 cr.; A-F or Audit; prereq 3101 or #)

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Education and Human Development (EDHD)
College of Education and Human Development

EDHD 1620 Current Topics: Strategies for Student Success (1.0 cr.; Student Option) For topics see Class Schedule.

EDHD 1701 Introduction to TRIO: Identity, Culture, and College Success (1.0 cr.; A-F Grade Basis; prereq TRIO student) How culture/identity play role in educational experience. Self-authorship skills to create educational/personal path that aligns with values/beliefs. Lecture, discussion, readings, activities.

EDHD 1920 CEHD Special Topics (1.0-3.0 cr.; Student Option) For topics, see Class Schedule.

EDHD 3001 Exploring the Teaching Profession I (2.0 cr.; A-F Grade Basis; prereq DirectTrack to Teaching program or @) Introduction to K-12 teaching as a profession. Culture of teaching, roles of teachers, student learning, multicultural/diverse students/contexts, societal influences. Volunteer experiences in Twin Cities.

EDHD 3002 Exploring the Teaching Profession II (2.0 cr.; A-F Grade Basis; prereq 3001, admission to DirectTrack 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 (1.0-12.0 cr.; Student Option; prereq #)
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 3300 Special Topics in Education and Human Development (1.0-6.0 cr.; Student Option)
Special topics in education/human development.

EDHD 5000 Cultures, Schools, and Communities (Human Relations) (1.0 cr.; A-F Grade Basis; prereq Enrolled in teacher initial licensure program)
Addressing social/cultural dimensions of education. Challenges/dilemmas facing contemporary educators. Speakers, simulations, presentations, professional learning communities, field assignments.

EDHD 5001 Learning, Cognition, and Assessment (3.0 cr.; Student Option; prereq MEd/initial licensure student or CLA music ed or preteaching major or #; psych course recommended)
Principles of learning, cognition, cognitive development, classroom management, motivation, instruction, assessment. Behaviorism, cognitive/social constructivism, human information processing theory. Intelligence, knowledge acquisition, reasoning skills, scholastic achievement, standardized testing, reliability/validity, student evaluation, performance assessment, portfolios.
EDHD 5003 Developmental and Individual Differences in Educational Contexts (2.0 cr.; A-F or Audit; prereq Jr 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 (2.0 cr.; A-F or Audit; prereq Teacher preparation program in [CEHD or music education or agriculture education or DirectTrack] 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 (2.0 cr.; A-F or Audit; prereq Jr 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 Audit; prereq [MEd/initial licensure or CLA music ed major or preteaching major or ]). Diverse educational technology in K-12 classrooms. Effective use of technology. Computer technologies used to stimulate personal productivity/communication and to enhance learning/learning processes.

EDHD 5008 Reading in the Content Areas for Initial Licensure Candidates (1.0-2.0 cr.; A-F Grade Basis; prereq Concurrent enrollment in licensure area methods course(s), enrolled in Initial Licensure Program, Internet access, basic understanding of [computer use, Web browsers, email, word processing software]). Web-based course. Fostering students’ reading related to learning from text.

EDHD 5009 Human Relations: Applied Skills for School and Society (1.0 cr.; A-F or Audit; prereq MEd/init 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 5010 Cultures, Schools, and Communities (Human Relations) (2.0 cr.; A-F Grade Basis; prereq Enrolled in initial licensure program) Addressing social/cultural dimensions of education. Challenges/dilemmas facing contemporary educators. Speakers, simulation, presentations, professional learning communities, field assignments.

EDHD 5013 Child and Adolescent Development for Teaching and Learning (1.0 cr.; A-F Grade Basis; prereq Enrolled in teacher initial licensure program) Attending to constant transitions/development in which children and adolescents negotiate their road to adulthood. How to foster learning/positive development.

EDHD 5014 Child and Adolescent Development for Teaching and Learning (2.0 cr.; A-F Grade Basis; prereq Enrolled in teacher initial licensure program) Attending to constant transitions/development in which children and adolescents negotiate their road to adulthood. How to foster learning/positive development.

EDHD 5015 Teaching Students with Special Needs in Inclusive Settings (1.0 cr.; A-F Grade Basis; prereq Enrolled in a teacher initial licensure program) Areas of exceptionally defined in federal/state regulations. Historical perspectives, definitions, etiology, characteristics, needs, and service delivery systems. Collaborating with special education personnel.

EDHD 5016 Teaching Students with Special Needs in Inclusive Settings (1.0-2.0 cr.; A-F Grade Basis; prereq Enrolled in teacher initial licensure program) Attending to constant transitions/development in which children/adolescents negotiate their road to adulthood. How to foster learning/positive development.

EDHD 5017 Academic Language and English Learners (1.0 cr.; A-F Grade Basis; prereq Enrolled in teacher initial licensure program) Working with English learners and other linguistically diverse students across content areas to develop academic language proficiency.

EDHD 5018 Academic Language and English Learners (1.0 cr.; A-F Grade Basis; prereq Enrolled in teacher initial licensure program) Working with English learners and linguistically diverse students across all content areas to develop academic language proficiency.

EDHD 5100 International Topics for Graduate Students (1.0-12.0 cr.; Student Option) Off-campus course. Topics from research exploration to academic/engagement activities. Delivered in international setting. Course requirements are determined by instructor(s) and reflect graduate-level rigor.

EDHD 5200 Special Topics: Professional Development for Educators (1.0-3.0 cr.; Student Option) Special topics course that permits offering a variety of research-based and scholarly content to meet the needs of educators from P-12 settings.

EDHD 5300 Special Topics in Education and Human Development (1.0-6.0 cr.; Student Option) Special topics in education and human development.

EPSY 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr) Interdisciplinary seminar. Topics specified in Class Schedule.

EPSY 3101 Creativity and Intelligence: an Introduction (3.0 cr.; Student Option No Audit) Classic/contemporary theories of creativity/intelligence, their development, implications for behavioral/social sciences and psychological/educational practices.

EPSY 3119 Learning, Cognition, and Assessment (3.0 cr.; A-F or Audit) Principles of learning, cognition, cognitive development, classroom management, motivation, instruction, and assessment. Topics: behaviorism, cognitive and social constructivism, human information processing theory, intelligence, knowledge acquisition, reasoning skills, scholastic achievement, standardized testing, reliability, validity, student evaluation, performance assessment, and portfolios.

EPSY 3123 Psychology of Multiculturalism in Education (3.0 cr.; A-F or Audit) Course critically examines social and cultural diversity in the United States, confronting social issues of poverty, handicappism, homophobia, racism, sexism, victim-blaming, violence, and so on, and presenting models for change. Students examine how and why prejudices develop.

EPSY 3123 Practicum: Service Learning, Psychology of Multiculturalism in Education (1.0-3.0 cr.; Student Option; prereq [3132 or 3132], #, enrollment in APECS minor) Thirty hours of service learning in multicultural communities. Students work with children, youth, or adults in ESL tutoring or after-school youth programs. Sensitivities/competencies related to multicultural issues in U.S. society.


EPSY 3301 Introduction to Educational Psychology (3.0 cr.; Student Option No Audit) History, current work. Future promise of educational psychology. Major topics in educational psychology. Focuses on interplay
between theory, empirical research, and practical applications.

EPSY 3302 Introduction to Communication Skills for Educational and Community Settings
(3.0 cr.; Student Option No Audit)
Working with diverse individuals/groups in educational/community settings.
Communication skills/concepts. Self-reflection on one's communication style.

EPSY 3303 Educational Psychology Undergraduate Research Practicum
(3.0 cr.; A-F or Audit; prereq 3264, minor in applied psychology for educational/community settings)
Supervised research experience. Students are matched with University faculty members and their research projects.

EPSY 4300 Special Topics in Educational Psychology
(1.0-3.0 cr.; Student Option)
Current issues in educational psychology or related coursework in areas not normally available through regular curriculum offerings.

EPSY 4613 Foundations of Special Education I
(3.0 cr.; A-F or Audit; prereq Child Development course or equiv)
Organization of educational programs/services for people with disabilities. First course for students seeking to become licensed in special education.

EPSY 5101 Intelligence and Creativity
(3.0 cr.; A-F or Audit)
Contemporary theories of intelligence and intellectual development and contemporary theories of creativity and their implications for educational practices and psychological research.

EPSY 5112 Knowing, Learning, and Thinking
(4.0 cr.; A-F or Audit)
Principles of human information processing, memory, and thought; mental operations in comprehension and problem solving; developing expertise and automaticity; emphasis on applied settings.

EPSY 5113 Psychology of Instruction and Technology
(3.0 cr.; A-F or Audit; Student Option)
Introduction to adult learning and instructional design. Application of core foundational knowledge to development of effective learning environments for adults. Topics include philosophy, learning theories, instructional models, development and experience, individual differences, evaluation, assessment, and technology.

EPSY 5114 Psychology of Student Learning
(3.0 cr.; A-F or Audit; Student Option)
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.

EPSY 5115 Psychology of Adult Learning and Instruction
(3.0 cr.; Student Option)
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.

EPSY 5119 Mind, Brain, and Education
(3.0 cr.; Student Option No Audit; prereq 3301 or equiv)
How educationally relevant skills/concepts develop in both typical/atypical children.

EPSY 5135 Human Relations Workshop
(4.0 cr.; Student Option)
Experiences addressing issues of prejudice and discrimination in terms of history, power, and social perception. Includes knowledge and skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, effective leadership, judgment and decision-making, prejudice reduction, conflict resolution.

EPSY 5142 Play in Development and Education
(3.0 cr.; A-F Grade Basis; prereq Courses 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 developmentally appropriate practice.*

EPSY 5151 Cooperative Learning
(3.0 cr.; Student Option)
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
(3.0 cr.; A-F Grade Basis; prereq Course in psychology)
Social development in educational settings, from preschool through high school.

EPSY 5157 Social Psychology of Education
(3.0 cr.; A-F or Audit)
Overview of social psychology and its application to education. Participants study the major theories, research, and major figures in field. Class sessions include lectures, discussions, simulations, role-plays, and experiential exercises.

EPSY 5191 Education of the Gifted and Talented
(3.0 cr.; A-F or Audit; Student Option)
Theories of giftedness, talent development, instructional strategies, diversity and technological issues, implications for educational practices and psychological inquiry, and international considerations.

EPSY 5200 Special Topics: Psychological Foundations
(1.0-4.0 cr.; Student Option)
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
(3.0 cr.; A-F or Audit; prereq 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 5220 Special Topics: Quantitative Methods
(1.0-4.0 cr.; Student Option)
Focus on special topics in methodological concepts involving theory, research, and practice in statistics, measurement, evaluation, and statistics education not covered in other courses.

EPSY 5221 Principles of Educational and Psychological Measurement
(3.0 cr.; Student Option)
Concepts, principles, and methods in educational/psychological measurement. Reliability, validity, item analysis, scores, score reports (e.g., grades). Modern measurement theories, including item response theory and generalizability theory. Emphasizes construction, interpretation, use, and evaluation of assessments regarding achievement, aptitude, interests, attitudes, personality, and exceptionality.

EPSY 5243 Principles and Methods of Evaluation
(3.0 cr.; Student Option)
Introductory course in program evaluation; planning an evaluation study, collecting and analyzing information, reporting results; overview of the field of program evaluation.

EPSY 5244 Survey Design, Sampling, and Implementation
(3.0 cr.; Student Option; prereq [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 5245 Advanced Survey Data Analysis
(3.0 cr.; Student Option; prereq 5244, 5261)
Practical course. Specific nature of survey data (typically categorical or ordinal). Appropriate data analytic methods.

EPSY 5246 Evaluation Colloquium: Psychological Foundations
(1.0 cr.; S-N or Audit; prereq 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
(3.0 cr.; Student Option; 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 5261 Introductory Statistical Methods
(3.0 cr.; Student Option)

EPSY 5262 Intermediate Statistical Methods
(3.0 cr.; Student Option; prereq 3264 or 5261 or equiv)

EPSY 5271 Becoming a Teacher of Statistics
(3.0 cr.; Student Option; prereq 5261 or equiv)
Current methods of teaching first courses in statistics. Innovative teaching methods, materials, and technological tools. Types of first courses, reform recommendations, goals for student learning, recommended
content, teaching methods, technology, student assessment.

**EPSY 5272 Statistics Teaching Internship**
(1.0-3.0 cr.; S-N Grading Basis; prereq Grad student, #)
Supervised teaching experience.

**EPSY 5281 Introduction to Computer Operations and Data Analysis in Education and Related Fields**
(3.0 cr.; Student Option; 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**
(1.0-9.0 cr.; Student Option)
Current issues in educational psychology or related areas not normally available through regular curriculum offerings.

**EPSY 5400 Special Topics in Counseling Psychology**
(1.0-4.0 cr.; Student Option)
Theory, research, and practice in counseling and student personnel psychology. Topics vary.

**EPSY 5401 Counseling Procedures**
(3.0 cr.; Student Option; 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 5415 Child and Adolescent Development and Counseling**
(4.0 cr.; A-F or Audit; prereq Grad student or MED student or K-12 [counseling endorsement or licensure] student)

**EPSY 5421 Leadership and Administration of Student Affairs**
(3.0 cr.; Student Option)
Theoretical approaches, administrative structure, and evaluation methods used in college/university student affairs.

**EPSY 5432 Foundations of Individual/Organizational Career Development**
(3.0 cr.; Student Option)
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 5451 College Students Today**
(3.0 cr.; Student Option)
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 5461 Cross-Cultural Counseling**
(3.0 cr.; A-F or Audit)

**EPSY 5604 Transition From School to Work and Community Living for Persons With Special Needs**
(3.0 cr.; Student Option)
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 5605 Collaborative Practices for the Special Educator**
(3.0 cr.; A-F Grade Basis; prereq Special Education licensure student or #)
Skills/knowledge required to consult/collaborate with school personnel, families, other professionals to maintain effective educational support.

**EPSY 5609 Family-centered Services**
(2.0 cr.; A-F or Audit)

**EPSY 5611 Research-based Practices in Academic and Behavior Disabilities**
(3.0 cr.; A-F Grade Basis)
Research that provides conceptual basis to aid in understanding of students with academic difficulties. Develop critical thinking skills through examination of research-based practices.

**EPSY 5612 Understanding of Academic Disabilities**
(3.0 cr.; A-F or Audit)
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 5614 Assessment and Due Process in Special Education**
(3.0 cr.; A-F or Audit; prereq 4613)
Assessment, planning, implementing educational programs for people with disabilities.

**EPSY 5615 Advanced Academic Interventions**
(3.0 cr.; A-F or Audit; prereq 5612)
Designing, implementing, and evaluating individual educational plans (IEPs) for special education service in learning disabilities, emotional/behavioral disorders, and mild mental/intellectual disabilities.

**EPSY 5616 Classroom Management and Behavior Analytic Problem Solving**
(3.0 cr.; Student Option)
Assumptions, procedures of problem solving approach to analyzing behavior/programs for classroom management. Conducting observations, intervening, evaluating behavioral change.

**EPSY 5617 Academic and Social Interventions for Students with Mild to Moderate Disabilities**
(3.0 cr.; A-F Grade Basis; prereq EPsy 5611 and 5613 or #)
Use problem solving model to make data-based decisions regarding implementation/evaluation of instruction for students with academic/behavioral difficulties.

**EPSY 5618 Specialized Interventions for Students With Mild/Moderate Disabilities in Reading & Written Language**
(3.0 cr.; A-F or Audit; prereq Enrollment in EBD or LD or DD or D/H 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 5619 Specialized Interventions in Mathematics for Students with Mild to Moderate Disabilities**
(3.0 cr.; A-F Grade Basis; prereq MthE 5855, Spec Ed licensure or grad student, #)

**EPSY 5621 Assessment and Instructional Design for Students with Developmental Disabilities**
(3.0 cr.; A-F or Audit; prereq 5613, 5614)
Methods/materials course. Functional/standards-based approaches to promoting academic learning in students with developmental disabilities.

**EPSY 5622 Programs and Curricula for Students with Developmental Disabilities**
(3.0 cr.; Student Option; prereq 5621 or [5661 and 5662])
Developing programs/curricula for students with moderate, severe, profound developmental delays, as well as severe multihandicapping conditions. Special consideration given to preparing children/youth for integrated community environments.

**EPSY 5624 Biomedical and Physical Impairments of Students with Developmental Disabilities**
(2.0 cr.; A-F or Audit)

**EPSY 5625 Education of Infants, Toddlers, and Preschool Children with Disabilities: Introduction**
(2.0 cr.; A-F or Audit)
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**
(3.0 cr.; Student Option; 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 5631 Module 1: Introduction to Augmentative and Alternative Communication (1.0 cr.; A-F Grade Basis) Terms/concepts related to augmentative/alternative communication. Myths/facts regarding AAC.

EPSY 5632 Module 2: Evidence-based Methods for AAC Assessment and Intervention (2.0 cr.; A-F Grade Basis; prereq 5631 or #) Evidence-based tools to conduct augmentative/alternative communication (AAC) assessments. AAC intervention plans. Data-driven strategies to evaluate progress.

EPSY 5633 Module 1: Speech-generating Devices and High-Tech AAC (1.0 cr.; A-F Grade Basis; prereq 5631 or #) Identifying, funding, customizing high-tech augmentative/alternative communication (AAC) interventions. Manufacturer/community resources. Data-driven strategies to evaluate progress.

EPSY 5636 Sensory Impairments of Students With Developmental Disabilities (2.0 cr.; Student Option; prereq 5613, 5614) Characteristics of learners with visual/auditory impairments. Design of instructional programs to remediate or circumvent disabilities, including use of prosthetic devices.

EPSY 5641 Foundations of Education for Individuals Who Are Deaf/Hard of Hearing (3.0 cr.; Student Option) 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 5646 Reading and Writing Practices with Deaf/Hard of Hearing Children (3.0 cr.; Student Option; prereq 5644 or general educ 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 (3.0 cr.; Student Option) 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 5649 Models of Instructional Programming With Deaf and Hard of Hearing Students (3.0 cr.; Student Option; prereq [5641, 5644] or #) Design/development of portfolios for various models of educational service delivery systems for individuals with hearing loss. Emphasizes consultation skills, curriculum management/modifications, materials/technology applications, and support service adaptations.

EPSY 5656 Social and Interpersonal Characteristics of Students with Disabilities (3.0 cr.; A-F or Audit) 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 Behavioral Problems in School Settings (3.0 cr.; A-F or Audit; prereq 5616, 5611) Comprehensive behavioral programs for students with social/emotional disabilities. Instructing students with social/emotional disabilities.


EPSY 5659 Assessment and Identification of Autism Spectrum Disorders (2.0 cr.; A-F Grade Basis; prereq 5661, Spec Ed grad or licensure student or #) Selection/use of assessment procedures that may be used to screen/identify children with autism spectrum disorders.

EPSY 5660 Social and Communicative Intervention Strategies for Individuals with Autism Spectrum Disorders (3.0 cr.; A-F Grade Basis; prereq 5661, Special Ed grad or licensure student or #) Intervention strategies designed to teach beginning communication/social skills to children with Autism Spectrum Disorders (ASD).

EPSY 5664 Transitions for Individuals with Autism Spectrum Disorders (2.0 cr.; A-F Grade Basis; prereq 5661, [Spec Ed grad or licensure student or #]) Legal/practical aspects of transition planning, specifically for students with ASD.

EPSY 5681 Education of Preschool Children With Disabilities: Methods and Materials (3.0 cr.; A-F Grade Basis; 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 5682 Education of Infants and Toddlers with Disabilities: Methods and Materials (3.0 cr.; A-F Grade Basis; prereq [5616, 5625] or #) Methods/materials available to maximize developmental and educational outcomes for young children with disabilities, birth to age 3, and their families in home, community, and school-based settings. Students develop, implement, and evaluate individualized education/family service plans.

EPSY 5701 Practicum: Field Experience in Special Education (1.0-6.0 cr.; A-F or Audit; prereq [5614, [FOE or SpEd grad or licensure 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; 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 5704 Practicum in Middle/Secondary Settings (1.0 cr.; S-N Grading Basis; prereq Spec Ed grad or licensure student or #) Preparation for practicing principles required for successful inclusion. Address model for best practices/requirements specified by Minnesota Board of Teaching.

EPSY 5705 Practicum in ECSE/Elementary Settings (1.0 cr.; S-N Grading Basis; prereq Spec Ed grad or licensure student) Principles for successful inclusion of students with moderate disabilities. Address model for best practices.

EPSY 5720 Special Topics: Special Education (1.0-4.0 cr.; Student Option) Lab/fieldwork approach. Generating action plan. Creating set of observation field notes. Collecting data. Specific problems/possibilities related to special education.
EPSY 5741 Student Teaching: Academic and Behavioral Strategist (6.0 cr.; S-N Grading Basis; prereq Spec Ed graduate or licensure student or #) 
Transfer of theoretical knowledge to practical application. Responsibilities of special education teacher in variety of settings.

EPSY 5742 Student Teaching: Autism Spectrum Disorders (6.0 cr.; S-N Grading Basis; prereq Special Education licensure program or #) 
Transfer of theoretical knowledge to practical application. Role/responsibilities of special education teacher in settings of elementary/secondary age.

EPSY 5751 Student Teaching: Deaf and Hard of Hearing (1.0-6.0 cr.; Student Option; 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 (1.0-6.0 cr.; S-N or Audit; 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 (1.0-6.0 cr.; S-N or Audit; 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 (1.0-6.0 cr.; A-F or Audit; prereq Completion of licensure courses for social and emotional disorders, #) 
Teach students with social and emotional disorders in public schools and other appropriate sites. Attend a weekly seminar on student teaching competencies.

EPSY 575S Student Teaching: Developmental Disabilities, Mild/Moderate (1.0-6.0 cr.; A-F or Audit; 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 (1.0-6.0 cr.; A-F or Audit; 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 (3.0 cr.; S-N Grading Basis; 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 (3.0 cr.; S-N Grading Basis; 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-to-three in their homes. Course includes seminar with discussion, cooperative learning experiences, and some lectures.

EPSY 5760 Special Topics in School Psychology (1.0-9.0 cr.; Student Option) 
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 (3.0 cr.; A-F or Audit) 
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 5849 Observation and Assessment of the Preschool Child (3.0 cr.; Student Option) 
Introduction to assessment principles and practices, including observational assessment methods, for children (birth to 5). Intended primarily for teachers in training and others interested in basic information regarding assessment and its relationship to intervention services for young children.

EPSY 5851 Engaging Diverse Students and Families (3.0 cr.; Student Option; prereq Honors senior or grad student) 
Theoretical, practical, scientific issues involved in school psychological practice/training/research. Theoretical/empirical bases for developing appropriate dispositions, practices, strategies. Illustrative lectures, discussions, group activities, case studies, presentations.

EPSY 5891 Independent Study in Educational Psychology (1.0-8.0 cr.; A-F or Audit; prereq #) 
Self-directed study in areas not covered by regular courses. Specific program of study is jointly determined by student and advising faculty member.

Electrical and Computer Engineering (EE) 
Institute of Technology

EE 1 Refresher Course for Electrical Engineers (0.0 cr.; A-F or Audit; prereq [BSEE or BEE]) 
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 (1.0 cr.; S-N or Audit) 
Introduction to engineering/computer engineering. Techniques and technologies developed by electrical and computer engineers.

EE 1301 Introduction to Computing Systems (4.0 cr.; Student Option; prereq &MATH 1271 or &MATH 1371) 

EE 1701W Energy, Environment, and Society (3.0 cr.; Student Option) 
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 2001 Introduction to Circuits and Electronics (3.0 cr.; Student Option; prereq &PHYS 1302, &(MATH 2243 or MATH 2373 or MATH 2573)) 

EE 2002 Introductory Circuits and Electronics Laboratory (1.0 cr.; Student Option; prereq 2001 or & 2001) 
Introductory lab in electronics to accompany 2001. Experiments with simple circuits. Familiarization with basic measurement tools and equipment.

EE 2006 Introductory Circuits Laboratory (0.5 cr.; Student Option) 
Meets concurrently with an arranged 2002 section.

EE 2011 Linear Systems, Circuits, and Electronics (3.0 cr.; Student Option; prereq 2001) 

EE 2101 Introduction to Electronics I (1.5 cr.; Student Option; prereq Linear circuits)

EE 2103 Introduction to Electronics II (1.0 cr.; Student Option; prereq 2001 or 2011)
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 (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 3005 Fundamentals of Electrical Engineering (4.0 cr.; Student Option; prereq Math 2243, Phys 1302; not for EE majors)

EE 3006 Fundamentals of Electrical Engineering Laboratory (1.0 cr.; Student Option; prereq Concurrent enrollment in 3005 is allowed but not required)
Lab to accompany 3005.

EE 3015 Systems Engineering (3.0 cr.; Student Option; prereq [2011, CSE] or %)

EE 3025 Statistical Methods in Electrical and Computer Engineering (3.0 cr.; Student Option; prereq Math 2243 or Math 2373 or Math 2573; Physics 1302 or Phys 1402; CSE or %)

EE 3041 Industrial Assignment I (2.0 cr.; A-F Grade Basis; prereq EE or CompE upper div, enrolled in ECE co-op program)
Industrial work assignment in engineering co-op program. Evaluation based on student's formal written report covering semester's work assignment.

EE 3101 Circuits and Electronics Laboratory I (2.0 cr.; Student Option; prereq [2002, 3115 or &3115], CSE) or %
Experiments in circuits/electronics.

EE 3102 Circuits and Electronics Laboratory II (2.0 cr.; Student Option; prereq [3101 or CSE or %], attendance first day of class)
Experiments in circuits/electronics. Team design projects.

EE 3115 Analog Electronics (3.0 cr.; Student Option; prereq [3015 or &3015, CSE] or %)

EE 3161 Semiconductor Devices (3.0 cr.; Student Option; prereq Upper div CSE; 2011, Phys 1302, Phys 2303 or Chem 1022)
Elementary semiconductor physics; physical description of pn junction diodes, bipolar junction transistors, field-effect transistors.

EE 3301 Transmission Lines, Fields, and Waves (3.0 cr.; Student Option; prereq [2011, Math 2243 or Math 2373 or Math 2573; Phys 1302 or Phys 1402] or %)
Properties of transmission lines, electrostatics, magnetostatics, and electromagnetic waves in unbounded space. Guides, cavities, radiation theory, antennas.

EE 3940 Special Topics in Electrical and Computer Engineering (1.0-4.0 cr.; Student Option; prereq #)
Topics that are not available in regular courses. Topics vary.

EE 3990 Curricular Practical Training (1.0-2.0 cr.; S-N Grading Basis; prereq #, undergrad EE or CompE major)
Industrial work assignment involving advanced electrical engineering technology. Reviewed and graded by faculty member. Final report covering work assignment.

EE 4038W Energy Conversion and Storage Laboratory (1.0 cr.; Student Option; prereq [EE or CompE upper div CSE] or %)
Laboratory experiences with the topics of 4161W, including the fundamental physics and chemistry of selected energy conversion and energy storage devices, their application, and their connection strategies in electric power applications.

EE 4163 Energy Conversion and Storage Laboratory (1.0 cr.; Student Option; prereq &4161W)
Provides laboratory experiences with the topics of 4161W, including the fundamental physics and chemistry of selected energy conversion and energy storage devices, their application, and their connection strategies in electric power applications.

EE 4231 Linear Control Systems: Designed by Input/Output Methods (3.0 cr.; Student Option; prereq [3015, upper div CSE or graduate student in CSE major] or #)

EE 4241 Energy Conversion and Storage Systems Laboratory (1.0 cr.; Student Option; prereq 4231 or &42431)
Lab to accompany 4231.

EE 4232 State Space Control System Design (3.0 cr.; Student Option; prereq [3015, upper div CSE] or #)

EE 4235 Linear Control Systems Laboratory (1.0 cr.; Student Option; prereq 4231 or 42323; no cr for [EE or CompE grad students)
Lab to accompany 4233.

EE 4301 Digital Design With Programmable Logic (4.0 cr.; Student Option; prereq 2301, [1301 or CSCI 1113 or CSCI 1901])

EE 4303 Introduction to Programmable Devices Laboratory (1.0 cr.; Student Option; prereq 2301, 2361; cannot receive cr for 4303 if cr granted for EE 4301)
Verilog Language. Combinatorial and sequential logic synthesis with Verilog. Implementation in Field Programmable Gate Arrays (FPGAs).

EE 4341 Embedded System Design (4.0 cr.; Student Option; prereq 2301, 2361, upper div CSE)

EE 4363 Computer Architecture and Machine Organization (4.0 cr.; Student Option; prereq 2361)
Introduction to computer architecture. Aspects of computer systems, such as pipelining, memory hierarchy, and input/output systems. Performance metrics. Examines each component of a complex computer system.

EE 4389W Introduction to Predictive Learning (3.0 cr.; Student Option; prereq [3025, ECE student] or STAT 3022; computer programming or MATLAB or similar environment is recommended for ECE students)
Empirical inference and statistical learning. Classical statistical framework, model complexity control, Vapnik-Chervonenkis (VC) theoretical framework, philosophical

EE 4501 Communications Systems (3.0 cr.; Student Option; prereq 3025)

EE 4505 Communications Systems Laboratory (1.0 cr.; Student Option; prereq 4501 or 4501H)
Experiments in analysis/design of wired/wireless communication systems. Lab to accompany 4501.

EE 4541 Digital Signal Processing (3.0 cr.; Student Option; prereq 3015, 3025) or #)

EE 4607 Wireless Hardware System Design (3.0 cr.; Student Option; prereq 3015, 3115, 3601, CSE 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, r/f/microwave device technologies, small-signal amplifiers, mixers, power amplifiers, oscillators.

EE 4609 Digital Signal Integrity (3.0 cr.; Student Option; prereq 2011, Phys 1301, 1302, [sr 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 DC Electric Drives (3.0 cr.; Student Option; 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 (1.0 cr.; Student Option; 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 4721 Introduction to Power System Analysis (3.0 cr.; Student Option; prereq 2011)

EE 4722 Power System Analysis Laboratory (1.0 cr.; Student Option; prereq 4721 or &4721)
Lab analysis of AC power systems, power system networks, power flow, short circuit, transient stability.

EE 4741 Power Electronics (3.0 cr.; Student Option; prereq 3015, 3115)
Switch-mode power electronics. Switch-mode DC power supplies. Switch-mode converters for DC and AC motor drives, wind/photovoltaic inverters, interfacing power electronics equipment with utility system. Power semiconductor devices, magnetic design, electro-magnetic interference (EMI).

EE 4743 Switch-Mode Power Electronics Laboratory (1.0 cr.; Student Option; prereq 4741 or & 4741)
Laboratory to accompany 4741. PSpice/Simulink-based simulations of converters, topologies, and control in switch-mode dc power supplies, motor drives for motion control, and inverters for interfacing renewable energy sources to utility grid.

EE 4930 Special Topics in Electrical and Computer Engineering Laboratory (5.0-2.0 cr.; A-F Grade Basis; prereq CSE sr or grad student or %)
Lab work not available in regular courses. Topics vary.

EE 4940 Special Topics in Electrical and Computer Engineering Laboratory (1.0-4.0 cr.; Student Option; prereq CSE or #)
Topics that are not available in regular courses. Topics vary.

EE 4951W Senior Design Project (4.0 cr.; Student Option; prereq 3015, 3115, 3102, attendance first day of class)
Team participation in formulating/solving open-ended design problems. Oral/written presentations.

EE 4970 Directed Study (1.0-3.0 cr.; Student Option; prereq Cr or # [may be repeated for credit]; %)
Studies of approved projects, either theoretical or experimental.

EE 4981H Senior Honors Project I (3.0 cr.; Student Option; prereq CSE sr or grad student or #)
Experience in research/design for electrical/computer engineering. Oral/written reports.

EE 4982V Senior Honors Project II (2.0 cr.; Student Option; prereq 4981)
Experience in research/design for electrical/computer engineering. Oral/written reports.

EE 5121 Transistor Device Modeling for Circuit Simulation (3.0 cr.; Student Option; prereq [3115, 3161, CSE grad student] or %)
Basics of MOS, bipolar theory. Evolution of popular device models from early SPICE models to current industry standards.

EE 5141 Introduction to Microsystem Technology (4.0 cr.; Student Option; prereq [3161, 3601, CSE grad student] or %)
Microelectromechanical systems composed of microsensors, microactuators, and electronics integrated onto common substrate. Design, fabrication, and operation principles. Labs on micromachining, photolithography, etching, thin film deposition, metallization, packaging, and device characterization.

EE 5163 Semiconductor Properties and Devices I (3.0 cr.; Student Option; prereq 4981)

EE 5164 Semiconductor Properties and Devices II (3.0 cr.; Student Option; prereq 5163 or #)

EE 5171 Microelectronic Fabrication (4.0 cr.; Student Option; prereq CSE grad student or %)
Fabrication of microelectronic devices. Silicon integrated circuits, GaAs devices. Lithography, oxidation, diffusion. Process integration of various technologies, including CMOS, double poly bipolar, and GaAs MESFET.

EE 5173 Basic Microelectronics Laboratory (1.0 cr.; Student Option; prereq [5171 or &5171], CSE grad student) or %)
Students fabricate a polysilicon gate, single-layer metal, NMOS chip, performing 80 percent of processing, including photolithography, diffusion, oxidation, and etching. In-process measurement results are compared with final electrical test results. Simple circuits are used to estimate technology performance.

EE 5181 Introduction to Nanotechnology (4.0 cr.; Student Option; prereq [3161, 3601, CSE grad student] or %)

EE 5231 Linear Systems and Optimal Control (3.0 cr.; Student Option; prereq [3015, CSE grad student] or #)

EE 5235 Robust Control System Design (3.0 cr.; Student Option; prereq CSE grad, 3015, 5231 or #)
Development of control system design ideas; frequency response techniques in design of single-input/single-output (and MIMO) systems. Robust control concepts. CAD tools.

EE 5239 Introduction to Nonlinear Optimization (3.0 cr.; Student Option; prereq [3025, Math 2373, Math 2374, CSE grad student] or %)

EE 5251 Optimal Filtering and Estimation (3.0 cr.; Student Option; prereq [[MATH 2243, STAT 3021] or equiv], CSE grad student) or %; 3025, 4231 recommended)

EE 5301 VLSI Design Automation I (3.0 cr.; Student Option; prereq [2301, CSE grad student] or %)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

EE 5302 VLSI Design Automation II (3.0 cr.; Student Option; prereq [5301, CSE grad student] or %)

EE 5323 VLSI Design I (3.0 cr.; Student Option; prereq [2301, 3115, CSE grad student] or %) Combinational static CMOS circuits. Transmission gate networks. Clocking strategies. Sequential circuits. CMOS process flows, design rules, structured layout techniques. Dynamic circuits, including Domino CMOS and DCVS. Performance analysis, design optimization, device sizing.

EE 5324 VLSI Design II (3.0 cr.; Student Option; prereq [5323, CSE 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 (3.0 cr.; Student Option; prereq [4301, [5323 or &5323], CSE grad student] or %) Complete design of an integrated circuit. Designs evaluated by computer simulation.

EE 5329 VLSI Digital Signal Processing Systems (3.0 cr.; Student Option; prereq [5323 or &5323], CSE grad student] or %) Programmable architectures for signal/media processing. Data-flow representation. Architecture transformations. Low-power design. Architectures for two's complement/ redundant representation, carry-save, and canonic signed digit. Scheduling/allocation for high-level synthesis.

EE 5333 Analog Integrated Circuit Design (3.0 cr.; Student Option; prereq [3115, CSE 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 (3.0 cr.; Student Option; prereq [4363 or CSci 4203], CSE 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 (3.0 cr.; Student Option; prereq [4363 or 5361 or CSci 4203 or 5201], [CSE grad student] or %) Tools/techniques for analyzing computer hardware, software, system performance. Benchmark programs, measurement tools, performance metrics. Deterministic/probabilistic simulation techniques, random number generation/testing. Bottleneck analysis.

EE 5381 Telecommunications Networks (3.0 cr.; Student Option; prereq [4501, 5531, CSE grad student] or %) Fundamental concepts of modern telecommunications networks, mathematical tools required for their performance analysis. Layered network architecture, point-to-point protocol stack, multilayer multiaccess communication/routing.

EE 5391 Computing With Neural Networks (3.0 cr.; Student Option; prereq [3025 or Stat 3091], CSE grad student] or %) Neural networks as a computational model. Connections to AI, statistics and model-based computation. Associative memory and matrix computation; Hopfield networks. Supervised networks for classification and prediction. Unsupervised networks for data reduction. Associative recognition/retrieval, optimization, time series prediction, knowledge extraction.

EE 5393 Circuits, Computation, and Biology (3.0 cr.; Student Option; prereq MATH 2263 or %) Connections between digital circuit design and synthetic/computational biology. Probabilistic, discrete-event simulation. Timing analysis. Information-Theoretic Analysis. Feedback in digital/ analog regulatory systems. Synthesizing stochastic logic and probabilistic biochemistry.


EE 5556 Image Processing and Applications (3.0 cr.; Student Option; prereq [4541, 5581, CSE grad student] or %) Two-dimensional digital filtering/transforms. Application to image enhancement, restoration, compression, and segmentation.

EE 5561 Information Theory and Coding (3.0 cr.; Student Option; prereq [5531, CSE grad student] or %) Source/channel models, codes for sources/channels. Entropy, mutual information, capacity, rate-distortion functions. Coding theorems.

EE 5583 Error Control Coding (3.0 cr.; Student Option; prereq [3025, Math 2373] or equiv), [CSE grad student or %] Error-correcting codes. Concepts, properties, polynomial representation. BCH, Golay, Reed-Muller/Reed-Solomon codes. Convolutional codes. Iterative codes.


EE 5601 Introduction to RF/Microwave Engineering (3.0 cr.; Student Option; prereq [3601, CSE grad student] or %) Fundamentals of EM theory and transmission lines concepts. Transmission lines and network analysis. CAD tool. Lumped circuit component designs. Passive circuit components. Connectivity to central communication theme.

EE 5602 RF/Microwave Circuit Design (3.0 cr.; Student Option; prereq [5601 or equiv], [CSE 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 5611 Plasma-Aided Manufacturing (4.0 cr.; A-F or Audit; prereq [[[MME 3321, ME 3322] or equiv], [upper div CSE or grad student]] or %)

EE 5613 RF/Microwave Circuit Design Laboratory (2.0 cr.; A-F Grade Basis; prereq [[5601 or &5601], CSE grad student] or %) Scattering parameters, planar lumped circuits, transmission lines, RF/microwave substrate materials, matching networks/tuning elements, resonators, filters, combiners/dividers, coupled/decoupled, lumped type lab.

EE 5616 Antenna Theory and Design (3.0 cr.; Student Option; prereq [[5601 or &5601], CSE grad student] or %) Antenna performance parameters, vector potential/radiation integral, wire antenna structures, broadband antenna structures, microstrip/aperture theory, antenna measurements.

EE 5621 Physical Optics (3.0 cr.; Student Option: prereq [3015, CSE grad student] or %) Physical optics principles, including Fourier analysis of optical systems/images, scalar diffraction theory, interferometry, and coherence theory. Diffractive optical elements, holography, astronomical imaging, optical information processing, microoptics.

EE 5622 Physical Optics Laboratory (1.0 cr.; Student Option; prereq [[5621 or &5621], CSE grad student] or %) Fundamental optical techniques. Diffraction and optical pattern recognition. Spatial/temporal coherence. Interferometry. Speckle. Coherent/incoherent imaging. Coherent image processing. Fiber Optics.

EE 5624 Optical Electronics (4.0 cr.; Student Option; prereq [[3601 or Phys 3002], CSE 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 (1.0 cr.; Student Option; prereq [[5627 or &5627], CSE grad student] or #) Experiments in fiber optics. Dielectric waveguides, modes in optical fibers, fiber dispersion/attenuation, properties of light sources/detectors, optical communication systems.

EE 5629 Optical System Design (2.0 cr.; Student Option; prereq CSE grad student or %) Elementary or paraxial optics. Non-paraxial, exact ray tracing. Energy considerations in instrument design. Fourier optics and image quality. Design examples: telescopes, microscopes, diffraction-limited lenses, projectors, scientific instruments.

EE 5653 Physical Principles of Magnetic Materials (3.0 cr.; Student Option; prereq CSE grad student or %) Physics of diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, ferrimagnetism. Ferromagnetic phenomena. Static/dynamic theory of micromagnetics, magneto-optics, and magnetization dynamics. Magnetic material applications.

EE 5655 Magnetic Recording (3.0 cr.; Student Option; prereq CSE grad student or %) Magnetic fundamentals, recording materials, idealized models of magnetic records/reproduction, analytic models of magnetic recording systems, inductive magnetic recording, digital magnetic recording, magnetic recording heads/media, digital recording systems.

EE 5657W Physical Principles of Thin Film Technology (4.0 cr.; Student Option; prereq CSE 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 5705 Electric Drives in Sustainable Energy Systems (3.0 cr.; Student Option; prereq [4701, CSE grad student] or %) Role of electric drives in wind-electric systems, inertial storage, elec/hybrid vehicles. AC machines for energy-efficient operation using d-q axis modeling. Vector-/direct-torque-controlled induction motor drives. Permanent-magnet and interior-permanent magnet ac motor drives. Sensorless drives. Voltage space-vector modulation technology.

EE 5707 Electric Drives in Sustainable Energy Systems Laboratory (1.0 cr.; Student Option; prereq 5705 or &5705) Lab to accompany 5705.

EE 5721 Power Generation Operation and Control (3.0 cr.; Student Option; prereq [4721, CSE 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 5725 Power Systems Engineering (3.0 cr.; Student Option; prereq [4721, CSE grad student] or %) Analysis of large power generation/transmission systems. Writing programs for state-by-state analysis and Monte Carlo analysis. Power system protection systems, system current calculations, short circuit detection, isolating faulted components. Characteristics of protection components.

EE 5741 Advanced Power Electronics (3.0 cr.; Student Option; prereq CSE grad student or %) Physics of solid-state power devices, passive components, magnetic optimization, advanced topologies. Unity power factor correction circuits, EMI issues, snubbers, soft switching in dc/ac converters. Practical considerations. Very low voltage output converters. Integrated computer simulations.

EE 5940 Special Topics in Electrical Engineering I (1.0-4.0 cr.; Student Option) Special topics in electrical and computer engineering. Topics vary.

EE 5950 Special Topics in Electrical Engineering II (1.0-4.0 cr.; Student Option) Special topics in electrical and computer engineering. Topics vary.

EE 5960 Special Topics in Electrical Engineering III (1.0-4.0 cr.; Student Option) Special topics in electrical and computer engineering. Topics vary.

EE 5970 Special Topics in Electrical Engineering IV (1.0-4.0 cr.; Student Option; prereq EE or CompE grad student or %; only available for Rochester Campus) Special topics in electrical and computer engineering. Topics vary.

EE 5990 Curricular Practical Training (1.0-2.0 cr.; S-N or Audit; prereq Grad student, %) Industrial work assignment involving advanced electrical engineering technology. Review by faculty member. Final report covering work assignment.

Endodontics (ENDO)

School of Dentistry


ENDO 3004 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit) Diagnosis/treatment of clinical cases. Complex cases, new/unique techniques.

ENDO 3005 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit; prereq 5304) Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 3006 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit) Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 3007 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit; prereq 5307) Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 3008 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit; prereq 5307, %) Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 3009 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit; prereq 5308) Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 3010 Advanced Clinical Endodontics (1.0-6.0 cr.; A-F or Audit; prereq 5309) Diagnosis/treatment of clinical cases. Complex cases, new techniques.

ENDO 3111 Advanced Endodontic Emergency (1.0 cr.; S-N or Audit; prereq %) Each student is assigned weekly periods (8 hours/week) and is responsible for all emergencies in the endodontic clinic during this time.

ENDO 3132 Advanced Endodontic Emergency (1.0 cr.; S-N or Audit; prereq 3101) Students assigned 8 hrs/wk, are responsible for emergencies in clinic.

ENDO 3133 Advanced Endodontic Emergency (1.0 cr.; S-N or Audit; prereq 3132)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic.

ENDO 5314 Advanced Endodontic
Emergency (1.0 cr.; S-N or Audit; prereq 5313)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic.

ENDO 5315 Advanced Endodontic
Emergency (1.0 cr.; S-N or Audit; prereq 5314, %)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic.

ENDO 5316 Advanced Endodontic
Emergency (1.0 cr.; S-N or Audit; prereq 5315)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic.

ENDO 5317 Advanced Endodontic
Emergency (1.0 cr.; S-N or Audit; prereq 5316)
Students assigned 8 hrs/wk, are responsible for emergencies in clinic.

ENDO 5329 Review of Cases (1.0 cr.; A-F or Audit; prereq %)
Oral/visual presentation of endodontic cases with follow up. Presentation of surgery cases before surgery.

ENDO 5330 Review of Cases (1.0-2.0 cr.; A-F or Audit; prereq 5329)
Oral/visual presentation of endodontic cases with follow up. Presentation of cases before surgery.

ENDO 5331 Review of Cases (1.0 cr.; A-F or Audit; prereq 5330)
Oral/visual presentation of endodontic cases with follow up. Presentation of cases before surgery.

ENDO 5332 Review of cases (1.0 cr.; A-F or Audit; prereq %)
Oral and visual presentation of endodontic cases with follow up. Presentations of surgery cases before surgeries.

ENDO 5400 Advanced Endodontics for the General Dentist (1.0 cr.; S-N or Audit; prereq %)
Advanced diagnosis/treatment of endodontics in clinic/office setting. Internship.

ENDO 5600 Endodontic Histopathology (1.0 cr.; S-N or Audit)
Physiology of pulpal/periapical diseases.
Normal histology of pulpal/periapical tissues.

ESL 10 Beginning Grammar (0.0 cr.; S-N or Audit; prereq Non-native English speaker)
Meaning/form/use of fundamental grammatical structures. Appropriate for students with some prior English.

ESL 20 Beginning Reading and Composition (0.0 cr.; S-N or Audit; prereq Non-native English speaker)
Skills/strategies for reading/writing in English. Fundamentals of writing at sentence/basic paragraph level. Vocabulary development. Appropriate for students with some prior English.

ESL 30 Beginning Oral Skills (0.0 cr.; S-N or Audit; prereq Non-native English speaker)
Skills/strategies for speaking/comprehending English. Vocabulary development. Appropriate for students with some prior English.

ESL 105 SIEP: High Beginning Grammar (0.0 cr.; S-N or Audit; prereq Non-native speaker of English; see English as a Second Language Program for override)
Form, function, meaning of English grammar.

ESL 110 High-Beginning Grammar (0.0 cr.; S-N or Audit; prereq Non-native English speaker)
Grammatical structures. Meaning, use, form.

ESL 115 SIEP: High Beginning Reading and Composition (0.0 cr.; S-N or Audit; prereq Non-native speaker of English; see Minnesota English as a Second Language Program for override)
English language reading and composition skills.

ESL 120 High-Beginning Reading and Composition (0.0 cr.; S-N or Audit; prereq Non-native English speaker)
Reading short passages of limited difficulty. Main ideas, vocabulary, reading speed, skimming/scanning. Writing fundamentals, spelling, punctuation, paragraphing, organization. Writing exercises, free writing.

ESL 125 SIEP, High Beginning Oral Skills (0.0 cr.; S-N Grading Basis; prereq Non-native speaker of English)
English spoken language skills, community contact.

ESL 130 High Beginning Oral Skills (0.0 cr.; S-N or Audit; prereq Non-native speaker of English)
English language reading/composition skills.

ESL 205 SIEP: Intermediate Grammar (0.0 cr.; S-N or Audit; prereq Non-native speaker of English)

ESL 210 Intermediate Grammar (0.0 cr.; S-N or Audit; prereq Non-native speaker of English)

ESL 215 SIEP: Intermediate Reading and Composition (0.0 cr.; S-N or Audit; prereq Non-native speaker of English; see English as a Second Language Program for override)
English grammar skills.

ESL 305 SIEP: Advanced Grammar (0.0 cr.; S-N or Audit; prereq Non-native speaker of English; see English as a Second Language Program for override)
English grammar skills.

ESL 310 Advanced Grammar (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N Grading Basis; prereq Non-native speaker of English)
English spoken language skills, community contact.

ESL 330 Advanced Oral Skills (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; prereq Non-native speaker of English; see English as a Second Language Program for override)
English grammar skills.

ESL 410 English Grammar for Academic Purposes (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; prereq Non-native speaker of English)
Reading for academic purposes.

ESL 425 SIEP, High Advanced Oral Skills (0.0 cr.; S-N Grading Basis; prereq Non-native speaker of English)
English spoken language skills, community contact.

ESL 430 High Advanced Oral Skills (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; 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 900 Current Issues in the Media (0.0 cr.; S-N or Audit; prereq Non-native speaker of English) News media as means of English improvement and as source of information/entertainment. International news events via radio broadcasts, newspaper, and other sources. Understanding American culture. Developing listening/speaking skills using American movies/television.

ESL 901 American Culture (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit; prereq Non-native English speaker) Oral/written communication skills in business setting.

ESL 904 TOEFL Preparation (0.0 cr.; S-N or Audit) 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 (0.0 cr.; Student Option; prereq Non-native speaker of English) Varying topics in learning English as a second language.

ESL 921 Academic Writing (0.0 cr.; S-N or Audit; prereq Non-native speaker of English) Writing for academic purposes.

ESL 931 Academic Speaking (0.0 cr.; S-N or Audit; 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 (1.0-5.0 cr.; S-N Grading Basis; 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 950 Pronunciation Improvement (0.0 cr.; S-N or Audit; prereq Non-native speaker of English) Aspects of English pronunciation necessary to improve comprehensibility and reduce foreign-accents. Enunciation, word, phrasal, and sentence stress. Intonation. Linking. Thought groups. Rhythm.

ESL 951 Pronunciation (0.0 cr.; S-N or Audit; prereq Non-native speaker of English) Aspects of English pronunciation necessary to improve comprehensibility and reduce foreign-accents. Enunciation, word, phrasal, and sentence stress. Intonation. Linking. Thought groups. Rhythm.

ESL 3001 Integrated Skills for Academic English (2.0 cr.; Student Option; 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 3101 Advanced English Grammar (4.0 cr.; Student Option; prereq %, non-native speaker of English, [C-TOEFL score 153-187 or equiv]. ESL program consent) Form, meaning, and use of common English grammatical structures in written/oral discourse. Adverb, adjective, and noun clauses. Verb tense, aspect, and modality. Grammar beyond sentence level. Application to development of revision/editing skills.

ESL 3102 English Grammar for Academic Purposes (4.0 cr.; Student Option; prereq 3101, [Non-native speaker of English, [C-TOEFL score of at least 190 or equiv]], %) Form, meaning, and use of an expanded repertoire of complex English grammatical structures used in academic written/oral discourse. Subordination, coordination, transition. Complex referential expressions. Complementation. Lexical grammar. Independent self-editing of academic writing.

ESL 3201 Advanced English Reading and Composition (5.0 cr.; Student Option; prereq Non-native speaker of English, [IBT score of at least 53-67 or equiv]], %) Comprehension of main ideas, organization, and support in longer authentic English texts. Expanded vocabulary comprehension. Fluency, focus, and persuasiveness through draft/revision. Focuses on accuracy/variety of expression.

ESL 3202 Academic Reading and Composition (5.0 cr.; Student Option; prereq 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 3302 Writing for Academic Purposes (4.0 cr.; Student Option; 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 3402 Research Writing for the American University (4.0 cr.; Student Option; 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 3501 Advanced English Listening and Speaking (5.0 cr.; Student Option; prereq Non-native speaker of English, [IBT score of at least 68 or equiv]], %) Speaking/understanding naturally spoken English in academic activities such as lecture comprehension, note taking, class discussions, and oral presentations. Emphasizes cross-cultural interaction related to academic subject matter.

ESL 3502 Academic Listening and Speaking (5.0 cr.; Student Option; prereq 3501, non-native speaker of English, [IBT score of at least 68 or equiv]], %) Understanding lectures and academic discussions. Focusses on critical listening. Students produce academic presentations and participate in discussions on subjects of general academic interest. Cross-cultural awareness. Negotiation of disagreement/misunderstanding.

ESL 3550 Pronunciation Improvement (2.0 cr.; Student Option; prereq Non-native speaker of English) Aspects of English pronunciation necessary to improve comprehensibility and reduce foreign-accents. Enunciation, word, phrasal, and sentence stress. Intonation. Linking. Thought groups. Rhythm.

ESL 3551 English Pronunciation (4.0 cr.; Student Option; prereq Non-native speaker of English) Improving production/perception of sounds of English language. Intelligibility of individual sounds, rhythm, intonation, word/sentence stress, linking phenomena in fast speech. Rules of pronunciation in relation to rules of English spelling.

ESL 3602 Speaking for Academic Purposes (4.0 cr.; Student Option; prereq 3502, non-native speaker of English, [C-TOEFL score of at least 190 or equiv]], %) Students participate in American academic interactions of various types: lectures, presentations, seminar-style discussions, informal exchanges. Presenting oneself professionally/socially in collegial settings with accuracy, variety, and flexibility.

ESL 3900 Special Topics in ESL (1.0-5.0 cr.; Student Option; prereq Non-native speaker of English, program consent) Topics vary.
ENGL 1001V Introduction to Language: 
Poetry, Drama, Narrative (4.0 cr.; A-F or Audit; prereq Honors or #) 
Techniques for analyzing/understanding literature. Readings of novels, short stories, poems, plays.

ENGL 1001W Introduction to Literature: 
Poetry, Drama, Narrative (4.0 cr.; Student Option) 
Basic techniques for analyzing/understanding literature. Readings of novels, short stories, poems, plays.

ENGL 1021V Introduction to the Essay (4.0 cr.; A-F Grade Basis) 
Choice of academic writers make based on audience, purpose, and context. Emphasizes effective use of University Libraries, including locating, evaluating, and using scholarly sources. Reading/writing assignments to extend/clarify arguments and improve control over writing. Selecting/limiting topics. Revision.

ENGL 1172 The Story of King Arthur (3.0 cr.; A-F or Audit) 
Arthurian literature, from earliest times to present. How same story can accommodate many different systems of belief. Form, changing historical backgrounds.

ENGL 1181V Honors: Introduction to Shakespeare (4.0 cr.; A-F or Audit; prereq Honors or #) 
Survey of Shakespeare's work, treating approximately 10 plays. Lecture.

ENGL 1181V Introduction to Shakespeare (4.0 cr.; Student Option) 
Survey of Shakespeare's work, treating approximately 10 plays. Lecture.

ENGL 1201V Honors: Contemporary American Literature (4.0 cr.; A-F or Audit; prereq Honors or #) 
Chronologically/thematically based readings from American literature. Approaches to literary analysis/criticism. Social/historical contexts of authorship/reading, literacy/artsventions. Writing/reading assignments to extend/clarify arguments and improve control over writing.

ENGL 1201W Contemporary American Literature (4.0 cr.; Student Option) 
Literature of the 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 (4.0 cr.; A-F or Audit; prereq Honors or #) 
Representative works by African American, American Indian, Asian American, and Chicano/Chicana writers, chiefly from 20th century. Social/cultural factors in America's literary past/present.

ENGL 1301W Introduction to Multicultural Literatures of the United States (4.0 cr.; Student Option) 
Representative works by African American, American Indian, Asian American, and Chicano/Chicana writers, chiefly from 20th century. Social/cultural factors informing America's literary past/present.

ENGL 1401V Honors: Introduction to "Third World" Literatures in English (4.0 cr.; A-F or Audit; prereq Honors or #) 
Diverse work produced in English outside the United States and Britain. Works represent different cultures, but treat concerns derived from a common post-colonial legacy.

ENGL 1401W Introduction to "Third World" Literatures in English (4.0 cr.; Student Option) 
Diverse works produced in English outside the United States and Britain. Works represent different cultures, but treat concerns derived from common post-colonial legacy.

ENGL 1501V The Story of King Arthur (3.0 cr.; A-F Grade Basis) 
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 Language and Society (4.0 cr.; Student Option) 
Nontechnical understanding of systematic, dynamic, creative nature of human language. Emphasizes English language.

ENGL 1701 Modern Fiction (3.0 cr.; Student Option) 
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 1701H Honors: Modern Fiction (3.0 cr.; Student Option; 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 1902 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr) 
Topics specified in Class Schedule.

ENGL 1905 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) 
Topics specified in Class Schedule.

ENGL 1907W Topics: Freshman Seminar (3.0 cr.; A-F or Audit) 
Topics specified in Class Schedule.

ENGL 1910W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) 
Topics specified in Class Schedule.

ENGL 3001V Honors: Textual Analysis, Methods (4.0 cr.; A-F Grade Basis; prereq Honors, [English major or minor or approved BIS or IDIM program with English area]) 
Introduction to major developments in contemporary criticism.

ENGL 3001W Textual Analysis: Methods (4.0 cr.; A-F Grade Basis; prereq English major or minor or premajor or BIS/IDIM-English) 
Close/critical reading, placing literature in history/culture. Idea of multiple approaches to literary works. Analysis of various literary forms, including poetry.

ENGL 3002 Modern Literary Criticism and Theory (3.0 cr.; Student Option) 
Problems of interpretation/criticism. Questions of meaning, form, authority, literary history, social significance.

ENGL 3002H Honors: Modern Literary Criticism and Theory (3.0 cr.; Student Option; prereq Honors or #) 
Problems of interpretation/criticism. Questions of meaning, form, authority, literary history, social significance.
ENGL 3010 Studies In Poetry (3.0 cr.; Student Option)
Special topics related to reading poetry in various interpretive contexts.

ENGL 3010H Studies in Poetry (3.0 cr.; Student Option; prereq Honors or #)
Special topics related to reading poetry in various interpretive contexts.

ENGL 3011 Diaspora Poetics (3.0 cr.; Student Option)
Verbal art, historic or recent, produced by displaced persons as basis for engagement with idea of creative, survivalist displacement of language itself.

ENGL 3012 Poetry as Cultural Critique (3.0 cr.; Student Option)
Examines the status of "poetry" in several cultures of the Americas bringing together techniques of close reading and broad cultural inquiry.

ENGL 3020 Studies in Narrative (3.0 cr.; Student Option)
Examine issues related to reading and understanding narrative in a variety of interpretive contexts. Topics may include "The 19th-century English (American, Anglophone) Novel," "Introduction to Narrative," or "Techniques of the Novel." Topics specified in the Class Schedule.

ENGL 3020H Honors: Studies in Narrative (3.0 cr.; A-F or Audit; prereq honors student)
Issues related to reading/understanding narrative in various interpretive contexts. Topics may include nineteenth-century English (American, Anglophone) novel, narrative, or techniques of the novel. Topics specified in Class Schedule.

ENGL 3021 Captivity in Literature and Film: From the Barbary Coast to Guantanamo Bay (3.0 cr.; Student Option)
Whether there is a captivity genre in English/Global literature, from early modern period to 21st century. Texts/films from numerous civilizations/histories.

ENGL 3022 Science Fiction and Fantasy (3.0 cr.; Student Option)
Variety of science fiction/fantasy authors, such as Mary Shelley, J.R.R. Tolkien, and Neil Gaiman.

ENGL 3023 Children's Literature (3.0 cr.; Student Option)
Range of children's literature, from classic fairy tales such as "Little Red Riding Hood" to contemporary texts such as Harry Potter and the Sorcerer's Stone.

ENGL 3023H Honors: Children's Literature (3.0 cr.; A-F Grade Basis; prereq Honors)
Range of children's literature, from classic fairy tales such as Little Red Riding Hood to contemporary texts such as Harry Potter and the Sorcerer's Stone.

ENGL 3024 The Graphic Novel (3.0 cr.; Student Option)
Graphic novel as well as manga.

ENGL 3027W The Essay (4.0 cr.; Student Option)
Incorporating narrative, descriptive, analytical, and persuasive techniques into writing on general topics. Effective argumentation through critical reading. Use of library resources. Awareness of context/audience.

ENGL 3030 Studies in Drama (3.0 cr.; Student Option)
Topics may include English Renaissance tragedy, English Restoration 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/themes such as gender/performance.

ENGL 3030H Honors: Studies in Drama (3.0 cr.; A-F Grade Basis; prereq Honors or #)
Topics may include English Renaissance tragedy, English Restoration, and 18th century American drama by writers of color. Single-author courses focus on writers such as Tennessee Williams and Eugene O'Neill, issues/themes such as gender, and performance.

ENGL 3032 Shakespeare in London (3.0 cr.; Student Option)
How are different interpretations of Shakespeare's works embodied in the theater? How are they transformed by location/context? Students attend/discuss theatrical productions.

ENGL 3040 Studies in Film: Pulp Fiction and Melodrama (3.0 cr.; Student Option)
Topics regarding film in variety of interpretive contexts, from range/historic development of American, English, Anglophone film.

ENGL 3040H Honors: Studies in Film (3.0 cr.; Student Option; 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 3046 Black and White (4.0 cr.; Student Option)

ENGL 3060 Studies in Literature and the Other Arts (3.0 cr.; Student Option)
Examines literature's role in conjunction with other arts including music, the visual arts, dance, etc. Topics specified in Class Schedule.

ENGL 3070 Studies in Literary and Cultural Modes (3.0 cr.; Student Option)
Modes of literary expression/representation that transcend conventional demarcations of genre and historic periods. Topics may include horror, romance, mystery, comedy, and satire.

ENGL 3071 The American Food Revolution in Literature and Television (3.0 cr.; Student Option)

ENGL 3080 General Topics (1.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

ENGL 3090H Honors: General Topics (3.0 cr.; A-F Grade Basis; prereq honors student)
Topics specified in Class Schedule.

ENGL 3101 Survey of Medieval English Literature (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit)
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 (3.0 cr.; Student Option)
Major and representative works of the Middle Ages. Topics specified in the Class Schedule.

ENGL 3115 Medieval and Renaissance Drama (3.0 cr.; A-F or Audit)
Medieval/Renaissance drama in terms of performance. Performance history, enactments of scenes from cycle/mortality plays, informal production of a morality play.

ENGL 3122 Shakespeare II: The Major Themes (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option)
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/translations.

ENGL 3133 Stuart England: 17th-Century Literature and Culture (3.0 cr.; Student Option)
Major/representative works of the Restoration and 18th century (1660-1798). Typical authors: Dryden, Pope, Swift, Johnson, Boswell, Fielding.

ENGL 3133H Honors: Stuart England: 17th-Century Literature and Culture (3.0 cr.; Student Option; prereq honors student)
Major/representative works of Restoration and 18th Century (1660-1798). Typical authors: Dryden, Pope, Swift, Johnson, Boswell, Fielding.

ENGL 3134 Milton and Rebellion (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit)
Major/representative works of the Restoration and 18th century (1660-1780). Typical authors: Dryden, Behn, Swift, Pope, Fielding, Burney.

ENGL 3151 Romantic Literatures and Cultures (3.0 cr.; A-F Grade Basis)
British literature written between 1780 and 1830. Concept of Romanticism. Effects of
ENGL 3161 Victorian Literatures and Cultures (3.0 cr.; Student Option)
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 (3.0 cr.; A-F Grade Basis; prereq Honors or #)

ENGL 3171 Modern British Literatures and Cultures (3.0 cr.; Student Option)
Survey of principal writers, intellectual currents, conventions, genres and themes in Britain from 1550 to the present. Typically included are Beckett, Golding, Kingsley and Martin Amis, Murdoch, Larkin, Hughes, Heaney, Lessing, Atwood, Shaffer, Stoppard, Fowles, and Drabble.

ENGL 3175 20th-Century British Literatures and Cultures I (3.0 cr.; Student Option)

ENGL 3176 20th-Century British Literatures and Cultures II (3.0 cr.; Student Option)

ENGL 3180 Contemporary Literatures and Cultures (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit; prereq Honors or #)
Issues related to reading/understanding British, American, and Anglophone fiction/poetry in various interpretive contexts.

ENGL 3211 American Poetry to 1900 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; prerequisite Honors or #)

ENGL 3231 American Drama (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; prerequisite 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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 3301 Asian America Through Arts and Culture (3.0 cr.; Student Option)
Interdisciplinary questions of Asian American identity, experience, and community. Literature, dance, music, photography, film, theater, other cultural forms. Students work with local Asian American arts groups/organizations. Attend local arts events.

ENGL 3330 Gay, Lesbian, Bisexual, and Transgendered Literature (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 or according to topics of contemporary and theoretical interest.

ENGL 3350H Honors: Women Writers (3.0 cr.; Student Option; prerequisite Honors or #)
Groups of writers in 19th or 20th century. Either focuses on writers from a single country or is comparative. Organized thematically or according to topics of contemporary/theoretical interest.

ENGL 3351W Voices from the Gaps: Writing and Art by Women of Color (4.0 cr.; Student Option)
Collaborative/individual student 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 (3.0 cr.; Student Option)
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." Weirness created through experimental text, form, and narrative.

ENGL 3352H Honors: Weird Books by Women (3.0 cr.; A-F Grade Basis; prerequisite Honors or #)
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.

ENGL 3400 Post-Colonial Literatures (3.0 cr.; Student Option)
Varied topics in post-Colonial literatures. Typical novelists include Chinua Achebe, Tsitsi Dangaremba, Fadia Faqir, Salman Rushdie; filmmaker Kidlat Tahimik; and "dub" poets Mutabaruka and Jean Binta Breeze.

ENGL 400H Honors: Post-Colonial Literatures (3.0 cr.; A-F Grade Basis; prerequisite Honors or #)
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 4501 Public Discourse: Coming to Terms With the Environment (3.0 cr.; Student Option)
Public discourse in various geographic regions and historical periods. See Course Guide for specific course description.
ENGL 3505 Community Learning Internships I (3.0 cr.; A-F or Audit)
Connections between literature/literacy, theory/practice, 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 (4.0 cr.; A-F or Audit; 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 3507W Introduction to Chicana/o Literature (3.0 cr.; Student Option)
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 nonfiction, drama, essay, poetry, and hybrid forms of literature.

ENGL 3592W Introduction to Black Women Writers in the United States (3.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
African American oral tradition, slave narrative, autobiography, poetry, essay, fiction, oratory, and drama, from colonial era through Harlem Renaissance.

ENGL 3598W Introduction to African American Literature and Culture II (4.0 cr.; Student Option)
African American oral tradition, autobiography, poetry, essay, fiction, oratory, and drama from after Harlem Renaissance to the end of 20th century.

ENGL 3601 Analysis of the English Language (4.0 cr.; Student Option)

ENGL 3711 Literary Magazine Production Lab I (4.0 cr.; A-F Grade Basis)
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 magazine staff responsibilities, call for submissions, make selections, edit/design, set budget, and begin fund-raising.

ENGL 3712 Literary Magazine Production Lab II (4.0 cr.; A-F Grade Basis)
Second of two courses. Students produce undergraduate art/literary magazine Ivory Tower. Students contact writers/artists, edit final selections/design/layout pages, select printer, distribute, and market journal. Reading/writing assignments on history of literary magazines.

ENGL 3713 Editing for Publication (4.0 cr.; Student Option; prereq Soph or jr 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 (4.0 cr.; Student Option)

ENGL 3870 Figures in English and North American Literature (3.0 cr.; Student Option)
Topics specified in the Class Schedule.

ENGL 3881 London Seminar (3.0 cr.; Student Option; prereq Completion of 3xxx composition requirement, %)
Broad topic of literary investigation crossing/integrating several areas of study. Sometimes team-taught. "Literature in London" program course.

ENGL 3883V Honors Thesis (1.0-4.0 cr.; A-F or Audit; prereq Honors candidacy in English, consent of English honors advisor)
See guidelines available from English honors adviser.

ENGL 3960W Senior Seminar (4.0 cr.; A-F or Audit; prereq English major, [jr or sr]; major adviser approval, %)

ENGL 3993 Directed Study (1.0-4.0 cr.; Student Option; prereq One 3xxx, [English major or minor or [BIS or IDIM or ICP] with English concentration], [jr or sr]; %, @)
Directed study arranged between student and advising faculty member.

ENGL 4003 History of Literary Theory (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit)
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 (1.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

ENGL 4152 Nineteenth Century British Novel (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit)
Poetry written in Britain during 19th century. Possible authors include Wordsworth, Byron, Hemans, Tennyson, Robert and Elizabeth Browning, D. G. and Christina Rossetti, Swinburne, and Hopkins.

ENGL 4222 American Drama by Writers of Color (3.0 cr.; A-F or Audit)
Selected works by Asian American, American African, American Indian, Latino, and Chicano playwrights. How racial/ethnic differences are integral to shaping different visions of American drama. History of minority/ethnic theaters, politics of casting, mainstreaming of the minority playwright.

ENGL 4233 Modern and Contemporary Drama (3.0 cr.; A-F or Audit)
Works written for theater in 19th/20th century. Emphasizes how major aesthetic forms of modern drama (the well-made play, realism, expressionism, symbolism, epic theater, absurdism) presented not just distinctive theatrical styles, but also new ways of seeing, for the theatrical spectator. How social differences, as informed by gender, class, and race, inform content/presentation.

ENGL 4311 Asian American Literature and Drama (3.0 cr.; A-F or Audit)
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 (3.0 cr.; Student Option)
Contextual readings of 19th-20th-century black novelists, including Chesnutt, Hurston, Wright, Baldwin, Petry, Morrison, and Reed.

ENGL 4602W Gender and the English Language (4.0 cr.; Student Option)
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** (4.0 cr.; Student Option)
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** (4.0 cr.; Student Option)
Description/analysis of English language variation from sociohistorical perspective 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** (3.0 cr.; Student Option)
Introduction to the language through 1150 A.D. Culture of Anglo-Saxons. Selected readings in prose/poetry.

**ENGL 4613 Old English II** (3.0 cr.; Student Option; prereq 4612)
Critical reading of texts. Introduction to versification. Readings of portions of Beowulf.

**ENGL 4721 Electronic Text** (3.0 cr.; Student Option)
Status/function of text, related questions as framed by electronic text.

**ENGL 4722 Alphabet to Internet: History of Writing Technologies** (4.0 cr.; Student Option)

**ENGL 5001 Ph.D. Colloquium: Introduction to Literary Theory and Literary Studies in the Modern University** (3.0 cr.; Student Option)
Where and what is literary study vis-à-vis the history of the discipline, of the humanities, and of the university—all in the context of a graduate education. Literary theory focusing on key theoretical works that address the discipline, the humanities, and the university.

**ENGL 5020 Readings in Narrative** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Grad student or #)
Advanced topics regarding film in a variety of interpretive contexts, from the range and historic development of American, English, and Anglophone film (e.g., "Fascism and Film," "Queer Cinemas"). Topics and viewing times announced in Class Schedule.

**ENGL 5090 Readings in Special Subjects** (1.0-4.0 cr.; Student Option; prereq grad student or #)
General background preparation for advanced study. Diverse selection of literature written in English, usually bridging national cultures and time periods. Readings specified in Class Schedule.

**ENGL 5110 Readings in Middle English Literature and Culture** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Grad student or #)
Literature written in English, 1660-1798. Topics may include British literature of Reformation and 18th century, 18th century American literature, a genre (e.g., 18th-century novel).

**ENGL 5150 Readings in 19th-Century Literature and Culture** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Grad student or #)
British, Irish, or American literatures, or topics involving literatures of two nations. Foci on either 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** (3.0 cr.; Student Option; 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, Rhys, West, Woolf, Lawrence and Huxley. Poetry by Hardy, Hopkins, Lloy, H.D., Yeats, Pound and Eliot. Drama by Synge and Shaw.

**ENGL 5176 20th-Century British Literatures and Cultures II** (3.0 cr.; Student Option; prereq Grad student or #)

**ENGL 5180 Readings in Contemporary Literature and Culture** (3.0 cr.; Student Option; prereq Grad student or #)

**ENGL 5200 Readings in American Literature** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Grad student or #)
Contextual readings of 19th-/20th-century American minority writers. Topics specified in Class Schedule.

**ENGL 5405 Readings in Post-Colonial Literature** (3.0 cr.; Student Option; prereq Grad student or #)
Selected readings in post-colonial literature. Topics specified in Class Schedule.

**ENGL 5510 Readings in Criticism and Theory** (3.0 cr.; Student Option; prereq Grad student or #)

**ENGL 5597 Harlem Renaissance** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (4.0 cr.; Student Option)
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** (4.0 cr.; Student Option; prereq [5401, 5711] or grad student in Engl)
Editing long text. Fiction, children’s literature, translations, indexes. Workshop/seminar.

**ENGL 5743 History of Rhetoric and Writing** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Grad student or #)
English: Creative Writing (ENGW) College of Liberal Arts

ENGW 1101W Introduction to Creative Writing (4.0 cr.; Student Option No Audit; prereq Students may not audit this course) Writing poetry/prose. Small group workshops, lectures by visiting writers.

ENGW 1102 Fiction Writing (Intro) (3.0 cr.; Student Option No Audit) Beginning instruction in art of fiction: characterization, plot, dialogue, and style. Writing exercises to generate ideas. Students read/discuss published fiction and their own writing.

ENGW 1103 Poetry Writing (Intro) (3.0 cr.; Student Option No Audit) Beginning instruction in art of poetry. Discussion of student poems and contemporary poetry. Ideas for generating material. Writing exercises in/out of class.

ENGW 1104 Journal, Essay, Memoir Writing (Introduction) (3.0 cr.; Student Option No Audit; prereq Students not allowed to audit this course) Art of literary nonfiction. Discussion of student work and contemporary creative nonfiction. Ideas for generating material. Writing exercises.

ENGW 3102 Fiction Writing (Intermediate) (3.0 cr.; Student Option No Audit; prereq 1101 or 1102; students not be allowed to audit this course) Exercises, experiments, assigned readings, discussion of student work.

ENGW 3104 Poetry Writing (Intermediate) (3.0 cr.; Student Option No Audit; prereq 1101 or 1102; students not allowed to audit this course) Exercises, experiments, assigned readings, discussion of student work.

ENGW 3105 Advanced Poetry Writing (4.0 cr.; Student Option; prereq 3104 or %) Opportunity to explore new poetic possibilities and read widely in contemporary poetry/poetics. Advanced workshop.

ENGW 3106 Journal, Essay, Memoir Writing (Intermediate) (3.0 cr.; Student Option No Audit; prereq 1101 or 1104; students not allowed to audit this course) Exercises, experiments, assigned readings, discussion of students’ work.

ENGW 3107 Advanced Literary Nonfiction (4.0 cr.; Student Option; prereq 3106 or %) Advanced workshop. Writing memoir, literary essays.

ENGW 3110 Topics in Creative Writing (3.0 cr.; Student Option No Audit; prereq 1101 or 1102 or 1103 or 1104 or %) Topics specified in Class Schedule.

ENGW 3190W Writing Workshop for Majors (4.0 cr.; A-F Grade Basis; prereq Engl 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 (4.0 cr.; Student Option; prereq %) Advanced workshop for graduate students with considerable experience in writing fiction.

ENGW 5104 Advanced Poetry Writing (4.0 cr.; Student Option; 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 poetics.

ENGW 5106 Advanced Literary Nonfiction Writing (4.0 cr.; Student Option; prereq %) Advanced workshop for graduate students with considerable experience in writing literary nonfiction.

ENGW 5110 Topics in Advanced Fiction Writing (4.0 cr.; Student Option; prereq %) Special topics in fiction writing. Topics specified in Class Schedule.

ENGW 5120 Topics in Advanced Poetry (4.0 cr.; Student Option; prereq %) Special topics in poetry writing. Topics specified in Class Schedule.

ENGW 5130 Topics in Advanced Creative Writing (4.0 cr.; Student Option; prereq #) Workshop. Might include work in more than one genre.

ENGW 5201 Journal and Memoir Writing (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Using memory in writing, from brainstorming to drafting to revision, in several genres (poems, traditional memoir essays, fiction). How diverse cultures shape memory differently.

ENGW 5205 Screenwriting (4.0 cr.; Student Option; 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 5210 Topics in Advanced Literary Nonfiction (4.0 cr.; Student Option; prereq %) Special topics in essay writing (e.g., arts reviewing, writing about public affairs, writing in personal voice). Topics specified in Class Schedule.

ENGW 5310 Reading as Writers (4.0 cr.; Student Option; prereq grad student, %) Special topics in reading fiction, literary nonfiction, poetry. Topics specified in Class Schedule.

ENGW 5506 Literary Aspects of Journalism (3.0 cr.; A-F or Audit) 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 (1.0-4.0 cr.; Student Option; prereq #, %, @) Projects in writing poetry, fiction, drama, and nonfiction, or study of ways to improve writing.

Entomology (ENT) College of Food, Agricultural and Natural Resource Sciences

ENT 1005 Insect Biology (4.0 cr.; Student Option) 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 1905 Topics: Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr) Topics vary.

ENT 3281 Veterinary Entomology (3.0 cr.; A-F or Audit) Biology/management of insects, mites, ticks that affect livestock, poultry, companion animals. Emphasizes problem identification/solving. Lecture, lab.

ENT 3925 Insects, Aquatic Habitats, and Pollution (3.0 cr.; A-F or Audit; prereq [3005 or Biol 3407 or FW 2001], [jr or sr] or #) Effects differing classes of pollutants have on insects that are aquatic. Insect life-cycle dynamics, trophic guilds, community structure. Hypotheses to explain community structure in streams, rivers, wetlands, ponds, lakes, reservoirs. Organic pollution, eutrophication, heavy metal pollution, runoff/siltation, acidification, thermal pollution. Changes in aquatic insect community structure. Designing/maintaining biological monitoring networks.

ENT 4015 Ornamentals and turf Entomology (3.0 cr.; Student Option; prereq 1xxx course in bio 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 (3.0 cr.; Student Option; 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 (1.0 cr.; Student Option; 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** (1.0-3.0 cr.; S-N or Audit; prereq COAFES jr or sr, complete internship contract available in COAFES 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 4231 Insect Behavior** (3.0 cr.; A-F or Audit; prereq Biol 1009 or equiv or #; [3005 or EEB 3111] recommended)


**ENT 4251 Forest and Shade Tree Entomology** (3.0 cr.; Student Option)

Biology, ecology, population management of forest/shade tree insects. Emphasizes predispersing factors/integrated management.

**ENT 4861 Aquatic Insects** (3.0 cr.; A-F Grade Basis; prereq College-level general biology course or equiv)


**ENT 5009 Pesticides in Horticulture: Their Use and Abuse** (3.0 cr.; A-F or Audit; prereq [[4015 or 4251], PIPA 2001] or #)

History of pesticide use. Case studies on specific pesticide issues, such as DDT, 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** (4.0 cr.; A-F or Audit; prereq 3005 or #)

Comparative study of insect structures/ functions from evolutionary perspective. Introduction to physiology of digestion, respiration, other organ systems.

**ENT 5021 Insect Taxonomy and Phylogeny** (4.0 cr.; Student Option)


**ENT 5041 Insect Ecology** (3.0 cr.; Student Option; 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 5045 Insect Population Dynamics** (3.0 cr.; A-F or Audit; prereq 3005 or #)


**ENT 5051 Scientific Illustration of Insects** (3.0 cr.; Student Option)


**ENT 5081 Insects, Aquatic Habitats, and Pollution** (3.0 cr.; A-F or Audit; prereq [3005, Biol 3407, FW 2001, EEB 4601] or #)


**ENT 5121 Applied Experimental Design** (4.0 cr.; Student Option; 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 5241 Ecological Risk Assessment** (3.0 cr.; Student Option; prereq #)

Evaluating current/potential impact of physical, chemical, biological agents on ecosystems. Identifying ecological stressors, assessing level of exposure, measuring ecological responses, communicating/managing risks. Class participation, two reaction papers, final exam, small-group project.

**ENT 5275 Medical Entomology** (3.0 cr.; Student Option; prereq #)

Biological impact on medical practice of human disease. Emphasizes disease transmission and host, vector, and pathogen interactions.

**ENT 5341 Biological Control of Insects and Weeds** (3.0-4.0 cr.; Student Option; prereq 3001, Biol 1009, EEB 3001 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 5351 Insect Pathology** (2.0 cr.; Student Option; prereq 5011)


**ENT 5361 Aquatic Insects** (4.0 cr.; A-F or Audit; prereq #)

Taxonomy, natural history of aquatic insects including their importance in aquatic ecology, water resource management, recreation, and conservation. Emphasizes family-level identification of immatures/adults. Field trips scheduled to local aquatic habitats. A collection is required.

**ENT 5371 Principles of Systematics** (3.0 cr.; Student Option; prereq #; offered alt yrs)

Theoretical/practical procedures of biological systematics. Phylogeny reconstruction, including computer assisted analyses, morphological/molecular approaches, species concepts, speciation, comparative methods, classification, historical biogeography, nomenclature. Use/value of museums.

**ENT 5900 Basic Entomology** (1.0-6.0 cr.; Student Option; prereq #)

For graduate students who need to make up certain deficiencies in their biological science background.

**ENT 5910 Special Problems in Entomology** (1.0-6.0 cr.; Student Option; prereq #)

Individual field, lab, or library studies in various aspects of entomology.

**ENT 5920 Special Lectures in Entomology** (1.0 cr.; Student Option)

Lectures or labs in special fields of entomological research. Given by visiting scholar or regular staff member.

**Entrepreneurship (ENTR)**

Curtis L. Carlson School of Management

**ENTR 3010 Introduction to Entrepreneurship** (4.0 cr.; A-F Grade Basis; prereq Mgmt 3001, 45 cr, CSOM student)

Fundamentals of entrepreneurship. Career paths, including new business start-ups, franchising, acquisitions (including family business succession), corporate venturing, and entrepreneurial services. Legal structures for new business formation, aspects of business law/business ethics.

**Environmental Sciences, Policy, and Management (ESPM)**

College of Food, Agricultural and Natural Resource Sciences

**ESPM 1001 Freshmen Orientation to Environmental Sciences, Policy, and Management** (1.0 cr.; A-F or Audit)

Academic planning, ESPM careers, liberal education requirements, internships. Building relationships with other students/faculty, student life, information technology, critical computer skills. New freshmen.

**ESPM 1002 Transfer Orientation Seminar** (1.0 cr.; A-F or Audit)

Academic planning, ESPM careers, liberal education requirements, internships. Building relationships with other students/faculty, student life, information technology, critical computer skills. Transfer and continuing students.

**ESPM 1011 Issues in the Environment** (3.0 cr.; Student Option)

Students evaluate social, ethical, political, and economic factors.

ESPM 1012H Environmental Science and Society (3.0 cr.; A-F Grade Basis; prereq Honors student)
Selection of current environmental issues affecting our daily lives. Scientific methodology used to investigate and resolve those issues. Global biogeochemical cycles (e.g., carbon, nitrogen, water). Scientific and social approach of investigation to environmental issues. How everything we do affects the environment in different ways. Visits to selected UMN laboratories.

ESPM 1425 The Atmosphere (4.0 cr.; A-F or Audit; prereq High school algebra)

ESPM 1901 Topics: Freshman Seminar (3.0 cr.; Student Option; prereq Fr)
Topics vary.

ESPM 1905 Freshman Seminar (1.0-3.0 cr.; Student Option)
Freshman Seminar: Topics Vary

ESPM 1906W Freshman Seminar (3.0 cr.; Student Option; prereq Fr)
Issues/topics related to natural resources and the environment. Topics vary each semester.

ESPM 2021 Environmental Sciences: Integrated Problem Solving (3.0 cr.; A-F or Audit; prereq 1011, ESPM major)
Simulations of environmental problem. Student teams develop strategy for kinds of data needed, analyzing data, and integrating findings. International perspectives on environmental problems/solutions.

ESPM 2401 Environmental Education/Interpretation (3.0 cr.; Student Option; prereq Soph)
Foundational view of environmental education/interpretation, its history, theories, and methodologies. Practical skills for teaching in the outdoors. Educational content, state/national standards, effective pedagogy for informal learning environments.

ESPM 3000 Seminar on Current Issues for ESPM (1.0 cr.; A-F or Audit; 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.

ESPM 3002 Colloquium: Exotic Plants and Animals (1.0 cr.; A-F or Audit)
Current exotic plants/animals in Great Lakes region and around 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.

ESPM 3011W Ethics in Natural Resources (3.0 cr.; Student Option)
Normative/professional ethics, and leadership considerations, applicable to managing natural resources and the environment. Readings, discussion.

ESPM 3012 Statistical Methods for Environmental Scientists and Managers (4.0 cr.; A-F or Audit; 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.

ESPM 3031 Applied Global Positioning Systems for Geographic Information Systems (3.0 cr.; A-F or Audit; prereq Intro GIS course, [jr or sr])
GPS principles, operations, techniques to improve accuracy, data output, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/cARRIER 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.

ESPM 3101 Conservation of Plant Biodiversity (3.0 cr.; A-F or Audit; prereq Biol 1001 or Biol 1002 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.

ESPM 3108 Ecology of Managed Systems (3.0 cr.; Student Option; prereq BIOL 1001 or BIOL 1009 or HORT 106 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.

ESPM 3111 Hydrology and Water Quality Field Methods (3.0 cr.; A-F or Audit; prereq 4061 or EEB 4601 or GEO 4601 or FR 3114)

ESPM 3113 Environmental Physics (3.0 cr.; A-F or Audit; prereq Phys 1101)
Concepts/principles of classic/modern physics applied to environmental problems arising from interaction between humans and the natural environment. Forms of pollution (e.g., land, water, air). Transport mechanisms. Anthropogenic greenhouse gas emissions. Global climate change. Social issues related to environmental problems.

ESPM 3202W Environmental Conflict Management, Leadership, and Planning (3.0 cr.; A-F or Audit)
Negotiation of natural resource management issues. Use of collaborative planning. Case study approach to conflict management, strategic planning, and building leadership qualities. Emphasizes analytical concepts, techniques, and skills.

ESPM 3211 Survey, Measurement, and Modeling for Environmental Analysis (3.0 cr.; Student Option; prereq [MATH 1031 or MATH 1051], [3012 or FW 4001 or STAT 3011], 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.

ESPM 3221 Soil Conservation and Land-Use Management (3.0 cr.; Student Option; prereq SOIL 1125 or 2125 or 2068)

ESPM 3241W Natural Resource and Environmental Policy (3.0 cr.; Student Option)
Political processes in management of the environment. How disagreements are addressed by different stakeholders, private-sector interests, government agencies, institutions, communities, and nonprofit organizations.

ESPM 3245 Sustainable Land Use Planning and Policy (3.0 cr.; A-F or Audit; prereq Jr or sr)
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 (3.0 cr.; A-F or Audit)
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 less developed countries.

ESPM 3261 Economics and Natural Resources Management (4.0 cr.; A-F or Audit)

ESPM 3271 Environmental Policy, Law, and Human Behavior (3.0 cr.; A-F or Audit)
What is necessary to achieve sustainable societies. What influences societal deliberation/decisions about environmental issues. How

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our behaviors affect natural systems. Key theoretical concepts of environmental social psychology and political science. How people respond to policies, using theoretical concepts from social psychology about attitudes, values, and social norms; applying these ideas to specific environmental problems and ethical debates.

ESPM 3425 Atmospheric Composition: From Smog to Climate Change (3.0 cr.; A-F Grade Basis; prereq [CHEM 1021, CHEM 1022, PHYS 1011, 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 (1.0-4.0 cr.; Student Option)

Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

ESPM 3575 Wetlands (3.0 cr.; Student Option)

Freshwater wetland classification, wetland biota, current/historic status of wetlands, value of wetlands. National, regional, Minnesota wetlands conservation strategies, ecological principles used in wetland management.

ESPM 3601 Sustainable Housing--Community, Environment, and Technology (3.0 cr.; A-F or Audit)

How sustainable housing practices build community. How community growth has impacted the environment and how natural events impact our communities. Science and technology required to build high performance houses.

ESPM 3602 Regulations and Corporate Environmental Management (3.0 cr.; A-F Grade Basis; prereq APEC 1101 or ECON 1101 or 3261W)

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 (3.0 cr.; A-F Grade Basis)

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 (3.0 cr.; A-F Grade Basis)

Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

ESPM 3605 Recycling: Extending Raw Materials (3.0 cr.; A-F Grade Basis)

Basic principles of recycling and its role in raw materials utilization, energy, and the environment. Recycling processes for commonly recycled materials, products, and their properties and environmental implications of recycling.

ESPM 3606W Pollution Prevention: Principles, Technologies, and Practices (3.0 cr.; A-F Grade Basis; prereq CHEM 1011 or [CHEM 1015, CHEM 1017] or #)

Pollution prevention, cleaner production. Design for the Environment (DfE), life cycle management. Practices and technologies that reduce industrial emissions/costs by preventing pollution.

ESPM 3607 Natural Resources Consumption and Sustainability (3.0 cr.; A-F Grade Basis)

Current world trends for industrial raw materials; environmental/other tradeoffs related to options for satisfying demand/needs; global and systemic thinking; provides a framework for beginning a process of thinking critically about complex environmental problems/potential solutions in a diverse global economy.

ESPM 3612W Soil and Environmental Biology (3.0 cr.; Student Option; prereq Biol 1009 or equiv, Chem 1021 or equiv; 2125 recommended)


ESPM 3656 Composting and Organics Utilization (3.0 cr.; A-F or Audit; prereq [SOIL 1125 or SOIL 2125], junior standing)

Practical introduction to composting technology/organics utilization for undergraduate students/industry professionals. How organics can be utilized in soils. Scientific steps involved in compost process. Application methods/rates.

ESPM 3703 Agroforestry in Watershed Management (3.0 cr.; Student Option)

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 4017W Water Quality Decision Making (4.0 cr.; A-F or Audit; prereq [ESPM 3611 or #; 3416 recommended])

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 4018W GIS in Environmental Science and Management (4.0 cr.; A-F or Audit; prereq FR 3131 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 4061W Water Quality and Natural Resources (3.0 cr.; Student Option)

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 4063 Directed Study (1.0-7.0 cr.; Student Option; prereq #)

Research, readings, and instruction.

ESPM 4094 Directed Research (1.0-7.0 cr.; Student Option; prereq #)

Research under the direction of department faculty.

ESPM 4096 Professional Experience Program: Internship (1.0 cr.; A-F Grade Basis; prereq CFANS undergrad, #, completed internship contract)

Students create oral/written report based on paid or volunteered work or field experience.

ESPM 4216 Contaminant Hydrology (2.0 cr.; A-F or Audit)

Principles of contaminant transport in percolate solution and in overland flow. Hydrologic cycle, percolation/runoff processes, contaminant transport, leachate sampling methods, remediation technologies, scale effects on road water quality, tillage technologies, control of sediment/chemical losses. Discussions mostly descriptive, but involve some computations.

ESPM 4242 Methods for Environmental and Natural Resource Policy Analysis (3.0 cr.; A-F or Audit; prereq [3241 or equiv], [3261 or equiv], prereq jr or sr)

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 4256 Natural Resource Law and the Management of Public Lands and Waters (3.0 cr.; A-F or Audit; prereq [2125, [Chem 1021 or equiv, [Phys 1042 or equiv]]; 3416 recommended)


ESPM 4295W GIS in Environmental Science and Management (4.0 cr.; A-F or Audit; prereq FR 3131 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 (3.0 cr.; Student Option; prereq [2125, [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.
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ESPM 4607 Industrial Biotechnology and the Environment (3.0 cr.; A-F Grade Basis; prereq BIOL 1009, CHEM 1021) Biotechnology pertaining to biobased products and development of their environmental impact.

ESPM 4609 Air Pollution Impacts, Management, and Ethical Challenges (3.0 cr.; A-F or Audit; 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 regulations. Personal perspectives/ethics related to air pollution, how they impact professional/civic life.


ESPM 5031 Applied Global Positioning Systems for Geographic Information Systems (3.0 cr.; A-F or Audit; prereq Grad student or #) GPS principles, operations, techniques to improve accuracy, Datum, projections, and coordinate systems. Differential correction, accuracy assessments discussed/applied in lab exercises. Code/Carrier 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.

ESPM 5061 Water Quality and Natural Resources (3.0 cr.; Student Option; prereq Grad student or #) Recent literature in field. Complements 4061. Ecology of aquatic ecosystems, how they are valuable to society and changed by landscape management. Case studies, impaired waters, TMDL process, student engagement in simulating water quality decision making.

ESPM 5071 Ecological Restoration (4.0 cr.; Student Option; prereq [One college course in ecology, one college course in [plant science or botany]] or #) Ecological/physiological concepts for revegetation of grasslands, wetlands, forests, and landscapes. Plant selection, stand establishment/evaluation. State/federal programs that administer restoration/reclamation. Field trips.

ESPM 5101 Conservation of Plant Biodiversity (3.0 cr.; A-F or Audit; prereq Grad student or #) Introduction to principles underlying assessment/conservation of plant biodiversity at individual, population, and community levels. Case studies in management of biodiversity to restore or maintain ecosystem function. Genetics, timber harvesting, invasive species, plant restoration. Planning theories, concepts, and constructs. Policies, processes, and tools for sustainable land use planning. Scientific/technical literature related to land use planning. Skills needed to participate in sustainable land use planning.

ESPM 5108 Ecology of Managed Systems (4.0 cr.; A-F or Audit; prereq Sr or grad student) Analysis of functioning of ecosystems primarily structured by managed plant communities. Managed forests, field-crop agroecosystems, rangelands, aquatic systems. Structure-function relations. Roles of biodiversity in productivity, resource-use efficiency, nutrient cycling, resilience. Emerging principles for design of sustainable managed ecosystems, provision of ecological services.

ESPM 5111 Hydrology and Water Quality Field Methods (3.0 cr.; A-F or Audit; prereq Grad student or #) 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.

ESPM 5202 Environmental Conflict Management, Leadership, and Planning (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq Grad student or #) Political processes at play in management of environment and how disagreements are addressed by different stakeholders, private-sector interests, government agencies and institutions, communities, and nonprofit organizations.

ESPM 5242 Methods for Natural Resource and Environmental Policy (3.0 cr.; A-F or Audit; 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/concepts to environmental/natural resource problems. Recognizing politically-charged environment in which decisions over use, management, and protection of these resources often occur.

ESPM 5245 Sustainable Land Use Planning and Policy (3.0 cr.; A-F or Audit; prereq Grad student or #) Planning, assessment/conservation of plant biodiversity, natural resource management, land use policies and programs. Implications of land use policies, market activities, and technological change. Policies and procedures in land use enforcement. Trends in land use, planning, and policy.

ESPM 5505 Wetland Soils (3.0 cr.; A-F or Audit; 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, labs, field hydric soil delineation project.

ESPM 5575 Wetlands (3.0 cr.; Student Option; prereq 3575, [or grad student or #])

ESPM 5601 Principles of Waste Management (3.0 cr.; A-F or Audit; prereq 1125 or 2125, Biol 1002/1009 or Chem 1021, Stat 3011, ApEc 1101 or #)

ESPM 5602 Regulations and Corporate Environmental Management (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

ESPM 5605 Recycling: Extending Raw Materials Supplies (3.0 cr.; A-F Grade Basis)

ESPM 5606 Pollution Prevention: Principles, Technologies, and Practices (3.0 cr.; A-F Grade Basis; prereq CHEM 1011 or [CHEM 1015, CHEM 1017] or #)
Pollution prevention, green chemistry, cleaner production, Design for the Environment (DfE), life cycle management. Pollution prevention practices and technologies that reduce industrial emissions/costs by preventing pollution.

ESPM 5607 Industrial Biotechnology and the Environment (3.0 cr.; A-F Grade Basis; prereq BIOL 1009, CHEM 1021, grad student)
Biotechnology pertaining to biobased products development and their environmental impact.

ESPM 5609 Air Pollution Impacts, Management, and Ethical Challenges (3.0 cr.; A-F or Audit; 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. Environmental ethics related to air pollution, how they impact professional/civic life.

ESPM 5703 Agroforestry in Watershed Management (3.0 cr.; Student Option; prereq Grad student or #)
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 (3.0 cr.; A-F or Audit; prereq Grad student or #)

Experimental and Clinical Pharmacology (ECP)
College of Pharmacy

ECP 5220 Regulatory Issues in Drug Research (1.0-2.0 cr.; Student Option; prereq ECP grad student or Pharm.D. professional student or #)
Regulatory issues encountered in conducting drug research trials. Performing different aspects of clinical trials. Lectures, readings, small group discussions, homework assignments.

ECP 5290 Clinical Clerkship (1.0-8.0 cr.; Student Option; prereq Grad experimental and clinical pharmacology)
Supervised study of pharmaceutical services at University of Minnesota Medical Center, Fairview or affiliated institutions.

ECP 5520 Drug Metabolism and Disposition (3.0 cr.; A-F or Audit; prereq Grad student or #)

ECP 5593 Directed Study in Experimental and Clinical Pharmacology (1.0-4.0 cr.; Student Option)
Student working with faculty member designs a directed study course, including a complete syllabus, appropriate time commitment, and workload for number of credits.

ECP 5594 Directed Research in Experimental and Clinical Pharmacology (1.0-4.0 cr.; Student Option)
Student works with faculty adviser to design a scientific research project.

Family Medicine and Community Health (FMCH)

FMCH 5345 Curriculum Design and Teaching Strategies for Medical Education I (3.0 cr.; A-F or Audit; prereq concurrent enrollment in 5346, #)
Identifying/developing course goals. Developing course, teacher, learner evaluations. Students must also take 5346, which follows immediately after 5345.

FMCH 5346 Curriculum Design and Teaching Strategies for Medical Education II (1.0 cr.; A-F or Audit; prereq 5345, #)
Taken with 5345. Practicum of lecture, demonstration, small-group discussion, clinical teaching, and computer-assisted instruction. Academic ethics, policies, copyright issues, tenure, academic freedom, problem-based learning.

FMCH 5564 Family Practice Seminar (1.0 cr.; O-N or Audit; prereq MD or DO degree)
Knowledge, skills, and attitudes in biomedical and behavioral sciences that form foundation for academic discipline of family medicine; medical decision making, common problems and procedures, family theory and assessment, clinical pharmacy, human sexuality.

FMCH 5650 Principles of Geriatrics I (1.0 cr.; P-N or Audit; prereq Medical School or dental school or GNP School graduate)
First in two-course sequence. Survey of major topics in geriatric medicine. Epidemiology, etiology, diagnosis, and treatment of major geriatric syndromes and illnesses.

FMCH 5651 Principles of Geriatrics II (1.0 cr.; P-N or Audit; prereq Medical School or dental school or GNP School graduate)
Second in two-course sequence. Survey of major topics in geriatric medicine. Epidemiology, etiology, diagnosis, and treatment of major geriatric syndromes and illnesses.

FMCH 5950 Critical Issues in Human Sexuality (2.0 cr.; O-N or Audit; prereq Enrollment in health sci grad programs in CSPP, Psy, PubH, SW or FSoS or #)
Assessment and treatment techniques pertaining to common sexual problems.

FMCH 5955 Directed Study (1.0-10.0 cr.; O-N or Audit; prereq #; qualified students may arrange for work on a tutorial basis)
Studies on special topics as arranged between student and faculty.

FMCH 5960 Basic Research Methods in Family Practice (3.0 cr.; A-F or Audit; prereq Grad student, #)
History and current status of research in family medicine, research resources available in the department. How to ask/define a research question, conduct a literature search, select a research methodology, meet federal requirements for protection of human subjects in research, critically read the medical literature and facilitate its discussion, and prepare a grant proposal.

FMCH 5961 Family Medicine Fellows and Junior Faculty Integration Seminar (1.0-9.0 cr.; A-F or Audit; prereq [Family medicine faculty or fellow], #)
Preparation for roles in academia. Achieving success as a clinical investigator. Funding
opportunities, authorship, collaboration, publishing, grant preparation.

Family Social Science (FSOS)
College of Education and Human Development

FSOS 1101 Intimate Relationships (4.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
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 (1.0 cr.; A-F or Audit; prereq Fr or soph or PSEO)
Money management. Responsible use of credit, specifically credit cards. Online course: 15 Web-based lessons.

FSOS 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

FSOS 2101 Preparation for Working With Families (2.0 cr.; A-F or Audit)
Systematic preparation for upper division education, research/field internships, and career possibilities in Family Social Science.

FSOS 2103 Family Policy (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; prereq PSTL 1004 or STAT 1001 or OMS 2550 or ESPY 3264 or STAT 3011 or PSY 4801 or #)

FSOS 2191 Independent Study in Family Social Science (1.0-4.0 cr.; Student Option; prereq Soph; #)
Independent reading or writing or research under faculty supervision.

FSOS 3101 Personal and Family Finances (3.0 cr.; Student Option; prereq At least soph or #)

FSOS 3102 Family Systems and Diversity (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq Varies by topic, at least soph)
Review of research/scholarly thought. Topics specified in Class Schedule.

FSOS 3191 Independent Study in Family Social Science (1.0-5.0 cr.; Student Option; prereq Jr, #)
Independent reading or writing or research under faculty supervision.

FSOS 3426 Alcohol and Drugs: Families and Culture (3.0 cr.; Student Option)

FSOS 3429 Counseling Skills Practicum I (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq [3101, 3102, 3429] or #)
Introduction to family financial management applications through different stages in family financial life cycle. Case studies.

FSOS 4154W Families and Aging (3.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 (2.0 cr.; A-F Grade Basis; prereq FSOS honors)
Individualizes the honors experience by connecting aspects of major program with special academic interests.

FSOS 4191 Independent Study in Family Social Science (1.0-4.0 cr.; Student Option; prereq Sr, #)
Independent reading or writing or research under faculty supervision.

FSOS 4294 Research Internship (1.0-4.0 cr.; Student Option; 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 (1.0-12.0 cr.; S-N or Audit; prereq [2101, at least jr] or #)
Directed paraprofessional work experience related to student’s area of study.

FSOS 5014 Quantitative Family Research Methods I (3.0 cr.; Student Option; 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 Family Research Laboratory (1.0 cr.; S-N or Audit; prereq Grad student or #)
Application of basic family research methods into experiential learning using statistical software. Analyses that correspond with problem situations in 5014 and that involve secondary data analyses. Using statistical
software for basic family research. Preparation to work with quantitative family data sets.

FSOS 5032 Family Systems Theories and Interventions (3.0 cr.; Student Option; prereq Grad student or #)
Systemic/cybernetic frameworks as they apply to diverse families. Thinking systemically about families across multiple ecological systems. How to identify crucial epistemological issues in theoretical/applied areas of family science. Theoretical frameworks. Experiential role-playing, guest presenters, videos, field work, research projects, reading clubs, class discussion.

FSOS 5101 Family Systems (3.0 cr.; Student Option; prereq grad student)
Family systems and other family theories focusing on the dynamics and processes relevant to family life. Diversity issues related to gender, ethnicity, sexual orientation, and disability. Issues related to divorce, single parenthood, and remarriage are covered. Family strengths and family problems are integrated.

FSOS 5150 Special Topics in Family Social Science (1.0-4.0 cr.; Student Option; prereq #) Review of research/scholarly thought. Topics specified in Class Schedule.

FSOS 5193 Directed Study in Family Social Science (1.0-6.0 cr.; Student Option; prereq FSOS or grad student in related field) tbd

FSOS 5426 Alcohol and Drugs: Families and Culture (2.0 cr.; Student Option) Overview of psychology/sociology of drug use/abuse. Life-span, epidemiological, familial, cultural data regarding use. Fundamentals of licit/illicit drug use behavior. Gender, ethnicity, social class, sexuality, sexual orientation, disability.

FSOS 5429 Counseling Skills Practicum I (3.0 cr.; Student Option) 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 5900 Special Topics in Family, Youth, and Community (1.0-4.0 cr.; Student Option) Topics not dealt with in regular courses. Topics vary by offering.

FSOS 5902 Family Education Perspectives (3.0 cr.; A-F or Audit)
Origins, evolution, and critique of alternative perspectives on family education. Implications for educators, programs, and participants.

FSOS 5904 Contemporary Family Education (3.0 cr.; A-F or Audit)
Contemporary conditions of and transitions in family life. Emphasizes implications for educators and educational programs.


FSOS 5908 Family and Work Relationships (3.0 cr.; A-F Grade Basis) Interactions of work/family roles, responsibilities, and aspirations. Resources, legal aspects, gender.

FSOS 5912 Sexuality Education (3.0 cr.; A-F Grade Basis) Development, delivery, and evaluation of sexuality education curriculum/programs.

FSOS 5914 Education for Family Communication (3.0 cr.; A-F Grade Basis) Development, delivery, and evaluation of curriculum/programs related to family communication.

FSOS 5932 Introduction to Parent Education (1.0 cr.; A-F Grade Basis) Philosophy, history, and models of parent education. Ethical, critically reflective professional practice.

FSOS 5936 Advanced Practice of Parent Education (3.0 cr.; Student Option; prereq 5935 or FE 5702 or %) Evolving perspectives of parent education. Emphasizes psycho-dynamic, conceptual-change approaches. Reflective/dialogic approaches for working with parents in understanding beliefs and examining their origins/consequences. Issues related to diversity, self-awareness, ethics, and evaluation.


FSOS 5942 Everyday Experiences of Families (2.0 cr.; A-F Grade Basis) Culture and everyday experiences of diverse families. Relevance to parent education and to professional development of parent educators. Research/theoretical knowledge woven with observation/personal reflection.


FSOS 5944 Parent Education Curriculum (2.0 cr.; A-F Grade Basis; prereq 5943 or #) How parent learning/development, child development, and family systems theories influence curriculum approaches/materials in parent education. Student develop construct, critique, and select curriculum.

FSOS 5945 Teaching and Learning in Parent Education (2.0 cr.; A-F Grade Basis; prereq 5943 or #) Students select/use parent education teaching strategies/processes to meet needs of various populations of adult learners. Critical reflection, ethical practices, parent educator competencies.

FSOS 5946 Assessment and Evaluation in Parent Education (2.0 cr.; A-F Grade Basis; prereq 5943 or #) Theory, terminology, issues, and approaches in assessment/evaluation. Emphasis on monitoring parent education program performance, assessing program quality, and measuring parent learning/development.

FSOS 5949 Student Teaching in Parent Education (2.0 cr.; A-F Grade Basis; prereq #) Supervised parent education practice to meet individual student needs/interests. Online discussion, reflection, cooperative learning.

Finance (FINA)
Curtis L. Carlson School of Management

FINA 1905 Freshman Seminar (1.0-3.0 cr.; A-F Grade Basis; prereq Fr) Topics vary. See Class Schedule.


FINA 4221 Principles of Corporate Finance (2.0 cr.; A-F Grade Basis; prereq 3001, CSOM major, actuarial science major) Theoretical/applied corporate finance, impact on investment decisions. Financing decisions, payout decisions, tax effects, managerial incentives.

FINA 424W Corporate Investment Decisions (4.0 cr.; A-F or Audit; prereq 3001, 4121, 4321, 4422, 4522, CSOM major) Managing firm's investment in working capital/fixed assets. Capstone course requiring application of corporate valuation principles from earlier coursework to cases involving working capital management, making capital budgeting decisions, targeting/evaluating firm performance, assessing mergers/acquisitions, and other topics.


FINA 4329 Security Analysis Capstone (2.0 cr.; A-F Grade Basis; prereq 4121, 4321, 4422, 4522, ACCT 5100 or ACCT 5101)

FINA 4422 Financial Modeling (2.0 cr.; A-F Grade Basis; prereq 3001, 4221, ACCT 5100 or 5101, CSOM major) 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 (2.0 cr.; A-F Grade Basis; prereq 3001, 4221, CSOM major) 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 (2.0 cr.; A-F Grade Basis; prereq 3001, 4121, 4321, CSOM major) 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 (2.0 cr.; A-F Grade Basis; 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 4621 The Global Economy (Macro) (2.0 cr.; A-F Grade Basis; prereq 3001, CSOM major) Survey of macroeconomic policies in emerging markets and developed countries. International dimensions of corporate finance. Exchange rates, interest rate parity, trade deficit/surplus.

FINA 4622 International Finance (2.0 cr.; A-F Grade Basis; prereq [3001, 4121 or 4221], CSOM major) Corporate investment, risk management decision making in international context. International capital markets, cost of capital in emerging economies. Measuring/managing currency risk.

FINA 4920 Topics in Finance (2.0 cr.; Student Option; prereq Varies) Topics vary.

### Finnish (FIN)
#### College of Liberal Arts

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>FIN 1001 Beginning Finnish</td>
<td>(5.0 cr.; Student Option)</td>
<td>Emphasis on working toward novice-intermediate low proficiency in all four language modalities (listening, reading, speaking, writing). Topics include every day subjects (shopping, directions, family, food, housing, etc.).</td>
</tr>
<tr>
<td>FIN 1002 Beginning Finnish</td>
<td>(5.0 cr.; Student Option; prereq FIN 1001)</td>
<td>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.</td>
</tr>
<tr>
<td>FIN 1003 Intermediate Finnish</td>
<td>(5.0 cr.; Student Option; prereq 1002)</td>
<td>Emphasis on intermediate proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is combined with authentic readings and essay assignments.</td>
</tr>
<tr>
<td>FIN 1004 Intermediate Finnish</td>
<td>(5.0 cr.; Student Option; prereq 1003)</td>
<td>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.</td>
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### Fisheries and Wildlife (FW)
#### College of Food, Agricultural and Natural Resource Sciences

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<tr>
<th>Course</th>
<th>Title</th>
<th>Description</th>
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<tr>
<td>FW 1001 Orientation in Fisheries, Wildlife, and Conservation Biology</td>
<td>(1.0 cr.; A-F or Audit)</td>
<td>Survey of technical requirements and education needed for careers in fisheries, wildlife, and conservation biology. Introduction to fields of work, problems, career opportunities.</td>
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<tr>
<td>FW 1901 Freshman Seminar</td>
<td>(1.0-3.0 cr.; Student Option; prereq Fr with no more than 29 cr)</td>
<td>In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.</td>
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<tr>
<td>FW 1905 Freshman Seminar</td>
<td>(1.0-3.0 cr.; Student Option; prereq fr)</td>
<td>Issues/topics related to natural resources and the environment. Topics vary.</td>
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</tbody>
</table>

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
FW 2001 Introduction to Fisheries, Wildlife, and Conservation Biology (3.0 cr.; Student Option; prereq BIOL 1001 or BIOL 1009) Fish, wildlife, and other forms of biodiversity. Single species, populations, ecosystems, and landscape approaches. Experimental/interactive course. Decision-case studies.

FW 2002 Threatened and Endangered Wildlife: Causes, Consequences, and Future Conservation (3.0 cr.; Student Option; prereq Intro biology course) 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 (3.0 cr.; Student Option; prereq BIOL 1001 or BIOL 1009 or BIOL 2012 or GEOL 1006 or #) Nature of oceans, their role sustaining life on planet. Diversity/ecology of organisms that live in coastal, deep, and open seas. Effects of humans on marine life. Resilience of marine life, its importance to human society. Cultures of oceanic peoples. Selected topics (e.g., fisheries science and conservation, marine mammal conservation, global warming).

FW 3565 Fisheries and Wildlife Ecology and Management: Field Trip (2.0 cr.; A-F Grade Basis; prereq #) 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 (4.0 cr.; A-F or Audit; 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 (4.0 cr.; Student Option; prereq BIOL 1001 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq Intro biology course, [or sr]) Foundation for understanding discipline of wildlife management. Preparation for upper division wildlife courses.

FW 4106 Important Plants in Fisheries and Wildlife Habitats (1.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq [BIOL 3407 or BIOL 3408W or BIOL 3807], [or #], FW major) Planning/implementation of research/management projects. Collect/analyze data in groups. Group/individual oral/written reports. Each student keeps a field journal.

FW 4136 Ichthyology (4.0 cr.; Student Option; prereq BIOL 1001 or BIOL 2012) Fish biology, adaptations to different environments and modes of living, and environmental relationships. Lab emphasizes anatomy and identification of Minnesota fishes.

FW 4191 Independent Study: Conservation Biology (1.0-5.0 cr.; Student Option; prereq #) Individual field, library, and lab research in conservation biology.

FW 4291 Independent Study: Fisheries (1.0-5.0 cr.; Student Option; prereq #) Individual field, library, and lab research in fisheries.

FW 4292 Special Lectures: Fisheries (1.0-5.0 cr.; Student Option; prereq #) Lectures in special fields of fisheries given by visiting scholar or regular staff member.

FW 4391 Independent Study: Wildlife (1.0-5.0 cr.; Student Option; prereq #) Individual field, library, and lab research in wildlife.

FW 4392 Special Lectures: Wildlife (1.0-5.0 cr.; Student Option; prereq #) Lectures on special topics of wildlife given by visiting scholar or staff member.

FW 4401 Fish Physiology and Behavior (3.0 cr.; Student Option; prereq 4136, BIOL 2012, CHEM 1021 (may be taken concurrently)) Fish mechanisms/behavior. Links between fish biology, fisheries ecology, management, aquaculture. Homeostasis, neurobiology, bioenergetics, reproduction, movement.

FW 4701 Fisheries and Wildlife Problem Solving (2.0 cr.; Student Option; prereq FW sr or grad student) Management problem identification/analysis, information gathering/analysis, oral/written reporting. Selected management issues.

FW 5003 Human Dimensions of Biological Conservation (3.0 cr.; Student Option; prereq [BIOL 1001 or BIOL 1009], [or BIOL 3407] Survey of social, psychological, economic, policy aspects of managing/conserving wildlife, fisheries, and related resources.

FW 5051 Analysis of Populations (4.0 cr.; Student Option; prereq [BIOL 3407 or BIOL 3408W], [4001 or STAT 3011 or ESPM 3012]; FW 4103) Regulation, growth, general dynamics of populations. Data needed to describe populations, population growth, population models, regulatory mechanisms.

FW 5292 Special Lectures: Fisheries (1.0-5.0 cr.; Student Option; prereq Grad student or #) Lectures in special fields of fisheries given by visiting scholar or regular staff member.

FW 5392 Special Lectures: Wildlife (1.0-5.0 cr.; Student Option; prereq Grad student or #) Lectures given by visiting scholar or staff member.

FW 5401 Fish Physiology and Behavior (3.0 cr.; Student Option; prereq &FW 4136, CHEM 1021, BIOL 2012) Fish physiology/behavior. Links between fish biology, fisheries ecology, management, aquaculture. How to write a research proposal. Homeostasis, neurobiology, bioenergetics, reproduction, movement.

FW 5601 Fisheries Population Analysis (3.0 cr.; A-F or Audit; 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 5605W Habitats and Regulation of Wildlife (3.0 cr.; A-F or Audit; prereq Biol 3407, [4103 or #]) Environmental interactions of wildlife at population/community levels. Environmental threats from human activities. Habitat management practices. Objectives, polices, regulations in population management.

FW 5604W Fisheries Ecology and Management (3.0 cr.; Student Option; prereq EEB 3603 or EEB 4601 or EEB 5601) Managed species/systems. Applied aquatic/fish ecology related to fisheries. Role of planning in fisheries management. Application of management tools, assessment of their efficacy.

FW 5625 Wildlife Handling and Imobilization for Research and Management (2.0 cr.; S-N or Audit; prereq General biology, [grad student or vet med student or FW sr]) 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.

Food Science and Nutrition (FSCN) College of Food, Agricultural and Natural Resource Sciences

FSCN 1011 Science of Food and Cooking (4.0 cr.; Student Option) Souffles, custards, sauces, coffee brewing, candy making used to examine physics/chemistry of heat transfer, foams, gels, emulsions, extractions, crystallization.

FSCN 1012 Sports Nutrition (2.0 cr.; Student Option) Physiological function and metabolic fate of all six classes of nutrients ingested by active individuals to improve athletic performance. Impact on physiology of ergogenic aids and various dietary supplements. Overview of these components in fulfilling energy/recovery needs for continual/progressive athletic performance. Web-based course.

FSCN 1013 Dietary Supplements: scientific, regulatory, and cultural aspects (3.0 cr.; Student Option) Use of dietary supplements in the U.S. How to measure risk of a dietary supplement, approach used by National Institute of Medicine for dietary recommendations. Dietary Supplements Health and Education Act, FTC responsibilities. How dietary supplements

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
are marketed. Other cultures as sources of supplements. Intellectual property rights of indigenous cultures. Use of supplements for health/performance. Course is online.

FSCN 1090 Topics: (3.0 cr.; A-F or Audit) Non-lab microbiology for nursing

FSCN 1102 Food: Safety, Risks, and Technology (3.0 cr.; Student Option No Audit) Introduction to inherent risks/safety of food supply. Use of public policy and food technology to reduce risks. Microbiological, chemical, and environmental hazards, government/industry controls.

FSCN 1112 Principles of Nutrition (3.0 cr.; Student Option; prereq High school [biology, chemistry]) Fundamental concepts of nutrition, nutrient functions, human nutritional requirements, food sources. Evaluating nutrition information/food safety. Role of nutrition in chronic disease, public policy, and the environment.

FSCN 1904 Topics: Freshman Seminar (3.0 cr.; A-F or Audit) Interdisciplinary seminar. Topics vary.

FSCN 1905 Topics: Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq Fr) Topics vary.

FSCN 2001 Healthy Foods, Healthy Lives: A Food System Approach to Cooking (3.0 cr.; Student Option; prereq [soph, jr, sr] or #) Skills/resources for food choices based on nutritional, environmental, local/global societal implications. Ethical/civic themes that guide food choices. Discussion/writing on how environmental, cultural, social, health issues impact personal food choices.

FSCN 2021 Introductory Microbiology (4.0 cr.; A-F Grade Basis; prereq BIOL 1009, CHEM 1015) How microbes impact our world in deadly/life-saving ways. Roles of bacteria, fungi, and viruses as agents of human diseases; in food spoilage/food borne diseases; and in food preservation/health promotion. Preventing plant diseases, food/drug production, cleaning up oil spills. Genetic engineering.

FSCN 3102 Introduction to Food Science (3.0 cr.; Student Option; prereq CHEM 1022 or [CHEM 1062 and CHEM 1066]) Introduction to chemical/physical properties of foods. Evaluating interaction/reaction of foods due to formulation, processing, preparation.

FSCN 3301 Food Choices: Healing the Earth, Healing Ourselves (3.0 cr.; Student Option; prereq Jr or sr or grad student) Link between our food/diet, agricultural practices, and health of planet. Food security. Cultural/personal context of food choices. Ways that food is produced, especially industrial monoculture. Food choices and the earth's bio diversity. Land use, water use, pollution, energy needs, climate change. Alternatives: organic/sustainable, fair trade. Economic policies/choices. Global tradeoffs.

FSCN 3480 Topics in FScN (1.0-4.0 cr.; Student Option) Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

FSCN 3612 Life Cycle Nutrition (3.0 cr.; Student Option; prereq 1112, Chem 1022) Nutritional changes throughout lifecycle. Pregnancy, lactation, childhood, adulthood, aging. Topics relevant to lifecycle changes (e.g., body composition, immunity, sports nutrition).

FSCN 3614 Nutrition Education and Counseling (3.0 cr.; Student Option; prereq 1112) Application of theories/principles of learning, behavior change, instructional methods to nutrition education and counseling in community settings.

FSCN 3615 Sociocultural Aspects of Food, Nutrition, and Health (3.0 cr.; A-F Grade Basis) Sociocultural aspects of regional/cultural diversity in food preferences and food behavior, food habits, demographics, lifestyles, food consumption, and expenditures. Effect of socioeconomic status, religious beliefs, age, and cultural meaning of foods on food choices.

FSCN 3731 Food Service Operations Management Laboratory (2.0 cr.; A-F or Audit; prereq [3102 or & 3102], [3732 or & 3732]) 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 (3.0 cr.; A-F or Audit; prereq 3102 or & 3102) Planning, preparing, delivering, serving, managing foods served away from home.

FSCN 4096 Professional Experience Program: Internship (1.0-4.0 cr.; A-F or Audit; prereq FSCN undergrads, #, 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 4112 Food Chemistry and Functional Foods (3.0 cr.; Student Option; prereq 3102, BIOC 3021) Most-important food constituents, their occurrence, structures, functional properties, and health benefits. Proteins, lipids, carbohydrates, water. Vitamins, minerals, enzymes, phytochemicals, food additives, contaminants.

FSCN 4211 Food Microbiology (3.0 cr.; Student Option No Audit; prereq BIOC 3021, [2021 or VBS 2032 or MICB 3301]) Most-important food 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 4222 Food Fermentations and Biotechnology (2.0 cr.; Student Option; prereq [MICB 3301, BIOC 4063] 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 4311 Food Quality (3.0 cr.; Student Option; prereq 1102, Jr) Management systems in processing/distribution of foods that ensure food quality/compliance with food laws/regulations. Quality management, HACCP, audits, plant/equipment design for sanitation, specifications, recalls, control systems.

FSCN 4210 Topics in Food Science and Nutrition (1.0-4.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq Undergrads, #) Individual lab or library research in an area related to food science or nutrition.

FSCN 4311 Chemical Reactions in Food Systems (2.0 cr.; Student Option; prereq 4112, 4312W) Chemical structure of major food constituents, carbohydrates, lipid, and proteins. Reaction/interaction pathways. Function within complex food matrix under various storage/processing conditions.

FSCN 4312W Food Analysis (4.0 cr.; Student Option; prereq 4112, STAT 3011) Components in foods. Focuses on analytical measurement. Chemical, physical, and sensory techniques to identify/characterize major/minor components in food systems.

FSCN 4332 Food Processing Operations (3.0 cr.; A-F or Audit; prereq 4331 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 (4.0 cr.; Student Option; prereq FSCN 4112, FSCN 4122, FSCN 4331) Demonstration/application of basic concepts of food engineering/processsing, food chemistry, and food microbiology to production of fluid, fermented, concentrated, and dehydrated dairy products.

FSCN 4345 Flavor Technology (3.0 cr.; Student Option; prereq 4112, 4121, 4331) Flavor/olf-flavor development in foods. Industrial production of food flavorings, their proper application to food systems.

FSCN 4349 Food Science Capstone (2.0 cr.; A-F Grade Basis; prereq Food science major, sr) Planning of process or product development project. Defining goals, preparing/following time line, reviewing literature, coordinating with experts, procuring supplies, writing progress reports. Determining ingredient specifications, lab/pilot plant production. Chemical, microbiological, and sensory testing. Oral/written presentations.

FSCN 4612 Advanced Human Nutrition (4.0 cr.; Student Option; prereq 1112, [CHEM 1022 or CHEM 1062 and CHEM 1066], [BIOC 3021 or PHSL 3051 or ANSC 3301 or BIOL 3211]) Advanced study of digestion/absorption of nutrients. Research techniques in nutrition, including human/epidemiological studies. Health promotion, disease prevention theories.

FSCN 4613 Experimental Nutrition (2.0 cr.; Student Option; prereq 4612, BIOC 3021, Stat 3011) Lab in chemical/biochemical methods of analysis of nutritional status.
FSCN 4614 Community Nutrition (3.0 cr.; A-F Grade Basis; prereq FSCN 1112) Nutrition risks associated with different age, sex, ethnic, and socioeconomic groups. Community needs assessment, Program planning and evaluation. Programs developed to address the needs and interests of people at different stages of the life cycle, ethnic or cultural backgrounds, and literacy levels.

FSCN 4621W Nutrition and Metabolism (4.0 cr.; Student Option; prereq 4612, BIOC 3021, ANSC 3301) Carbohydrate, lipid, and protein metabolism. Uses systems/holistic approach to emphasize how metabolic pathways interrelate.

FSCN 4622 Nutritional Toxicology, the basic science of diet-related toxicants (3.0 cr.; A-F Grade Basis; 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 (1.0 cr.; S-N or Audit; prereq [(FSCN 4665) or 4666], 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 4665 Medical Nutrition Therapy I (3.0 cr.; A-F or Audit; prereq 4612, Phal 3051, BIOC 3021) Nutrition assessment and support. Pathology, management, and nutrition therapy for disorders of the gastrointestinal, immune, and respiratory systems, and cancer.

FSCN 4666 Medical Nutrition Therapy II (3.0 cr.; A-F or Audit; 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.

FSCN 4732 Food and Nutrition Management (3.0 cr.; A-F or Audit; prereq 3732) Financial and human resource management applied to a variety of business and institutional settings. Field trips may be required.

FSCN 5101 Food Regulation in the United States (2.0 cr.; A-F or Audit; prereq [(Grad or sr) food science or nutrition major] or #) U.S. system of regulation of food product formulation, manufacturing, labeling and advertising, including insight into the manner in which regulation and the underlying food laws are affected by scientific developments and changing societal values and concerns.

FSCN 5441 Introduction to New Product Development (2.0 cr.; Student Option; prereq 4111, 4331) Interactive course that introduces students to the principles of new product development, from identification and testing of new product concepts, through prototype testing, to basic process design using examples from industry.

FSCN 5461 Food Packaging (2.0 cr.; Student Option; prereq 1102, 3102, Phys 1102 or Phys 1302) Materials, principles, and procedures of packaging as they apply to food products. Emphasis is on consumer products, but the principles also apply to bulk and institutional foods and ingredients.

FSCN 5481 Sensory Evaluation of Food Quality (2.0 cr.; Student Option; prereq 3102, STAT 3011) Fundamentals of sensory perception. Test designs/methods in studying sensory qualities of foods. Issues in sensory evaluation. Group research project.

FSCN 5521 Flavor Technology (2.0 cr.; Student Option; prereq 4112) Overview of flavor chemistry/related technology. Analytical techniques, mechanisms of flavor development (chemical/biogenesis), off-flavors, industrial production/applications of food flavorings.

FSCN 5531 Grains: Introduction to Cereal Chemistry and Technology (2.0 cr.; Student Option; prereq BioI 1009, Chem 1022) Origins, structure, biochemistry, and cellular properties of major cereal grains as they relate to primary processing (milling) and secondary processing (production of cereal products).

FSCN 5601 Management of Eating Disorders (3.0 cr.; Student Option; prereq [Sr or grad student] in health related program or #) Etiology, occurrence, course, treatment, and prevention of eating disorders from a multidisciplinary perspective. Roles/ responsibilities of eating disorder treatment team members of varying types across various treatment milieus.

Foreign Study - SPAN (FSSP) College of Liberal Arts

FSSP 3960 Preparatory Seminar for SPAN Overseas Research (4.0 cr.; A-F or Audit; prereq %) Preparatory seminar for SPAN overseas research.

FSSP 3970 Seminar for SPAN Overseas Research (4.0 cr.; A-F or Audit; prereq %) Seminar for SPAN overseas research.

FSSP 5960 Preparatory Seminar for SPAN Overseas Research (4.0 cr.; A-F or Audit; prereq %) Preparatory seminar for SPAN overseas research.

FSSP 5970 Seminar for SPAN Overseas Research (4.0 cr.; A-F or Audit; prereq %) Seminar for SPAN overseas research.

FSSP 5980 Seminar for SPAN Overseas Research (1.0-4.0 cr.; A-F or Audit; prereq %)

Forest Resources (FR) College of Food, Agricultural and Natural Resource Sciences

FR 1001 Orientation and Information Systems (1.0 cr.; A-F or Audit) 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, periodic indexes.

FR 1101 Dendrology: Identifying Forest Trees and Shrubs (3.0 cr.; Student Option) Identification nomenclature, classification, and distribution of common/important forest trees/shrubs. Use of keys. Field/lab methods of identification.

FR 1901 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq freshman) In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

FR 2101 Identifying Forest Plants (1.0 cr.; A-F or Audit; prereq [BioI 1001 or Biol 1008]; 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 Croquet Forestry Center.

FR 2102 Northern Forests: Field Ecology (2.0 cr.; A-F or Audit; prereq BioI 1001 or Biol 1009) Field examination of natural history of northern/boreal forests with respect to soils, ecological characteristics of trees, community-environment relationships, stand development, succession, and regeneration ecology. Taught at Croquet Forestry Center.

FR 2104 Measuring Forest Resources (1.0 cr.; A-F or Audit) Introduction to land survey, tree/forest stand measurement (mensuration), and forest sampling techniques. Taught at Croquet Forestry Center.

FR 3104 Forest Ecology (4.0 cr.; A-F or Audit; prereq BioI 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 3131 Geographical Information Systems (GIS) for Natural Resources (4.0 cr.; A-F Grade Basis; prereq Soph or jr or sr or UHP Fr) Spatial data development/analysis in science/management of natural resources. Data structures/sources/collection/quality. Geodesy, map projections, spatial/tabular data analysis. Digital elevation data, terrain analysis, cartographic modeling/layout. Lab exercises.
FR 3203 Forest Fire and Disturbance Ecology (3.0 cr.; A-F or Audit; prereq [3104 or equiv], course fee) Ecology, history, management, and control of fire, wind, insect 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 3204 Landscape Ecology and Management (3.0 cr.; A-F or Audit; prereq Ecology course) 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 3262 Remote Sensing of Natural Resources and Environment (3.0 cr.; Student Option) Principles/techniques of remote sensing and its applications to mapping/monitoring land/water resources from local to global scales. Forest and natural resource inventory. Forest cover and soil mapping. Landuse/global change analysis. Lab provides hands-on experience working with aerial photography and digital sensing imagery.

FR 3411 Managing Forest Ecosystems: Silviculture (3.0 cr.; Student Option; 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 (2.0 cr.; Student Option; 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 implications of method/equipment choices. Selling timber. Sale design, layout, and administration. Two all-day field trips.

FR 3471 Forest Planning and Management (3.0 cr.; A-F or Audit; 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 (1.0-3.0 cr.; Student Option; prereq [3104, 3411, 3431] or #) 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 (3.0 cr.; Student Option; 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 4293 Directed Study (1.0-5.0 cr.; Student Option; prereq #) Study/project on topic of personal interest in consultation with faculty member. Initial proposal, reports of accomplishments.

FR 5051 Urban Forest Management: Managing Greenspaces for People (3.0 cr.; Student Option; prereq [1101, 3501, Ent 4251, PiPa 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 5411 Field Silviculture (2.0 cr.; Student Option; prereq [3104, 3411] 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. Two-day field trips to forests managed by state/industry.

FR 5415 Field Remote Sensing and Resource Survey (2.0 cr.; Student Option; 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 5421 Field Timber Harvesting and Road Planning (2.0 cr.; Student Option; prereq [3411, 3431] or #) Design, layout, and administration of timber sales. Forest road planning and design. Protecting residual trees during harvesting operations. Timber appraisal, forest management guidelines. Road location and profiling. Planning/layout considerations. Field trips to visit timber harvesting and road planning sites with public and private organizations. Taught at Cloquet Forestry Center.

FR 5504 Forest Ecology (4.0 cr.; A-F or Audit; 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 5514 Hydrology and Watershed Management (3.0 cr.; Student Option; prereq Grad student or #) Introduction to hydrologic cycle and water processes in upland/riparian systems. Applications of hydrological concepts to evaluate impacts of forest management and other land use patterns/activities on water yield, stormflow, erosion, sedimentation, and water quality. Concepts, principles, and applications of riparian/watershed management. Economic/social factors. National/global examples. Emphasizes forest ecosystems.

FR 5531 Geographical Information Systems (GIS) for Natural Resources (4.0 cr.; A-F Grade Basis; 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 5546 Science and Policy of Global Environmental Change (3.0 cr.; Student Option; prereq 3104 or Biol 3407 or equiv) Intro to critical issues underpinning global change and its biological implications. Current scientific literature on evidence for global change and potential effects on a wide range of biological processes. Economic/political impact on global change.

FR 5553 Forest and Wetland Hydrology (3.0 cr.; Student Option; 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 5561 Northern Forest Field Course (2.0 cr.; A-F or Audit; 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–environmental relationships, stand development,
Management of forest ecosystems for sustaining ecological integrity, soil productivity, water quality, wildlife habitat, biological diversity, commodity production in landscape context. Tools for forest dynamics, disturbances, regeneration, reclamation, silvicultural systems. Ramifications of management choices. Weekend field trip.

FR 5412 Digital Remote Sensing (3.0 cr.; Student Option; prereq 3262 or grad student or #)


FR 5413 Managing Forest Ecosystems: Silviculture Lab (1.0 cr.; Student Option; prereq FR [major or minor] or grad student)

Development of silvicultural prescriptions to achieve various landowner objectives. Timber cruise, growth/yield simulations, stand density management diagrams, thinning schedules, use of forest vegetation simulator. Field trips, computer labs, lectures.

FR 5431 Timber Harvesting and Road Planning (2.0 cr.; Student Option; prereq Grad student or #)

Forest operations. Terminology, engineering, equipment/harvesting system options, productivity/costs. Relationship to forest management and silviculture. Road planning, forest management guidelines. Mitigating potential impacts to soil/water resources. Environmental implications of method/equipment choices. Selling timber. Sale design, layout, and administration. Two all-day field trips.

FR 5471 Forest Planning and Management (3.0 cr.; A-F or Audit; 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 (1.0-3.0 cr.; Student Option; prereq 5 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 (3.0 cr.; Student Option; 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 5611 Field Silviculture (1.0 cr.; Student Option; prereq Grad student)

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 5615 Field Remote Sensing and Resource Survey (1.0 cr.; Student Option; 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.

FR 5621 Field Timber Harvesting and Road Planning (1.0 cr.; Student Option; prereq Grad student)


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**French (FREN)**

**College of Liberal Arts**

**FREN 100 Reading French in the Arts and Sciences (0.0 cr.; S-N Grading Basis)**

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 (5.0 cr.; Student Option)**

Basic listening, speaking, reading, and writing skills. Emphasis on communicative competence. Some cultural readings.

**FREN 1002 Beginning French (5.0 cr.; Student Option; prereq 1001 or equiv)**

Basic listening, speaking, reading, and writing skills. Emphasis on communicative competence. Some cultural readings.

**FREN 1003 Intermediate French (5.0 cr.; Student Option; prereq 1002 or Entrance Proficiency Test)**

Development of listening, writing, and speaking skills in the context of cultural themes related to the Francophone world. Grammar review and elaboration.

**FREN 1004 Intermediate French (5.0 cr.; Student Option; prereq 1003 or Entrance Proficiency Test)**

Development of listening, reading, writing, and speaking skills in the context of cultural themes related to the Francophone world. Grammar review and elaboration.

**FREN 1022 Accelerated Beginning French (5.0 cr.; Student Option; 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
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

FREN 3101W Methods in French and Francophone Studies (4.0 cr.; Student Option; prereq 3016 or equiv)
Writing intensive. Critical methods, standards of scholarship, and body of knowledge specific to French and Francophone studies. Understand/analyze literary and nonfiction texts, cultural artifacts, and audio/visual media pertaining to France and Francophone communities across the centuries.

FREN 3111 Medieval Stories (3.0 cr.; Student Option; prereq 3101)
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 3140 Topics in Medieval and Renaissance Literature (3.0 cr.; Student Option; prereq 3101)
Different aspects of French literature/culture of medieval/Renaissance periods (11th-16th century). Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Readings may be literary, critical, cultural, historical, political, etc. Specific content posted in department and in Course Guide.

FREN 3170 The Unruly Subject(s) of Classicism: Writing, History, Power in Ancien Régime France (3.0 cr.; Student Option; prereq 3101)
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 3172 The Court Society: Literature, Culture, Spectacle (3.0 cr.; Student Option; prereq 3101)
Examines the court and salon society in 17th-century France. The production of taste, sociability, and national identity is considered in literature, painting, architecture, and the plastic arts.

FREN 3181 Mapping Enlightenment in 17th- and 18th-Century French Prose (3.0 cr.; Student Option; 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 3240 Topics in Ancien Regime Literature (3.0 cr.; Student Option; prereq 3101)
Different aspects of French literature/culture from early modern period (17th/18th centuries). 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 3250 French Poetry (3.0 cr.; Student Option; 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 3260 Dramas of Culture: 20th-Century French and Francophone Theater (3.0 cr.; Student Option; prereq 3101)
Key movements, dramatists, and contexts of 20th-century French and Francophone theater. Areas of study include naturalist and symbolist legacies as well as existentialist, avant-garde, and contemporary performance and drama.

FREN 3310 Literature of Revolution and Upheaval (3.0 cr.; Student Option; prereq 3101)
A study of revolutionary movements in France 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 3321 Producing the Bourgeois Subject: The Sense of Self in 18th-Century French Literature (3.0 cr.; Student Option; prereq 3101)
Examines the role of 18th-century literature in shaping the notion of self and social identity. Attention is given to the novel and its relation to new reading practices and publics.

FREN 3330 Literature and the Making of Modern France: 20th-Century Perspectives (3.0 cr.; Student Option; prereq 3101)
Developments of literary culture of 20th-century France in the context of historical events and social transformations.

FREN 3340 Topics in Modern French Literature (3.0 cr.; Student Option; prereq 3101)
Modern French literature/culture, defining modern period as that of post-Revolution France. Content varies depending on instructor. Literary, historical, or social problem. Period, author, genre, or topic of interest. Specific content posted in department and in Course Guide.

FREN 3350 Topics in Literature (3.0 cr.; Student Option; prereq 3101)
Focuses on a problem, period, author, or topic of interest. Specific content posted in department and listed in Course Guide.

FREN 3360 Coming of Age (3.0 cr.; Student Option; 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 3380 Modern Times: Literature of the 19th and 20th Centuries (3.0 cr.; Student Option; prereq 3101)
Variously emphasizing the two centuries. Sample topics include: esthetic currents (Realism and the novel); cultural considerations (gendered representations); philosophical concerns (the relation of individuals to the social body in civil society).

FREN 3410 Quebecois Literature (3.0 cr.; Student Option; 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 3451 North African Cinema (3.0 cr.; Student Option; prereq 3101)
Cinemas of the Maghreb, the northern African nations of Morocco, Algeria, and Tunisia. Themes may include North African cities/communities; gender, class and ethnicity; and impact of globalization in migratory patterns. Films. Readings in philosophy, history, sociology, anthropology, and cultural critique.
FREN 3471 Topics in Francophone African Literature and Cultures (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 3500 Linguistic Analysis of French (3.0 cr.; A-F Grade Basis; prereq 3015)
Introduction to scientific study of French language. Concepts/terminology to describe nature/functioning of sounds, words, sentences/meaning, and variation. Taught in French.

FREN 3501 Structure of French: Phonology (3.0 cr.; Student Option; prereq 3015, [3014 or 3500 or Ling 3001 or #])
Advanced study of sound system of contemporary French.

FREN 3521 History of the French Language (3.0 cr.; Student Option; prereq 3015, [3500 or Ling 3001 or #])
Origins/development of French language from Latin to contemporary French. Selected texts. Present stage/development.

FREN 3531 Sociolinguistics of French (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3015, [3500 or Ling 3001 or #])

FREN 3601 French Civilization and Culture I (3.0 cr.; Student Option; prereq 3015)
Roman occupation of Gaul to 1715.

FREN 3602 French Civilization and Culture II (3.0 cr.; Student Option; prereq 3015)
1705 to present.

FREN 3611 Deciphering Courtly Literatures of Medieval France (3.0 cr.; A-F Grade Basis; prereq 3015)
Cultural practices of 12th-century Angevin/Capetian courts. Lyrics, romances, texts/artworks. Patronage, authorship, representation of self, understanding of various "others" (women, Orthodox Christians, Muslims).

FREN 3636 Human Nature from Descartes to Sade (3.0 cr.; A-F Grade Basis; prereq 3015)
Explores ethical dimensions of human nature/legacy from Descartes to Sade.

FREN 3650 Topics in French/ Francophone Cultures (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3015, 63016)
Why physical violence is intimately linked to spectacular representations. Theater as collective arena in which society attends to pressing problems. How/why repeated presence of violence was something meant to be held in early modern France and elsewhere.

FREN 3705 Atlantic Crossings: The French View Americans (and Vice Versa) (3.0 cr.; Student Option; prereq Not for majors) French perspectives on the United States and American perspectives on France in "travel" literature and film examined in their historical, political, and cultural contexts. Taught in English. Knowledge of French helpful but not necessary.

FREN 3710W Reading Libertinage: Dangerous Lessons in Translation (3.0 cr.; Student Option; prereq Non [major or minor] in French or [French [major or minor], #]; students [majoring or minor] in French arrange work in French [reading, writing] with instructor)
Libertine 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 3712 Reading Libertinism (3.0 cr.; Student Option; prereq French majors/minors: 3015, 3101 strongly recommended; non-majors: no pre-reqs) Underworld, subversive, and philosophical countercultures that imagine the impossible and push society to its limits. Why society always has a philosophical underground, how it shapes our understanding of individual responsibility. Shifting notions of acceptable/moral behavior. Groups that thoughtfully push the limits of what is imaginable. Role of philosophizing/imagining in creating society/values. Taught in English.

FREN 3733 The Idea of Paris (3.0 cr.; Student Option) Ranges across literature, painting, photography, film, and architecture. Meanings that the idea of Paris acquired in modern French cultural imagination. Paris read critically as proteman metaphor, myth, or allegory of urban modernity. Views of Paris as defining American cultural imagination. Taught in English.

FREN 3736 Human Nature from Descartes to Sade (3.0 cr.; A-F Grade Basis) Explores ethical dimensions of human nature/history/legacy from Descartes to Sade.

FREN 3750 Topics in French or Francophone Literature and Culture (3.0 cr.; Student Option; prereq Non-French major; knowledge of French helpful)
Theme, problem, period, or topic of interest in French or Francophone literature or culture. See Class Schedule. Taught in English.

FREN 3955 Directed Teaching (1.0-5.0 cr.; S-N or Audit; prereq %) Directed teaching.

FREN 4001 Beginning French (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1001. See 1001 for course description.

FREN 4002 Beginning French (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1002. See Fren for course description.

FREN 4003 Intermediate French (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1003. See 1003 for course description.

FREN 4004 Intermediate French (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1004. See 1004 for course description.

FREN 4022 Accelerated Beginning French (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1002. See 1022 for course description.

FREN 4101V Honors: Seminar in French Studies (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 4109W Senior Project in French and Francophone Studies (1.0 cr.; A-F Grade Basis; prereq Completion of most major coursework or permission of DUS) Completion of a research paper based on a paper written for a previous course or expansion of a project undertaken in a concurrent course.

FREN 4110V Honors Thesis (1.0-2.0 cr.; A-F Grade Basis; prereq Candidate for honors in French, [completion of most major coursework or permission of DUS]) Directed study used to develop and complete the honors thesis in French and Francophone studies.

FREN 4510 Topics in French Linguistics (3.0 cr.; Student Option; prereq 3015) Topics from French syntax, pragmatics, discourse analysis, or sociolinguistics.

FREN 4970 Directed Readings (1.0-4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 5260 The Returns of Tragedy (3.0 cr.; Student Option; prereq 3111 or above) Tragedy as dramatic form in relation to social order, myth and history, and theatre.

FREN 5301 Critical Issues in French Studies (3.0 cr.; Student Option; prereq Grad or #) Introduces the methods of interpretation and critical debates that have shaped and continue to define the discipline of French studies. Provides a practical introduction to graduate-level literary research.

FREN 5350 Topics in Literature and Culture (3.0 cr.; Student Option; prereq 3101 or equiv) Problem, period, author, or topic of interest. See Class Schedule.

FREN 5470 Post/Colonial Francophone Literatures (3.0 cr.; Student Option; prereq 3111 or above) Francophone literature from North Africa, Africa, and the Caribbean of the colonial and/or post-colonial eras in the light of relevant literary and cultural theories.

FREN 5501 Structure of French: Phonology (3.0 cr.; Student Option; prereq Ling 3001 or 5001, grad) Advanced study of sound system of contemporary French.

FREN 5531 Sociolinguistics of French (3.0 cr.; Student Option; prereq 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 5541 Oral Discourse of French (3.0 cr.; Student Option; prereq 3015, grad student; Ling 5001 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 5995 Directed Teaching (1.0-6.0 cr.; S-N or Audit; prereq #) Directed teaching.

FRIT 3600 The Renaissance (3.0 cr.; Student Option) Relationships between the visual arts, literature, science, philosophy, and politics in Europe from about 1300-1600. Works of artists, writers, and intellectuals (e.g., Michelangelo Buonarrotti, Niccolo Machiavelli, Michel de Montaigne), different artistic and literary forms (e.g., portrait, sonnet, essay), and broad thematic issues, including the individual, antiquity, the state, and discovery. Team taught.

FRIT 3802 Cinema and Realism (3.0 cr.; Student Option) Examines French poetic realism, relating it to two other periods of realist film, Italian Neorealism and American film noir. Taught in English. Knowledge of French helpful but not necessary.

FRIT 3803 New Wave Cinemas: Love, Alienation and Landscape in Post-War Italian and French Film (3.0 cr.; Student Option) 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.

FRIT 3804 Cinema and Culture: The City of Paris (3.0 cr.; Student Option) 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.

FRIT 3850 Topics in French and Italian Cinema (3.0 cr.; Student Option; prereq Knowledge of [French or Italian] helpful but not required) Theme, problem, period, filmmaker, or topic of interest in French/Italian cinema. See Class Schedule. Taught in English.

FRIT 3851 France, Italy and North Africa in Films on Contemporary Migrations (3.0 cr.; Student Option; prereq Knowledge of French or Italian recommended) Films shot in France, Italy, and North Africa (Morocco, Algeria, Tunisia). Representations of migrants, regular/clandestine immigration. Globalization, identity, hospitality, racism, modes of communication/integration. In-class films include Andrea Téchiné's Far, Yasmine Kassari's The Sleeping Child, and Io, L'Altro. All have English subtitles. Readings in English, some available in French and Italian.

FRIT 3880 Topics in French and Italian Literatures and Cultures (3.0 cr.; Student Option) Topic of interest in interrelational and cross-cultural exchanges that have contributed to Italian/French literature and culture, from Medieval to modern period. Topics vary with instructor. See Course Guide.

FRIT 5257 Passionate Beings: Literary and Historical Experience of Gay Men and Homophobia in American Culture (3.0 cr.; 396 cr.; A-F or Audit) 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 3001 Introduction to GLBT Studies (3.0 cr.; Student Option) 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 3212 Dissident Sexualities in U.S. History (3.0 cr.; A-F or Audit; prereq Jr or sr or #) Sexualities that have challenged dominant social/cultural norms. Transgender, bisexual, lesbian, and gay identities/communities. Politics of sex across lines of race/ethnicity. Controversial practices, including sex work.

GLBT 3301 Gay, Lesbian, Bisexual, and Transgender Social Movements in the United States (3.0 cr.; Student Option) Interdisciplinary course. Development of GLBT social movements using social movement theory/service learning.

GLBT 3404 Transnational Sexualities (3.0 cr.; Student Option) 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.


GLBT 3472 Men and Homophobia in American Culture (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option)
GWSS 1001 Gender, Power, and Everyday Life (3.0 cr.; Student Option)
U.S. multi-/cross-cultural studies of contemporary social, cultural, and personal conditions of women's lives. Includes honors recitation.

GWSS 1002 Politics of Sex (3.0 cr.; Student Option)
Introductory survey of historical, cultural, psychological, and sociopolitical dimensions of analyzing gender/sexuality. Norms/deviances pertaining to gender/sexuality as differently enacted/understood by social groups in different time/place-specific locations.

GWSS 1003W Women Write the World (3.0 cr.; Student Option)
Concepts in literary studies. Poems, plays, short stories, novels, essays, letters by women from different parts of world. Focuses on lives, experiences, and literary expression of women, including basic concepts of women's studies.

GWSS 1004 Screening Sex: Visual and Popular Culture (3.0 cr.; Student Option)
Film history and theory; feminist critique of popular culture.

GWSS 1005 Engaging Justice (3.0 cr.; Student Option)
U.S./cross-cultural studies of social movements/political organizing around justice/equality.

GWSS 1006 Skin, Sex, and Genes (3.0 cr.; Student Option)
Interdisciplinary course that explores the tense relationships between science, medicine and gender and sexuality.

GWSS 1007 Introduction to GLBT Studies (3.0 cr.; Student Option)
History of contemporary GLBT-identified communities. Terms of theoretical debates regarding sexual orientation, identity, experience. Analyzes problems produced/insights gained by incorporating GLBT issues into specific academic, social, cultural, political discourses.

GWSS 1002 Freshman Seminar (3.0 cr.; A-F or Audit; 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.

GWSS 1101 Gender, Sexuality, and Politics in America (3.0 cr.; Student Option)
Ways public/private life intersect through issues of gender, sexuality, family, politics, and public life. Ways racial, ethnic, and class divisions have manifested in political ideologies affecting private life.

GWSS 1403 Queering Theory (3.0 cr.; Student Option; prereq 1002 or 3102 or #)
Lesbianism and lesbian identities as products of cultural practices, relations, and meanings that are historically specific/changing.

GWSS 1593 Directed Study (1.0-12.0 cr.; Student Option)
Directed Study

GWSS 1907 Topics: Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics/description vary. See Class Schedule, Course Guide.

GWSS 1904 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

GWSS 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics/description vary. See Class Schedule, Course Guide.

GWSS 1910W Topics: Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics/description vary. See Class Schedule, Course Guide.

GWSS 3003H Honors: Gender, Race, and Class: Women's Lives in the United States (3.0-4.0 cr.; Student Option; prereq Honors) Comparative study of women/gender, race, class, sexuality in two or more U.S. ethnic cultures. Honors recitation.

GWSS 3002W Gender, Race, and Class: Women's Lives in the United States (3.0 cr.; Student Option)
Comparative study of women/gender, race, class, and sexuality in two or more U.S. ethnic cultures. Includes honors recitation.

GWSS 3003 Gender and Global Politics (3.0 cr.; Student Option)

GWSS 3003H Honors: Gender and Global Politics (3.0-4.0 cr.; Student Option; prereq honors) Similarities/differences in women's experiences throughout world from cross-cultural/historical perspective. Uses range of reading materials/media (feminist scholarship, fiction, film, news media, oral history, autobiography). Includes honors recitation.


GWSS 3102V Honors: Feminist Thought and Theory (3.0-4.0 cr.; Student Option) Feminist theoretical perspectives. How theory develops in response to traditions/forms of practice.


GWSS 3190 Topics: Theory, Knowledge, and Power (3.0 cr.; Student Option)
Topics specified in Class Schedule.

GWSS 3201 Sociology of Gender (3.0 cr.; A-F or Audit; prereq 1001 or 1002 or #)

GWSS 3202H Honors: Biology of Women (4.0 cr.; Student Option)

GWSS 3203W Blood, Bodies and Science (3.0 cr.; Student Option)
Ways in which modern biology has been site of conflict about race/gender. Race/gender demographics of scientific professions.

GWSS 3290 Topics (3.0 cr.; A-F Grade Basis) Topics specified in Class Schedule.

GWSS 3290H Topics: Biology, Health, and Environmental Studies: Enviro/ Feminism (3.0 cr.; Student Option; prereq Honors) Concepts of environmental biology, changing conditions of life on earth, creating a sustainable future. Connection between feminism and environmental justice. Disproportionate impact of environmental crises on women, children, and economically disadvantaged communities.

GWSS 3301W Women Writers (3.0 cr.; Student Option) Complexities of women's roles and way women writers have used various genres of literature to articulate personal and social struggles. Fiction, poetry, drama, critical nonfiction texts. Fidelity/betrayal within relationships and societal perceptions. What images of femininity do these writers convey? How do formal and stylistic devices transform meaning?

GWSS 3302 Women and the Arts (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option) 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 Queer Cinema (3.0 cr.; Student Option) What "queer" and "queering" signify in relation to cinema. Directors, films, styles, genres of queer cinema. Ways in which traditional narrative codes are challenged/repackaged. Ideological dimensions. Impact of political climate. Readings, screenings, discussions, assignments.

GWSS 3306 Pop Culture Women (3.0 cr.; Student Option) Contemporary U.S. feminism as political/intellectual movement. Ways in which
GWSS 3307 Feminist Film Studies (3.0 cr.; Student Option)

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 (3.0 cr.; A-F or Audit)

Comparative survey of ethnographic/ethnohistorical writings by/about American Indian women.

GWSS 3413 Women and Gender in Latin American History (3.0 cr.; Student Option)

Changino gender norms in Latin America over time as compared with lives of women of men of diverse classes, ethnic groups. How women responded to their position in society, on continuum from accomodation to resistance.

GWSS 3414 Women in Medieval Europe (3.0 cr.; A-F or Audit)

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 Feminist Perspectives on Domestic Violence and Sexual Assault (3.0 cr.; A-F Grade Basis)

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 (3.0 cr.; Student Option)


GWSS 3490 Topics: Political Economy and Global Studies (3.0 cr.; Student Option)

Topics specified in Class Schedule.

GWSS 3503 Women and the Law (3.0 cr.; Student Option)

Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.

GWSS 3590 Topics: Social Change, Activism, Law, and Policy Studies (3.0 cr.; Student Option)

Topics specified in Class Schedule.

GWSS 3681 Gender in the Islamic World (3.0 cr.; A-F Grade Basis; prereq At least soph)

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.

GWSS 3690 Topics: Women, Society, and Race in the United States (3.0 cr.; Student Option)

Topics specified in Class Schedule.

GWSS 3880H Honors Directed instruction (1.0-8.0 cr.; Student Option; prereq honors)

Directed instruction.

GWSS 3890H Topics: Honors Seminar (1.0-8.0 cr.; Student Option; prereq honors)

Topics vary. Topics that students would like faculty to develop into a course or topics closely related to faculty research/scholarship or contemporary issues.

GWSS 3893H Honors Directed Study (1.0-8.0 cr.; Student Option; prereq honors)

Honors directed study.

GWSS 3894H Honors Directed Research (1.0-8.0 cr.; Student Option; prereq honors)

Honors directed research.

GWSS 3980 Directed Instruction (1.0-12.0 cr.; Student Option; prereq #, %, @)

Directed Instruction.

GWSS 3993 Directed Study (1.0-12.0 cr.; Student Option; prereq #, %, @)

TBD

GWSS 3994 Directed Research (1.0-12.0 cr.; Student Option; prereq #, %, @)

TBD

GWSS 4001 Nations, Empires, Feminisms (3.0 cr.; A-F Grade Basis)

Feminist critiques of the nation-state and citizenship, political economy and development, globalization, and/or empire and colonialism. Overview of the broader literature and an interrogation of specific attendant questions (such as how do feminists theorize state violence; what are feminist and queer critiques of U.S. empire; and how do feminists theorize globalization from above and below).

GWSS 4002 Politics of Engagement and Social Justice (3.0 cr.; A-F Grade Basis)

Ways in which feminist scholars have thought about and worked to complicate the opposition between theory and praxis. Diverse efforts by intellectuals situated within the Western academy to produce scholarship that is committed to deinstitutionalizing knowledge production and relevant to political struggles confronted by their own material and institutional inequalities.

GWSS 4003 Science, Bodies, Technologies (3.0 cr.; Student Option)

Feminist approaches to scientific methods and practices. Relationship between scientific practices and social relations, emphasizing the larger social, political, and economic context in which scientific knowledge production takes place. How scientific knowledge structures relationships of power and inequality, and constructs understandings of bodies and identities. Ways in which science shapes meanings of sex, race, gender and sexuality.

GWSS 4004 Queering Desire (3.0 cr.; Student Option)

Core perspectives of queer theory. Recent extensions and manifestations.

GWSS 4102 Women, Gender, and Science (3.0 cr.; Student Option; prereq 1001 or 1002 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 (3.0 cr.; Student Option)

Western/non-Western feminist theories in conversation. Historical, cultural, political context. Relation of theory to activism.
GWSS 4103H Transnational Feminist Theories (3.0 cr.; Student Option; prereq [3102, 8 cr WOST] or grad student or #) Western/non-Western feminist theories in conversation. Historical, cultural, and political context. Relation of theory to activism.

GWSS 4108 Senior Seminar: Writing (1.0 cr.; Student Option; prereq GWSS major [jr or sr]) Capstone course. Conduct independent research/writing in conjunction with 3xxx-, 4xxx-, or 5xxx-level GWSS class.

GWSS 4122 Philosophy and Feminist Theory (3.0 cr.; Student Option; prereq 8 crs in [philosophy or women's studies] 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.

GWSS 4190 Topics: Theory, Knowledge, and Power (3.0 cr.; Student Option; prereq Sr or grad student or #) Topics specified in Class Schedule.

GWSS 4201 The Older Woman: A Feminist Perspective (3.0 cr.; Student Option; prereq 12 cr in WoSt or substantial work in psych or soc sci) Myths and realities surrounding conceptualizations of older women in public, private, personal, social, sexual, professional, and community interactions.

GWSS 4290 Topics: Biology, Health, and Environmental Studies (3.0 cr.; Student Option; prereq Sr or grad student or #) Topics specified in Class Schedule.

GWSS 4390 Topics: Visual, Cultural, and Literary Studies (3.0 cr.; Student Option; prereq Sr or grad student or #) Topics specified in Class Schedule.

GWSS 4401 Chicana/Latina Cultural Studies (3.0 cr.; Student Option) Readings in Chicana/Latina cultural studies. TV, film, art, music, dance, theatre, literature. Identity/sexuality. Production of culture/theory.

GWSS 4402 Rebels, Radicals, and Revolutionaries: History of Western Feminisms (3.0 cr.; Student Option) Survey of main currents in history of western feminist thought, politics, and social movements from 1770s to present.

GWSS 4403 Queering Theory (3.0 cr.; Student Option; prereq 1002 or 3102 or #) Lesbianism and lesbian identities as products of cultural practices, relations, and meanings that are historically specific/changing.

GWSS 4404 Gender, Nation, and Literature in Latin America (3.0 cr.; Student Option; prereq [1001 or course on feminist theory], [jr or sr]) Latin American literature/film concerning gendered nature of Latin American politics, society, and history. Texts by (mostly) women writers/filmmakers. Texts are in English but available in Spanish or Portuguese.

GWSS 4406 Black Feminist Thought in the American and African Diasporas (3.0 cr.; Student Option) Critically examine spatiality of African descendant women in Americas/larger black diaspora. Writings from black feminist/queer geographies, history, contemporary cultural criticism. Recent black feminist theorizing.


GWSS 4490 Topics: Political Economy and Global Studies (3.0 cr.; Student Option; prereq Sr or grad student or #) Topics specified in Class Schedule.

GWSS 4505 Legislative Internship (3.0 cr.; Student Option; 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 4590 Topics: Social Change, Activism, Law, and Policy Studies (3.0 cr.; Student Option; prereq Jr or sr or grad student) Topics specified in Class Schedule.

GWSS 4621W Rhetoric of Feminism (3.0 cr.; Student Option) History/criticism of rhetoric of feminism from 19th century to present.

GWSS 4690 Topics: Women, Society, and Race in the United States (3.0 cr.; Student Option) Topics specified in Class Schedule.

GWSS 4790 Topics: Sexuality Studies (3.0 cr.; Student Option) Topics specified in Class Schedule.

GWSS 4900W Women's Studies Seminar (3.0 cr.; A-F or Audit; 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 (1.0-8.0 cr.; Student Option) TBD

GWSS 4993 Directed Study (1.0-5.0 cr.; Student Option; prereq Filled out student/faculty contract, #, %, @) TBD

GWSS 4994 Directed Research (1.0-8.0 cr.; Student Option) TBD

GWSS 5101 Feminist Approaches to Ethnography (3.0 cr.; Student Option) 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 5102 Feminist Approaches to History (3.0 cr.; Student Option; prereq 8 cr WoSt or grad or #) Analysis and practice of feminist history. Theories, methods, and sources that address the interrelationship of gender, race, class, and sexuality.

GWSS 5103 Feminist Pedagogy (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option; prereq [Wrost 5108, Wrost 5850]; 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 5107 Gender, Culture, and Science (3.0 cr.; Student Option) Critical study of some of the major papers concerning the relations of gender and scientific inquiry produced in the past 20 years.

GWSS 5122 Philosophy and Feminist Theory (3.0 cr.; Student Option; prereq 8 crs in [philosophy or women's studies] 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.

GWSS 5190 Topics: Theory, Knowledge, and Power (3.0 cr.; Student Option) Topics specified in Class Schedule.

GWSS 5201 Global Processes and the Politics of Sexuality (3.0 cr.; Student Option; 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 5290 Topics: Biology, Health, and Environmental Studies (3.0 cr.; Student Option) Topics specified in Class Schedule.

GWSS 5300 Communication and Gender (3.0 cr.; A-F or Audit; 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 5390 Topics: Visual, Cultural, and Literary Studies (3.0 cr.; Student Option) Topics specified in Class Schedule.

GWSS 5404 Working Class Women's Cultures (3.0 cr.; Student Option; 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 5405 Chicanas: Women and Work (3.0 cr.; Student Option; prereq #) Chicanas, their various relationships to family/community. Local, national, and global work forces. Questions/issues related to growing integration of world's systems of production.

GWSS 5406 Black Feminist Thought in the American and African Diasporas (3.0 cr.; Student Option) Critically examines spatiality of African descendant women in Americas/larger black diaspora. Writings from black feminist/queer
General Dentistry (GEND)
School of Dentistry

GEND 5151 Advanced General Dentistry Seminar I (5.0-10.0 cr.; S-N or Audit)
Clinical seminars with emphasis on treatment planning, case presentation, techniques and materials, comprehensive oral healthcare and maintenance, and issues in practice management. Correlated with concurrent clinical experiences.

GEND 5152 Advanced General Dentistry Seminar II (5.0-10.0 cr.; S-N or Audit)
Clinical seminars with emphasis on treatment planning, case presentation, techniques and materials, comprehensive oral healthcare and maintenance, and issues in practice management. Correlated with concurrent clinical experiences.

GEND 5153 Advanced General Dentistry Seminar III (2.0-10.0 cr.; S-N or Audit)
Clinical seminars with emphasis on treatment planning, case presentation, techniques and materials, comprehensive oral healthcare and maintenance, and issues in practice management. Correlated with concurrent clinical experiences.

GEND 5254 Advanced General Dentistry Clinic I (5.0-15.0 cr.; S-N or Audit)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5255 Advanced General Dentistry Clinic II (5.0-15.0 cr.; S-N or Audit)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5256 Advanced General Dentistry Clinic III (5.0-15.0 cr.; S-N or Audit)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5261 Advanced General Dentistry Clinical Administration I (5.0-10.0 cr.; S-N or Audit)
Field experience in community dental clinic practice and administration.

GEND 5262 Advanced General Dentistry Clinical Administration II (5.0-10.0 cr.; S-N or Audit)
Field experience in community dental clinic practice and administration.

GEND 5263 Advanced General Dentistry Clinical Administration III (1.0-10.0 cr.; S-N or Audit)
Field experience in community dental clinic practice and administration.

GEND 5264 Advanced General Dentistry Clinic IV (1.0-15.0 cr.; S-N or Audit)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

GEND 5265 Advanced General Dentistry Clinic V (1.0-15.0 cr.; S-N or Audit)
Comprehensive oral health care delivered in a variety of settings, emphasizing complex restorative care, coordinating care with dental and medical specialists, special needs patients, and advanced techniques.

Genetics, Cell Biology and Development (GCD)
College of Biological Sciences

GCD 2002 Ethical and Social Challenges in Genetics (3.0 cr.; A-F Grade Basis; prereq BIOL 1009 or equiv)
For nonscientists. Advances in genetics and their application to society. Ethical and social issues of advancements in genomics and genetics in our everyday lives.

GCD 3022 Genetics (3.0 cr.; Student Option; prereq BIOL 1002 or BIOL 1009)
Mechanisms of heredity, their implications for biological populations. Applications to practical problems.

GCD 3033 Principles of Cell Biology (3.0 cr.; A-F Grade Basis; prereq BIOL 1009 or equiv)
Components and activities common to eukaryotic cells. Chromosomes, membranes, organelles and the cytoskeleton, and processes including cellular communication, replication, motility, transport and gene expression. Relevance to human health and medicine. Appropriate for non-CBS majors.

GCD 3485 Bioinformatic Analysis: Introduction to the Computational Characterization of Genes and Proteins (3.0 cr.; A-F Grade Basis; prereq BIOL 4003; [BIOL 4004 or &BIOL 4004 or #])
Contemporary stem cell biology with emphasis on mechanisms/applications. Embryonic,
tissue-specific, and induced pluripotent stem cells and potential uses in human disease.

GCD 4793W Directed Studies: Writing Intensive (1.0-7.0 cr.; S-N or Audit; prereq #, %)
Individual study on selected topics or problems. Emphasizes selected readings, use of scientific literature. Written report.

GCD 4794W Directed Research: Writing Intensive (1.0-6.0 cr.; S-N or Audit; prereq #, %)
Laboratory or field investigation of selected areas of research including written report.

GCD 4893 Directed Studies (1.0-7.0 cr.; S-N or Audit; prereq #, %)
Individual study on selected topics or problems. Emphasizes selected readings and use of scientific literature.

GCD 4994 Directed Research (1.0-6.0 cr.; S-N or Audit; prereq #, %)
Laboratory or field investigation of selected areas of research.

GCD 5036 Molecular Cell Biology (3.0 cr.; Student Option; prereq Biol 4004 or #; 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)**
College of Liberal Arts

GIS 5530 GIS Internship (1.0-3.0 cr.; S-N Grading Basis; prereq #, strong GIS/mapping skills)
Practical hands-on experience using GIS to solve problems in a real-world work environment.

GIS 5555 Basic Spatial Analysis (3.0 cr.; Student Option; prereq [STAT 3001 or equiv, MGIS student] or #)
How to use spatial data to answer questions on a wide array of social, natural, and information science issues. Exploratory data analysis/visualization. Spatial autocorrelation analysis/regression.

GIS 5571 ArcGIS I (3.0 cr.; Student Option; prereq [GEOG 5561 or equiv, status in MGIS program, familiarity with computer operating systems] or #)
First of a two-course series focusing on ArcGIS Desktop. Overview of ArcGIS system and its use for spatial data processing. Data capture, editing, geometric transformations, map projections, topology, Python scripting, and map production.

GIS 5572 ArcGIS II (3.0 cr.; Student Option; prereq [GIS 5571, [GEOG 5561 or equiv, in MGIS program] or #)
Continues GIS 5571. Raster analysis, dynamic segmentation, geometric networks, geocoding, Python scripting, and data interoperability. Substantial projects include map and poster design and production.

GIS 5573 Desktop Mapping (1.5 cr.; Student Option; prereq [GEOG 5561 or equiv, in MGIS program] or #)
Desktop mapping functions using ArcGIS software. Application of these systems to the display and analysis of geographical data.

GIS 5574 GIS and the Internet (3.0 cr.; Student Option; prereq [GEOG 5561 or equiv, in MGIS program] or #)
Web-based technologies. Plan, design, develop, and publish a web-based GIS solution. Building websites, preparing data for the web, commercial software, Open Source software, volunteer geographic information, open GIS standards and developing a web GIS application. Hands-on experience with a variety of web GIS technologies and software.

GIS 5575 Surveying and the Global Positioning System (GPS) (2.0 cr.; Student Option; prereq [GEOG 5561 or equiv, in MGIS program] or #)
Surveying techniques and its relationship to GPS of use to GIS professionals. Geodesy, data adjustment, datums, ellipsoids, coordinate systems, and transformations.

GIS 5577 Spatial Database Design and Administration (3.0 cr.; Student Option; prereq MGIS student or #)
Spatial database design, development planning/management, maintenance, security, access/distribution, and documentation.

GIS 5578 GIS Programming (3.0 cr.; Student Option; prereq MGIS student or #)
Programming techniques using Python and other languages specifically relating to GIS technologies.

GIS 5590 Special Topics in GIS (1.0-3.0 cr.; A-F or Audit; prereq #)
Topics vary according to curricular needs, technological developments in field.

**Geography (GEOG)**
College of Liberal Arts

GEOG 1301V Honors: Our Globalizing World (4.0 cr.; A-F Grade Basis; prereq Honors)
Introduction to geographical understandings of globalization and of connections/differences between places.

GEOG 1301W Our Globalizing World (4.0 cr.; Student Option)
Introduction to geographical understandings of globalization and of connections/differences between places.

GEOG 1372 Geography of Global Cities (3.0 cr.; Student Option)

GEOG 1403 Biogeography of the Global Garden (4.0 cr.; Student Option)
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 (4.0 cr.; A-F Grade Basis; 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 1425 Introduction to Meteorology (4.0 cr.; Student Option; prereq High school algebra)

GEOG 1502 Mapping Our World (3.0 cr.; Student Option)
Fundamental issues related to acquisition, storage, manipulation, analysis, display, and interpretation of spatially-referenced data. Emphasizes mathematical analysis of data, interpretation of cultural/physical patterns critical to development of geographical reasoning.

GEOG 1901 Freshman Seminar (3.0 cr.; A-F Grade Basis; prereq Fr)
Topics specified in Class Schedule.

GEOG 1904 Freshman Seminar (3.0 cr.; Student Option; prereq freshman)
Topics specified in Course Guide.

GEOG 1905 Freshman Seminar (3.0 cr.; Student Option; prereq Fr)
Topics specified in Class Schedule.

GEOG 1906W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

GEOG 1910W Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

GEOG 1973 Geography of the Twin Cities (3.0 cr.; Student Option)
Social and physical characteristics of the Twin Cities. Their place in the urban network of the United States.

GEOG 3101 Geography of the United States and Canada (4.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Regional differentiation of human groups and environments; culture contact and problems of underdeveloped countries south of the Sahara.

**GEOG 3161 Europe: A Geographic Perspective** (3.0 cr.; Student Option)
Comparative analysis and explanation of Europe's physical, demographic, ethnic/cultural, economic, political, and urban landscapes. European integration—the European Union. Transformation of Eastern Europe.

**GEOG 3212 Producing India** (3.0 cr.; Student Option)

**GEOG 3331 Geography of the World Economy** (3.0 cr.; Student Option)
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 3361W Geography and Public Policy** (3.0 cr.; Student Option)
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 3371V Honors: Introduction to Urban Geography** (4.0 cr.; Student Option; prereq Honors)
Character, distribution, development of cities in present-day world. Internal/external locational relationships.

**GEOG 3377 Music in the City: Sounds and Bodies in Different Places** (3.0 cr.; A-F or Audit)
Geographical conceptions of place, space, embodiment, and identity. Case studies of music.

**GEOG 3378 The Third World: Development, poverty, possibility** (3.0 cr.; Student Option)
Processes underlying socioeconomic change in the Third World. Evolving global economy, internal spatial/socioeconomic conditions. Theories of modernization, development, and underdevelopment.

**GEOG 3379 Environment and Development in the Third World** (3.0 cr.; A-F or Audit; prereq Soph or jr or sr)

**GEOG 3388 Going Places: Geographies of Travel and Tourism** (3.0 cr.; A-F Grade Basis)
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** (4.0 cr.; A-F or Audit)
Geographic patterns, dynamics, and interactions of atmospheric, hydrospheric, geomorphic, pedologic, and biologic systems as context for human population, development, and resource use patterns.

**GEOG 3411W Geography of Health and Health Care** (4.0 cr.; Student Option)
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 3431 Plant and Animal Geography** (3.0 cr.; Student Option)
Introduction to biogeography. Focuses on patterns of plant/animal distributions at different scales over time/space. Evolutionary, ecological, and applied biogeography. Paleobiogeography, vegetation-environment relationships, vegetation dynamics/disturbance ecology. Human impact on plants/animals, nature conservation. Discussions, group/individual projects, local field trips.

**GEOG 3511 Principles of Cartography** (4.0 cr.; Student Option; 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 3521 Digital Planet: Understanding Your World in the Information Age** (3.0 cr.; Student Option)
Mobile geospatial information technologies—cell phone tracking/vehicle navigation to virtual globe mapping. Potentials, limits, and concerns about their use and ongoing developments. Use GPS and video to produce a GeoDiary. Surveillance, cyberspace, and more common geospatial applications, especially those relying on mobile devices.

**GEOG 3523 Digital Mapping: Introduction to Making Online Maps for the Humanities and Sciences** (3.0 cr.; Student Option)
Digital technologies with an emphasis on creating online maps and using digital geobrowser technologies. Google Earth, NASA WorldWind. Quantum GIS, GPS software/hardware. Manipulating data, preparing analysis, and making online interactive maps, called mashups.

**GEOG 3531 Numerical Spatial Analysis** (4.0 cr.; Student Option)
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** (4.0 cr.; Student Option; 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 3561H Honors: Principles of Geographic Information Science** (4.0 cr.; Student Option; prereq Honors, Jr or sr)
Introduction to study of geographic information systems (GIS). GIS application domains, data models/sources, analysis methods, output
GEOG 3997 Senior Project (2.0 cr.; A-F Grade Basis; prereq #, %) 
Senior Project add-on credit. Must be taken concurrently with required or elective course related to area of specialization.

GEOG 4001 Modes of Geographic Inquiry (4.0 cr.; Student Option) 
Examination of competing approaches to the study of geography. Environmental determinism; regional tradition; scientific revolution; behavioral geography; modeling and quantitative geography; radical geography; interpretative and qualitative approaches; feminist and postmodern geography; ecological thinking and complexity; geographic ethics.

GEOG 4022W Environmental Thought and Practice (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option) 
Introduction to the study of the 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 4700 Community Service Learning (1.0-3.0 cr.; Student Option; 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 5361 Geography and Real Estate (4.0 cr.; Student Option; prereq Jr or sr) 
Origins and evolution of land ownership in the United States.

GEOG 5374W The City in Film (4.0 cr.; Student Option; prereq grad 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/children). Meets concurrently with 3374. Additional weekly meeting discusses films, readings. Project on a topic selected in consultation with instructor.

GEOG 5385 Globalization and Development: Political Economy (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option) 
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 (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option) 
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 (3.0 cr.; Student Option; 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 5423 Climate Models and Modeling (3.0 cr.; Student Option; prereq 3401 or #) 
Survey of development and research with simple and complex (three-dimensional) climate models. Environmental processes and their numerical representation in climate models; evaluation of model sensitivity and accuracy; coupling between atmosphere, biosphere, hydrosphere, and cryosphere; assessment of model predictions for climate change.

GEOG 5426 Climatic Variations (3.0 cr.; Student Option; prereq 1425 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 5431 Plant and Animal Geography (3.0 cr.; Student Option) 
Introduction to biogeography. Focuses on patterns of plant/animal distributions at different scales over time/space. Evolutionary, ecological, and applied biogeography. Paleobiogeography, vegetation-environment relationships, vegetation dynamics/disturbance ecology, human impact on plants/animals, nature conservation. Discussions, group/individual projects, local field trips.

GEOG 5511 Principles of Cartography (3.0 cr.; Student Option) 

GEOG 5512 Cartography: Topics (3.0 cr.; Student Option; prereq 3511 or 3531 or #) 
Selected topics include the system of cartographic communication, map design, map reading, map analysis, history of cartography.
GEOG 5530 Cartography Internship (2.0-7.0 cr.; S-N or Audit; prereq #) Provides intensive hands-on experience in contemporary map production and design, ranging from GIS applications to digital prepress. Strong computer skills essential.

GEOG 5531 Numerical Spatial Analysis (4.0 cr.; Student Option) Applied/theoretical aspects of geographical quantitative methods for spatial analysis. Emphasizes analysis of geographical data for spatial problem solving in human/physical areas.

GEOG 5561 Principles of Geographic Information Science (4.0 cr.; Student Option; 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 5562 Geographic Information Science and Analytical Cartography (3.0 cr.; Student Option; prereq GIS 5571 or #) Algorithms/data structures for digital cartographic data, topological relationships, surface modeling, and interpolation. Map projections, geometric transformations, numerical generalization, raster/vector processing. Hands-on experience with software packages.

GEOG 5563 Advanced Geographic Information Science (3.0 cr.; Student Option; prereq B or better in 5561 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 (3.0 cr.; Student Option; prereq 3561 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 5565 Geographical Analysis of Human-Environment Systems (3.0 cr.; Student Option; prereq 3561 or 5561 or FR 4131 or LA 5573 or one intro GIS course or grad student or #) Applications of geographic information systems and other spatial analysis tools to analysis of environmental systems patterns, dynamics, and interactions. Focuses on global to landscape databases developed to analyze atmospheric, hydrospheric, geomorphic, pedologic, biologic, and human landuse systems.

GEOG 5839 Introduction to Dendrochronology (3.0 cr.; Student Option; 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 5900 Topics in Geography (3.0 cr.; Student Option; prereq sr or grad. #) Special topics and regions. Course offered by visiting professors in their research fields.

Geological Engineering (GEOE) College of Science and Engineering


GEOE 4341 Engineering Geostatistics (3.0 cr.; A-F or Audit; 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. geologic site characterization, and special sampling designs.


GEOE 4352 Groundwater Modeling (3.0 cr.; A-F or Audit; prereq [4351, CE 4351, [CSE upper div or grad student]] or #) Analytic element method. Mathematical/computer modeling of single/multiple aquifer systems. Groundwater recovery. Field problems. Theory/application of simple contaminant transport models, including capture zone analysis.

GEOE 4311 Experimental Geomechanics (3.0 cr.; A-F or Audit; prereq CSE upper division or grad student, 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 5321 Geomechanics (3.0 cr.; A-F or Audit; prereq CSE upper division or grad student, 4301, CE 4301, or #) Review of elasticity theory and solution of some elastic boundary value problems relevant to geomechanics. Wave propagation in unbounded elastic media. Elements of fracture mechanics and applications. Elements of poroelasticity and applications.

GEOE 5331 Geomechanics Modeling (3.0 cr.; A-F or Audit; prereq CSE upper division or grad student, 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.

GEOE 5341 Wave Methods for Nondestructive Testing (4.0 cr.; A-F or Audit; prereq [AEM 2021, AEM 3031] or #)
GER 222 Reading German (0.0 cr.; A-F or Audit)
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 (5.0 cr.; Student Option)
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 (5.0 cr.; Student Option; prereq 1001)
Listening, reading, speaking, writing. Emphasizes proficiency. Topics include free-time activities, careers, and culture of German-speaking areas.

GER 1003 Intermediate German (5.0 cr.; Student Option; prereq 1002 or Entrance Proficiency Test)

GER 1004 Intermediate German (5.0 cr.; Student Option; prereq 1003 or completion of Entrance Proficiency Test at 1004 level)

GER 1022 Beginning German Review (5.0 cr.; Student Option; 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 (3.0 cr.; Student Option)
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 1904 Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

GER 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

GER 1905H Honors Freshman Seminar (3.0 cr.; Student Option; prereq Fr or fewer than 30 cr)
Topics specified in Class Schedule.

GER 1909W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

GER 1910W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

GER 3011W Conversation and Composition (4.0 cr.; Student Option; prereq 1004)
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 (3.0 cr.; Student Option; 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 3014 German Media (3.0 cr.; Student Option; prereq 3011)

GER 3016 Techniques of Translation (3.0 cr.; Student Option; prereq 3011)
Theory/practice of translation from/to German in various genres. Idiomatics, stylistics, and cross-cultural aspects of translation.

GER 3021 Business German (3.0 cr.; Student Option; prereq 3011 or equiv)
German economy, business culture. Practice of language used in business. Reading/discussion of German business documents. Preparation of formal letters and reports.

GER 3104W Reading and Analysis of German Literature (3.0 cr.; Student Option; prereq 3011)
Introduction to literary analysis. Readings from drama, prose, and lyric poetry, from 18th century to present.

GER 3410 German Literature Before 1750 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3011)
German literature, 1720-1810. Enlightenment/Weimar classicism in historical/cultural context. Reading/discussion of literary/philosophical works, aesthetic criticism.

GER 3431 19th-Century Literature (3.0 cr.; Student Option; prereq 3011)
Literary/cultural exploration of 19th-century German literature through an investigation of romanticism, realism, and naturalism. Reading/discussion of literary/critical texts.

GER 3441 20th-Century Literature (3.0 cr.; Student Option; prereq 3011)
German literature, from 1890 to present, in historical, political, social, and cultural context.

GER 3460 Women Writers in German Literature (3.0 cr.; Student Option; prereq 3011)
Historical/historical investigation of selected German women writers, from perspectives of feminist theory, gender studies, and cultural studies/theory. Approaches may be thematic, generic, or chronological.

GER 3490 Topics in German Literature (3.0 cr.; Student Option; prereq 3011)
Intensive exploration of specific authors, literary genres, or literary topics not covered in period courses.

GER 3500 Contemporary Germany (3.0 cr.; Student Option; prereq 3011)
Social, political, and cultural developments in Germany, from 1945 to present.

GER 3510 Topics in German Studies (3.0 cr.; Student Option; prereq 3011)
One topic in depth dealing with culture or civilization of German-speaking countries.

GER 3520 Topics in Austrian and Central European Culture (3.0 cr.; Student Option; prereq 3011)
Culture, politics, and economy in Austria and Central Europe. Comparative analysis of cultural/political developments. Topics vary.

GER 3531 Selected Readings in German Intellectual History (3.0 cr.; Student Option; prereq 3011)
Philosophical writings on culture, history, and art. Authors include Lessing, Schiller, Kant, Hegel, Marx, Nietzsche, and Freud.

GER 3593 Directed Studies: German-Speaking Countries (4.0 cr.; Student Option; prereq 3011, %)
Preparation for research abroad during semester before departure. Written/oral reports upon return.

GER 3601 German Medieval Literature (3.0 cr.; Student Option; 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 3604W Introduction to German Cinema (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 3641 German Folklore (3.0 cr.; Student Option; prereq No knowledge of German)
GER 3701 History of the German Language (3.0 cr.; Student Option; prereq 1004)
Change in grammar and lexicon, 750 A.D. to present.

GER 3702 Beginning Middle High German (3.0 cr.; Student Option; prereq 1004)
Middle High German grammar. Selected literary texts.

GER 3704 German Dialects (3.0 cr.; Student Option; prereq 1004)
Contemporary regional dialects recorded on tape and written in texts. Synchronic and diachronic analysis.

GER 3993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #, %, @))
Guided individual reading or study.

GER 4001 Beginning German (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1001. See 1001 for course description.

GER 4002 Beginning German (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1002; see Ger 1002 for course description.

GER 4003 Intermediate German (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1003. See 1003 for course description.

GER 4004 Intermediate German (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1004. See 1004 for course description.

GER 4040 German Play: Oral Interpretation and Performance of German (1.0-3.0 cr.; Student Option)
Dramatic reading of German play for pronunciation; preparation and rehearsal for production and performance of German play.

GER 5011 Advanced Conversation and Composition (3.0 cr.; Student Option; prereq 3012, [grad student or adv undergrad])
Achieving high proficiency in writing/speaking professional/academic German.

GER 5016 Advanced Translation: Theory and Practice (3.0 cr.; Student Option; prereq 3011 or #)

GER 5410 Topics in German Literature (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3011)
A topic of contemporary German culture explored in depth.

GER 5610 German Literature in Translation (3.0 cr.; Student Option; prereq No knowledge of German required; or 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 (3.0 cr.; Student Option; prereq 3xxx 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 (3.0 cr.; Student Option; prereq 3011)
Historical development of German, from beginnings to 1450.

GER 5712 History of the German Language II (3.0 cr.; Student Option; prereq 5711)
Historical development of German from 1450 to 2000.

GER 5721 Introduction to Middle High German (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option)
Study of the poetry of Old Saxon. Detailed investigation of Old Saxon in comparison with the other Old Germanic languages.

GER 5740 Topics in Germanic Medieval Studies (3.0 cr.; Student Option)
Topics specified in Class Schedule.

GER 5993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #, %, @)
Guided individual reading or study.

GERON 5112 Aging: Policy and Demography (3.0 cr.; Student Option; prereq [Grad-level research methods, basic; statistics course] or #)

GERO 5115 Introduction to Geriatrics (2.0 cr.; S-N Grading Basis)
Online course. Major topics in geriatrics. How to diagnose/treat conditions common in caring for older people.

GERO 5125 Gerontology Service Learning (3.0 cr.; Student Option)
At least 100 hours of service to seniors or organizations serving seniors required. Longitudinal one-on-one relationship with at least two seniors. Service activities may include: friendly visiting, escorting seniors to medical appointments, chore services, teaching health education to groups of seniors and staff, participating in social or recreational activities with seniors, assisting with immunization and screening programs, assisting seniors with selection of health plans, or providing volunteer home health aide or nursing assistant services or emergency non-medical response under the supervision of a nurse. Students may use up to 25 percent of their service time for project that benefits the campus as a whole. Reading, monthly class discussions, a term paper and weekly self-reflection.

**GERO 5191 Independent Study: Gerontology**

(1.0-4.0 cr.; Student Option No Audit; prereq Approval of [adviser, DGS] for gerontology minor)

Independent study: gerontology.

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**Global Studies (GLOS)**

**College of Liberal Arts**

**GLOS 1015V Honors: Introduction to Global History Since 1950**

(4.0 cr.; Student Option; prereq honors)


**GLOS 1015W Globalization: Issues and Challenges**

(4.0 cr.; Student Option)

Increased global interconnections over past 50 years. Impact of information revolution on human rights, economic inequality, ecological challenges, and decolonization. Comparative cases from Asia, Africa, Latin America, or Middle East.

**GLOS 1112 Globalization and Social Justice**

(3.0 cr.; A-F Grade Basis)

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.

**GLOS 1200H Honors: Global Studies Practicum**

(3.0 cr.; A-F or Audit)

Experiential experience in one part of world as integral feature of undergraduate education and as preparation for learning language of area visited.

**GLOS 1600 Topics in Global Studies**

(3.0 cr.; Student Option)

Topics vary every semester. See Class Schedule.

**GLOS 1672 Geography of Global Cities**

(3.0 cr.; Student Option)


**GLOS 1902 Freshman Seminar**

(3.0 cr.; A-F or Audit; prereq freshman)

Topics specified in Class Schedule.

**GLOS 1904 Freshman Seminar**

(3.0 cr.; A-F or Audit; prereq freshman)

Topics specified in Class Schedule.

**GLOS 1905 Freshman Seminar**

(3.0 cr.; A-F or Audit; prereq freshman)

Topics specified in Class Schedule.

**GLOS 1909W Topics: Freshman Seminar**

(3.0 cr.; A-F or Audit; prereq Fr)

Topics specified in Class Schedule.

**GLOS 3003 Cultural Anthropology**

(3.0 cr.; Student Option; prereq Anth 1003 or #)


**GLOS 3031 Altering States: After Communism**

(3.0 cr.; Student Option)

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.

**GLOS 3143 Living in the Global**

(3.0 cr.; A-F Grade Basis)

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.

**GLOS 3144 Knowledge, Power, and the Politics of Representation in Global Studies**

(4.0 cr.; Student Option; prereq 6 cr in social sciences including [GEOG 1301 or HIST 1012 or HIST 1015 or HIST 1018 or HIST 1019 or POL 1025], global studies major)

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.

**GLOS 3144H Honors: Knowledge, Power, and the Politics of Representation in Global Studies**

(4.0 cr.; A-F Grade Basis; prereq 6 cr in social sciences [including GEOG 1301 or HIST 1012 or HIST 1015 or HIST 1018 or HIST 1019 or POL 1025], honors global studies major)

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.

**GLOS 3145 Theoretical Approaches to Global Studies**

(4.0 cr.; A-F or Audit; prereq [6 cr in social sciences including 1015W or GEOG 1301 or HIST 1012 or HIST 1018 or POL 1025 or #], [global Studies major or minor])

Social, political, economic, cultural, historical processes shaping contemporary global phenomena. Topics may include nationalism, colonialism, cultural production, environmental sustainability, globalization of economy, migration/diasporas, global conflict/ cooperation.

**GLOS 3145H Theoretical Approaches to Global Studies**

(4.0 cr.; A-F or Audit; prereq [6 cr in social sci including at least one of the following [1015W or GEOG 1301 or HIST 1012 or HIST 1018 or POL 1025], GLOS honors student] 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.

**GLOS 3219 History of Capitalism: Uneven Development Since 1500**

(3.0 cr.; Student Option)


**GLOS 3301 Environment & Empire**

(3.0 cr.; A-F or Audit; prereq [3101, 3144] or #)


**GLOS 3302 Debating "Development": Contested Visions**

(3.0 cr.; A-F or Audit; prereq [3101, 3144] or #)

Radical critiques of idea/practice of development? Debates over development. Vocabularies (Marxist, feminist, post-structuralist, ecological) that drive the debates.

**GLOS 3303 Environment and Development in the Third World**

(3.0 cr.; A-F or Audit; prereq Soph or jr or sr)


**GLOS 3304 Sustainable People, Sustainable Planet**

(3.0 cr.; Student Option; 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.

**GLOS 3305 Life for Sale: Global Debates on Environment, Science, and Society**

(3.0 cr.; A-F Grade Basis; prereq At least soph)


**GLOS 3401 International Human Rights Law**

(3.0 cr.; A-F or Audit; prereq [3101, 3144] or #)

Issues, procedures, advocacy strategies regarding promotion/protection of international human rights. Students analyze recent case studies of human rights violations in light of evolving laws, enforcement mechanisms.

**GLOS 3402 Human Rights Internship**

(3.0 cr.; A-F or Audit)

Hands-on experience at organizations engaged in promoting/protecting international human rights. Students work 100 hours in non-governmental organization. Substantive background on human rights laws/procedures.
GLOS 3415 Global Institutions of Power: World Bank, International Monetary Fund, and World Trade Organization (3.0 cr.; A-F Grade Basis)

GLOS 3422 20th-Century Europe From the End of World War II to the End of the Cold War: 1945-91 (3.0 cr.; Student Option)
Social, economic, political, and cultural impacts of WWII. Division of Europe, communist regimes in Eastern Europe, cooperation in Western Europe, impacts of modernization. End of Cold War.

GLOS 350V Honors Course: Supervised Research Paper (4.0 cr.; A-F Grade Basis; prereq %)
Supervised research paper.

GLOS 3602 Other Worlds: Globalization and Culture (3.0 cr.; A-F or Audit; prereq [3101, 3144] or #)
Globalization produces complex, sometimes volatile, local responses. Course explores interconnectedness of the world, considering not one world, but many. Topics include colonialism, consumption, diasporic conditions, global media, nationalism, supra-national governance. Examines how globality is experienced and contested locally and specifically.

GLOS 3605 From Printing Press to Internet: Media, Communications, and History (3.0 cr.; A-F or Audit)
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.

GLOS 3613W Food, Culture, and Society (3.0 cr.; A-F Grade Basis)
Food issues from a sociological perspective. Cross-cultural differences in how groups/societies think about and relate to food.

GLOS 3620 Foreign Language News Coverage of International Events (1.0 cr.; Student Option; 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 (3.0 cr.; Student Option)
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 3681 Gender and the Family in the Islamic World (3.0 cr.; A-F Grade Basis; prereq At least soph; SOC 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.

GLOS 3701W Population in an Interacting World (4.0 cr.; Student Option)
Comparative analysis/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.

GLOS 3900 Topics in Global Studies (1.0-5.0 cr.; Student Option)
Topics vary each semester. See Class Schedule.

GLOS 3906 Foreign Language Immersion Program Completion (1.0 cr.; S-N or Audit; prereq Enrolled in full course load in target language departmental offering of Foreign Language Immersion Program)
Credit attached to Foreign Language Immersion Program.

GLOS 3910 Topics in East Asian Studies (1.0-3.0 cr.; Student Option)
Selected topics in East Asian Studies not covered in regular courses. Topics reflect instructor interests.

GLOS 3920 Topics in European Studies (3.0 cr.; Student Option)
Topics vary. See Class Schedule.

GLOS 3921 Europe: A Geographic Perspective (3.0 cr.; Student Option)
Comparative analysis/explanation of Europe's physical, demographic, ethnic/cultural, economic, political, and urban landscapes. European integration: European Union, transformation of Eastern Europe.

GLOS 3930 Topics in Latin American Studies (3.0 cr.; Student Option)
Topics vary. See Class Schedule.

GLOS 3940 Topics in Middle Eastern Studies (4.0 cr.; Student Option)
Description varies with topic title.

GLOS 3950 Topics in Russian Area Studies (3.0 cr.; Student Option)
Description varies with topic title.

GLOS 3960 Topics in South Asian Studies (3.0 cr.; Student Option)
Topics vary. See Class Schedule.

GLOS 3961 Culture and Society of India (3.0 cr.; Student Option)
Contemporary society and culture in South Asia from an anthropological perspective with reference to nationalism; postcolonial identities; media and public culture; gender, kinship and politics; religion; ethnicity; and the Indian diaspora.

GLOS 3970 Topics in African Area Studies (3.0 cr.; Student Option)
Topics vary. See Class Schedule.

GLOS 3981W Major Project Seminar (3.0 cr.; A-F or Audit; prereq %)
Students formulate research questions, select topic, and develop/produce 25-30 page paper.

GLOS 3993 Directed Study (1.0-5.0 cr.; Student Option; prereq #, %, @)
Guided individual reading or study.

GLOS 4104 Crime and Human Rights (3.0 cr.; Student Option; prereq SOC 1001, at least one 3xxx SOC or GLOS course recommended)
Serious violations of humanitarian and human rights law; criminalization. Impact of interventions on memories/future of cycles of violence. Case studies on the Holocaust, Balkan wars, Darfur, My Lai massacre, etc. Criminal justice, truth commissions, vetting, compensation programs.

GLOS 4221 Globalize This! Understanding Globalization Through Sociology (3.0 cr.; A-F or Audit)

GLOS 4305 Society and the Environment: A Growing Conflict (3.0 cr.; A-F or Audit; prereq SOC 1001 or environmental course or #)
Societal causes/cures of ecological problems such as global warming, species extinction, and resource exhaustion.

GLOS 4311 Race, Class, and the Politics of Nature (3.0 cr.; A-F Grade Basis)
Global debates over how nature is produced, consumed, degraded, sustained, and defended. Analytics of race/class. Politics of North-South relations.

GLOS 4344 Europe and its Margins (3.0 cr.; A-F Grade Basis; 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. Ethnography, fiction, film.

GLOS 4406 Sociology of International Law (3.0 cr.; A-F or Audit; prereq SOC 1001 or 3101 or 3102 or SOC 3111 or #)
Cultural values/practices in a globalized world. Role of international law. Immigration, terrorism, Americanization, structure of international legal system.

GLOS 4609 MSID Directed Research (2.0-8.0 cr.; Student Option; 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 (4.0 cr.; A-F or Audit; 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 4802 Cross-Cultural Perspectives on Work (4.0 cr.; A-F or Audit; prereq @)
GLOS 4803 MSID Country Analysis (4.0 cr.; A-F or Audit; prerequisite)
Multidisciplinary study of host country.
Emphasizes social sciences and history, especially concepts/information regarding development.

GLOS 4805 Community Internships in the Global South (4.0 cr.; A-F Grade Basis; prerequisite 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 (4.0 cr.; A-F or Audit)
Topics vary. See Class Schedule.
GLOS 5301 Environment & Empire (3.0 cr.; A-F or Audit; prerequisite [3101, 3144] or #)
Key issues in environmental history. Emphasizes global colonial processes that have made modern environment. Global spread of diseases, modern remaking of world's flora/fauna, idea of nature. New technologies and the environment. Conservationist ideology.
GLOS 5403 Human Rights Advocacy (3.0 cr.; Student Option; prerequisite Grad student)

GLOS 5602 Other Worlds: Globality and Culture (3.0 cr.; A-F or Audit; prerequisite [3101, 3144, grad student] or #)
Interconnectedness of world. Considering not one world, but many. Colonialism, consumption, diasporic conditions, global media, nationalism, supranational governance. How globality is experienced/contested locally/specifically.

GLOS 5801 International Development: Critical Perspectives on Theory and Practice (3.0 cr.; A-F or Audit; prerequisite Admission to MSID prog, grad student)
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 5802 Cross-Cultural Perspectives on Work (3.0 cr.; A-F or Audit; prerequisite Admission to MSID prog, grad student)
Intercultural communication concepts/skills. U.S. cultural/value system. Stages of adjustment, coping strategies for cross-cultural boundaries. Host-country cultural characteristics. Emphasizes work, family, community, views of development.

GLOS 5803 MSID Country Analysis (3.0 cr.; A-F or Audit; prerequisite Admission to MSID prog, grad student)
Multidisciplinary study of host country. Emphasizes social sciences and history, especially concepts/information regarding development.

GLOS 5805 Community Internships in the Global South (3.0 cr.; A-F Grade Basis; prerequisite 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 (3.0 cr.; A-F or Audit; prerequisite 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 5807 Applied Field Methds (3.0 cr.; A-F or Audit; prerequisite Admission to MSID prog, Grad student)
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.

GRAD 5102 Preparation for University Teaching for Nonnative English Speakers (2.0 cr.; S-N Grading Basis; prerequisite [English Language Proficiency Rating of 4 or successful completion of Foundations course], current or anticipated TA assignment, #)
Theory/practice of teaching in higher education in the United States. Emphasizes awareness of cross-cultural communication issues. Students practice in a simulated instructional setting.

Graduate School (GRAD)
Graduate School
GRAD 999 Graduate School Active Status (0.0 cr.; No Grade Associated; prerequisite Grad student)
Graduate School active status.

GRAD 5105 Practicum in University Teaching for Nonnative English Speakers (2.0 cr.; S-N or Audit; prerequisite [5102 or English Language Proficiency Rating of 2 or 3], [current or anticipated TA assignment] Theory, advanced practice in teaching in higher education for nonnative speakers of English.
Emphasizes interactive teaching strategies, oral presentation skills, legal/policy issues.

**GDES Design (GDES)**

**College of Design**

**GDES 1170 Topics in Graphic Design**

(1.0-4.0 cr.; A-F or Audit)

In-depth investigation of specific topic, announced in advance.

**GDES 1311 Foundations: Drawing and Design in Two and Three Dimensions**

(4.0 cr.; A-F or Audit; 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**

(4.0 cr.; A-F or Audit; prereq [1311 or DHA 1311], [1312 or DHA 1312], [GDES major or pre-major], semester of portfolio review) or design minor or #)

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**

(4.0 cr.; A-F or Audit; prereq Graphic Design premajor design minor 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**

(1.0-4.0 cr.; S-N Grading Basis; 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 2342 Web Design**

(3.0 cr.; A-F or Audit; prereq 1311, 1312, 1315, DDES 1101, [GDES major or pre-major], semester of portfolio review) or design minor or #)

Graphic design elements/principles applied to website design. HTML, CSS. Working with interactive media and file formats.

**GDES 2345 Typography**

(4.0 cr.; A-F or Audit; prereq 1311, 1312, 1315, DES 1101, [GDES major or pre-major or design minor])

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 2350 Design Material Topics**

(1.0-4.0 cr.; A-F or Audit)

Letterpress, screen, and relief printing, or bookmaking. Defined but varying range of media expression. Graphic design communication through group/individualized projects in a cohort and under supervision of faculty.

**GDES 2361 Design Process: Photography**

(3.0 cr.; A-F or Audit; prereq [1311 or DHA 1311], [1312 or DHA 1312], [graphic design major or grad student or design minor or #])

Photography for graphic designers: digital/film photographic developing/image manipulation, printing.

**GDES 2398W Design and its Discontents: Design, Society, Economy and Culture**

(3.0 cr.; A-F Grade Basis)


**GDES 3170 Topics in Graphic Design**

(1.0-4.0 cr.; A-F or Audit)

In-depth investigation of specific topic.

**GDES 3196 Field Study: National or International**

(1.0-4.0 cr.; A-F or Audit)

Faculty-directed field study in national or international setting.

**GDES 3312 Color and Form in Surface Design**

(4.0 cr.; A-F or Audit; prereq [1311 or DHA 1311], [1312 or DHA 1312], [GDES design major or design minor or #])

Use of color/form representation in two-dimensional surface applications. Historical use of color and of spatial representation in visual communication.

**GDES 3351 Text and Image**

(3.0 cr.; A-F or Audit; prereq [2345 or DHA 2345], graphic design major, pass portfolio review)

Composition of visual information using grid structures to integrate text/image. Information/expressive aspects of graphic design, hierarchical relationships of visual elements. Methods of text layout that enhance communication.

**GDES 3352 Identity and Symbols**

(3.0 cr.; A-F or Audit; prereq [2345 or DHA 2345], GDES 3351, pass portfolio review, graphic design major)

Representation of abstract ideas through symbols. Development of visual identity systems.

**GDES 3353 Packaging and Display**

(3.0 cr.; A-F or Audit; prereq [2345 or DHA 2345], 3351, graphic design major, pass portfolio review)

Application of graphic design principles to three-dimensional projects. Principles of three-dimensional design/space applied to labeling, packaging, and display.

**GDES 4113W History of Graphic Design**

(4.0 cr.; A-F or Audit; prereq Intro history or art history course)

Historical analysis of visual communication. Technological, cultural, and aesthetic influences. How historical events are communicated/perceived through graphic presentation/imagery.

**GDES 4160H Honors Capstone Project**

(2.0 cr.; A-F Grade Basis; prereq Graphic design honors)

Individualizes honors experience by connecting aspects of major program with special academic interests.

**GDES 4193 Directed Study in Graphic Design**

(1.0-4.0 cr.; A-F or Audit; prereq Undergrad, #)

Independent study in Graphic Design under tutorial guidance.

**GDES 4196 Internship in Graphic Design**

(1.0-3.0 cr.; S-N or Audit; 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**

(4.0 cr.; A-F or Audit)

Studio experience in the development and production of surface design. Screen printing, batik, resist dying, shibori, cyanotypes, and dye transfers are included.

**GDES 4345 Advanced Typography**

(4.0 cr.; A-F or Audit; prereq [2345 or DHA 2345], 3351, graphic design major) or design grad student or #)

Expressive visual communication of words. Fundamental legibility of “invisible art,” overt expression through type. Students complete extended typographic project.

**GDES 4350 Advanced Design Material Topics**

(1.0-4.0 cr.; A-F or Audit)

Letterpress, screen, and relief printing, or bookmaking. Defined but varying range of media expression. Graphic design communication through group/individualized projects in a cohort, under supervision of faculty.

**GDES 4352 Design Process: Bookmaking**

(3.0 cr.; A-F or Audit; prereq Graphic design major or grad student or design minor or #)


**GDES 4354 Graphic Design IV: Integrative Campaign**

(4.0 cr.; A-F or Audit; 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**

(3.0 cr.; S-N Grading Basis; prereq [4354 or DHA 4354 or 4365 DHA 4365], graphic design major)


**GDES 4361W Thesis Studio and Writing**

(4.0 cr.; A-F Grade Basis; prereq Graphic design major, sr)

Research and design of comprehensive graphic design thesis project.

**GDES 4362 Senior Thesis and Exhibition**

(4.0 cr.; A-F Grade Basis; prereq 4361W, graphic design major, sr standing)

Design, production, and exhibition of comprehensive graphic design thesis project.

**GDES 4399W Theory of Electronic Design**

(3.0 cr.; A-F or Audit; 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**

(1.0-4.0 cr.; A-F or Audit; prereq Jr or sr or grad student)

In-depth investigation of specific topic, announced in advance.
## Courses Listed in this Catalog

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

### Greek (GRK)

#### College of Liberal Arts

**GRK 1001 Beginning Classical Greek I** (5.0 cr.; Student Option)
Introduction to classical Greek.

**GRK 1002 Beginning Classical Greek II** (5.0 cr.; Student Option; prereq Grade of at least [C- or S] in 1001 or %)
Greek grammar/syntax. Readings from educational authors, including Herodotus and Aristophanes.

**GRK 3003 Intermediate Greek Prose I** (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 3993 Directed Studies** (1.0-4.0 cr.; Student Option; prereq #)
Guided individual research or study.

**GRK 4951W Major Project** (4.0 cr.; A-F Grade Basis; 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 5003 Intermediate Greek Prose:** Graduate Student Enrollment (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq [5003 or equiv], grad student or %)

**GRK 5100 Advanced Reading** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq [GRK 3004 or equiv], at least two yrs of college level Greek. Must contact Classical and Near Eastern Studies department for permission to register.)

**GRK 5701 Prose Composition** (3.0 cr.; Student Option; 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 5702 Text Criticism** (3.0 cr.; Student Option; prereq Grad student or #)

**GRK 5704 Greek Paleography** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Grad student or #)
Historical/comparative grammar of Greek/ Latin, from their Proto-Indo-European origins to classical norms.

**GRK 5706 History of Greek** (3.0 cr.; Student Option; 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** (1.0 cr.; S-N Grading Basis; prereq Enrollment in a grad program in Department of Classical/Near Eastern Studies)
Practice in reading Greek texts at sight.

**GRK 5993 Directed Studies** (1.0-4.0 cr.; Student Option; prereq grad student or #)
Guided individual reading or study.

**GRK 5994 Directed Research** (1.0-12.0 cr.; Student Option; prereq Grad student or #)
Supervised original research on topic chosen by student.

**GRK 5996 Directed Instruction** (1.0-12.0 cr.; Student Option; prereq Grad student or #)
Supervised teaching internship.

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### Health Informatics (HINF)

#### Academic Health Center Shared

**HINF 5115 Interprofessional Healthcare Informatics** (3.0 cr.; Student Option; prereq Grad student or professional student or #)

**HINF 5430 Health Informatics I** (3.0-4.0 cr.; A-F or Audit)

**HINF 5431 Health Informatics II** (3.0 cr.; A-F or Audit)

**HINF 5436 Seminar** (1.0 cr.; S-N or Audit)
Presentation and discussion of research problems, current literature and topics of interest in Health Informatics.

**HINF 5494 Topics in Health Informatics** (1.0-6.0 cr.; Student Option; prereq #)
Individual or group studies in health informatics.

**HINF 5496 Internship in Health Informatics** (1.0-6.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit; prereq [5430, 5431] or #). MH1 student

Students apply related 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.

HINF 5501 US Health Care System: Information Challenges in Clinical Care (0.0-1.0 cr.; S-N or Audit; prereq HINF informatics student or #)

Health care system and its unique interaction between key health system stakeholders. Relationship between patients, providers, payers, and regulatory bodies. Role of information management and challenges of information standardization and exchange.

HINF 5510 Applied Health Care Databases: Database Principles and Data Evaluation (3.0 cr.; A-F or Audit; prereq HINF student or grad student or #)

Principles of database modeling, design and manipulation for health care data analysis. Use a relational database management system and structured query language (SQL) to compose and execute query statements. Critically evaluate query results in a health care context.

HINF 5520 Clinical Informatics and Patient Safety (2.0 cr.; A-F or Audit; prereq HINF student or permission number)

Application/operation of clinical information systems, electronic health records, decision support and their application in the health care system. Use of clinical information systems and their association with health care delivery, payment, quality, and outcomes.

HINF 5530 Health Care Software Management (2.0 cr.; A-F or Audit; prereq HINF student or #)

Health care software and unique interaction between key stakeholders in health care software development and implementation. Systems analysis, software development, and software life cycle management for health care applications.

HINF 5540 Interprofessional Health Informatics (2.0 cr.; A-F Grade Basis)

Informatics applications in various healthcare professions. Clinical specialties. Informatics tools to improve healthcare services/outcomes through lectures/presentations.

HSM 4501 Writing for the Health Professions (3.0 cr.; A-F or Audit; prereq 45 cr)

How to critically review medical literature and present research data. Scientific method, logical system, 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 (3.0 cr.; A-F or Audit)

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 (3.0 cr.; A-F or Audit; prereq 45 cr)

Background/skills 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 4571 Introduction to Grant Writing for Health Care and Nonprofit Organizations (3.0 cr.; A-F or Audit; prereq 45 credits)

Research/write grants. Identify potential funding sources, respond to Request for Proposal by creating needs assessment, goal statement, budget/grant funding plans. Trends in public/private health care/social services funding.

HSM 4581 Teaching in the Health Care Setting (3.0 cr.; A-F or Audit; 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)

College of Liberal Arts

HEBR 1001 Beginning Hebrew I (5.0 cr.; Student Option)

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 (5.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1001 or 4101] or #)

Continuation of 1001. Leads to speaking, listening comprehension, reading, and writing Hebrew. Emphasizes communication proficiency. Cultural materials.

HEBR 1101 Beginning Biblical Hebrew I (5.0 cr.; Student Option)

Basic grammar/syntax preparatory to reading simple narrative texts in Bible. Multiple approaches to problems/issues in biblical scholarship.

HEBR 1102 Beginning Biblical Hebrew II (5.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1002 or 4002] or #)

Progression to more sophisticated reading of narrative, prophetic, and legal texts. Presentation/discussion of multiple approaches to problems/issues in biblical scholarship.

HEBR 3011 Intermediate Biblical Hebrew I (5.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1002 or 4002] or #)


HEBR 3012 Advanced Biblical Hebrew II (5.0 cr.; Student Option; prereq Grade of at least [C- or S] in 3011 or #)


HEBR 3090 Advanced Modern Hebrew (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1102 or 4105] or #)

Text of Hebrew Bible. Basic research tools/ commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies.

HEBR 3102 Intermediate Biblical Hebrew II (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3012 or 3102 or #)

In-depth reading, analysis, and discussion of classical Hebrew texts. Reading fluency, methods of research in biblical studies.

HEBR 3300 Post-Biblical Hebrew: Second Temple Period (3.0 cr.; Student Option; 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 4000 Rabbinic Texts (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq #, %) Historical, linguistic, literary, religious, or humanistic study of Hebrew society and culture. Approach and method of study varies with topic.

HEBR 3993 Directed Studies (1.0-4.0 cr.; Student Option; prereq @) Guided individual reading or study.

HEBR 4001 Beginning Hebrew I (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1001 or 4001] or #) Speaking, listening comprehension, reading/writing Hebrew. Emphasizes communication proficiency. Cultural materials. Meets with 1002.

HEBR 4011 Intermediate Hebrew I (3.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1002 or 4002] or #) Prepares students for CLA language requirement. Speaking, reading, writing, and comprehension of modern Hebrew. Students read/discuss prose, poetry, news, and film. Taught primarily in Hebrew. Meets with 3011.


HEBR 4014 Basics of Biblical Hebrew I (3.0 cr.; Student Option; prereq grad student) Basic grammar/syntax preparatory to reading simple narrative texts in Bible. Multiple approaches to problems/issues in biblical scholarship. Meets with 1104.

HEBR 4015 Basics of Biblical Hebrew II (3.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1102 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 (3.0 cr.; Student Option; prereq Grade of at least [C- or S] in [1102 or 4105] or [#; grad student]) Text of Hebrew Bible. Basic research tools/commentaries. Close reading of narrative biblical texts. Reading fluency, methods of research in biblical studies. Meets with 1311.

HEBR 4107 Intermediate Biblical Hebrew II (3.0 cr.; Student Option; 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. Meets with 3102.

HEBR 5909 Advanced Modern Hebrew (3.0 cr.; Student Option; prereq 3012 or #) Various authentic Hebrew texts. Comprehension/speaking. Concentrated entirely in Hebrew. Emphasizes Modern Israeli Hebrew. Grammar, widening vocabulary. Contemporary short fiction, essays, articles on cultural topics, films, Hebrew Internet sites, TV.

HEBR 5200 Advanced Classical Hebrew (3.0 cr.; Student Option; prereq [3 sem of biblical Hebrew, 5 sem of modern Hebrew] or [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 (3.0 cr.; Student Option; 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, pseudopigrapha). Focuses on historical development of Hebrew language and literature in relation to earlier biblical sources.

HEBR 5400 Rabbinic Texts (3.0 cr.; Student Option; 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 5990 Topics in Hebrew Studies (1.0-4.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq @, %) Guided individual reading or study.

Hindi and Urdu (HNUR) College of Liberal Arts

HNUR 1101 Beginning Hindi and Urdu (5.0 cr.; Student Option) Listening, speaking, reading, writing. Emphasizes development of communicative competence.

HNUR 1102 Beginning Hindi and Urdu (5.0 cr.; Student Option; prereq 1101 or 4001 or #) Listening, speaking, reading, writing. Emphasizes development of communicative competence.

HNUR 3101 Intermediate Hindi and Urdu (5.0 cr.; Student Option; prereq 1102, 4002) Reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

HNUR 3102 Intermediate Hindi and Urdu (5.0 cr.; Student Option; prereq 3101, 4003) Reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

HNUR 3131 Advanced Hindi and Urdu (4.0 cr.; Student Option; prereq [3102, 4004] or @) Continued emphasis on the development of communication skills, i.e., the ability to comprehend both written and spoken texts, and to speak, read, and write in Hindi and Urdu beyond the intermediate level.

HNUR 3132 Advanced Hindi and Urdu (4.0 cr.; Student Option; prereq [3131, 4005] or @) Continued emphasis on the development of communication skills, i.e., the ability to comprehend both written and spoken texts, and to speak, read, and write in Hindi and Urdu beyond the intermediate level.

HNUR 3290 Hindi-Urdu Language Teaching Tutorial (1.0 cr.; S-N Grading Basis; prereq Grade of A in HNDI 4162) Students tutor beginning students of Hindi-Urdu and are part of department's Hindi-Urdu language team.

HNUR 4001 Beginning Hindi and Urdu (3.0 cr.; Student Option) Listening, speaking, reading, writing. Emphasizes development of communicative competence.

HNUR 4002 Beginning Hindi and Urdu (3.0 cr.; Student Option; prereq 1101 or 4001 or #) Listening, speaking, reading, writing. Emphasizes development of communicative competence.

HNUR 4003 Intermediate Hindi and Urdu (3.0 cr.; Student Option; prereq 1102, 4002) Reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

HNUR 4004 Intermediate Hindi and Urdu (3.0 cr.; Student Option; prereq 3101, 4003) Reading, writing, speaking, and listening skills. Grammar review, basic compositions, oral presentations.

HNUR 4005 Advanced Hindi and Urdu (3.0 cr.; Student Option; prereq 3102 or 4004 or #)

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
HIST 3010 Introduction to Medieval History (3.0 cr.; Student Option)
Europe from the Fall of Rome to the Renaissance. Politics, institutions, society, economy, and culture of the Middle Ages.

HIST 3151W British History to the 17th Century (4.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
Civil War, Revolution, and constitutional settlement. Industrialization and growth of democracy. Emphasis on socioeconomic, political, and cultural development in pre-colonial Africa

HIST 3211 History of Sexuality in Europe (3.0 cr.; A-F or Audit)
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 andضح, women's legal status, from colonial era to resistance. 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 3212 Dissident Sexualities in U.S. History (3.0 cr.; A-F or Audit; prereq Jr or Sr or #)
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 topics, including sex work.

HIST 3244 History of Eastern Europe (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Viking society and expansion of Viking influence abroad. Viking impact on Western Europe; interactions with Slavic lands; settlement of North Atlantic islands; and Western Europe's impact on Scandinavian lands. Analyzes archaeological, historical, linguistic, and numismatic evidence.

HIST 3281 European Intellectual History: The Early Modern Period, Antiquity to 1750 (3.0 cr.; Student Option)
First of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings from original sources.

HIST 3282 European Intellectual History: The Modern Period, 1750-Present (3.0 cr.; Student Option)
Second of a two-semester course. European thought in its historical/cultural context. Emphasizes development of philosophical/scientific thought, its relation to thinking about the individual and the community. Readings from original sources.

HIST 3347 Women in Early and Victorian America: 1600-1890 (3.0 cr.; Student Option)
The varied experiences of American women 1600-1900. Topics include women's involvement in the dispossession of native peoples, westward expansion, slavery, industrialization, reform, revolution, and transformations in family life and sexuality.

HIST 3348 Women in Modern America (3.0-4.0 cr.; Student Option)
History of women in the United States from 1890 to the present. Explores women's changing roles in politics, the labor force, the family, and popular culture.

HIST 3349 U.S. Women's Legal History (3.0 cr.; A-F or Audit; prereq Soph or Jr or Sr or #)
Women's legal status, from colonial era through 20th century. Women's citizenship, civil rights, Marriage, divorce, and child custody. Reproductive/physical autonomy/integrity. Economic/educational equality.

HIST 3351 Women and Diasporas in Modern History (3.0 cr.; Student Option)
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 3417 Food in History (3.0 cr.; Student Option)
Dietary effects of industrial modernity. Material culture, social beliefs. Examples from around world.

HIST 3418 Drink in History (3.0 cr.; Student Option)
Society, politics, and economic issues that have shaped American history for nearly two centuries. Focuses on influences of colonial histories, capitalist development, ethnic/racial conflict, foreign intervention, Catholic Church, civil war through region. Readings cover events in Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama.

HIST 3424 Women and Gender in Latin American History (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 3426 Pirates of the Caribbean (3.0 cr.; Student Option)
History of early modern globalization through one of its most cosmopolitan actors, the pirate. Geographical focus in the Caribbean basin. Networks of capitalism, migration, empire, and nascent nationalism. Global phenomena through marginalized participants--pirates, maroons, rebels, criminals, piraques, and privateers. Alternate historical narratives on emergence of the modern world.

HIST 3428 Latin American History in Film and Text (3.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
Survey of African history from earliest times to 1800. Focuses on socioeconomic, political, and cultural development in pre-colonial Africa from ancient Egypt through the era of the trans-Atlantic slave trade.

HIST 3432 Modern Africa in a Changing World (4.0 cr.; Student Option)
Survey of modern African history from early 19th century to present. Focuses on socioeconomic, political, and cultural
development in Africa, from abolition of trans-Atlantic slave trade through postcolonial era.

HIST 3435 History of South Africa from 1910 (3.0 cr.; Student Option)
History of the South African Republic 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 (3.0 cr.; Student Option)

HIST 3444 Chicana and Chicano History: 1821-1945 (3.0 cr.; Student Option)
Experiences of people of Mexican descent in the United States. Important eras in histories of Mexico, the United States, and Mexican Americans. Central role of Chicana/os in U.S. history, culture, and politics.

HIST 3452 African Conservation Histories (3.0 cr.; Student Option)
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 have interacted with and managed their lands/resources.

HIST 3461 Introduction to East Asia I: The Imperial Age (3.0-4.0 cr.; Student Option)

HIST 3462 From Subjects to Citizens: The History of East Asia From 1500 to the Present (3.0-4.0 cr.; Student Option)
How Asian states, societies, economies, and cultures linked with one another and with European powers. How period’s historical effects still resonate. Covers India, China, Japan, Korea, and Indochina.

HIST 3465W China in the Ming and Qing Dynasties (3.0 cr.; Student Option)
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 3466 Religion and Society in Imperial China (3.0 cr.; Student Option)

HIST 3468 Social Change in Modern China (3.0 cr.; Student Option)

HIST 3469 History of Women and Family in China, 1600-2000 (3.0 cr.; Student Option)

HIST 3471 Modern Japan, Meiji to the Present (1868-2000) (3.0 cr.; Student Option)

HIST 3476 War and Peace in Japan Through Popular Culture (4.0 cr.; A-F or Audit)
War-related issues in Japan. Animation films, comics from 1940s to 1990s. Mobilization of culture for WWII. Conflict between constitutional pacifism and national security. Japan’s role in cold war and post-cold war worlds.

HIST 3477 Samurai, Geisha, and How They Became Japanese (3.0 cr.; A-F or Audit)
How samurai, geisha, and Zen Buddhism came to be considered as the quintessential Japanese traditions in 20th century. Modernity, nationalism, orientalism, international politics, globalization.

HIST 3479 History of Chinese Cities and Urban Life (3.0-4.0 cr.; A-F or Audit)
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 (3.0 cr.; Student Option)
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 3485 History of Women and Family in China, 1600-2000 (3.0 cr.; A-F or Audit)

HIST 3487 The Vietnam Wars: French Colonialism and U.S. Intervention in Indochina (3.0 cr.; Student Option)

HIST 3489 20th Century India (3.0 cr.; A-F or Audit)
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 3493 Islam: Religion and Culture (3.0 cr.; Student Option; prereq Soph orjr or sr)

HIST 3502 Ancient Israel: From Conquest to Exile (3.0 cr.; Student Option)
Israelite history in context of what is known from Egyptian, Canaanite, and Mesopotamian sources. Focuses on issues raised by archaeological data related to Israelite conquest of Canaan.

HIST 3503 Ancient Iran (3.0 cr.; Student Option)
Development of ancient Iranian culture under Achaemenians and Sassanians. Impact of Zoroastrian religion on Iranians, on Hellenism, and on domains such as Bactria. Iran’s contribution to cultures of Silk Road.

HIST 3504 The Cultures of the Silk Road (3.0 cr.; Student Option)
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 3505 Survey of the Modern Middle East (3.0 cr.; Student Option)

HIST 3506 Modern Iran: Nationalism, Religion, and the Struggle to Create Modern Iran (3.0 cr.; Student Option)
Iranian history from the fall of the Sassanids (7th C. CE) to the present. Shi’ite Islam in a world context. Iranian dynasties. Iran’s entrance into modern world politics.

HIST 3507 History of Modern Egypt (3.0 cr.; A-F Grade Basis)
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 (3.0 cr.; A-F or Audit)
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 (3.0 cr.; Student Option)
Diversity of social/cultural interactions between Muslims and Jews and between Islam and Judaism since 1700. What enabled the two religious communities to peacefully coexist? What were causes of conflict? Why is history of Muslim-Jewish relations such a contested issue?
HIST 3512 History of Modern Israel/Palestine: Society, Culture, and Politics (3.0 cr.; Student Option)

HIST 3541 Islam in World History (3.0 cr.; Student Option)
Islam as force of global integration. Ways it has accomplished this. Early military/technological innovation. Activities of merchants, pilgrims, and missionaries.

HIST 3546 Islam and the West (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Survey of Islam's most successful empire, from its founding circa 1300 to its demise in 1923. Lands, institutions, peoples, historical legacy.

HIST 3600 The Renaissance (3.0 cr.; Student Option)
Relationships between the visual arts, literature, science, philosophy, and politics in Europe from about 1300-1600. Works of artists, writers, and intellectuals (e.g., Michelangelo Buonarotti, Niccolo Machiavelli, Michel de Montaigne), different artistic and literary forms (e.g., portrait, sonnet, essay), and broad thematic issues that include the individual, antiquity, state, and discovery. Team taught.

HIST 3606 Christians, Muslims, and Jews in the Middle Ages (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; 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 Islamdom.

HIST 3609 Military History of Western Europe (3.0 cr.; Student Option)
Concept and conduct of war in Western Europe in the Middle Ages and the relation between the military and society.

HIST 3611 Medieval Cities of Europe: 500-1500 (3.0 cr.; Student Option)
Evolution of Western European cities from the late Roman town to the early Renaissance city-state.

HIST 3613 History of the Crusades (3.0 cr.; Student Option)

HIST 3614 Women in Medieval Europe (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
Origins of medieval Europe, Germanic and Viking invasions, feudalism, manorialism, Islam, the papacy, monarchies, intellectual developments.

HIST 3619 Chivalry, Crisis, and Revival: Medieval History 1050-1500 (3.0 cr.; Student Option)
Chivalry and courtly love, crusades, revival of towns and trade, monarchies, religious developments, Black Death, famine, and wars

HIST 3621 Renaissance Italy: 1200-1550 (3.0 cr.; Student Option; prereq intro course in European history before 1500 recommended)
Political/cultural history of city-states of northern/central Italy, 1200-1550. Emphasizes Florence and Venice. Readings include Dante and Machiavelli.

HIST 3632 History of Germany; Reformation to Unification: 1500-1871 (3.0 cr.; Student Option)
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 3633 Modern Germany, 1870-Present (3.0 cr.; Student Option)

HIST 3637 Modern Russia: From Peter the Great to the Present (3.0 cr.; Student Option)
Political, social, and cultural forces which have shaped modern Russia. Emphasis will be on modernization, attempts at reforms in the imperial and Soviet period, and the dissolution of empires.

HIST 3652 Early Modern Britain (3.0 cr.; Student Option)
British society/culture during early modern era, especially 16th and 17th centuries. May include themes related to political developments, economy/social structure, gender, religion, literature, or interaction with other world regions.

HIST 3681 Irish History (3.0 cr.; Student Option)
History of Ireland, primarily modern, with emphasis on politics and Anglo-Irish relations.

HIST 3691W The British Empire (3.0 cr.; A-F or Audit)
Gain/loss of colonies in Ireland, America, India, Africa. Development of racism, multicultural composition of British society, debates about economic motives for empire, resistance of colonized peoples to conquest/domination.

HIST 3704W Daily Life in Europe: 1300-1800 (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit)
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 3706 Baroque Rome: Art and Politics in the Papal Capital (3.0 cr.; Student Option)
Center of baroque culture—Rome—as city of spectacle and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

HIST 3708 The Age of Curiosity: Art and Knowledge in Europe, 1500-1800 (3.0 cr.; Student Option)
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 3714 Medieval Spain (3.0 cr.; Student Option)
Development of the medieval kingdoms of Spain from Roman times to ca. 1500. Major social, economic, and cultural developments. Christians, Jewish, and Muslim interaction. Role of Spain in the beginning of European expansion.

HIST 3719 The Making of Contemporary Europe (3.0 cr.; Student Option)

HIST 3721 Studies in 20th-Century Europe From the Turn of the Century to the End of World War II: 1900-45 (3.0 cr.; Student Option)
Social, political, and cultural changes/conflicts. Background to WWII, 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: 1945-81 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)

HIST 3727W History of the Holocaust (3.0 cr.; Student Option)

HIST 3728 Human Rights and Crimes Against Humanity (3.0 cr.; A-F or Audit)
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 3729 Nazi Germany and Hitler’s Europe (3.0 cr.; A-F or Audit)
Comprehensive exploration of Third Reich. Students will examine How the Nazis came to power, transformations of 1930s, imposition of racial politics against Jews/others, nature of total war. Students read historical accounts, memoirs, state documents, view films.

HIST 3731 Modern France and Its Empire: Identity, Citizenship and the State 1780 to the Present (3.0 cr.; Student Option)
History of citizen/state in France from French Revolution to present.

HIST 3747 Habsburg Central Europe: 1740-1918 (3.0 cr.; Student Option)

HIST 3767 Eastern Orthodoxy: History and Culture (3.0 cr.; Student Option)
Development of the orthodox church in Byzantium, the Islamic Near East, the Slavic world and in the diaspora; impact of orthodoxy on political and cultural institutions, interaction with other Christian and non-Christian communities; orthodox spirituality and aesthetics.

HIST 3775 History of Jews in Europe and the Atlantic World, from 1700 to Present (3.0 cr.; Student Option)
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 3776 Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries (3.0 cr.; Student Option)

HIST 3797 History of Population (3.0 cr.; Student Option)
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 3801 The People of Early America: 16th to 18th Centuries (3.0 cr.; Student Option)
Multicultural approach to early American history focusing on the interactions of Africans, Europeans, and American Indians who came together to create a new world in North America during the 16th, 17th, and 18th centuries.

HIST 3802 "Sinners, Saints, and Savages": Religion in Early America (3.0 cr.; Student Option; prerequisite Non-F or A)

HIST 3803 Radicalism in Early America (3.0 cr.; A-F or Audit; prerequisite 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 3804 Religion and the U.S. Founding: Contest Then and Now over the Place of Religion in Politics (3.0 cr.; Student Option)

HIST 3809 The Peoples of Revolutionary America (3.0 cr.; Student Option)

HIST 3812 The Civil War and Reconstruction (3.0 cr.; Student Option)
United States from 1848 to 1877. Causes of sectional crisis; Southern secession; Lincoln and emancipation; military history; impact of war North and South; Reconstruction efforts to change the Southern life and transform the status of African Americans.

HIST 3821 United States in the 20th Century to 1945 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit)
Understanding of law/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 3835 Law in American Life: 1865 to Present (3.0 cr.; Student Option)

HIST 3837 Minnesota History (3.0 cr.; Student Option)
Topics in political/social history of Minnesota and its region in nineteenth/twentieth centuries.

HIST 3838 Genealogy and Family Histories in American History (3.0 cr.; A-F Grade Basis)
How historians study families to explore race/ class. Techniques for researching genealogy and family history. For final project, students research/write on history of a family, in many cases their own.

HIST 3841 American Business History (3.0 cr.; Student Option)

HIST 3844 American Economic History to 1870 (3.0 cr.; Student Option)
Economic development, regional specialization and early industrialization. Slavery and southern development. The role of railroads and government policies. Economic impact of the Civil War.

HIST 3845 American Economic History: 1870 to the Present (3.0 cr.; Student Option)
HIST 3875W Comparative Race and Ethnicity
(3.0 cr.; Student Option)
Evolution of African American political mobilization.

HIST 3862 American Immigration History
(3.0 cr.; A-F or Audit)
Global migrations to U.S. from Europe, Asia, Latin America, and Africa, from early 19th century to present. Causes/cultures of migration. Migrant communities, work, and families. Xenophobia, assimilation/integration, citizenship, ethnicity, race relations. Debates over immigration. Place of immigration in America's national identity.

HIST 3863 The Black Diaspora in Historical Perspective
(3.0 cr.; Student Option)

HIST 3864 African American History, 1619-1865
(4.0 cr.; A-F or Audit)
Importance of dynamics of class, gender, region, and political ideology. Changing nature of race/racism.

HIST 3865 African American History, 1665 to Present
(4.0 cr.; A-F or Audit)
Integral migrations, industrialization, unionization, Great Depression, world wars, large-scale movements for social/political change.

HIST 3868 Race, War, and Race Wars in American History
(3.0 cr.; A-F Grade Basis)
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 3869 Urban American History: Race, Class, Gender, and Sexuality in Urban America
(3.0 cr.; A-F Grade Basis)

HIST 3871 American Indian History: Pre-Contact to 1830
(3.0 cr.; Student Option)
Introduction to American Indian history from ancient native America to the removal era. Focuses on the social, cultural, political, and economic diversity of Native American peoples and Native American experiences with European colonialism.

HIST 3872 American Indian History: 1830 to the Present
(3.0 cr.; Student Option)
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
(4.0 cr.; A-F or Audit)
America through its cultural diversity. Changing notions of "American" national identity/citizenship from nineteenth 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.

HIST 3877 Asian American History, 1850-1899
(3.0 cr.; Student Option)
Asian American history and contemporary issues, from 1850 to the present. Immigration, labor, anti-Asian movements, women/families, impact of World War Two, new immigrant/refugee communities, civil rights, Asian American identity/culture.

HIST 3878 American West
(3.0 cr.; Student Option)
American West from Mexican-American War to present. U.S. expansion, Native-Anglo conflict, migration/immigration. Race, ethnicity, labor, class, and gender in the West. Business/politics of "settling" the region.

HIST 3900 Topics in Medieval and Modern European History
(1.0-4.0 cr.; Student Option; 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
(1.0-4.0 cr.; Student Option; 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
(1.0-4.0 cr.; Student Option; 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
(3.0 cr.; Student Option)
Selected topics in Near Eastern, Egyptian, Greek, and Roman history.

HIST 3940 Topics in Asian History
(1.0-4.0 cr.; Student Option; prereq Jr or Sr or #)
Selected topics in Asian history not covered in regular courses. To be taught as staffing and demand exist.

HIST 3959 How to Do History
(3.0 cr.; A-F or Audit; 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
(3.0 cr.; A-F Grade Basis; 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 3960 Topics in History
(1.0-4.0 cr.; Student Option; prereq Soph or Jr or Sr or #)
Selected history topics not covered in regular courses.

HIST 3980W Supplemental Writing in History
(1.0 cr.; Student Option; prereq #; must take a 3-cr 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
(1.0-4.0 cr.; Student Option; prereq #)
Internship with a historical society, government, or community historical organization. Arranged through and supervised by department.

HIST 3993 Directed Study
(1.0-16.0 cr.; A-F or Audit; prereq %, #, @)
Guided individual reading or study. Open to qualified students for one or more semesters.

HIST 3994 Directed Research
(1.0-16.0 cr.; A-F or Audit; prereq #, %, @)
Qualifying students work on a tutorial basis.

HIST 4071 History of Rome to 78 B.C.
(3.0 cr.; Student Option; 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 4072 History of Rome: 78 B.C. to A.D. 117
(3.0 cr.; Student Option; prereq An appropriate introductory course is recommended)
Intensively examine the political, institutional, and socioeconomic history of Rome from the death of Sulla in 78 B.C. to the death of Trajan in A.D. 117.

HIST 4073 History of Rome: A.D. 117 to 641
(3.0 cr.; Student Option; 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 4910 Topics in U.S. History
(1.0-4.0 cr.; Student Option; prereq Jr or Sr or grad or #)
Selected topics in U.S. history not covered in regular courses. Taught as staffing permits.

HIST 4960 Topics in History
(1.0-4.0 cr.; Student Option; prereq Jr or Sr or grad or #)
Selected topics in history not covered in regular courses. Taught as staffing permits.

HIST 4961V Honors: Major Paper
(4.0 cr.; A-F Grade Basis; 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
(4.0 cr.; A-F or Audit; 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
(3.0 cr.; A-F Grade Basis; prereq [Honors, Jr or Sr] or [history major, %]) Themes vary by instructor. Reading/discussion of historiography/methodology. Research component.

HIST 4962H Undergraduate Honors Proseminar
(3.0 cr.; A-F Grade Basis; prereq [Jr or Sr], honors) Themes vary depending on the instructor. Reading/discussion of historiography/methodology, research.

HIST 4970 Historical Internship
(1.0-12.0 cr.; Student Option)
Internship with a historical society, government, or community historical organization. Arranged through and supervised by department.

HIST 5011 Quantitative Methods for Historical Research (4.0 cr.; Student Option; prereq #) Basics of quantitative historical data collection, measurement, and analysis.

HIST 5051 Before Herodotus: History and Historiography of Mesopotamia and the Ancient Near East (3.0 cr.; A-F or Audit; prereq #) Historical method/sources for ancient Near Eastern history. Historical traditions. Historiographic texts of Mesopotamia and neighboring regions of the ancient Near East. Secondary emphasis on their relationship to works of classical historians such as Herodotus. Use of these sources in modern historiography of ancient Near East.

HIST 5053 Doing Roman History: Sources, Methods, and Trends (3.0 cr.; Student Option; prereq Grad student or #) Survey of major scholarship in field of Roman history since Mommsen. Political, cultural, social, military, and economic history. Focuses on methodological problems posed by evidence. Ways in which these issues shape research.

HIST 5111 Proseminar in the History of Medieval Europe (3.0 cr.; A-F or Audit; prereq Advanced undergrads of exceptional ability or grads, #) 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 (3.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit) Transformations undergone in post-socialist societies of Eastern Europe, former Soviet Union. Ramifications of abandonment of state socialism. Introductions to market relations. Effect of former system, new market system on cultural institutions/identities.

HIST 5264 Imperial Russia: Formation and Expansion of the Russian Empire in the 18th and 19th Centuries (3.0 cr.; Student Option) Interaction with Europe and Asia; attempts at modernization and reform; emancipation of the serfs and rise of revolutionary movements.

HIST 5265 20th-Century Russia: The Collapse of Imperial Russia, the Revolutions, and the Soviet Regime (3.0 cr.; Student Option) 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 (3.0 cr.; A-F or Audit) Viking society and expansion of Viking influence abroad. Viking impact on Western Europe. Interactions with Slavic lands and settlement of North Atlantic islands. Western Europe's impact on Scandinavian lands. Analyzes archaeological, historical, linguistic, and numismatic evidence.

HIST 5276 Intellectual and Cultural History of Modern Greece (3.0 cr.; Student Option) Literary and cultural contributions of modern Greece. The modern Greek experience seen through Greek historical and cultural monuments. An attempt at self-definition.

HIST 5285 Problems in Historiography and Representation of the Holocaust (3.0 cr.; Student Option; prereq JWST 3521 or RELS 3521) 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 (3.0 cr.; Student Option) 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 5295 Social History of Russia and Eastern Europe From the Late 19th Century to the Present (3.0 cr.; Student Option) Social movements (revolutionary, nationalist, women's); communist and post-communist societies.

HIST 5379 Problems in Early American History (3.0 cr.; Student Option) 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 (3.0-4.0 cr.; Student Option; 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 (3.0 cr.; Student Option) Women's history/masculinity. Gender/colonialism, marriage, sexuality, nationalism, labor, political movements, feminism.

HIST 5436 Social History of African Women: 1850 to the Present (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) 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 5439 Environment and Society in Africa (3.0 cr.; Student Option; prereq #) Major historiographical and theoretical, and methodological debates concerning people-environment relations in Africa, from rise of human societies to present. Environment and the rise of civilizations. Demography, colonial environmental policies, conservation, disease, indigenous knowledge, water management, food.

HIST 5441 Transformations in Pre-Colonial African History (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) 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 5466 China in the Ming and Qing Dynasties (3.0 cr.; Student Option) Political/social history of China from 1600 until end of Qing dynasty in 1911. Ethnicity, daily life, legal structures, city life, peasantry.

HIST 5468 Social Change in Modern China (3.0 cr.; Student Option) 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq Grad student or #) History of gender/sexuality in modern Japan and Korea. Geography of Japan. Theoretical/methodological literature not specific to Japan.
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Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
An exploration of topics central to the history of medicine. Emphasis on mid-18th century to the present. Topics vary yearly.

HIST 5950 Topics in Latin American History (1.0-4.0 cr.; A-F or Audit; prereq Grad or advanced undergrad with #) Selected topics in Latin American history not covered in regular courses. Taught as staffing permits.

HIST 5960 Topics in History (1.0-4.0 cr.; Student Option; prereq Grad or [advanced undergrad with #]) Selected topics in history not covered in regular courses. Taught as staffing permits.

HIST 5962 Topics in Europe (3.0 cr.; A-F or Audit; prereq Grad student, #) Research proseminar on actions of Europeans in wider world, 1350-1790. Based on documents in James Ford Bell Library.

HIST 5964 Comparative Economic History (3.0 cr.; A-F or Audit; 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 5970 Advanced Research in Quantitative History (4.0 cr.; A-F or Audit) Students will carry out publishable-quality research on a quantitative historical topic.


HIST 5980 Topics in Comparative Women's History (3.0-4.0 cr.; A-F or Audit; prereq Grad student or [advanced undergrad, #]) Cross-cultural/thematic explorations in history of women. Topics vary. May include gender and colonialism; women and class formation; women and religion; sexuality; medical construction of gender; women's narratives as historical sources; gender and politics.

HIST 5990 Readings in Comparative History (3.0 cr.; A-F Grade Basis; prereq #) Students read/discuss historical works that focus on common theme or employ similar methods in different geographic areas. Issues of cross-area comparison. Topics vary (e.g., peasant societies, race/ethnicity, states/nationalism).

HIST 5993 Directed Study (1.0-16.0 cr.; Student Option; prereq [Grad student or sr], #, %, @) Guided individual reading or study.

HIST 5994 Directed Research (1.0-16.0 cr.; Student Option; prereq [Grad student or sr], #, %, @) Work on a tutorial basis.

**History of Medicine (HMED)**

HMED 3001V Health, Disease, and Healing I (4.0 cr.; A-F Grade Basis; prereq Honors) Introduction to intellectual/social history of European/American medicine, health care from classical antiquity through 18th century. Meets with 3001W.

HMED 3001W Health, Disease, and Healing I (4.0 cr.; Student Option) Introduction to intellectual/social history of European/American medicine, health care from classical antiquity through 18th century.

HMED 3002W Health Care in History II (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) 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 health prospects for health.

HMED 3055 Women, Health, and History (3.0 cr.; Student Option) Women's historical roles as healers, patients, research subjects, health activists. Biological determinism, reproduction, mental health, nursing, women physicians, public health reformers, alternative practitioners. Gender disparities in diagnosis, treatment, research, careers. Assignments allow students to explore individual interests.


HMED 3075 Technology and Medicine in Modern America (3.0-5.0 cr.; Student Option) How technology came to medicine's center-stage. Impact on medical practice, institutions, consumers, production of medical knowledge, professionalization, health policy, gender/race disparities in health care.

HMED 5200 Early History of Medicine to 1700 (3.0 cr.; A-F or Audit) An introductory survey of the history of medicine in Europe and America.

HMED 5201 History of Medicine from 1700 to 1900 (3.0 cr.; Student Option; prereq 5200) An introductory survey of the history of medicine in Europe and America.

HMED 5210 Seminar: Theories and Methods in Medical History (3.0 cr.; A-F or Audit) Historiography of the history of medicine.

HMED 5211 Seminar: Theories and Methods in Medical History (3.0 cr.; A-F or Audit; prereq 5210) Use of archives, primary sources. Supervised research project.

HMED 5600 Directed Study (0.0-4.0 cr.; Student Option; prereq #) Directed Study.

HMED 5940 Topics in the History of Medicine (3.0-4.0 cr.; Student Option) Seminar on the historical relations between medicine and the State from the 18th to 20th centuries.

**History of Science and Technology (HSCI)**

HSCI 1212 Life on Earth: Perspectives on Biology (4.0 cr.; Student Option) 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. Environmental debates across national
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**University of Minnesota Twin Cities Undergraduate Catalog**

**HSCI 5242 The Darwinian Revolution** (3.0 cr.; Student Option)
- Scientific, economic, political, religious, philosophical dimensions of Darwinism.
- Comparative reception of Darwinism in different countries/cultures.

**HSCI 5244 History of Ecology and Environmentalism** (3.0 cr.; Student Option)
- 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 5331 Technology and American Culture** (3.0 cr.; Student Option)

**HSCI 5332 Science and American Culture** (2.0-3.0 cr.; Student Option)

**HSCI 5401 Ethics in Science and Technology** (3.0 cr.; Student Option)
- 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** (3.0 cr.; Student Option)
- Interaction of art and science, from Renaissance to 19th century. Development of linear perspective, color theory, artistic practice, and scientific illustration/representation.

**HSCI 5421 Engineering Ethics** (3.0 cr.; Student Option)
- Engineering ethics in historical context, including the rise of professional engineering societies; ethical problems in engineering research and engineers' public responsibility; ethical implications of advanced engineering systems such as the production of nuclear weapons; development of codes of ethics in engineering.

**HSCI 5993 Directed Studies** (1.0-15.0 cr.; Student Option; prereq)
- Guided individual reading or study.

**HSCI 5994 Directed Research** (1.0-15.0 cr.; Student Option; prereq #)
- TBD

**HMNG 1001 Introduction to Hmong Language** (5.0 cr.; Student Option)

**HMNG 1002 Introduction to Hmong Language** (5.0 cr.; Student Option; prereq 1001)

**HMNG 1011 Beginning Hmong** (5.0 cr.; Student Option)
- Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

**HMNG 1012 Beginning Hmong** (5.0 cr.; Student Option; prereq 1011)
- Continuation of 1011. Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence.

**HMNG 1015 Accelerated Beginning Hmong** (5.0 cr.; Student Option; prereq Ability in basic spoken Hmong)
- Review of grammar/usage, practice in reading/writing. Introduction to Hmong literature and formal writing. Topics in Hmong culture.

**HMNG 1016 Accelerated Intermediate Hmong** (5.0 cr.; Student Option; prereq 1015, ability in basic spoken Hmong)
- Review of grammar/usage, continued practice in reading/writing. Expanded introduction to Hmong literature and formal writing. Selected topics in Hmong culture.

**HMNG 3021 Intermediate Hmong** (5.0 cr.; Student Option; prereq 1012)
- Listening, speaking, reading, and writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations.

**HMNG 3022 Intermediate Hmong** (5.0 cr.; Student Option; prereq 3021)
- Continuation of 3021. Listening, speaking, reading, writing. Grammar review/elaboration. Authentic texts, cultural readings, basic compositions, oral presentations.

**HMNG 3031 Advanced Hmong** (4.0 cr.; Student Option; 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** (4.0 cr.; Student Option; prereq 3031 or equiv or #)
- Speaking, listening, reading, 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 3290 Hmong Language Teaching Tutorial** (1.0 cr.; S-N Grading Basis; prereq Grade of A in 3022)
- Students tutor beginning students of Hmong and are part of department's Hmong language team.

**HMNG 4001 Beginning Hmong** (3.0 cr.; Student Option; prereq Grad student)
- Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence. Meets with 1011.

**HMNG 4002 Beginning Hmong** (3.0 cr.; Student Option; prereq 4001, grad student)
- Continuation of 4001. Listening, speaking, reading, and writing skills. Emphasizes development of communicative competence. Meets with 1012.

**HMNG 4003 Intermediate Hmong** (3.0 cr.; Student Option; prereq 4002, grad student)

**HMNG 4004 Intermediate Hmong** (3.0 cr.; Student Option; prereq 4003, grad student)

**HMNG 4005 Accelerated Beginning Hmong** (3.0 cr.; Student Option; prereq Ability in basic spoken Hmong, grad student)

**HMNG 4006 Accelerated Intermediate Hmong** (3.0 cr.; Student Option; prereq 4005, ability in basic spoken Hmong, grad student)

**HMNG 4007 Advanced Hmong** (3.0 cr.; Student Option; prereq 4004 or equiv or #)
- Speaking, listening, reading, 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 4008 Advanced Hmong** (3.0 cr.; Student Option; prereq 3031 or 4007 or equiv or #)
- Speaking, listening, reading, 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 5040 Readings in Hmong Texts** (2.0-4.0 cr.; Student Option; prereq 1016 or 3022 with grade of at least B or #)

**Honors Colloquia (HCOL)**
- **Academic Affairs, Senior Vice President**

**HCOL 3801H Honors Challenge Course** (3.0 cr.; A-F Grade Basis; prereq [Soph or Jr or Sr], honors student)
- Team-taught by researchers/lecturers from many fields, inside/outside the University. Challenges to Minnesota, United States.
and world. Problem-solving approach to big questions. Focuses on immigration.

**HCOL 3803H Honors Challenge Course** (3.0 cr.; A-F Grade Basis; prereq [Soph or jr or sr], honors student)
Team-taught by researchers/lecturers from many fields, inside/outside the University. Challenges to Minnesota, United States, and world. Problem-solving approach to big questions. Focuses on food systems.

**HCOL 3805H Honors Challenge** (3.0 cr.; A-F Grade Basis; prereq [Jr or sr], honors
Team-taught by researchers/lecturers from many fields, inside/outside the University. Challenges to Minnesota, United States, and world. Problem-solving approach to big questions. Focuses on water.

**HCOL 3996H Honors: Research Internship** (1.0-3.0 cr.; A-F Grade Basis; prereq Honors student)
Supervised research-based internship with a University Honors Program community partner.

### Honors Seminar (HSEM)

**Academic Affairs, Senior Vice President**

**HSEM 2005H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq Fr or soph honors)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

**HSEM 2007H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq freshman or sophomore honors student)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

**HSEM 2008H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2101H Honors Seminar** (3.0 cr.; A-F or Audit; prereq [Fr or soph with less than 60 cr], honors)
Topic specified in Course Guide.

**HSEM 2111H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2117H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2200H Honors Seminar** (3.0 cr.; A-F or Audit; prereq [Fr or soph with less than 60 cr], honors)
Topic specified in Course Guide.

**HSEM 2205H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors)
Special topics. Emphasizes active learning. Frequently interdisciplinary.

**HSEM 2208H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2303H Honors Seminar** (3.0 cr.; A-F or Audit; prereq [Fr or soph with less than 60 cr], honors)
Topic specified in Course Guide.

**HSEM 2303H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics Course; emphasis on active learning; frequently interdisciplinary.

**HSEM 2303H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph], honors)
Topics Course. Emphasizes active learning.

**HSEM 2404H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2405H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2406H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis)
Emphasizes active learning. Frequently interdisciplinary.

**HSEM 2505H Honors Seminar** (3.0 cr.; A-F or Audit; prereq [Fr or soph with less than 60 cr], honors)
Topic specified in Course Guide.

**HSEM 2501H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis)
Honors seminar. Emphasis on active learning; frequently interdisciplinary.

**HSEM 2503H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2504H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors)
Honors seminar. Emphasizes active learning. Frequently interdisciplinary.

**HSEM 2606H Honors Seminar** (3.0 cr.; A-F or Audit; prereq [Fr or soph with less than 60 cr], honors)
Topic specified in Course Guide.

**HSEM 2707H Honors Seminar** (3.0 cr.; A-F or Audit; prereq [Fr or soph with less than 60 cr], honors)
Topic specified in Course Guide.

**HSEM 2808H Honors Seminar** (3.0 cr.; A-F or Audit)
Interdisciplinary course. Emphasizes active learning.

**HSEM 2909H Honors Seminar** (3.0 cr.; A-F or Audit)
Interdisciplinary course. Emphasizes active learning.

**HSEM 2101H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion course; active learning; frequently interdisciplinary.

**HSEM 2103H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq Fr or soph honors)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

**HSEM 2110V Honors Seminar** (3.0 cr.; A-F Grade Basis; prereq [Fr or soph], honors)
Topics course; often interdisciplinary.

**HSEM 2120V Honors Seminar** (2.0; A-F Grade Basis)
Honors seminar, writing intensive.

**HSEM 2130V Honors Seminar** (3.0 cr.; A-F Grade Basis; prereq Honors, [fr or soph])
Honors seminar, writing intensive.

**HSEM 2205H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion; active learning; frequently interdisciplinary.

**HSEM 2513H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph], honors)
Special topics. Emphasizes active learning. Interdisciplinary.

**HSEM 2539H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion; active learning; frequently interdisciplinary.

**HSEM 2338H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics discussion. Emphasizes active learning. Frequently interdisciplinary.

**HSEM 2607H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq Fr or soph honors)
Honors seminar; emphasis on active learning; frequently interdisciplinary.

**HSEM 2609H Honors Seminar** (3.0 cr.; A-F Grade Basis)
Emphasizes active learning. Frequently interdisciplinary.

**HSEM 2634H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics course; emphasis on active learning; frequently interdisciplinary.

**HSEM 2637H Honors Seminar** (2.0-3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors student)
Special topics course; emphasis on active learning; frequently interdisciplinary.

HSEM 2941H Honor Topics (2.0-3.0 cr.; A-F Grade Basis) Special topics: Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 2901H Honors Directed Study (1.0-2.0 cr.; A-F Grade Basis; prereq #) Extra credit to be used in conjunction with an existing honors seminar.

HSEM 2902H Honors Directed Study (1.0-2.0 cr.; A-F Grade Basis; prereq #) Extra credits to be used in conjunction with an honors seminar.

HSEM 2941H Honor Topics (2.0-3.0 cr.; A-F Grade Basis) Special topics. Team taught.

HSEM 2942H Honor Topics (2.0-3.0 cr.; A-F Grade Basis) Team taught.

HSEM 2991H Honors Directed Research (1.0-3.0 cr.; A-F Grade Basis) Honors Directed Research

HSEM 2960H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis) Special topics discussion course; emphasis on active learning; frequently interdisciplinary.

HSEM 2967H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasizes active learning. Frequently interdisciplinary.

HSEM 2968H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasizes active learning. Frequently interdisciplinary.

HSEM 3007H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasizes active learning. Frequently interdisciplinary.

HSEM 3008H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasis on active learning; frequently interdisciplinary.

HSEM 3010H Honors Seminar (2.0-4.0 cr.; A-F or Audit; prereq [Jr or sr], honors) Special topics. Discussions, active learning. Often interdisciplinary.

HSEM 3011H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis) Topics course.

HSEM 3012H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr], honors) Special topics. Discussions, active learning. Often interdisciplinary.

HSEM 3013H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasizes active learning. Frequently interdisciplinary.

HSEM 3014H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasizes active learning. Frequently interdisciplinary.

HSEM 3020H Honors Seminar (2.0-4.0 cr.; A-F or Audit; prereq [Jr or sr], honors) Special topics. Discussions, active learning. Often interdisciplinary.

HSEM 3021H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors) Honors seminar; emphasis on active learning; frequently interdisciplinary.

HSEM 3022H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr], honors) Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3025H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics course; emphasis on active learning; frequently interdisciplinary.

HSEM 3026H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Topics course; emphasis on active learning; frequently interdisciplinary.

HSEM 3028H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion course; emphasizes active learning. Frequently interdisciplinary.

HSEM 3030H Honors Seminar (3.0 cr.; A-F or Audit; prereq [Jr or sr], honors) Special topics. Discussions, active learning. Often interdisciplinary.

HSEM 3033H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion; emphasizes active learning. Frequently interdisciplinary.

HSEM 3034H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr], honors) Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3037H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq [Jr or sr] honors student) Special topics discussion; emphasizes active learning. Frequently interdisciplinary.
HSEM 3070H Honors Seminar (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Honors seminar: emphasis on active learning; frequently interdisciplinary.

HSEM 3093H Directed Studies (1.0-4.0 cr.; Student Option; prereq Jr or sr, honors, %, @)
Additional research related to seminar topic.

HSEM 3103H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Honors seminar: emphasis on active learning; frequently interdisciplinary.

HSEM 3110V Writing Intensive Honors Seminar (3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Special topics course. Discussions, active learning. Often interdisciplinary in perspective.

HSEM 3120V Honors Seminar (1.0-3.0 cr.; A-F or Audit; 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 3130V Honors Seminar (1.0-3.0 cr.; A-F or Audit; 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 3205H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors student)
Special topics discussion; active learning; frequently interdisciplinary.

HSEM 3206H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3207H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3210H Honors Book Discussion (1.0 cr.; S-N Grading Basis; prereq Jr or sr, honors)
Students read a text, meet to discuss. Lectures on text by faculty, other experts.

HSEM 3307H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis)
TBD

HSEM 3320H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Special topics, discussions, active learning. Often interdisciplinary.

HSEM 3307H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors student)
Special topics discussion; active learning; frequency interdisciplinary.

HSEM 3410H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors)
Special topics. Discussion based. Frequently interdisciplinary.

HSEM 3522H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Special topics. Discussion oriented, emphasizes active learning. Frequently interdisciplinary.

HSEM 3530H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors student)
Special topics course, emphasis on active learning, frequently interdisciplinary.

HSEM 3609H Honors seminar (2.0-3.0 cr.; A-F Grade Basis)
TBD

HSEM 3692H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Frequently interdisciplinary.

HSEM 3716H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors student)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3801H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3802H Honors Seminar (2.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr, honors)
Emphasizes active learning. Frequently interdisciplinary.

HSEM 3901H Honors Directed Study (1.0-2.0 cr.; A-F Grade Basis; prereq #)
Extra credit to be used in conjunction with an honors seminar.

HSEM 3902H Honors Directed Study (1.0-2.0 cr.; A-F Grade Basis; prereq #)
Extra credit to be used in conjunction with an honors seminar.

HSEM 3941H Honors Topics (2.0-3.0 cr.; A-F Grade Basis)
Team taught.

HSEM 3942H Honors Topics (2.0-3.0 cr.; A-F Grade Basis)
Team taught.

HSEM 3991H Honors Directed Research (1.0-3.0 cr.; A-F Grade Basis)
TBD

HSEM 3992H Honors Interdisciplinary Research (1.0-3.0 cr.; A-F Grade Basis; prereq Jr or sr honors student)
Independent/collaborative research course arranged with a faculty member through which honors students will bring varying academic perspectives to research topics.

HSEM 4941H Honors Topics (2.0-3.0 cr.; A-F Grade Basis)
Team taught.

HSEM 4942H Honors Topics (2.0-3.0 cr.; A-F Grade Basis)
Team taught.

Horticultural Science (HORT)
College of Food, Agricultural and Natural Resources Sciences

HORT 1001 Plant Propagation (4.0 cr.; Student Option)
Principles and techniques of propagating plants by seeds, cuttings, grafts, buds, layers, and division. Lectures on principles; labs on practice of various propagating techniques.

HORT 1003 Horticulture for the Home Gardener (3.0 cr.; Student Option)

Extension publications/resources.

HORT 1013 Floral Design (3.0 cr.; Student Option)

HORT 1014 Edible Landscape (3.0 cr.; Student Option)
Tracing our relationship with edible landscapes traces to our hunting-gathering origins. Technological/social changes that have distanced us from our food. Integrating food plants into pleasing, sustainable, and edible landscapes in yards, neighborhoods, and cities.

HORT 1015 Woody and Herbaceous Plants (4.0 cr.; A-F Grade Basis)
How to identify plants around the world. A few hundred of the most important cultivated plants for northern climates, their distinguishing features, common uses, cultural specificities, and notable cultivars.

HORT 1031 Vines and Wines: Introduction to Viticulture and Enology (3.0 cr.; Student Option No Audit; prereq 21 yrs of age by date of 1st class meeting)
History of wine, principles of biology, culture of grapevine, fermentation, sensory evaluation of wine.

HORT 1061 The Sustainable Lawn (3.0 cr.; Student Option)
Common turfgrasses. How to manage home lawns in sustainable way. Maintaining quality turf areas with reduced inputs.

HORT 1090 Directed Studies (1.0-3.0 cr.; Student Option)
Approved field, lab, or greenhouse experiences in application of horticultural information/practices.

HORT 1901 Topics: Freshman Seminar (3.0 cr.; Student Option; prereq Fr)
Topics vary.

HORT 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr)
Topics vary.

HORT 1942 Topics: Freshman Seminar (3.0 cr.; A-F or Audit)
Interdisciplinary seminar. Topics specified in Class Schedule.

HORT 2031 Organic Food: How to Grow It, Where to Buy It, Can It Feed the World? (3.0 cr.; Student Option)

HORT 2100 Agricultural Biochemistry (3.0 cr.; A-F Grade Basis; prereq CHEM 1011 or [1015, &1017] or CHEM 1021 or #)
HORT 3000 Horticulture Global Seminar (3.0 cr.; Student Option No Audit)
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 3005W Environmental Effects on Horticultural Crops (4.0 cr.; Student Option; 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 3090 Directed Studies (2.0-12.0 cr.; Student Option; prereq Nonfr, #)
Approved field, lab, or greenhouse experiences in application of horticultural information/practices.

HORT 3131 Student Organic Farm Planning, Growing, and Marketing (3.0 cr.; Student Option; 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 3480 Topics in Turfgrass (1.0-4.0 cr.; A-F Grade Basis)
Various topics in turfgrass.

HORT 4000 International Experiences in Horticultural Science (3.0 cr.; Student Option)
Perspectives in horticultural science/cultural diversity through various international settings. Preparation for international study tour of one to three weeks.

HORT 4015 Advanced Woody and Herbaceous Plant Topics (1.0 cr.; A-F Grade Basis; prereq 1015)
Species, cultivars, identification, and use for each genus of each family of woody and herbaceous plants.

HORT 4061W Turfgrass Management (3.0 cr.; A-F Grade Basis; prereq 1001 or #)
Biological and cultural aspects of turfgrass weeds, pest management, and crop improvement. Emphasis on plant propagation and management strategies for turfgrass communities and landscape plant systems. sod production, industrial grounds, lawn care, park/recreation areas, athletic field management, business management, and case studies.

HORT 4062 Turfgrass Weed and Disease Science (1.0-3.0 cr.; A-F Grade Basis; prereq [4061, PLPA 2001] or #)
Turfgrass weed/weed problems. How to deal with these problems using an integrated approach. Biology, identifying features, and management strategies for turfgrass disease problems. ways to apply IPM principles to turfgrass disease problems.

HORT 4083 Turfgrass Science (3.0 cr.; A-F Grade Basis; 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 4071W Applications of Biotechnology to Plant Improvement (4.0 cr.; Student Option; prereq [BIOL 1009 or equiv or grad student], #)

HORT 4096 Professional Experience Program: Internship (1.0 cr.; A-F Grade Basis; prereq CFANS undergrad, completed internship contract prior to employment)
Professional experience in horticulture firms or government agencies attained through supervised practical experience. Students evaluate reports, consult with faculty advisers/employers.

HORT 4096W Professional Experience Program: Internship (2.0 cr.; S-N Grading Basis; prereq CFANS undergrad)
Professional experience in horticultural businesses, government agencies, arboretum, and botanical gardens achieved through a supervised practical experience. Students produce a final publication focusing on writing for lay audiences. Project starts before the internship begins and ends approximately two months after the internship is complete.

HORT 4141W Plant Production I (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; Student Option; 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 investigate hybridization, variation, and selection.

HORT 4461 Horticultural Marketing (3.0 cr.; A-F Grade Basis; 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 5007 Advanced Plant Propagation (3.0 cr.; Student Option; prereq 1001)

HORT 5011 Common Chinese Medicinal Plants: Classification, Identification, and Application (3.0 cr.; Student Option; prereq 1001 or BIOL 1009 or #)

HORT 5012 Common Chinese Medicinal Plants: Growing and Processing (3.0 cr.; Student Option; prereq [1001 or BIOL 1009, CHEM 1015, HORT 5011] or #)
How to grow, process, and store 40 common Chinese herbs and herbal products.

HORT 5023 Public Garden Management (2.0 cr.; Student Option)

HORT 5031 Fruit Production and Viticulture for Local and Organic Markets (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq [3005, ENT 1005, PLPA 2001, SOIL 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 Plant Production II (4.0 cr.; A-F or Audit; prereq 1001, 1015)

HORT 5071 Ecological Restoration (4.0 cr.; Student Option; prereq [One college course in ecology, one college course in [plant science or botany]] or #)

HORT 5090 Directed Studies (1.0-6.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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.
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

**HRIR 3031 Staffing and Selection: Strategic and Operational Concerns** (2.0 cr.; Student Option; prereq CSOM upper div undergrad major grad)

**HRIR 3032 Training and Development** (2.0 cr.; Student Option; 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** (2.0 cr.; Student Option)
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** (2.0 cr.; Student Option)
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** (2.0 cr.; Student Option; prereq [[At least 60 sem cr or 75 qr cr], 2.00 GPA] or %)
Introduction to compensation/reward programs in employment 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** (2.0 cr.; Student Option; 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 and responsibilities, historical influences on policy and practice in the private and public sectors.

**HRIR 3072 Collective Bargaining and Dispute Resolution** (2.0 cr.; Student Option; 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** (4.0 cr.; A-F Grade Basis; prereq [3031 or 3031], 3041 or 3041]; [two 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/efficient/authentic leadership throughout the organization.

**HRIR 5000 Topics in Human Resources and Industrial Relations** (2.0 cr.; Student Option; prereq HRIR MA student)
Topics in human resources and industrial relations.

**HRIR 5022 Managing Diversity** (2.0 cr.; Student Option; prereq CSOM upper div undergrad major grad)
Ways to effectively manage increasingly diverse workforce. Human resource practices examined with respect to diversity. How to incorporate diversity into decision making to enhance organizational performance.

**HRIR 5023 Employment and Labor Law for the HRIR Professional** (2.0 cr.; A-F Grade Basis; prereq [At least 60 sem cr or 75 qr 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 5024 Employee Performance: Appraisal and Management** (2.0 cr.; Student Option; prereq CSOM upper div undergrad major grad)
How employee performance is organized, evaluated, and managed to achieve organizational/individual performance goals. Job design standards, employee appraisal systems, worker satisfaction.

**HRIR 5025 Comparative and International Human Resources and Industrial Relations** (2.0 cr.; Student Option; prereq Grad majors must register A-F)

**HRIR 5028 Leadership and Personal Development** (2.0 cr.; A-F Grade Basis)
Effective/ethical leadership. Leadership theory. Personal leadership strengths/weaknesses. Exercises, role playing, giving/receiving feedback. Students create leadership development plan.

**HRIR 5054 Public Policies on Employee Benefits: Social Safety Nets** (2.0 cr.; Student Option; prereq Undergraduate in micro economics; HRIR grad majors must register A-F)

**HRIR 5061 Public Policies on Work and Pay** (3.0 cr.; Student Option)
Analysis of public policies regarding employment, unions, and labor markets. Public programs affecting wages, employment, worker mobility, security, and quality of work life. Policy implications of the changing nature of work.

**HRIR 5062 Personnel Economics** (2.0 cr.; Student Option; 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** (1.0-8.0 cr.; Student Option; prereq % or #)
Individual readings or research topics.

**Icelandic (ICEL)**
College of Liberal Arts

**ICEL 1101 Intensive Modern Icelandic** (6.0 cr.; Student Option; prereq %)
Basic listening, speaking, reading, writing.
Everyday subjects (shopping, directions, family, food, housing). Culture/society. First half is at University of Minnesota-Twin Cities; second half is at University of Iceland- Reykjavik. Six-week course.

**ICEL 4101 Intensive Modern Icelandic** (3.0 cr.; Student Option; prereq grad student, %)
Basic listening, speaking, reading, writing.
Everyday subjects (shopping, directions, family, food, housing). Culture/society. First half is at University of Minnesota-Twin Cities; second half is at University of Iceland- Reykjavik. Six-week course. Meets with 1101.

**Industrial Engineering (IE)**
College of Science and Engineering

**IE 1101 Foundations of Industrial and Systems Engineering** (4.0 cr.; Student Option; prereq MATH 1371, MATH 1372, CSE student)
History/development of industrial/systems engineering, operations planning, quality control, human factors, resource management, financial engineering, facility location/layout, optimization, probabilistic/stochastic models, simulation, project management, management systems design, computer/information systems management.

**IE 2021 Engineering Economics** (4.0 cr.; A-F Grade Basis; prereq MATH 1372, CSE student)
Cost/design process, cost estimation models, cash flow analysis, interest rate models, time value of money, evaluation of projects, internal rate of return, depreciation and income taxes, price changes and inflation, capital budgeting, decision making under uncertainty.

**IE 3011 Optimization I** (4.0 cr.; A-F Grade Basis; prereq 1101, MATH 2274, MATH 2372, ISyE major)
Optimization models, data/solutions, linear programming, simplex method, duality theory, sensitivity analysis, network optimization models, integer programming.

**IE 3012 Optimization II** (4.0 cr.; A-F Grade Basis; prereq 3011, ISyE major)
Nonlinear programming, convexity, gradient method, constrained optimization, Lagrangian
IE 3041 Industrial Assignment I (2.0 cr.; A-F or Audit; 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 3522 Quality Engineering and Reliability (4.0 cr.; A-F Grade Basis; prereq MATH 2372, MATH 2374, STAT 3021, ISyE major) Quality engineering/management, economics of quality. Statistical process control, reliability, maintainability, availability.

IE 3553 Simulation (4.0 cr.; A-F Grade Basis; prereq CSI 1113, STAT 3021, ISyE major) Introduction to techniques/tools of stochastic simulation. Applications from finance and insurance risk. Problems in inventory/queueing.


IE 4041 Senior Design (4.0 cr.; A-F Grade Basis; prereq 1101, 2021, 3012, 3522, 3553, 4011, 4511, 4541, STAT 3021, ISyE senior) Students work in small teams to address an open-ended problem in industrial/systems engineering. Teams work with faculty or industry advisers. Teams do a project, midterm/final presentation, and final report.

IE 4042 Industrial Assignment II (2.0 cr.; A-F or Audit; 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 4043 Industrial Assignment III (4.0 cr.; A-F or Audit; prereq 4042) 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.


IE 4521 Statistics, Quality, and Reliability (4.0 cr.; Student Option; prereq 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 4541 Project Management (4.0 cr.; A-F Grade Basis; prereq ISyE senior) Introduction to engineering project management. Analytical methods of selecting, organizing, budgeting, scheduling, and controlling projects. Risk management, team leadership, program management.

IE 4551 Production and Inventory Control (4.0 cr.; A-F Grade Basis; prereq 1101, 2021, 3011, STAT 3021, ISyE major) Methods for managing production, inventory, and supply chain operations. Demand forecasting, inventory control, production planning/scheduling, supply chain coordination, and manufacturer's flow analysis. Implications of emerging technologies, business practices, and government regulations.

IE 5080 Topics in Industrial Engineering (1.0-4.0 cr.; Student Option; prereq Upper div or grad student) Topics vary each semester.

IE 5111 Systems Engineering I (2.0 cr.; A-F or Audit; prereq CSE upper div or grad student) Overview of systems-level thinking/techniques in context of a case study or project. Topics vary each semester. Hands-on techniques applied to specific problems. Topics pertinent to systems engineering thinking/techniques presented in 5111. Hands-on techniques applied to specific problems. Topics pertinent to effectiveness of system design process. Practices and organizational/reward structure to support collaborative, globally distributed design team.

IE 5112 Introduction to Operations Research (3.0 cr.; A-F or Audit; prereq [Math 2243 or Math 2373 or equiv.], [one semester of probability or statistics], [CSE 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 (4.0 cr.; A-F or Audit; prereq 5111, a course on basic probability, [CSE 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 5513 Engineering Safety (4.0 cr.; A-F Grade Basis; prereq [4521 or equiv], [4541 or grad student or CNR]) Analytical methods of selecting, organizing, budgeting, scheduling, and controlling projects, including risk management, team leadership, and program management.

IE 5545 Decision Analysis (4.0 cr.; Student Option; 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 5551 Production Planning and Inventory Control (4.0 cr.; Student Option; prereq CNR or upper div or grad student) Inventory control, supply chain management, demand forecasting, capacity planning, aggregate production and material requirement planning, operations scheduling, and shop floor control. Quantitative models used to support decisions. Implications of emerging information technologies and of electronic commerce for supply chain management and factory operation.
INET 4031 System Administration (4.0 cr.; A-F or Audit; prereq [CSCI 4061 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 (2.0 cr.; A-F or Audit) 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 4041 Emerging Network Technologies and Applications (3.0 cr.; A-F or Audit; prereq [CSCI 4211 or equiv professional experience or #], 45 cr) Underlying theory. Driving needs (technological, business). Developing technology. Competing technologies. Lectures by guest expert speakers. Case studies. Labs.

INET 4051 IT Infrastructure Operations (3.0 cr.; A-F or Audit; prereq [CSCI 4212 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 4083 System Analysis and Design (2.0 cr.; A-F or Audit; prereq 4082 or project management experience) Requirements management, analysis, and design of computer system solutions targeting business objectives. System development life cycle. Development methodologies. Analysis/design tools/techniques; communication strategies. System architecture as business strategy.

INET 4153 Policy and Regulation: Effects on Global IT Infrastructure (3.0 cr.; A-F or Audit; 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 (1.0-4.0 cr.; A-F or Audit; prereq ITI student, %) Independent project. Topic arranged with and supervised by ITI faculty.

INET 4596 Internship (1.0-3.0 cr.; Student Option; prereq [ITI major or certificate student], [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 (3.0 cr.; A-F or Audit; prereq 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 (2.0 cr.; A-F or Audit; 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.

Information and Decision Sciences (IDSC)
Curtis L. Carlson School of Management


IDSC 3101 Introduction to Programming (2.0 cr.; A-F Grade Basis)
Computer programing used by companies to build sophisticated information systems.
Variables, control structures. Data structures such as arrays/collectins. Programming style, graphical user interfaces (GUIs).

IDSC 3102 Intermediate Programming (2.0 cr.; A-F Grade Basis; prereq 3101 or [equiv experience, #])
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 (2.0 cr.; A-F Grade Basis)

IDSC 3104 Enterprise Systems (2.0 cr.; A-F Grade Basis; prereq 3001)

IDSC 3202 Analysis and Modeling for Business Systems Development (4.0 cr.; A-F or Audit; prereq 3001)

IDSC 4204W Information Services Management (4.0 cr.; A-F Grade Basis; prereq 3104, 3202)
Information services as service function. Business models/strategies, IS organizational structures, outsourcing, global teams, IT Infrastructure Library (ITIL), lean integration. Managing infrastructure. Internet protocols/standards, mobile communications, storage (data centers, cloud computing). Managing an IT project portfolio and office.

IDSC 4301 Information Systems Capstone Course: A Live Case (2.0 cr.; A-F Grade Basis; prereq 3202, CSOM major)
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 (2.0 cr.; A-F Grade Basis; prereq 3001)
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 (2.0 cr.; A-F Grade Basis; prereq 3001)
Information technology audit function, internal control, audit process, smart operations, network security, systems development life cycle, enterprise resource planning risk, compliance issues. IT governance, business continuity, frameworks/methodologies. Lectures, case studies, real-world examples.

IDSC 4421 Financial Information Systems and Technologies (2.0 cr.; A-F or Audit; prereq 3001)
IS in financial services, corporate financial operations, and investment management. Traditional vs electronic financial markets, computerized trading, digital sources of financial data, electronic money, decision technologies in financial services. Software development skills for personal investments.

IDSC 4431 Advanced Database Design (2.0 cr.; A-F or Audit; prereq 3103 or CSCI 4707 or CSCI 5707)
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 4441 Electronic Commerce (2.0 cr.; A-F or Audit; prereq 3001)

IDSC 4444 Business Analytics (2.0 cr.; A-F Grade Basis; prereq 3001)
Data mining/personalization techniques. Exploratory/predictive data mining techniques. Data preparation, data visualization, online analytical processing (OLAP), recommender systems. How business analytics techniques are applied in variety of business applications/organizational settings.

IDSC 4455 Web 2.0: The Business of Social Media (2.0 cr.; A-F Grade Basis; prereq 3001)
Business use of social media technologies. Blogs, wikis, social networking sites. Readings, forum discussion, case analyses. How technologies engage consumers, market products or services, benefit from open innovation, foster collaboration among employees.

IDSC 4490 Information Systems Special Topics (2.0 cr.; A-F or Audit)
Discussion and analysis of current topics and developments in information systems.

IDSC 4491 Independent Study in Information Systems (1.0-4.0 cr.; A-F Grade Basis; prereq #)
Independent study in information systems.

ISE 5011 Computer Applications in Infrastructure Systems Engineering (2.0 cr.; A-F or Audit; prereq ISE grad student)
Advanced application of computer tools/methods in infrastructure engineering problems. Spreadsheet Visual Basic programming, HTML, JAVA script.

ISE 5112 Infrastructure Systems Engineering Management (2.0 cr.; A-F or Audit; prereq ISE grad student)
Managing a public works infrastructure. Case studies of decision making in an environment of conflicting interests.

ISE 5113 Computer Applications in Infrastructure Systems Engineering (2.0 cr.; A-F or Audit; prereq ISE grad student)
Advanced application of computer tools/methods in infrastructure engineering problems. Spreadsheet Visual Basic programming, HTML, JAVA script.

ISE 5201 Pavement Management Maintenance and Rehabilitation (2.0 cr.; A-F or Audit; prereq ISE grad student)

ISE 5202 Traffic Engineering Management (2.0 cr.; A-F or Audit; prereq ISE student)

ISE 5301 Bridge Management Maintenance and Rehabilitation (2.0 cr.; A-F or Audit; prereq ISE grad student)

ISE 5302 Critical Infrastructure Security and Protection (2.0 cr.; A-F Grade Basis; prereq ISE grad student or #)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE 5401</td>
<td>Water Distribution Systems</td>
<td>1.0-4.0 cr.; A-F or Audit; prereq ISE grad student Components/design of water distribution systems. Methods of evaluation/management. Maintenance/rehabilitation techniques.</td>
</tr>
<tr>
<td>ISE 5402</td>
<td>Storm Water Management</td>
<td>2.0 cr.; A-F or Audit; prereq ISE grad student Components/design of storm water collection systems. Methods of evaluation/management. Maintenance/rehabilitation techniques.</td>
</tr>
<tr>
<td>ISE 5403</td>
<td>Water Treatment Systems</td>
<td>2.0 cr.; A-F or Audit; prereq ISE student Components/design of water treatment systems. Evaluation/management methods. Maintenance/rehabilitation techniques.</td>
</tr>
<tr>
<td>ISE 5500</td>
<td>Public Interactions</td>
<td>1.0 cr.; A-F or Audit; prereq ISE student Techniques for effective public communication. How to run a public hearing. Resources for publishing public notices. Sequence course in three parts.</td>
</tr>
<tr>
<td>ISE 5501</td>
<td>Geographic Information Systems</td>
<td>2.0 cr.; A-F or Audit; prereq ISE student Introduction to geographic Information Systems (GIS) for infrastructure. GIS application domains, data models/sources, analysis methods, and output techniques. Lectures, readings, hands-on experience with GIS software.</td>
</tr>
<tr>
<td>ISE 5504</td>
<td>Construction Law and Ethics</td>
<td>2.0 cr.; A-F or Audit; prereq ISE student Ethical framework for responsible management of public works projects. Moral leadership, trust in public/private organizations, quality control.</td>
</tr>
<tr>
<td>ISE 5950</td>
<td>Special Topics</td>
<td>1.0-4.0 cr.; A-F or Audit; prereq % Special interdisciplinary topics.</td>
</tr>
<tr>
<td>IS 5993</td>
<td>Directed Studies</td>
<td>1.0-4.0 cr.; Student Option; prereq % Guided individual reading or study.</td>
</tr>
<tr>
<td>INS 4100</td>
<td>Corporate Risk Management</td>
<td>2.0 cr.; Student Option 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 reduction, retention and transfer, including insurance.</td>
</tr>
<tr>
<td>INS 4101</td>
<td>Employee Benefits</td>
<td>2.0 cr.; Student Option; prereq 4100 or 5100 or HRIR 3021 or 47 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.</td>
</tr>
<tr>
<td>INS 4200</td>
<td>Insurance Theory and Practice</td>
<td>2.0 cr.; Student Option Risk theory 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.</td>
</tr>
<tr>
<td>INS 4202</td>
<td>Personal Financial Planning 2: Tax and Estate Planning Techniques</td>
<td>2.0 cr.; Student Option; prereq 4201 or 5201 Estate planning, tax management techniques. Charitable giving, probate process, use of health care directives, durable powers of attorney, revocable/irrevocable trusts, wills, asset distribution.</td>
</tr>
<tr>
<td>INS 5000</td>
<td>Personal Financial Planning 2: Tax and Estate Planning Techniques</td>
<td>2.0 cr.; Student Option; prereq 5201 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.</td>
</tr>
<tr>
<td>ICP 3000</td>
<td>Career Skills in the Professional Environment</td>
<td>2.0 cr.; Student Option; prereq 60 cr Career planning and job search processes appropriate to business/professional careers in corporate culture.</td>
</tr>
<tr>
<td>ICP 3093</td>
<td>Directed Study</td>
<td>1.0-15.0 cr.; Student Option; prereq # Independent, directed study.</td>
</tr>
<tr>
<td>ICP 3201</td>
<td>Career and Internship Preparation</td>
<td>1.0 cr.; A-F Grade Basis; 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.</td>
</tr>
<tr>
<td>ID 1201</td>
<td>Major and Career Exploration</td>
<td>2.0 cr.; Student Option; prereq Fr or soph Students learn about their unique interests, skills, personality, values. Using this information in choosing major/career. Importance of internships, community service, other practical experiences.</td>
</tr>
<tr>
<td>ID 3201</td>
<td>Career Planning</td>
<td>2.0 cr.; Student Option For juniors and seniors. A practical introduction to integrating individual talents, values, interests, and experience with critical career search strategies. Emphasis on understanding the marketplace, internet research, strategic resume writing, networking, and interviewing.</td>
</tr>
<tr>
<td>ID 3205</td>
<td>Law School Exploration</td>
<td>2.0 cr.; Student Option Assessment of fit between individual, law school, and career field of law. Off-campus informational interviews, site visits.</td>
</tr>
<tr>
<td>ID 3208</td>
<td>Internship Reflection: Making Meaning of Your Experience</td>
<td>1.0 cr.; Student Option; prereq % Allows students to examine, reflect on, and construct meaning from their internship experience through self assessment of personal and career needs and goals, examination of what it means to be a “professional” and operate within professional environments, evaluation of performance and accomplishments, articulation of knowledge and skills via effective resume writing.</td>
</tr>
<tr>
<td>ID 3561</td>
<td>HECUA Off Campus Programs</td>
<td>4.0 cr.; Student Option; prereq &amp;3562, &amp;3563 Role of creative writers and literature in effecting social change.</td>
</tr>
<tr>
<td>ID 3562</td>
<td>HECUA Off Campus Programs</td>
<td>4.0 cr.; Student Option; prereq &amp;3561, &amp;3563 Testing theoretical perspectives of literature and social change by writing fiction, poetry, and creative nonfiction.</td>
</tr>
<tr>
<td>ID 3563</td>
<td>HECUA Off-Campus Study Program</td>
<td>8.0 cr.; Student Option; prereq &amp;3561, &amp;3562, % Project-based internship with professional-level responsibilities. Opportunities to integrate experience with two companion courses.</td>
</tr>
</tbody>
</table>

**Innovation Studies (IS)**

**College of Continuing Education**

**Insurance and Risk Management (INS)**

**Curtis L. Carlson School of Management**

**IS 4151 Innovation for Leaders and Organizations** (3.0 cr.; A-F or Audit; prereq 45 cr) History of innovation process, importance to individuals/organizations. Strategies to foster innovation. Responsibilities in innovation skill-building/leadership.

**IS 5001 Introduction to Innovation Studies** (1.0-4.0 cr.; A-F or Audit; 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.

**IS 5002 Final Project for Innovation Studies** (1.0-4.0 cr.; A-F or Audit; prereq Completion of IS requirements, %.) Either an internship in an organization or a hands-on study project on a contemporary issue or problem. Students apply expertise/ideas to a real-world situation.

**IS 5100 Innovation Studies Seminar** (1.0-4.0 cr.; A-F or Audit; prereq %) Innovation studies topics.

**College of Liberal Arts**

**Interdepartmental Study (ID)**

**University of Minnesota Twin Cities Undergraduate Catalog**

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

ID 3564 HECUA Off-Campus Study Program: Environment and Agriculture: Sustainable Food Systems (4.0 cr.; A-F Grade Basis; prereq %) Students devote summer to practice of sustainable farming.

ID 3571 HECUA: Inequality in America - Contested Theories of Poverty, Inequality, and Social Change (4.0 cr.; Student Option; prereq &3571, 3573, %) Roots/strategies for addressing urban inequality/poverty. Interdisciplinary field study, seminar work, internship.

ID 3572 HECUA: Inequality in America - Social Policy and Anti-Poverty Strategies in Theory and Practice (4.0 cr.; Student Option; prereq &3571, 3573, %) Roots/strategies for addressing urban inequality/poverty. Interdisciplinary field study, seminar work, internship.


ID 3581 HECUA: Arts for Social Change - Art and Culture in Political, Social, Historical Context (4.0 cr.; Student Option; prereq &3582, 3583, %) Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship.

ID 3582 HECUA: Arts Praxis - Social Justice Theory and Practice in the Field (4.0 cr.; Student Option; prereq &3581, 3583, %) Arts, popular culture, social change. Interdisciplinary field study, seminar work, internship. Offered spring semester.

ID 3591 HECUA Off-Campus Study Program: Environmental Sustainability: Adaptive Ecosystem Management (4.0 cr.; A-F Grade Basis; 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 3592 HECUA Off-Campus Study Program: Environmental Sustainability: Dimensions of Environmental Change (4.0 cr.; A-F Grade Basis; prereq &3591, 3593, 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 (4.0 cr.; A-F Grade Basis; prereq &3591, &3592, 3594, %) Field research project on environmental issues. Students work with scientists and community members and conduct publishable research.

ID 3594 HECUA Off-Campus Study Program: Environmental Sustainability, Internship (4.0 cr.; A-F Grade Basis; prereq &3591, &3592, 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 3900 University YMCA Collegiate Allies (1.0 cr.; S-N Grading Basis; prereq Active participation in a U YWCA program, #) Contextualize learning through multiple settings of real life experiences. Students are engaged in seminar topics that help them to find significant meaning and understanding of themselves and others in multicultural environments. Community service activities, connecting knowledge and practice, and reflecting on how experiences have informed them in becoming effective and engaged citizens and lifelong learners.

ID 3901 Scholars Program Capstone Seminar (1.0 cr.; A-F Grade Basis; 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 3960 Interdepartmental Study Topics (3.0 cr.; A-F Grade Basis) Selected interdepartmental topics not covered in regular courses. Directed study (1.0-4.0 cr.; Student Option; prereq #, %) Guided individual reading or study.

ID 3950 Interdisciplinary Archaeological Studies (INAR) College of Liberal Arts

INAR 5100 Topics in Interdisciplinary Archaeological Studies (3.0 cr.; A-F or Audit; prereq INAR grad major or #) Topics specified in the Class Schedule.

IDES 1170 Topics in Interior Design (1.0-4.0 cr.; A-F or Audit) In-depth investigation of specific topic, announced in advance.

IDES 1601 Interior Design Studio I (4.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F Grade Basis; 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. Problemsolving.

IDES 2196 Work Experience in Interior Design (1.0-4.0 cr.; S-N Grading Basis; 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 (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; prereq [2603 or DHA 2603], 2613, 2621) 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 2612 Interior Materials and Specifications (4.0 cr.; A-F or Audit; prereq [Pass portfolio review, interior design major] or #) Environmental issues, from global to interior spaces. Effect of building codes/legislation, social awareness. Functional/aesthetic relation of materials/resources to interior design.

IDES 2613 Interior Structures, Systems, and Life Safety (4.0 cr.; A-F Grade Basis; prereq Interior design major) Codes, standards, regulations, and guidelines that govern design of interior space and support life safety. Integration of building systems. Structures for non-residential/residential occupancy. Building/energy codes. Lectures, guest speakers, field trips.

IDES 2621 Computer Aided Design: Interior Design (4.0 cr.; A-F Grade Basis; 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 2622 Computer Applications (2.0 cr.; A-F Grade Basis; prereq Interior design major) Computer-aided design, its role in interior design. Use of software applications for construction drawings, two-/three-dimensional
representation. Modeling for interior design problem-solving/presentation.

**IDES 3161 History of Interiors and Furnishings: Ancient to 1750** (4.0 cr.; A-F or Audit)

Study of European and American interiors and furnishings, including furniture, textiles, and decorative objects.

**IDES 3162 History of Interiors and Furnishings: 1750 to Present** (4.0 cr.; A-F or Audit)

European/American interiors/furnishings, including furniture, textiles, and decorative objects.

**IDES 3170 Topics in Interior Design** (1.0-4.0 cr.; A-F or Audit)

In-depth investigation of specific topic.

**IDES 3196 Field Study: National or International** (1.0-4.0 cr.; A-F or Audit; prereq #)

Faculty-directed field study in national or international setting.

**IDES 3605 Interior Design Studio V** (4.0 cr.; A-F Grade Basis; prereq [2604 or DHA 2604, DHA 2613] 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** (4.0 cr.; A-F Grade Basis; prereq [2604 or DHA 2604], 2612)

Interior design problems dealing with medium-scale spaces. Focuses on medium office design.

**IDES 3612 Lighting Design** (3.0 cr.; A-F Grade Basis; prereq Interior design major or #)


**IDES 3614 Interior Design Ethics and Professional Practice** (4.0 cr.; A-F Grade Basis; prereq 2604 or DHA 2604)

Business of interior design, professional ethics, and responsible design. Ethical theory/conduct. Responsibility to business, clients, colleagues, and community at large and globally.

**IDES 3622 Computer Applications II** (2.0 cr.; A-F Grade Basis; prereq 2621)

Advanced concepts/terms in computer modeling. Computer graphics, three-dimensional modeling, rendering, and animation to provide representation strategies for interior design problem-solving/presentation. Applications such as Autodesk Revit, AutoCAD, and Autodesk 3ds Max Design.

**IDES 4160 Honors Capstone Project** (2.0 cr.; A-F Grade Basis; prereq Interior design honors)

Individualizes honors experience by connecting aspects of major program with special academic interests.

**IDES 4193 Directed Study in Interior Design** (1.0-4.0 cr.; A-F or Audit; prereq Undergrad, #)

Independent study in interior design under tutorial guidance.

**IDES 4196 Internship in Interior Design** (1.0 cr.; S-N or Audit; prereq 3606, #)

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** (4.0 cr.; A-F Grade Basis; prereq [3605, 3606] or [DHA 3605, 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** (4.0 cr.; A-F Grade Basis; 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** (3.0 cr.; A-F Grade Basis; prereq 3605 or DHA 3605)

Research methods for programming interior design solutions. Developing comprehensive program. Issues that affect interior design research/practices.

**IDES 4616 Sustainable Commercial Interior Design** (3.0 cr.; A-F Grade Basis; prereq 2613 or DHA 2613 or Architecture major or #)

Intent, requirements, submittals, technologies/strategies to achieve LEED CI standards in existing, new construction, or tenant improvement projects.

**IDES 5170 Topics in Interior Design** (1.0-4.0 cr.; A-F or Audit; prereq Jr or sr or grad student)

In-depth investigation of specific topic, announced in advance.

**IDES 5193 Directed Study in Interior Design** (1.0-4.0 cr.; A-F or Audit; prereq Jr or sr or grad student)

Independent study in interior design under tutorial guidance.

**IDES 5196 Field Study: National/International** (1.0-10.0 cr.; A-F or Audit; prereq #)

Faculty-directed field study in national or international setting.

**International Business (IBUS)**

Curtis L. Carlson School of Management

**IBUS 3002 Managerial Accounting in Argentina** (4.0 cr.; A-F Grade Basis; prereq Carlson School International Programs consent)

Managerial accounting study abroad.

**IBUS 3003 Information Systems for Business Processes and Management: An International Perspective** (4.0 cr.; A-F Grade Basis; prereq Carlson School International Programs consent)

Study abroad.

**IBUS 3010 Introduction to Global Entrepreneurship in China** (4.0 cr.; A-F Grade Basis; prereq Carlson School International Programs consent)

Terms, concepts, skills for analyzing fundamental business practices in global economy.

**IBUS 3021 Human Resources Management in Australia** (4.0 cr.; A-F Grade Basis; prereq ECON 1101, ECON 1102, PSY 1001)


**IBUS 3033W Business Communication in India** (4.0 cr.; A-F Grade Basis)

Education abroad course. Similar to MGMT 3033W with additional international experience end of semester.

**IBUS 3080 Sustainability and Corporate Social Responsibility in Costa Rica** (4.0 cr.; A-F Grade Basis)

Partnership with Caribou Coffee. Coffee value chain of Caribou Coffee, from coffee bean origins through coffee served at Caribou Coffee and stakeholders throughout. Students write report delivered to Caribou's top management team and employees.

**IBUS 3200 The Carlson Freshman Semester Abroad in Spain** (0.0-18.0 cr.; S-N or Audit; prereq Carlson first yr student, Carlson International Programs consent)

Studies student business and language courses abroad during their freshman year at Carlson.

**IBUS 3300 The Carlson Freshman Semester Abroad in China** (0.0-16.0 cr.; S-N or Audit; prereq Carlson School first yr student, Carlson International Programs consent)

Studies student business and language courses abroad during their freshman year at Carlson.

**IBUS 3400 International Programs Elective** (1.0-4.0 cr.; S-N Grading Basis)

Elective course for education abroad.

**IBUS 3700 London School of Economics Summer Program** (3.0-6.0 cr.; S-N Grading Basis)

Summer study abroad at London School of Economics. Students select one or two sessions based on their academic needs/interests.

**IBUS 4010 Management of Technology in the Middle East** (3.0 cr.; A-F Grade Basis; prereq Undergrad, consent of Carlson School International Programs)

Undergraduate study abroad in Israel.

**IBUS 4050 Management of Innovation and Change** (4.0 cr.; A-F Grade Basis; prereq [MGMT 3001 or MGMT 3010], CSON upper div. #)

Applying theories/research on how new organizational programs, products, and technologies are developed/implemented. Diagnostic skills. How innovation unfolds.

**IBUS 4080 Life Sciences in South Africa--An International Business Perspective** (4.0 cr.; A-F or Audit; prereq Carlson School International Programs consent)

International business environment of South Africa.

**IBUS 4082W Brand Management** (4.0 cr.; A-F Grade Basis; prereq MKTG 3001, MKTG 3010, MKTG 3040)


**IBUS 4090 Corporate Strategy in Emerging Europe** (4.0 cr.; A-F Grade Basis; prereq Carlson Global Institute 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.

IBUS 4641 International Finance and Risk Management (4.0 cr.; A-F or Audit; prereq FINA 3001) Foreign exchange markets, international financial systems, foreign exchange rate determination, measuring/managing currency risk, multinational capital budgeting, cost of capital in emerging economies.

IBUS 5100 Undergraduate Semester: CIMBA (Consortium of Universities for International Studies) (0.0-18.0 cr.; A-F Grade Basis; prereq 60 cr, Carlson School International Programs consent) Semester study at one of Carlson School's international exchange partner universities. Students select courses based on the academic needs/interests. For current offerings contact Carlson International Programs.

IBUS 5101 Copenhagen Summer Program in International Business (Undergraduate) (7.5 cr.; S-N or Audit; prereq 60 cr completed by time of study abroad, Carlson School International Programs consent) Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interests. For current offerings contact Carlson International Programs.

IBUS 5102 Vienna Summer Program in International Business (Undergraduate) (4.0 cr.; S-N Grading Basis; prereq Consent of Carlson School International Programs) Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interests. For current offerings contact Carlson International Programs.

IBUS 5103 Norway Summer Program in International Business (Undergraduate) (5.0 cr.; S-N Grading Basis; prereq Consent of Carlson School International Programs) Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interests.

IBUS 5110 Business and the Environment in Costa Rica (4.0 cr.; A-F Grade Basis; prereq Sr or grad student, consent of Int'l Programs) How businesses maintain/increase profits by taking care of environment. Sustainable development, environmental strategy. Travel to Costa Rica to join students from INCAE (partner school) for series of courses. Case studies, site visits, field trips. Taught in English.

IBUS 5120 Vienna Seminar: International Business (Graduate) (4.0 cr.; A-F Grade Basis; prereq Carlson grad student, consent of Carlson International Programs) Rapidly changing business environment of Central/Eastern Europe. Students work in teams with students from WU-Vienna University of Economics and Business for two weeks in May/June in Central/Eastern Europe.

IBUS 5130 France Seminar: Doing Business in the European Union (Graduate) (4.0 cr.; S-N Grading Basis; prereq Carlson grad student, Carlson School International Programs consent) Two-week study abroad program at Universite Jean-Moulin Lyon 3 in Lyon, France. Includes courses taught by international faculty, site visits, cultural excursions.

IBUS 5140 Vienna Summer Program: International Business (Graduate) (0.0-15.0 cr.; S-N Grading Basis; prereq Carlson grad student, consent of Carlson School International Programs) Summer study abroad program at Europe's largest business school (WU-Vienna). Students take three business classes, plus German language. Program participants from Europe, Asia, Latin America, and the United States.

IBUS 5150 India Seminar: Managing in a Global Environment (4.0 cr.; A-F Grade Basis; prereq Carlson School International Programs) View of sourcing and delivery of knowledge-intensive tasks. Site visits, meetings with business executives and governmental agencies. Two weeks in India over January break, preceded by Friday evening classes in fall term B (November, early December).

IBUS 5160 Cologne Summer Program: European Management (Grad) (8.0 cr.; S-N Grading Basis; prereq Carlson School grad student, Carlson School International Programs consent) Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interest.

IBUS 5170 China Seminar: An International Business Challenge (Graduate-1) (4.0 cr.; A-F Grade Basis; prereq Carlson grad student, consent of Carlson School International Programs) Collaboration with corporate partner and business school in China. Students work in multi-cultural teams to analyze real-life business problems that corporations face in China, and examine cultural, social, and economic differences surrounding global business.

IBUS 5171 China Seminar: Understanding Supply Chain Resiliency (4.0 cr.; A-F Grade Basis; prereq Grad student, consent of Carlson School International Programs) Collaboration with corporate partner and business school in China. Students work in multicultural teams to analyze real-life business problems that corporates face in China.

IBUS 5172 IBUS 5172: Global Business Practicum Brazil (4.0 cr.; A-F Grade Basis) Study abroad course. Short-term global enrichment program traveling to Brazil in May.

IBUS 5180 Economics in Transition: A Study of Central and Eastern Europe (4.0 cr.; S-N Grading Basis; prereq %) Seminar. Students participate in field study with executive MBA students. Run by executive MBA program at Wirtschaftsuniversiteit, Vienna, Austria. Insights into Central/Eastern European economies of Bucharest, Romania, and St. Petersburg, Russia, which are in the process of transitioning from central planning to market system.

IBUS 5190 Brazil Seminar: Doing Business in Brazil (4.0 cr.; A-F Grade Basis; prereq Carlson grad student, Carlson School International Programs consent) Two-week study abroad at Escola de Administração de Empresas da Sao Paulo da Fundacao Getulio Vargas (FGV). Full class days, cultural tours, field trips, site visits.

IBUS 5200 International Business: Undergraduate Exchange (0.0-16.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5201 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5202 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5203 International Business: Undergraduate Exchange (0.5-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5204 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5205 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr completed, Carlson International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5206 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5207 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5208 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5209 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5210 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5211 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5212 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5213 International Business: Undergraduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq 60 cr, Carlson School International Programs consent) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.
IBUS 5209 International Business: Graduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5300 International Business: Graduate Exchange (0.0-16.0 cr.; S-N or Au; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interests. For current offerings, contact Carlson School International Programs.

IBUS 5301 Copenhagen Summer Program in International Business (Graduate) (4.0-8.0 cr.; S-N Grading Basis; prereq Carlson School grad student, consent of Carlson School International Programs) Summer study abroad at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interests.

IBUS 5302 International Business: Graduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5303 International Business: Graduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on their academic needs/interests.

IBUS 5304 International Business: Graduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5305 International Business: Graduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5306 International Business: Graduate Exchange (1.0-6.0 cr.; S-N or Audit; prereq Carlson School grad student, consent of Carlson School International Programs) Study at one of Carlson School's international exchange partner universities. Students select courses based on academic needs/interests.

IBUS 5998 Directed Studies in International Business (1.0-32.0 cr.; Student Option) Study at one of Carlson School's International Programs.

**Course Descriptions**

**ITAL 100 Reading Italian in the Arts and Sciences (0.0 cr.; S-N Grading Basis)** 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 (5.0 cr.; Student Option)** Emphasis on the four language skills (listening, speaking, writing, and reading) and on Italian culture.

**ITAL 1002 Beginning Italian (5.0 cr.; Student Option; prereq 1001 or #)** Listening, speaking, writing, reading. Italian culture.

**ITAL 1003 Intermediate Italian (5.0 cr.; Student Option; prereq 1001-1002)** Grammar review and development of intermediate level of proficiency in listening, reading, writing and speaking. Emphasis on some cultural aspects of contemporary Italy.

**ITAL 1004 Intermediate Italian (5.0 cr.; Student Option; 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 (5.0 cr.; Student Option; prereq Italian [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 1737 Friends and Countrymen (3.0 cr.; Student Option)** Study of the problematic relation between friendship and citizenship as formulated by Dante in the "Inferno" and as we may interpret it in analyzing today's civic issues. Attention to Dante's reliance on and implicit critique of Aristotle's "Nicomachean Ethics." Taught in English.

**ITAL 1837 Imagining Italy: Italian and Italian-American Culture, History, and Society through Film (4.0 cr.; Student Option)** Weekly guest lectures and critical readings expand from different disciplinary perspectives upon issues raised by films. Urban life, religion, nationalism, opera, violence, leisure, food, fascism, terrorism, family, emigration/immigration, ethnicity, Mediterranean culture.

**ITAL 1904 Freshman Seminar (3.0 cr.; A-F or Audit; prereq 1004)** Intensive reading, writing, speaking practice. Study of cultural materials in authentic formats.

**ITAL 3201 Reading Italian Texts: Poetics, Rhetoric, Theory (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3015)** Examines literary representations of travel, migration, immigration, exile, and tourism in Italy from the Enlightenment to the present.

**ITAL 3209 Literature of Medieval City-States (4.0 cr.; Student Option; prereq 3015)** The beginnings of Italian vernacular literature in the context of the city-states of the 11th to 14th centuries.

**ITAL 3219 Literature of the Despotisms (4.0 cr.; Student Option; prereq 3015)** Prose, verse, and drama of Italy under the Signorie and foreign invaders, 1400-1650.

**ITAL 3301 Italian Dialects and Their Literature (4.0 cr.; Student Option; prereq 3015)** Study of selected Italian dialects and dialect texts in their cultural and historical settings.

**ITAL 3305 Staging the Self: Theater and Drama in Modern Italy (4.0 cr.; Student Option; 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 3459W Senior Project (1.0 cr.; Student Option)** Research/writing on issue/theme in Italian studies. Projects range from scholarly paper to artistic/creative writing or musical composition, photography, poetry, or fiction. Research/analytical component.

**ITAL 3501 The World in the City: Italy 1100-1660 (3.0 cr.; Student Option; prereq 3015)** The culture and civilization of Italian cities in medieval and early modern periods.

**ITAL 3502 Making of Modern Italy: From the Enlightenment to the Present. (3.0 cr.; Student Option; prereq 3015)** Italian literary, cultural, and symbolic practices from the Enlightenment to the present.

**ITAL 3550 Topics in 19th Century Italy (3.0 cr.; Student Option; prereq 3015 or #)**
ITAL 3637 From Ancient Rome to Renaissance Florence: Siena on the “French Road” (3.0 cr.; A-F Grade Basis)
Roman antiquity, Middle Ages, Renaissance. Economic/commercial history. Role of Italian trade with East/France. Italian culture from time of Caesars through medieval city-states/standard-setting culture of Italian Renaissance.

ITAL 3640 Topics in Italian Studies (3.0 cr.; Student Option; prereq 3015 or #)
Topics of interest in studies of Italian or Italian American culture of 20th century. Literary, critical, cultural, historical, or social issues, a specific author, a genre, or other topic. Content varies by instructor, see Course Guide.

ITAL 3806 Negotiating the Terms: Italian Film and Literature (3.0 cr.; Student Option)
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 3837 Imagining Italy: Italian and Italian-American Culture, History, and Society Through Film (4.0 cr.; Student Option)

ITAL 4001 Beginning Italian (2.0 cr.; Student Option; prereq Grad student or #) Meets concurrently with 1001. See 1001 for course description.

ITAL 4002 Beginning Italian (2.0 cr.; Student Option; prereq Grad student or #) Meets concurrently with 1002. See 1002 for course description.

ITAL 4003 Intermediate Italian (2.0 cr.; Student Option; prereq Grad student or #) Meets concurrently with 1003. See 1003 for course description.

ITAL 4004 Intermediate Italian (2.0 cr.; Student Option; prereq Grad student or #) Meets concurrently with 1004. See 1004 for course description.

ITAL 4363 Drama and Spectacle in Italy, 1200-1770 (4.0 cr.; Student Option; prereq 3015) Italian drama, festival and spectacle from the medieval sacred plays to the reform of the theater by Goldoni.

ITAL 4307 Novellistica (3.0 cr.; Student Option; prereq 3201, or permission of director of undergrad studies)
Study of birth and development of the novella genre. Reading and discussion of stories form the Novellino, Boccaccio, Sacchetti, Bandello, Bigolini, Basile, Verga, Deledda, Calvino, Introduction to formal study of novella structure.

ITAL 4970 Directed Readings (1.0-4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq grad student or #) Rhetorical/poetic aspects of language and literature. Interpretive methods, theoretical concepts.

ITAL 5203 Italian Travelers: From the Enlightenment to the Present (3.0 cr.; Student Option; prereq grad student or #) Literary representations of travel, migration, immigration, exile, and tourism in Italy, from Enlightenment to present.

ITAL 5209 Trecento Literature: Ruling the Canon (4.0 cr.; Student Option; 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 5289 The Narrow Door: Women Writers and Feminist Practices in Italian Literature and Culture (4.0 cr.; Student Option; prereq 3015)
Focuses on issues of gender, sexual difference, equality, and emancipation raised by Italian women writers and thinkers from the 19th century to the present.

ITAL 5305 Staging the Self: Theater and Drama in Modern Italy (4.0 cr.; Student Option; prereq grad student or #) Theatrical representations of the self in modern Italy. Focuses on issues of identity, genre, and class in theatrical works ranging from Alfieri’s Mirra, Pirandello’s Enrico IV to Dacia Maraini’s Clytemnestra.

ITAL 5321 Italian Renaissance Epic (4.0 cr.; Student Option; prereq 3015, 3201 or #) Study of the narrative poems of Boiardo, Ariosto, and Tasso in the context of the fashioning of early modern Europe.

ITAL 5337 Nation and Narration: Writings in the 19th Century (4.0 cr.; Student Option; 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, Gioia, Verga, Serao, and Deledda studied in the context of a range of sociopolitical and cultural issues.

ITAL 5401 Mondo di Dante (4.0 cr.; Student Option; prereq 3015, 3201 or #) Intensive reading of Dante’s Inferno, Purgatorio, and Vita Nuova with emphasis on Dante’s linguistic and cultural contributions.

ITAL 5550 Topics in 19th Century Italy (3.0 cr.; Student Option; prereq Ital 3015 or #) Explores the literature and culture of Italy in the 19th century. Content will vary depending on the instructor. Topics and readings may include literary, critical, cultural, historical, and/or social issues, a specific author, a genre, or other topics of interest for the period. Specific content will be posted in the department and listed in the Course Guide.

ITAL 5609 World of Dante (4.0 cr.; Student Option) Taught in English. Intensive reading of Dante’s Inferno, Purgatorio, and Vita Nuova with emphasis on the personal, poetic, and political stakes of the journey of Dante’s pilgrim through hell to the earthly paradise.

ITAL 5640 Topics in Italian Studies (3.0 cr.; Student Option; prereq Ital 3015) Topics of interest in studies of Italian and/or Italian American culture of the 20th century. Topics and readings may include literary, critical, cultural, historical, and/or social issues, a specific author, a genre, or other topics. Content varies by instructor. Specific content posted in the department and in the Course Guide.

ITAL 5806 Negotiating the Terms: Italian Film and Literature (3.0 cr.; Student Option; 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.

JPN 1011 Beginning Japanese (6.0 cr.; Student Option) An introduction to speaking, reading, and writing Japanese.

JPN 1012 Beginning Japanese (6.0 cr.; Student Option; prereq 1011) Introduction to speaking, reading, and writing Japanese.

JPN 3021 Intermediate Japanese (5.0 cr.; Student Option; prereq 1012 or #) Intermediate speaking, reading, and writing in Japanese.

JPN 3022 Intermediate Japanese (5.0 cr.; Student Option; prereq 3021 or #) Intermediate-level instruction in speaking, reading, and writing in Japanese.

JPN 3031 Third-Year Japanese (4.0 cr.; Student Option; prereq 3022 or #) Advanced intermediate-level instruction in speaking, reading, and writing Japanese. Development of reading proficiency in modern Japanese prose.

JPN 3032 Third Year Japanese (4.0 cr.; Student Option; prereq 3031 or #) Advanced intermediate-level instruction in speaking, reading, and writing Japanese. Development of reading proficiency in modern Japanese prose.

JPN 3090H Honors Course: Tutorial (1.0-4.0 cr.; Student Option) Tutorial.

JPN 3290 Japanese Language Teaching Tutorial (1.0 cr.; S-N Grading Basis; prereq Grade of A in 4042) Students tutor beginning students of Japanese and are part of department’s Japanese language team.

JPN 4001 Beginning Japanese (3.0 cr.; Student Option; prereq Grad student) Speaking, reading, and writing Japanese. Meets with 1011.

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
JPN 4002 Beginning Japanese (3.0 cr.; Student Option; prereq 4001, grad student) Speaking, reading, and writing Japanese. Meets with 1012.


JPN 4004 Intermediate Japanese (3.0 cr.; Student Option; prereq 4003, grad student) Speaking, reading, and writing in Japanese. Meets with 3022.


JPN 4041 Advanced Japanese Conversation and Composition (4.0 cr.; Student Option; prereq 3032 or #) Practice in advanced spoken and written Japanese. Typical assignments include essays, summaries, and formal interviews in Japanese.

JPN 4042 Advanced Japanese Conversation and Composition (4.0 cr.; Student Option; prereq 4041 or #) Practice in advanced spoken and written Japanese. Typical assignments include essays, summaries, and formal interviews in Japanese.

JPN 5040 Readings in Japanese Texts (3.0 cr.; A-F or Audit; prereq 4042 or equiv or #) Students read authentic materials of various types to increase reading/listening ability. Topics specified in Class Schedule.

JPN 5071 Communicative Competence for Japan-Oriented Careers (4.0 cr.; Student Option; 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.

JPN 5993 Directed Studies in Japanese (1.0-15.0 cr.; Student Option; prereq #, %, @) Individual study with guidance of a faculty member.

JWST 1034 Introduction to Jewish History and Civilization (3.0 cr.; Student Option) 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 1701 Beginning Yiddish I (3.0 cr.; Student Option) Introduction to Yiddish.

JWST 1702 Beginning Yiddish II (3.0 cr.; Student Option) First year, second semester introduction to Yiddish.

JWST 1905 Freshman Seminar (3.0 cr.; Student Option) Topics specified in Class Schedule.

JWST 1909W Remembering to Forget: The Holocaust and Its Afterlife (3.0 cr.; A-F or Audit; 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 theory. Emphasizes both urge to study Holocaust as singular event and drawbacks of hyper-memory bordering on amnesia.

JWST 3034 Introduction to Jewish History and Civilization (3.0 cr.; Student Option) 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 3111 Too Jewish? The Complex Jewish Historical and Cultural Identity (3.0 cr.; Student Option) Jewish American history, society, and culture. 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 3115 Midrash: Jewish Biblical Interpretation (3.0 cr.; Student Option) 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 3117 African American and Jewish American Relations in the United States (3.0 cr.; Student Option) 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 3119 Midrash: Jewish Biblical Interpretation (3.0 cr.; Student Option) 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.

JWST 3201 The Bible: Context and Interpretation (3.0 cr.; Student Option) Introduction to the modern academic study of the Old Testament/Hebrew Bible in the historical context of literature from ancient Mesopotamia. Read Babylonian Epic of Creation, Epic of Gilgamesh, Hammurabi, Genesis, Exodus, Psalms. Stories of creation, law, epic conflict, and conquest.


JWST 3204 Dead Sea Scrolls (3.0 cr.; Student Option) 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 3401 The Art and Architecture of the Jewish People (3.0 cr.; Student Option) Jewish art and architecture from antiquity to 7th-century C.E. Issues include Jewish art and the Second Commandment, non-Jewish artistic traditions, the nature of Jewish art.

JWST 3502 Ancient Israel: From Conquest to Exile (3.0 cr.; Student Option; prereq Knowledge of Hebrew not required, 3501 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.

JWST 3511 Muslims and Jews: Conflict and Coexistence in the Middle East and North Africa Since 1700 (3.0 cr.; Student Option) Diversity of social/cultural interactions between Muslims and Jews and between Islam and Judaism since 1700. What enabled the two religious communities to peacefully coexist? What were causes of conflict? Why is history of Muslim-Jewish relations such a contested issue?


JWST 3522 History of the Arab-Israeli Conflict (3.0 cr.; Student Option) 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 3601 Fleeing Hitler: German and Austrian Filmmakers Between Europe and Hollywood (3.0 cr.; Student Option) German/American films by famous directors who left Europe in Nazi period. Analysis of films...
by Fritz Lang, Max Ophuls, Robert Siodmak, Otto Preminger, Billy Wilder, Douglas Sirk, and others. Films as art works and as cultural products of particular social, political, and historical moments.

JWST 3606 "Christians, Muslims, and Jews in the Middle Ages" (3.0 cr.; Student Option)

Modern Christian expansion, jihad/crusade, anti-Jewish violence/persecution. Trade, intellectual exchange, religious dialogue.

JWST 3631 "Jewish Writers and Rebels in Germany, Austrian, and American Culture" (3.0 cr.; Student Option)

Investigate literary and 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.

JWST 3632W "Jewish Women in the United States" (3.0 cr.; Student Option)

Analyze 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" (4.0 cr.; Student Option; prereq Beginning Yiddish or equiv of one year of Yiddish study or #)

Continuing studies in Yiddish.

JWST 3712 "Intermediate Yiddish II" (4.0 cr.; Student Option; prereq 3711 or #)

Continuing studies in Yiddish.

JWST 3721 "Advanced Yiddish I" (4.0 cr.; Student Option; prereq Intermediate Yiddish or equiv of two years of Yiddish study or #)

Continuing studies in Yiddish.

JWST 3722 "Advanced Yiddish II" (4.0 cr.; Student Option; prereq 3721 or #)

Continuing studies in Yiddish.

JWST 3775 "History of Jews in Europe and the Atlantic World, from 1700 to Present" (3.0 cr.; Student Option)

Analyze 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 3778 "Jews of the Islamic Mediterranean and Christian Europe, 7th-17th Centuries" (3.0 cr.; Student Option)

Analyze 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 3970 "Supplemental Discussion in Jewish Studies" (1.0 cr.; Student Option; prereq Concurrent registration)

Extra discussion section with T.A. Attached to concurrent 3xxx course.

JWST 4000W "Final Project, Writing Intensive" (4.0 cr.; A-F or Audit; prereq JWSt major, permission of dir of undergrad studies)

Independent research/writing under supervision of a faculty sponsor. A student may approach any JWSt faculty member to develop a program of independent research/writing in an area of student interest. Independent research and writing, under supervision of a faculty sponsor. Student makes a contract with instructor to write an in-depth research paper, or comparable project, to be completed in conjunction with a JWSt 5xxx course.

JWST 4711 "Intermediate Yiddish I" (3.0 cr.; Student Option; prereq Beginning Yiddish or equiv of one year of Yiddish study or [grad student, #])

Continuing studies in Yiddish.

JWST 4712 "Intermediate Yiddish II" (3.0 cr.; Student Option; prereq 4711 or [#])

Continuing studies in Yiddish.

JWST 4721 "Advanced Yiddish I" (3.0 cr.; Student Option; prereq Intermediate Yiddish or equiv of two years of Yiddish study or [grad student, #])

Continuing studies in Yiddish.

JWST 4722 "Advanced Yiddish II" (3.0 cr.; Student Option; prereq 4721 or [grad student, #])

Continuing studies in Yiddish.

JWST 5111 "Problems in Historiography and Representation of the Holocaust" (3.0 cr.; Student Option; prereq JWST 3521 or RelS 3521 or #)

Focuses on issues connected with the Holocaust. Inclusiveness of other groups, Holocaust vs. Shoah, historiographical conflicts about perpetrators, an examination of the problems of representation in literature and art, problems of narrative theology after Auschwitz.

JWST 5115 "Midrash: Jewish Biblical Interpretation" (3.0 cr.; Student Option)

Jewish law studies as mirror of society and as way to actualize its value. Original socioreligious contexts, current applications. Biblical interpretations addressing moral, theological, legal, and literary problems.

JWST 5204 "Dead Sea Scrolls" (3.0 cr.; Student Option)

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 5900 "Topics in Jewish Studies" (3.0-4.0 cr.; Student Option)

Topics specified in Class Schedule.

JWST 5992 "Directed Readings" (1.0-12.0 cr.; Student Option; prereq #)

Guided individual reading or study.

**Journalism and Mass Communication (JOUR)**

**College of Liberal Arts**

**JOUR 1001 Introduction to Mass Communication** (3.0 cr.; A-F or Audit; prereq Pre-jour or non-jour major)


**JOUR 1001H Honors: Introduction to Mass Communication** (3.0 cr.; A-F or Audit; prereq Honors, [pre-jour or non-jour major])


**JOUR 1905 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)

Topics specified in Class Schedule.

**JOUR 1910W Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)

Topics specified in Class Schedule.

**JOUR 3004V Honors: Information for Mass Communication** (3.0 cr.; A-F Grade Basis; 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** (3.0 cr.; A-F Grade Basis; prereq Jour major or jour minor or approved IDIM major or ICP major or BIS major; prereqs do not apply to IDL 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** (3.0 cr.; A-F or Audit; 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** (3.0 cr.; A-F or Audit; 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** (3.0 cr.; A-F or Audit; prereq Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])

Media in socioeconomic-political-technological context of a specific historical period. Focuses on legal context and ethics questions.

**JOUR 3101 News Reporting and Writing** (3.0 cr.; A-F Grade Basis; prereq [3004W or...}
JOUR 3201 Principles of Strategic Communication (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V or 3004W], |jour major or approved IDIM major or ICP major or BIS major|)

JOUR 3251 Evaluative Research in Strategic Communication (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], [3201 or 3202], |jour major or approved BIS/IDIM/ICP major|)
Applied quantitative research methods in advertising/public relations campaign development, management, and evaluation. Focus on scientific primary research methods.

JOUR 3253 Account Planning (3.0 cr.; A-F Grade Basis; prereq [JOUR 304W or JOUR 304V], [JOUR 3201 or JOUR 3202], |jour major or approved BIS/IDIM/ICP major|)
Role of account planning in integrated strategic communications development. Students master skills needed to become an account planner/apply skills in various situations/settings.

JOUR 3614 History of the Document (3.0 cr.; A-F or Audit; 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 Editing for Print and Digital Audiences (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V, 3011 or 3011H], |jour major or approved IDIM major or ICP major or BIS major|)
Improving copy through copy editing/rewriting. Selecting/editing news-content editorial for newspapers, magazines, and online services. Experience using news judgment to present information in print and on the web.

JOUR 3727W Professional Writing for Strategic Communication (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V, 3201 or 3202, 3241 or 3279W or concurrent], |jour major or approved IDIM major or ICP major or BIS major|)
Skills course focused on digital media, including integrating variety of social networking platforms with conventional strategic communication activities.

JOUR 3734 People of Color and the Mass Media (3.0 cr.; A-F or Audit; 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 3745 History of Media Communication (3.0 cr.; A-F or Audit; prereq Non-jour major or |jour major, course appr on prog plan| or |pre-jour, adviser approval|)

JOUR 3746 Electronic News Writing and Reporting (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], [3011 or 3011H or 3279W], |jour major or approved IDIM major or ICP major or BIS major|)
Newswriting, reporting, video photography/editing, on-air delivery.

JOUR 3751 Economics of New Media (3.0 cr.; A-F or Audit; 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 3752 Internet and Global Society (3.0 cr.; A-F or Audit; 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 3820 Advertising Strategy and Creative Development (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], 3201, |jour major or approved IDIM major or ICP major or BIS major|)
Basic principles of graphic design. Students develop their own aesthetic sense/graphic design skills through the study/creation of effective communication tools. Tutorial guides. Develop software technology skills necessary to complete assignments.

JOUR 3840 Advanced Reporting (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], [3011 or 3011H or 3279W], |jour major or approved IDIM major or ICP major or BIS major|)

JOUR 3841 Mass Media Ethics: Moral Reasoning and Case Studies (3.0 cr.; A-F or Audit; 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 3775 Administrative Law and Regulation for Strategic Communication (3.0 cr.; A-F Grade Basis; prereq Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])

Mass communication law/regulation for professional strategic communicators. Court decisions/regulations affecting legal rights/privileges relevant to advertising, public relations, new media professions.

JOUR 3776 Mass Communication Law (3.0 cr.; A-F or Audit; prereq Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])

Brief historical background, First Amendment rights, basic law of defamation, free press/fair trial, access to news, access to press, privacy, contempt, obscenity, regulation of broadcasting/advertising.

JOUR 3776H Mass Communication Law (3.0 cr.; A-F or Audit; prereq Honors, [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 Media and Politics (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)

Analysis of role of mass media in politics. Emphasizes television and electoral campaigns, News coverage vs. newsmaking. Free press in democracy.

JOUR 3990 Special Topics in Mass Communication: Professional (3.0 cr.; A-F or Audit; prereq [[3004V or 3004W], 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 (3.0 cr.; A-F or Audit; prereq Jour major or jour minor or approved IDIM major or ICP major or BIS major)

Context course not regularly offered. Topics specified in Class Schedule.

JOUR 3993 Directed Study (1.0-3.0 cr.; A-F or Audit; prereq [jour major or jour minor or approved IDIM major or ICP major or BIS major or #, %, @])

Directed study, projects.

JOUR 3996 Directed Internship (1.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq [[3004V or 3004W], 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/artists/journalists.

JOUR 4193 Walter H Brovold and John Cameron Sim Community Newspaper Practicum (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], [3101 or 3101H or 3201], [jour major or approved IDIM major or BIS major] or [pre-jour, adviser approval])

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 (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], 3201, 3241, [jour major or approved IDIM major or ICP major or BIS major])


JOUR 4259 Strategic Communication Case Analysis (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], 3201 or Jour 3202), one additional 32xx skills course, [jour major or approved IDIM major or ICP major or BIS major]

Strategic communication cases related to campaigns/issues in business, government, education, or community.

JOUR 4262 Management for Strategic Communication (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], 3201 or Jour 3202), one additional JOUR 32xx skills course, [jour major or approved IDIM major or ICP major or BIS major]

This is a senior level course that teaches the concepts and methods for effective management placing them in the context of organizations in the field of mass communication.

JOUR 4263 Strategic Communication Campaigns (3.0 cr.; A-F or Audit; prereq [4242 or 4259 or 4262 or &4262], [jour major or approved IDIM major or ICP major or BIS major])

Developing campaign strategy/tactics. Planning/decision-making skills. Students work in groups with varying specializations.

JOUR 4272 Interactive Advertising (3.0 cr.; A-F or Audit; prereq Jour major or mass comm minor or approved IDIM major or ICP major or BIS major)

Interactive advertising models. Issues related to creating, measuring, pricing, targeting interactive ads. Interactive ads in global, legal, ethical contexts.

JOUR 4274W Advertising in Society (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major, [course appr on prog plan] or [pre-jour, adviser approval])

Forms of regulation. Self-regulation/governmental. Critique of advertising's role in society. Current issues (e.g., stereotyping, political advertising, advertising to children).

JOUR 4302 Electronic Photojournalism (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq [[3004W or 3004V], 3451, [3121 or &3121]], [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 4451 Capstone: Advanced Electronic News Writing and Reporting (3.0 cr.; A-F or Audit; prereq [3004W or 3004V], [3101 or 3101H], 3451, [3121 or &3121], [jour major or approved IDIM major or ICP major or BIS major])

Researching, reporting, shooting, writing, editing TV news packages. Lecture, lab.

JOUR 4452 Capstone: Electronic Newscast Producing (3.0 cr.; A-F Grade Basis; prereq [3004W or 3004V], [3101 or 3101H], 3451, [3121 or &3121], [jour major or approved IDIM major or ICP major or BIS major])

Planning, writing, producing live TV newscasts. Lecture, lab.

JOUR 4551 New Media and Culture (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)

History, theories, social impact of digital/interactive media on culture. How new media - including the Internet, mobile devices, websites, applications, social media - may change ways people communicate/distribute/process information.

JOUR 4721 Mass Media and U.S. Society (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major with course appr on prog plan or pre-jour with adviser approval)


JOUR 4721H Mass Media and U.S. Society (3.0 cr.; A-F or Audit; prereq Honors, [jour major, course appr on prog plan] or [pre-jour, adviser approval])


JOUR 4733H Honors Thesis Seminar (3.0 cr.; A-F Grade Basis; prereq Jour major, [or or sr], honors)

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 (3.0 cr.; A-F or Audit; prereq Non-jour major or [jour major, course appr on prog plan] or [pre-jour, adviser approval])

JOUR 491 Special Topics in Mass Communication: Context (3.0 cr.; A-F or Audit; prereq Jour major or jour minor or advanced IDIM major or ICP major or BIS major; non-majors with permission number only) Special context topics not regularly offered. Topics specified in Class Schedule.

JOUR 4990H Honors: Special Topics in Mass Communication (3.0 cr.; A-F or Audit; 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 4991 Special Topics in Mass Communication (3.0 cr.; A-F or Audit; prereq Jour major or jour minor or approved IDIM major or ICP major or BIS major; non-majors with permission number only) Special context topics not regularly offered. Topics specified in Class Schedule.

JOUR 4993H Honors: Projects (3.0 cr.; A-F or Audit; prereq Jour major, honors div regis, @, %, #) Honors projects.

JOUR 5101 Health Writing (3.0 cr.; A-F or Audit; prereq [3004V or 3004V], [3101 or 3101H], 3121, [jour major or advanced 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 (3.0 cr.; A-F Grade Basis; [3004V or 3004V], [3101 or 3101H], 3121, [jour major or approved IDIM major or ICP major or BIS major] or grad student) Techniques/issues of special project stories. Explanatory, investigative, civic, and literary or ethnographic journalism. Topics (e.g., civil rights, governmental malfeasance, health care problems) typically involved in these stories.

JOUR 5155 Capstone: Database Reporting (3.0 cr.; A-F Grade Basis; [3004V 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 (3.0 cr.; A-F Grade Basis; prereq [[3004V or 3004V], [3101 or 3101H], [3155 or 3173W or 4321 or 4021]], [jour major or approved IDIM major or ICP major or BIS major] or grad student) Writing, editing, illustration, design, layout, and photocomposition of print or Web magazine. Emphasizes reporting, telling substantive stories. Students work in groups with varying specializations.

JOUR 5251 Psychology of Advertising (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major, course appr on prog plan) or [pre-jour, adviser approval] Psychological principles, research techniques, applications in advertising/selling. Consumer attitudes/behavior. Psychological mechanisms upon which effectiveness of advertisements/commercials depends.

JOUR 5501 Communication and Public Opinion (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; prereq Non-jour major or [jour major, course approval in program plan] or [pre-jour, adviser approval]) Intersection of mass media, public health, behavior. Role of theory in understanding intended/unintended campaign effect. Role of health journalism. Decisions that inform media-based interventions.

JOUR 5542 Theory-based Health Message Design (3.0 cr.; A-F or Audit; 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 or #) 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 (3.0 cr.; A-F or Audit; prereq [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 designs. Cross-sectional, experimental, and time-based designs. Foci on summative efforts.

JOUR 5552 Law of Internet Communications (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major with course appr on prog plan or [pre-jour with adviser approval]) Whether/how/which traditional media laws/regulations apply to the Internet. Developing law of communication on Internet, global/ethical issues.

JOUR 5601W History of Journalism (3.0 cr.; A-F or Audit; prereq Jour major or jour minor or approved IDIM major or ICP major or BIS major; IDL sections are open to non-majors; prerequisites do not apply to IDL sections) Development of American media, from beginnings in Europe to present day. Rise of film/radio/television/Internet. Relation of communications development to political, economic, social trends.

JOUR 5606W Literary Aspects of Journalism (3.0 cr.; A-F or Audit; prereq non-jour major or [jour major, course approval in program plan] or [pre-jour, adviser approval]) Literary aspects of journalism. American/British writers, past/present. Lectures, discussions, weekly papers, critiques.

JOUR 5615 History of the Documentary (3.0 cr.; A-F or Audit; 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/influence of visual media industries and of public-image making.

JOUR 5725 Management of Media Organizations (3.0 cr.; A-F or Audit; prereq Non-jour major or jour major with course appr on prog plan or prejour with adviser approval) Introduction to concepts/principles of media management. Strategic planning, leadership, organizational strategies, ethical/legal issues. Working in teams. Balance sheets, income statements. Motivating/promoting people.

JOUR 5777 Contemporary Problems in Freedom of Speech and Press (3.0 cr.; A-F or Audit; prereq Jour major or jour minor or approved IDIM major or ICP major or BIS major) Legal/constitutional derivation of freedom of speech/press. Emphasizes case law, statutes, judicial theories. Leading cases in privacy torts, prior restraints, news gathering/dissemination. Access to courts/government, including via the Internet. Legal-research techniques.

JOUR 5990 Special Topics in Mass Communication: Professional (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq Jour major or jour minor or approved IDIM major or ICP major or BIS major or grad student) Special context topics not regularly offered. Topics specified in Class Schedule.

KIN 1050 Beginning Military Physical Fitness Training (1.0 cr.; A-F or Audit) 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 sports activities. Students are organized into groups of similar fitness levels.

KIN 1375 Play Behavior (3.0 cr.; Student Option) 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 (3.0 cr.; A-F or Audit) Professional practice and disciplinary dimensions of kinesiology, recreation, and
sport. Subdisciplines, relevant issues, practical applications.
KIN 1902 Freshman Seminar: Cultural Diversity
(1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.
KIN 1904 Freshman Seminar: Global Perspectives
(3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.
KIN 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.
KIN 3001 Lifetime Health and Wellness
(3.0 cr.; A-F or Audit)
Overview of health/wellness. Physical, emotional, intellectual, spiritual, social, environmental, and financial health. Influence of societal changes on general health/wellness of diverse populations.
KIN 3027 Human Anatomy for Kinesiology Students
(3.0 cr.; A-F or Audit)
Introduction to human anatomy. Emphasizes musculoskeletal anatomy germane to athletic training, biomechanics, exercise physiology, motor learning/development.
KIN 3050 Advanced Military Physical Fitness Training
(1.0 cr.; A-F or Audit; prereq 4 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 3112 Introduction to Biomechanics
(4.0 cr.; A-F Grade Basis; prereq [PHYS 1101W or PHYS 1201W or PHYS 1301W or PHYS 1401V or PHYS 1412V or PHYS 1417V])
KIN 3113 First Responder for Coaches and Athletic Trainers
(3.0 cr.; A-F or Audit)
KIN 3114 Prevention and Care of Athletic Injuries
(3.0 cr.; A-F or Audit; prereq [PHYS 1101W or PHYS 1201W or PHYS 1301W or PHYS 1401V or PHYS 1412V or PHYS 1417V])
KIN 3126W Sport and Exercise Psychology
(3.0 cr.; A-F or Audit; prereq Kin major or #)
Thoughts, feelings, and behaviors of people in physical activity contexts. Foundations approach to theory/research in sport and exercise psychology.
KIN 3131W History and Philosophy of Sport
(3.0 cr.; A-F or Audit; prereq Kin major or #)
Introductory exposition 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
(3.0 cr.; A-F or Audit; 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
(3.0 cr.; A-F or Audit; 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
(3.0 cr.; A-F Grade Basis)
Experientially-based course. Using mental skills training strategies (e.g., imagery, goal setting, relaxation and retraining) to enhance sport performance and personal growth of athletes.
KIN 3143 Organization and Administration of Sport
(3.0 cr.; A-F or Audit; prereq Kin major or #)
How to organize/administer sports/activities. Practice/class organization, meet/game organization, facility/equipment needs, finances.
KIN 3168 Soccer Coaching Theory and Skill Development
(2.0 cr.; A-F Grade Basis; 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
(2.0 cr.; A-F Grade Basis; 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
(2.0 cr.; A-F Grade Basis; 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
(2.0 cr.; A-F Grade Basis; 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
(2.0 cr.; A-F Grade Basis; 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 3178 Tennis Coaching Theory and Skill Development
(2.0 cr.; A-F Grade Basis; 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
(2.0 cr.; A-F Grade Basis; 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 3327 Teaching Physical Education in the Elementary School
(2.0 cr.; A-F or Audit; 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
(4.0 cr.; A-F or Audit; prereq [KIN 3027 or ANAT 3001 or ANAT 3601 or ANAT 3611])
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
(3.0 cr.; Student Option)
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
(1.0-10.0 cr.; S-N Grading Basis; 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 3981 Research Methods in Kinesiology
(3.0 cr.; A-F or Audit; prereq Kin major or #)
How to understand/interpret/read research. Research question, study design, quantitative/qualitative methods. Instrumentation, statistical methods, study limitations/implications. Critiquing peer-reviewed articles. Designing a research study.
KIN 3993 Directed Study in Kinesiology
(1.0-10.0 cr.; A-F Grade Basis; 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
(1.0-10.0 cr.; A-F Grade Basis; prereq Kin honors, #)
Student-selected clinical or research experience.
KIN 4001H Honors Seminar in Kinesiology
(3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq [3112, 3132, 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 4134 The Aging Motor System (3.0 cr.; A-F Grade Basis; prereq [3132, 3135, Kin major] or #) Impact of aging on the motor system and its influence on activities of daily living (ADL); posture, falls, participation in physical activity, performance operating personal transportation systems. Effects of aging (behavioral and biological) on coordination/control and its related perceptual-cognitive correlates.

KIN 4136 Embodied Cognition (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; prereq [3385 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, convolutionary aids, exercise in environmental extremes, gender/heritability factors related to adaptation to training.

KIN 4441 Movement Neuroscience (3.0 cr.; A-F Grade Basis; prereq 3135 or #) Neural basis of human motor function. Neuroanatomy and neurophysiology of motor control and learning. Seminar for students in kinesiology, neuroscience, physical therapy, physiology, psychology, bioengineering, and human movement science.

KIN 4520 Current Topics in Kinesiology (1.0-4.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit; 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 designs work in applied field.

KIN 4841 Athletic Performance and Environmental Considerations (3.0 cr.; Student Option No Audit; 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 (3.0 cr.; Student Option No Audit; prereq 4981 or #) Introduction to varied contributions of sport sciences to athletic performance. Evaluation of historical contributions toward modern day research questions.

KIN 4981 Understanding Kinesiology Research (3.0 cr.; A-F Grade Basis; prereq Intro statistics recommended) Prepares students to critically analyze research specific to kinesiology.

KIN 5001 Foundations of Human Factors/ Ergonomics (3.0 cr.; A-F or Audit) 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 (3.0 cr.; A-F or Audit) 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 (3.0 cr.; A-F or Audit) 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; prereq 3126W or equiv or grad student or #) Theory/research in sport psychology. Human behavior in sport and physical activity settings.

KIN 5136 Psychology of Coaching (3.0 cr.; Student Option) Psychological dimensions of coaching across age levels, including coaching philosophy, leadership, communication skills, motivation, and mental skills training for performance enhancement.

KIN 5141 Nutrition for Health and Physical Performance (3.0 cr.; A-F or Audit; prereq FScN 1112 or equiv) Requirements and physiologic roles of nutrients and physical activity in promotion of health/performance. Assessment of energy requirements. RDAs, food composition/safety, weight management. Prevention of chronic diseases; emphasizes coronary heart disease.

KIN 5142 Applied Sport Nutrition for Athletic Performance (3.0 cr.; Student Option; prereq Grad student or #) Latest research related to nutrition and human performance. Tools to differentiate between trends and scientific research related to optimizing human performance.

KIN 5152 Curriculum Development in Physical Education (2.0 cr.; A-F or Audit; prereq initial licensure/MEd phys ed student) Trends, issues, and challenges in early childhood/K-12 physical education. Potential effect on curriculum.

KIN 5171 Foundations of Kinesiology (3.0 cr.; A-F or Audit; 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 (1.0-4.0 cr.; S-N or Audit; prereq 5103 or 5101 or 5102 or 5104 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 5201 Health Education Foundations (3.0 cr.; A-F Grade Basis)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

KIN 5202 Current Issues in Health (2.0 cr.; A-F Grade Basis)
Critical thinking for health issues in research/media. Issues specific to conflict, stress, public policy, and communication. Projects, debates.

KIN 5203 Health Media, Consumerism, and Communication (2.0 cr.; A-F Grade Basis)
Effects of media, consumerism, technology, and health related issues. Students form/defend opinions on positive/negative aspects of how health information is disseminated and how individual health decisions are made.

KIN 5204 Methods in Health Education (3.0 cr.; A-F Grade Basis; prereq Health licensure student or #)
Background knowledge/skills to deliver comprehensive health education program. Techniques, skills, and methods for teaching active learning projects. Lessons/units in health curriculum developed/demonstrated. Focuses on grades 5-12.

KIN 5205 Health Education Curriculum (3.0 cr.; A-F Grade Basis; prereq Health licensure student or #)

KIN 5235 Advanced Biomechanics II: Kinetics (3.0 cr.; A-F or Audit; prereq [3112 or equiv], PMed 5135, undergrad college physics, intro calculus)

KIN 5371 Sport and Society (3.0 cr.; A-F or Audit; prereq [3027 or equiv], 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 (3.0 cr.; Student Option)
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 (3.0 cr.; A-F or Audit; prereq Undergrad [physiology or biology])
Exercise testing/prescription with modifications required because of special considerations associated with aging, gender differences, environmental conditions, or presence of medical conditions.

KIN 5421 Sport Finance (3.0 cr.; A-F or Audit; 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.

KIN 5435 Advanced Theory and Techniques of Exercise Science (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq Kin or rec 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; Student Option)
Application of design to meet human needs. Design of fabricated products, tools/machines, software/hardware interfaces, art/culture, living environments, and complex sociotechnical systems.

KIN 5511 Sport and Gender (3.0 cr.; A-F Grade Basis)
Critically examines women's involvement in contributions to sport, physical activity, and leisure.

KIN 5585 Pediatric Physiology and Health: Concepts and Applications (2.0 cr.; A-F Grade Basis; prereq 3385 or 4385)
Current understanding of pediatric medicine and exercise physiology. Use of physical activity and weight management in the treatment of various diseases (i.e. obesity) that affect children and adolescents.

KIN 5601 Sport Management Ethics and Policy (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq Kin or Rec grad student or #)
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 (3.0 cr.; A-F Grade Basis; 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 (1.0-6.0 cr.; S-N Grading Basis; 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 (1.0-8.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq Grad student or #)

KIN 5723 Psychology of Sport Injury (3.0 cr.; Student Option; prereq Intro psych course)
Psychosocial bases of risk factors preceding sport injury; responses to the occurrence of sport injury, and the rehabilitation process. Lecture, discussion, guest lecture, interviews, and presentation experience.

KIN 5725 Organization and Management of Physical Education and Sport (3.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F Grade Basis; 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 Clinical Movement Neuroscience (3.0 cr.; A-F Grade Basis; prereq [3027 or ANAT 3001 or ANAT 3601 or ANAT 3611 or equiv], [PHSL 3051 or equiv], [4441])

KIN 5981 Research Methodology in Kinesiology, Recreation, and Sport (3.0 cr.; A-F or Audit; prereq 3151 or equiv)
Defines/reviews various types of research in exercise/sport science, physical education, and recreation studies. Qualitative research, field studies, and methods of introspection as alternative research strategies to traditional scientific paradigm.
KIN 5987 Professional Skills and Grant Writing for Health Sciences (2.0 cr.; Student Option No Audit; 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 (1.0-9.0 cr.; A-F Grade Basis; prereq [KIN upper div undergrad or MEd or grad student], #)
Independent study under tutorial guidance.

KIN 5995 Research Problems in Applied Kinesiology (1.0-6.0 cr.; A-F Grade Basis; 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.

KOR 1011 Beginning Korean (5.0 cr.; Student Option)
Basic grammatical structure, vocabulary, and expressions of modern colloquial Korean. Introduces Korean writing system.

KOR 1012 Beginning Korean (5.0 cr.; Student Option; prereq 1011)
Basic grammatical structure, vocabulary, and expressions of modern colloquial Korean.

KOR 3021 Intermediate Korean (5.0 cr.; Student Option; prereq 1012)
Speaking, reading, and writing at intermediate level in modern colloquial Korean. Simple narration/written reports. Some basic Chinese characters may be introduced.

KOR 3022 Intermediate Korean (5.0 cr.; Student Option; prereq 3021)
Speaking, reading, and writing at intermediate level in modern colloquial Korean. Narration/written reports. Introduction of additional basic Chinese characters.

KOR 3031 Third Year Korean (4.0 cr.; Student Option; prereq 3022)

KOR 3032 Third Year Korean (4.0 cr.; Student Option; prereq 3031)

KOR 3290 Korean Language Teaching Tutorial (1.0 cr.; S-N Grading Basis; prereq Grade of A in 3032)
Students tutor beginning students of Korean and are part of department's Korean language team.

KOR 3993 Directed Studies (1.0-3.0 cr.; Student Option; prereq #, @)
Directed study in topics of Korean literature, culture, language, or linguistics.

KOR 4001 Beginning Korean (3.0 cr.; Student Option; prereq Grad student)

KOR 4002 Beginning Korean (3.0 cr.; Student Option; prereq 4001, grad student)
Basic grammatical structure, vocabulary, and expressions of modern colloquial Korean. Meets with 1012.

KOR 4003 Intermediate Korean (3.0 cr.; Student Option; prereq 4002, grad student)
Speaking, reading, and writing in modern colloquial Korean. Simple narration/written reports. Basic Chinese characters may be introduced. Meets with HMNG 3021.

KOR 4004 Intermediate Korean (3.0 cr.; Student Option; prereq 4003, grad student)

KOR 4005 Third Year Korean (3.0 cr.; Student Option; prereq 4004, grad student)

KOR 4006 Third Year Korean (3.0 cr.; Student Option; prereq 4005, grad student)

KOR 4041 Advanced Readings in Modern Korean (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3032 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.

LAAS 5425 Atmospheric Processes I: Thermodynamics and Dynamics of the Atmosphere (3.0 cr.; A-F or Audit; prereq One yr college-level [calculus, physics])
Basic laws governing atmospheric motion through analysis of atmospheric dynamics and thermodynamics at the micro, synoptic, and global scales. Fundamental thermodynamic and dynamical processes/equations governing the behavior of the atmosphere/apply to larger-scale geophysical situations.

LAAS 5426 Atmospheric Processes II: Radiation, Composition, and Climate (3.0 cr.; A-F or Audit; prereq [one yr college-level [calculus, physics, chemistry]]; LAAS 5425 recommended)

Land and Atmospheric Science (LAAS)
College of Food, Agricultural and Natural Resource Sciences

LAAS 5050 Integrated Topics in Land & Atmospheric Science (3.0 cr.; A-F or Audit)
Earth system science. Interactions between the land and atmosphere. Biogeochemistry, human-environment interactions, environmental biophysics, and global environmental change.

LAAS 5051 Thesis Proposal Writing for Land & Atmospheric Science (2.0 cr.; A-F or Audit)
Grant proposals, including proposal formats of various funding sources, how to develop a significance statement, hypotheses and objectives, background, methods, project summary, time line, and budget. Critique proposal samples/discuss other aspects of seeking funding for research. Discuss LAAS graduate program prelim exam process.

LAAS 5311 Soil Chemistry and Mineralogy (3.0 cr.; Student Option; prereq [Chem 1022 or equiv], Phys 1102, grad or #)

LAAS 5425 Atmospheric Processes I: Thermodynamics and Dynamics of the Atmosphere (3.0 cr.; A-F or Audit; prereq One yr college-level [calculus, physics])
Basic laws governing atmospheric motion through analysis of atmospheric dynamics and thermodynamics at the micro, synoptic, and global scales. Fundamental thermodynamic and dynamical processes/equations governing the behavior of the atmosphere/apply to larger-scale geophysical situations.

LAAS 5426 Atmospheric Processes II: Radiation, Composition, and Climate (3.0 cr.; A-F or Audit; prereq [one yr college-level [calculus, physics, chemistry]]; LAAS 5425 recommended)

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
energy budget and cycling of greenhouse gases. Application to numerical modeling.

LAAS 5515 Soil Formation: Earth Surface Processes and Biogeochemistry (3.0 cr.; A-F or Audit; prereq 2125 or #)

Landscape Architecture (LA) College of Design

LA 1001 Sustainability by Design (3.0 cr.; A-F Grade Basis)
How the Twin Cities region (as example of many metropolitan areas) can adapt to climate change, depleted energy resources, and other environmental impacts. How cities and places are designed, how places influence sustainable lifestyles. How to adapt the Twin Cities/other cities to a changing world.

LA 1201 Learning from the Landscape (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit)
Development of basic skills in perceiving/representing material environment. Sketching/drawing conventions of visual phenomena/forms.

LA 1401 The Designed Environment (3.0 cr.; A-F or Audit)
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 2301 Advanced Representation for Environmental Design (3.0 cr.; Student Option; prereq 1301)
Perceiving/representing material environment. Multiple media approaches in environmental design representation. Analytical diagramming as means of developing design ideas. Interface between hand rendered and digital representation.

LA 2302 Computer-Aided Representation for Environmental Design (3.0 cr.; Student Option; prereq 1301, 2301)
Use of computer-aided design (CAD) technologies in developing, representing, and communicating environmental design ideas. Adobe Creative Suite™, Autodesk AutoCAD™, DynaSCAPE™, ESRI ArcMap™, etc. Integration of images generated from various computer and hand-rendered technologies.

LA 3001 Understanding and Creating Landscape Space (3.0 cr.; A-F or Audit; prereq Landscape design and planning [major or minor] or #)
Introduction to spatial design issues at all scales.

LA 3002 Informants of Creating Landscape Space (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option; prereq FR 3131 or &FR 3131 or GEOG 3561 or &GEOG 3561)
Critical environmental parameters affecting growth/development of metropolitan areas. Students assess these parameters and prepare multifunctional land use plan for a defined locale.

LA 3204 Holistic Landscape Ecology and Bioregional Practice (3.0 cr.; A-F or Audit; prereq [IEEB 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 Architectural History (3.0 cr.; A-F or Audit)
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 for creation of landscape architectural works.

LA 3501 Environmental Design and Its Biological and Physical Context (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit; prereq BED major or BED minor or #)
Theory applications of landfill systems for design, Landform typology, representation methods, manipulation techniques, use of land survey data, earthwork construction issues, Spatial accommodation of vehicles in landscape architecture, including road design.

LA 4001 Sustainable Landscape Design and Planning Practices (3.0 cr.; Student Option; prereq 1301, [2301 or ARCH 3301], 3001, 3002)
Critical environmental parameters affecting the growth and development of metropolitan areas.
Students assess these parameters/prepare a multifunctional land use plan for a defined locale.

LA 5201 Making Landscape Spaces and Types (3.0 cr.; A-F or Audit; 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 (1.0 cr.; S-N or Audit)
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 (6.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; 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 5301 Introduction to Landscape Architecture Drawing (3.0 cr.; Student Option; prereq LA grad student or accelerated B.E.D. student)
Perceiving/representing material environment. Sketching/drawing conventions, visual phenomena and forms.

LA 5351 AutoCAD I (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (1.0 cr.; S-N or Audit; 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 (1.0 cr.; S-N or Audit; prereq Arch/LA 5371, LA grad or #)
Current techniques and computer programs, and their application to landscape architecture computing.

LA 5374 Representation for Landscape Architectural Construction (3.0 cr.; Student Option)

LA 5375 Advanced Rendering in Landscape Architecture (3.0 cr.; Student Option)

LA 5400 Topics in Landscape Architecture (1.0-3.0 cr.; Student Option; 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 (1.0-3.0 cr.; Student Option; prereq #)
tbd

LA 5402 Directed Studies in Landscape Architecture History and Theory (1.0-6.0 cr.; Student Option; prereq #)
Independent studies under the direction of landscape architecture faculty.

LA 5403 Directed Studies in Landscape Architecture Technology (1.0-6.0 cr.; Student Option; prereq #)
Independent studies under the direction of landscape architecture faculty.

LA 5404 Directed Studies in Landscape Architecture Design (1.0-6.0 cr.; Student Option; prereq #)
Independent studies under the direction of landscape architecture faculty.

LA 5405 Interdisciplinary Studies in Landscape Architecture (1.0-6.0 cr.; A-F or Audit; prereq #)
Research, planning, or design projects. Topics vary.

LA 5406 Urban Design Journal (3.0-4.0 cr.; A-F or Audit; 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 a 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 (3.0-4.0 cr.; A-F or Audit; prereq Admitted to Denmark International Study Program co-sponsored by the University; given in Denmark)
Individual and small-group 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.

LA 5408 Landscape Architecture, Architecture, and Planning (3.0-4.0 cr.; A-F or Audit; 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 a 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit)
Assessment of influence of individuals on the formation of the profession of landscape architecture from 1800 to present. Lectures, presentations, field trips, readings, papers, projects.

LA 5514 Making the Mississippi (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq [5201, 5203, plant identification course] or #)
Design principles for using plants in landscape. Cultural/ecological principles in design projects of various scales. Lectures, presentations, field trips, readings, projects.

LA 5573 Landscape Technology: Introduction to Geographic Information Systems (3.0 cr.; A-F or Audit; 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 5574 Identification of Minnesota Flora (3.0 cr.; A-F or Audit; prereq BED accelerated status or LA grad student or #)
Introduction to identification of approximately 500 plants commonly used by landscape
architects and environmental designers in Minnesota. Students develop a working knowledge of over 250 plants. Focuses on plant selection techniques, plant landscape associations, and issues of plants for use in standard landscape architectural settings. Round field sessions.

**LA 5755 Infrastructure, Natural Systems and the Space of Inhabited Landscapes** (3.0 cr.; A-F or Audit; prereq Grad student)
Cross-disciplinary exploration of urban infrastructural solutions to mitigate/reverse anthropogenic impacts on Earth. Design of sustainable urban infrastructure systems, policy options, available technologies, criteria, design methods.

**LA 5790 Special Topics in Metropolitan Design** (3.0 cr.; A-F or Audit; prereq Enrollment in CMD prog or #)

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**LAT 3004 Intermediate Latin Poetry: Vergil** (4.0 cr.; Student Option; prereq Grade of at least [C- or S] in [3003 or 3113] or %)

**LAT 3199 Latin AP Credit** (4.0-8.0 cr.; No Grade Associated; prereq Score of [3 or 4 or 5] on [AP Vergil or AP Latin Literature] exam)

**LAT 3300 Intermediate Latin Prose** (4.0 cr.; Student Option; prereq Grade of at least [C- or S] in [3113 or #])
Readings in Latin prose. Introduction to Latin meter. Vergil and Catullus/Ovid offered in alternate years.

**LAT 3993 Directed Studies** (1.0-4.0 cr.; Student Option; prereq # and %)
Guided individual reading or study.

**LAT 4951W Major Project** (4.0 cr.; Student Option; 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 5003 Intermediate Latin Prose: Graduate Student Enrollment** (3.0 cr.; Student Option; prereq [Grade of at least [C- or S] in [1002 or 5001] or #], grad student)

**LAT 5004 Intermediate Latin Poetry for Graduate Students** (3.0 cr.; Student Option; prereq [5003 or equiv], grad student or %)

**LAT 5100 Advanced Reading** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq [LAT 3004 or equiv], at least two yrs of college level Latin. Must contact Classical and Near Eastern Studies department for permission to register.)
Authors of late antiquity, Middle Ages, Renaissance. Topics specified in Class Schedule.

**LAT 5701 Latin Prose Composition** (3.0 cr.; Student Option; prereq Grad student or #)
Latin grammar, syntax, diction, and prose style. Graduated exercises in prose composition.

**LAT 5702 Text Criticism** (3.0 cr.; Student Option; prereq Grad student or #)

**LAT 5703 Epigraphy** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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** (1.0 cr.; S-N Grading Basis; prereq Enrolled in a grad program in Department of Classical/Near Eastern Studies)
Practice in reading Latin texts at sight.

**LAT 5993 Directed Studies** (1.0-4.0 cr.; Student Option; prereq #, %)
Guided individual reading or study.

**LAT 5994 Directed Research** (1.0-12.0 cr.; Student Option; prereq Grad student or #)
Guided research on original topic chosen by student.

**LAT 5996 Directed Instruction** (1.0-12.0 cr.; Student Option; prereq Grad student or #)
Supervised teaching internship.

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**Latin American Studies (LAS)**
College of Liberal Arts

**LAS 3251 Role of Renewable Natural Resources in Developing Countries** (1.0 cr.; A-F or Audit)
International perspectives on resource use in developing countries. Integration of natural resource issues with social, economic, and policy considerations. Overviews of agriculture, forestry, agroforestry, non-timber forest products, water resources, certification, and development issues. Latin American case studies.

**LAS 3401W Early Latin America to 1825** (4.0 cr.; A-F or Audit)
Societies of Americas, Spain, and Portugal before contact. Interactions among Native Americans, African slaves, and Europeans, from colonization through independence. Religion, resistance, labor, gender, race. Primary sources, historical scholarship.

**LAS 3402W Modern Latin America 1825 to Present** (4.0 cr.; Student Option)
National and contemporary period 1825 to present. Social, cultural, political, and economic change.

**LAS 3429 Latin American History in Film and Text** (3.0 cr.; Student Option)
Cinematic representations of Latin America in the context of other historical and literary narratives. Experiences of Latinos in Hollywood. Compare U.S. films with those produced in Latin America. Specific themes vary by term (e.g., women, revolution, colonialism).
LASK 3441 Chicana/o History to 1900 (3.0 cr.; Student Option)  
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 3502W Foundations of Brazilian Culture (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option)  
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 4465 Housing in World Perspective (3.0 cr.; A-F or Audit; prereq DHA 2401, DHA 2463 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.

LAS 4479 Latin American Politics (3.0 cr.; Student Option; prereq Pol 1054 or Pol 3051 or non-pol sci grad or #)  
An overview of Latin American politics and political economy focused on authoritarianism, human rights, and re-democratization; development and economic policy; social movements; ethnicity and race; religion; revolution; U.S.-Latin American relations.

LASK 1001 Mastering Skills for College Success (2.0 cr.; Student Option)  
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 (1.0 cr.; S-N or Audit; 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 (2.0 cr.; S-N Grading Basis; 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 (1.0-4.0 cr.; A-F or Audit; prereq %)  
Interdisciplinary topics.

LS 5125 Field Experience (1.0-8.0 cr.; A-F or Audit; prereq MLS student or #)  
Oft-campus observation, experience, and evaluation in interdisciplinary field of study.

LS 5950 Special Topics (1.0-4.0 cr.; A-F or Audit; prereq %)  
Interdisciplinary topics.

LS 5993 Directed Studies (1.0-4.0 cr.; Student Option; prereq Grad student, %)  
Guided individual reading or study.

LS 5994 Directed Research (1.0-4.0 cr.; Student Option; prereq #)  
Tutorial for qualified graduate students.

**Linguistics (LING)**  
College of Liberal Arts

LING 1701 Language and Society (4.0 cr.; Student Option)  
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) (3.0 cr.; Student Option; prereq Fr)  
Topics specified in Class Schedule and Course Guide.

LING 1905 Freshman Seminar (3.0 cr.; Student Option; prereq Fr)  
Topics specified in Class Schedule.

LING 1907W Freshman Seminar (3.0 cr.; Student Option; prereq freshman)  
Topic specified in Course Guide.

LING 1909W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)  
Topics specified in Class Schedule.

LING 3001 Introduction to Linguistics (4.0 cr.; Student Option)  
Scientific study of human language. Methods, questions, findings, and perspectives of modern linguistics. Components of the language system (phonetics/phonology, syntax, semantics/pragmatics); language acquisition; language/social variables; language/cognition; language change; language processing; language/public policy.

LING 3001H Honors: Introduction to Linguistics (4.0 cr.; A-F Grade Basis; prereq Honors candidate or #)  

LING 3051H Honors: Thesis (3.0 cr.; A-F Grade Basis; prereq Linguistics honors candidate, #)  
Supervised planning and research for honors thesis to be completed in 3052.

LING 3052V Honors: Thesis (3.0 cr.; A-F Grade Basis; prereq 3051)  
Supervised research, writing, and revision for honors thesis begun in 3051.

LING 3101W Languages of the World (3.0 cr.; Student Option; prereq 3001 or 3001H or 5001 or #)  
Survey of language families of the world. Classifying languages genetically/typologically. Historical relationships among languages.

LING 3601 Historical Linguistics (3.0 cr.; Student Option; prereq 3001 or #)  
Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages.

LING 3721 Bilingualism (3.0 cr.; Student Option; prereq 1701 or 3001 or 3001H or 5001)  

LING 4002 Linguistic Analysis (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 4202 Syntax II (3.0 cr.; Student Option; prereq 4201 or 5201)  
Syntactic theory. Principles and Parameters (P&P) approach to grammar. Focuses on Minimalist Program (MP).

LING 4302W Phonology I (3.0 cr.; Student Option; 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 4303 Phonology II (3.0 cr.; Student Option; prereq Ling 4302W)  

LING 4901W Major Project Seminar (3.0 cr.; S-N Grading Basis; prereq Ling major, [or sr])  
Revision/expansion of a paper completed for a linguistics course.

LING 5001 Introduction to Linguistics (4.0 cr.; Student Option; prereq grad or #)  
Phonetics, phonology, morphology, syntax, semantics, and historical-comparative linguistics; language learning and psychology of language; linguistic universals; language in society.

LING 5101 Language Types and Linguistic Universals (3.0 cr.; Student Option; prereq [[3001 or 3001H or 5001], [4201 or 5201], [4302W or 5302]) or #)  
Comparison of languages and language types. Cross-linguistic similarities/universals of language, their explanation.
LING 5105 Field Methods in Linguistics I  (4.0 cr.; Student Option; prereq [4201 or 5201], [4302W or 5302] or #)
Techniques for obtaining/analyzing linguistic data from unfamiliar languages through direct interaction with native speakers.

LING 5201 Syntactic Theory I  (3.0 cr.; Student Option; prereq 3001 or 3001H or 5001 or #)
Concepts/issuses in current syntactic theory.

LING 5202 Syntactic Theory II  (3.0 cr.; Student Option; prereq 4201 or 5201)
Modern syntactic theory. Syntactic phenomena in various languages. Syntactic argumentation, development of constraints on grammar formalisms.

LING 5205 Semantics  (3.0 cr.; Student Option; prereq [4201 or 5201] or #)
Analysis of sentence meaning. Semantic properties. Relations such as analyticity, entailment, quantification, and genercity. 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  (3.0 cr.; Student Option; prereq [4201 or 5201] or #)
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 5302 Phonological Theory I  (3.0 cr.; Student Option; prereq 3001 or 3001H or 5001 or #)

LING 5303 Phonological Theory II  (3.0 cr.; Student Option; prereq 4302W or 5302 or #)
Phonology of human languages. Reading papers in the literature. Doing research in phonology.

LING 5461 Conversation Analysis  (3.0 cr.; Student Option; prereq 3001 or 3001H or 5001 or #)
Discourse processes. Application of concepts through conversation analysis.

LING 5462 Field Research in Spoken Language  (3.0 cr.; Student Option; 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  (3.0 cr.; Student Option; prereq 3001 or 3001H or 5001 or #)
First/second language acquisition.

LING 5601 Historical Linguistics  (3.0 cr.; Student Option; prereq 3001 or 3011H or 5001)
Historical change in phonology, syntax, semantics, and lexicon. Linguistic reconstruction. Genetic relationship among languages.

LING 5801 Introduction to Computational Linguistics  (3.0 cr.; Student Option; prereq [4201 or 5201] or programming experience or #)
Methods/issuses in computer understanding of natural language. Programming languages, their linguistic applications. Lab projects.

LING 5900 Topics in Linguistics  (1.0-4.0 cr.; Student Option)
Topics vary. See Class Schedule.

LING 5931 Morphology and Syntax of Contemporary English  (3.0 cr.; Student Option; prereq 3001 or 3001H or 5001 or #)
Linguistic analysis of word/sentence structure of contemporary English. Focuses on data from recorded/written texts.

LING 5993 Directed Study  (1.0-3.0 cr.; Student Option; prereq #, %. @)
Directed study for Linguistics.

Management (MGMT)
Curtis L. Carlson School of Management

MGMT 1001 Contemporary Management  (3.0 cr.; A-F Grade Basis; prereq Carlson School fr or soph)
How/why organizations differ in form/purpose in complex environments/technologies. Managerial challenges related to international management, social responsibility. Models of effective leadership/teamwork.

MGMT 1001H Honors: Contemporary Management  (3.0 cr.; A-F Grade Basis; prereq [Fr or soph] honors)
How/why organizations differ in their forms/purposes in relation to complex/changing environments/technologies. Challenges related to international management and social responsibility. Models of effective leadership/teamwork.

MGMT 1005 Corporate Responsibility and Ethics  (3.0 cr.; A-F Grade Basis)
Identify/apply ethical principles to resolution of moral challenges in management. Understanding place of business/corporation in society.

MGMT 3001 Fundamentals of Management  (3.0 cr.; A-F or Audit)
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  (3.0 cr.; A-F Grade Basis; prereq CSOM, soph or jr)
Business strategy. How business firms set and pursue their goals. Key categories of strategic issues and concepts/frameworks managers use to analyze and address those issues. Attention to specific firms and situations.

MGMT 3010 Introduction to Entrepreneurship  (4.0 cr.; A-F or Audit)

MGMT 3014 Topics in International Business, Government, and Society  (4.0 cr.; A-F or Audit)
Selected topics.

MGMT 3033V Honors: Business Communication  (3.0 cr.; A-F or Audit; 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. Recitation times are arranged.

MGMT 3033W Business Communication  (3.0 cr.; A-F or Audit; prereq Fr composition, CSOM upper-div, at least 60 cr)
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 3040 Understanding the International Environment of Firms: International Business  (2.0 cr.; A-F or Audit; prereq 1001 or 1001H or 3001)
Theories, frameworks, tools, and facts for understanding the environment of firms in international competition. Main world-level economic flows (trade, investment, finance). How country-/industry-level economic, political, and sociocultural factors influence behavior/functions of firms in international competition.

MGMT 3070 Topics in Management  (2.0-4.0 cr.; A-F or Audit)
Selected topics.

MGMT 3080 Topics in Ethics  (4.0 cr.; A-F or Audit; prereq At least 60 cr [taken or in progress])
Topics vary with each offering.

MGMT 3090 Topics in Leadership  (2.0-4.0 cr.; A-F or Audit)
Selected topics.

MGMT 3480 Topics: Natural Resources  (3.0 cr.; A-F Grade Basis)
Individual topics related to natural resources.

MGMT 3602 Topics: Environmental Regulations  (3.0 cr.; A-F Grade Basis)
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  (3.0 cr.; A-F Grade Basis; 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  (3.0 cr.; A-F Grade Basis)
Environmental problems such as climate change, ozone depletion, and loss of biodiversity.

MGMT 3900 International Business Communication  (3.0 cr.; A-F Grade Basis)
Impact of culture and communication on business interactions. How to adapt and respond to intercultural interactions. Business culture and cross-cultural communication in
a business context rather than on general country or regional cultural issues.

MGMT 4000 Issues in Nonprofit Management (4.0 cr.; A-F Grade Basis; prereq Sr nonprofit major or consent of Capstone. Students choose a project with nonprofit organization in local community. Readings/discussions tie managerial theory to actual experiences.

MGMT 4002 Managerial Psychology (4.0 cr.; A-F or Audit)

Behavioral principles, methods, and skills that underlie and compose dimensions of managerial competence and contribute to management’s 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 (3.0 cr.; A-F or Audit; 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 4008 Entrepreneurial Management (4.0 cr.; A-F Grade Basis; prereq 8/3010 or IBUS 3010)

Management of a new venture after founding. Internal/external challenges of managing a startup organization. Working with resource constraints and understanding how business models may change over time.

MGMT 4031 Industry Analysis and Competitive Strategy (3.0 cr.; A-F Grade Basis)

How firms maximize returns in the face of competition, uncertainty, and rapidly changing technology and demand conditions. Sources of value creation and value capture; sustainable competitive advantage and strategic commitment.

MGMT 4040 Negotiation Strategies (4.0 cr.; A-F Grade Basis)

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 (2.0 cr.; A-F or Audit; prereq 3001 or 3010)

Applying theories/research on how new organizational programs, products, and technologies are developed/implemented. Diagnostic skills. How innovation unfolds.

MGMT 4060 Entrepreneurial Perspectives (2.0 cr.; A-F Grade Basis; prereq 3010)

Students are paired in small groups with entrepreneur of a leading Minnesota businesses to write/present paper on the development of their business. Students analyze cases of five other participating entrepreneurs.

MGMT 4080W Applied Technology Entrepreneurship (4.0 cr.; Student Option)

Team projects based on commercializable technologies or innovations. Teams present their ideas to investors and industry professionals. Students are encouraged to submit their business plans to Minnesota Cup.

MGMT 4100 Topics in Management (2.0-4.0 cr.; A-F Grade Basis)

Topics vary.

MGMT 4101 Independent Study in Strategic Management and Organization (1.0-4.0 cr.; A-F or Audit; prereq # or %)

Students contract with faculty on independent studies.

MGMT 4170W New Business Feasibility and Planning (4.0 cr.; A-F Grade Basis; prereq 3010)

New-business-opportunity identification/development. Students conduct feasibility analysis, create formal business plan, gather feasibility data, and contact potential customers, suppliers, and other primary sources.

MGMT 4171W Entrepreneurship in Action I (4.0 cr.; A-F Grade Basis; prereq 3010, 4008 or 4408), 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 (4.0 cr.; A-F Grade Basis; prereq 4171)

Second of two-semester sequence. In fall, students identify business opportunity, develop concept, determine resources required, and launch business. In spring, students implement business plan, manage business, and determine exit strategy.

MGMT 4500 Senior Seminar in International Business (2.0 cr.; A-F Grade Basis; prereq CSOM cr, IB major)

International business capstone. Topics related to doing business globally. Opportunity to integrate study abroad and coursework experiences.

MGMT 5019 Business, Natural Environment, and Global Economy (2.0 cr.; A-F Grade Basis; prereq MBA student)

Resource deployment policies that affect the natural environment. Sustainability. Local/global environmental threats, how government policies address these issues. Business strategies/practices that produce "win-win" outcomes.

MGMT 5480 Topics in Natural Resources (3.0 cr.; A-F Grade Basis)

Specific topic for each offering.

MOT 4010 Management of Science and Technology in the Middle East, Global Seminar (3.0 cr.; A-F Grade Basis)

Middle East global seminar, including 8 weeks of classroom learning prior to May departure. Technology areas such as solar energy, water desalination, security technology, alternative fuels, and biomedical devices.

MOT 5001 Leadership and Management Development for Research Scientists (2.0 cr.; A-F Grade Basis)

Provides graduate students (and advanced UG's) interested in careers in research with a working knowledge of business functions, strategies for development of leadership and team building skills and career progression planning. Content and experiential learning approach reflect challenges faced by scientific professionals.

MOT 5224 Introduction to Technological Leadership and Management: Assessing Emerging and Pivotal Technologies (1.0 cr.; A-F Grade Basis)

Selected emerging technologies expected to play key roles in future industrial development.

MOT 5591 MOT Independent Study (1.0-3.0 cr.; S-N or Audit; prereq MOT grad student)

Independent study in MOT-related topic.

Managerial Communications (MCOM)

Curtis L. Carlson School of Management

MCOM 5400 Managerial Communications for the HR Professional (2.0 cr.; A-F Grade Basis; prereq HRIR student)

Memo writing, oral presentations, and team communication required of HR professional. Emphasizes hands-on, experiential learning, including videotaping.

MCOM 5500 Strategic Managerial Communication (Comprehensive Course) (4.0 cr.; A-F Grade Basis; prereq MBA student)

Communication strategies at three levels: interpersonal, teams, and external relations. Students compare communication styles. Organizational, persuasive, and language strategies.

MCOM 5510 Persuasive Writing in Business (2.0 cr.; A-F Grade Basis; prereq MBA student)

Writing to motivate/affect change. Form/content. Techniques of persuasion. Producing polished text. Writing with power.

MCOM 5520 Persuasive Writing in Business: Non-Native Speakers of English (2.0 cr.; A-F Grade Basis; prereq MBA student, non-native English speaker)

Writing to motivate/affect change. Form/content, techniques of persuasion. Producing polished text. Writing with power.

MCOM 5530 Strategies and Skills for Managerial Presentations (2.0 cr.; A-F Grade Basis; prereq MBA student)


MCOM 5540 Strategies and Skills for Managerial Presentations: Non-Native
Speakers of English (2.0 cr.; A-F Grade Basis; prereq MBA student, non-native speaker of English) Delivering key messages with clarity/ confidence regardless of audience or setting. Maximizing impact as a speaker, seated/ standing. Personal communication style and audience. Tailoring message. Handling questions/answers. Using audio/visual tools. Presenting as a team.

Manufacturing Operations Management (MM)
College of Continuing Education

MM 3001 Manufacturing in a Global Economy (3.0 cr.; A-F or Audit) How global economy has transformed manufacturing sector. Systems, quality engineering, process improvement, supply-chain management, product/systems innovation, regulatory affairs, technology use to manage change.

MM 3205 Engineering for Manufacturing Operations (3.0 cr.; A-F or Audit; prereq 30 cr) Foundational mechanical, electrical, industrial, and manufacturing engineering concepts/ techniques essential to manufacturing operations management. Collaborating with other functional departments in enterprise to develop and maintain effective/efficient manufacturing operations. Production strategies for quality, safety, and time/cost efficiency. Allocation of resources, productivity, cost analysis.

MM 4011 Design of Manufacturing Systems and Simulations (3.0 cr.; A-F or Audit; 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.

MM 4012 Manufacturing Processes and Technology (3.0 cr.; A-F or Audit; prereq 3001 or manufacturing experience) Overview and modeling of commonly used core manufacturing processes. Process descriptions, process capabilities and performance, process models relating process parameters to part/process characteristics, process and quality control methods consistent with ISO9001 requirements.

MM 4035 Global Supply Chain Management (3.0 cr.; A-F or Audit; prereq 4102 or ABUS 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.

MM 4039 Manufacturing Outsourcing Decisions (2.0 cr.; A-F or Audit; prereq [3001 or professional experience], 4035, ACCT 2050) Strategies to evaluate/make business decisions related to outsourcing a product or manufacturing process. How to assess risks associated with outsourcing. How to maintain control of key supply chain factors for delivery of quality/value.

MM 4045 Regulated Industry Compliance (3.0 cr.; A-F or Audit; prereq 3001 or manufacturing experience) High tech industry compliance with government regulations. Medical and technical sector: agencies, regulations/standards, compliance strategy, challenges, processes/controls, costs/risk/ethics, tracking/analysis/reporting. Product development and compliance systems for design, regulatory, quality, facilities/equipment, materials, packaging/labeling.


MM 4311 Sustainable Lean Manufacturing (2.0 cr.; A-F or Audit; prereq 3001, 45 cr) Sustainability and lean practices in manufacturing operations. Topics include concepts. History; metrics for auditing/improving processes. Product, operations, and supply chain planning. Communicating value/results. Impact on business, environmental, and social value.

MM 4550 Special Topics in Manufacturing (1.0 cr.; A-F or Audit) Seminar. Timely issues/themes in manufacturing.

MT 3111 Elements of Microelectronic Manufacturing (3.0 cr.; A-F Grade Basis; 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 (1.0 cr.; A-F Grade Basis; prereq 3111) Basic process steps to make top-down micro-/nano-scaled structures. Oxidation, photolithography, etch processes, 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 (3.0 cr.; A-F Grade Basis; prereq Physics, chemistry, [college algebra or precalculus], 45 cr) Thin film materials such as metals/oxides, photolithography, methods of deposition. HV/ UHV range. Vacuum deposition, sputtering, chemical vapor deposition.

MT 3131 Introduction to Materials Characterization (4.0 cr.; A-F Grade Basis; 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 3141 Principles and Applications of Bionanotechnology (4.0 cr.; A-F Grade Basis; prereq Completion of physics, chemistry, [college algebra or precalculus] with grade of at least C-, 45 sem cr) Introduction to protein, lipid, and nucleic biochemistry. Biomolecule design, production using recombinant DNA technology. Use in nanodevices and nano-materials. Applications of biological molecules in bionanotechnology. Effects of Brownian motion. Biomolecular surfaces forces. Biomolecule structure alterations due to molecular interaction. Self-assembly.

MT 3142 Nanoparticle Technology and Engineering Laboratory (1.0 cr.; A-F Grade Basis; 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.

Marketing (MKTG)
Curtis L. Carlson School of Management

MKTG 3001 Principles of Marketing (3.0 cr.; A-F or Audit; prereq ECON 1101) Introduction to terms, concepts, and skills for analyzing marketing problems. Factors outside the organization affecting its product, pricing, promotion, and distribution decisions. Cases from actual organizations.

MKTG 3010 Marketing Research (4.0 cr.; A-F or Audit; prereq [3001 or 83001] or [OMS 2550 or equiv]) Methods for collecting/analyzing data to solve marketing problems. Research design, secondary/primary data collection, sample design, data analysis.

MKTG 3040 Buyer Behavior (4.0 cr.; A-F or Audit; prereq 3001, [3010 or 8301]) Application of behavioral sciences to buyer behavior. Perception, attitudes, learning, persuasion, motivation, decision-making, social/cultural influences, managerial implications.

MKTG 4030 Sales Management (4.0 cr.; A-F or Audit; prereq 3001, 3010, 3040) Hiring, motivating, performance enhancement. Customer relationship management, data analysis, quantitative methods. Developing metrics to evaluate individual/group

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Performance in attaining an organization's strategic goals.

MKTG 4050 Integrated Marketing Communications (4.0 cr.; A-F or Audit; prereq 3001, 3010, 3040)
Managing/integrating communication aspects of marketing, advertising, sales promotion, public relations, setting objectives, selecting media, measuring effectiveness, sales promotion techniques. Issues in global IMC.

MKTG 4060 Marketing Channels (4.0 cr.; A-F or Audit; prereq 3001, 3010, 3040)
Design/management of channels of distribution in consumer/industrial settings. Interrelationships between marketing institutions in channels of distribution, logistics, supply chain strategies.

MKTG 4080W Marketing Strategy (4.0 cr.; A-F or Audit; prereq 3001, 3010, 3040, 12 cr in marketing, sr)
Determining product markets where organizations should compete based on ability to create maintain competitive advantage. External environment of business. Constructing/evaluating global marketing strategies. Largely case-based.

MKTG 4082W Brand Management (4.0 cr.; A-F Grade Basis; prereq 3001, 3010, 3040)

MKTG 4090 Marketing Topics (2.0-4.0 cr.; A-F or Audit; prereq 3001, 3010)
Selected topics/problems of current interest considered in depth. Class discussion, projects.

Master of Business Taxation (MBT)
Curtis L. Carlson School of Management

MKTG 5200 Tax Accounting Methods and Periods (4.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Rules affecting timing of income and deductions for tax purposes. Examination of cash and accrual accounting methods on an overall basis and with respect to individual items of income and deductions; rules for changing accounting methods and periods; annual accounting and transactional concepts, including the claim of right doctrine, the Arrowsmith doctrine, and the tax benefit rule.

MKTG 5220 Tax Research, Communication, and Practice (4.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)

MKTG 5230 Corporate Taxation I (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)

MKTG 5323 Mergers and Acquisitions I (2.0 cr.; A-F or Audit; prereq 5230, MBT student)
Different types of acquisitions, dispositions, reorganizations, and spin-offs involving C corporations. Tax consequences of acquisition to corporations/shareholders involved. Use of 388 elections, limitations on acquired net operating losses/credits, use of covenants not to compete, consulting agreements, deferred payment terms, treatment of transactions, costs.

MBT 5333 Tax Aspects of Consolidated Returns (2.0 cr.; A-F or Audit; prereq 5230, MBT student)

MBT 5335 Taxation of the Small Business Corporation (2.0 cr.; A-F or Audit; prereq 5230, MBT student)
Federal income taxation of S corporations. Election eligibility; termination of status; treatment of income and deduction items; distributions, basis of stock and debt. Compensation arrangements in closely held corporations; fiscal year issues; personal service corporations; advantages of C corporations: corporation liquidation and redemption rules; S corporation's built-in-gains tax.

MBT 5340 Taxation of Partners and Partnerships (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Reviews tax consequences associated with formation, operation, and dissolution of a partnership.

MBT 5346 ASC 740 Computations and Analysis (2.0 cr.; A-F or Audit; prereq 5230, MBT student)
Foreign operations, tax allocations, interim period tax calculations.

MBT 5350 Wealth Transfer I (Estates and Gifts) (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)

MBT 5353 Trusts and Estates (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)

MBT 5360 State and Local Taxation (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Examines state levying of individual income, corporate income, property, sales, and excise taxes. Tax problems of businesses with multistate operations.

MBT 5361 State and Local Taxation II (2.0 cr.; A-F or Audit)
Income/sales tax consequences of mergers/ acquisitions, corporate reorganizations. Practical application of tax concepts. Planning ideas in drop shipments, investment holding companies, e-commerce, leasing companies, and like tax alternatives. Real property taxation, individual income taxation, state administrative tax procedures, state payroll considerations.

MBT 5363 Compensation and Benefits (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Federal income taxation of executive compensation, relevant fringe benefit programs. Benefit programs other than qualified retirement plans. Salary continuation, stock options, non-profit organization plans, health/welfare plans.

MBT 5370 Taxation of Property Transactions (2.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Determining realized gain or loss and recognized gain or loss, and tax treatment of that gain or loss on property dispositions. Consequences of property transactions including depreciation, depletion, basis, and capital gains problems.

MBT 5380 Tax Aspects of International Business I (2.0 cr.; A-F or Audit; prereq 5230, MBT student)
Multinational business operations/transactions involving foreign income. Tax consequences of transactions with/by foreign organizations/ companies.

MBT 5381 Tax Aspects of International Business II (2.0 cr.; A-F or Audit; prereq 5380, MBT student)
Foreign tax credit, Subpart F planning opportunities, international structuring (joint ventures, use of entity classification regulations). Transfer pricing, foreign currency. Legislative, regulatory, and judicial developments.

MBT 5382 Transfer Pricing (2.0 cr.; A-F or Audit; prereq 5230, 5380 or equiv)
Transfer pricing requirements facing multinational companies. Tax requirements of the United States and other countries that have adopted the "arm's-length standard" or the transfer pricing guidelines adopted by the Organization for Economic Cooperation and Development. Regulations, methods, economic models, pricing policies, transaction accounting, and management of audits of managing transfer prices within a multinational company.

MBT 5390 Topics in Taxation (1.0-4.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Topics vary.

MBT 5420 Current Topics in Taxation (1.0-4.0 cr.; A-F or Audit; prereq ACCT 5135, MBT student)
Tax research/compliance, other tasks. Students submit summary paper.

MBT 5500 Business, Government, and Economic Tax Policy (2.0 cr.; A-F Grade Basis; prereq ACCT 5135, MBT student)
Effects of business and government on the tax system. Social, political, economic, and cultural values affecting the tax system. Macroeconomics/ its implication for taxation. History of taxes/alternate approaches to taxation, public finance, and government
Master of Development Practice (MDP)  
System Acad Admin, Acad Units

MDP 5001 Ways of Knowing and Sustainable Livelihoods (2.0 cr.; A-F or Audit; prereq Grad MDP major or #)  
Complexes of interdisciplinary study of development and a range of ways of knowing the field of development studies and sustainability. Approaches practiced by physical, biological, social science, and humanities scholars. "Ways of knowing" in different cultures/groups and from a variety of situated perspectives. Key issues and concepts and key methodological challenges facing us as we engage in interdisciplinary and international development study and practice. Sustainable livelihoods. Team taught when possible by faculty from biological, social sciences, and humanities, or at minimum will include guest lecturers who can offer a range of disciplinary perspectives on questions of development.

MDP 5002 Research Methods for Sustainable Livelihoods (2.0 cr.; A-F Grade Basis; prereq MDP grad student or #)  
Research/writing skills to support work in international development. Discussion of basic qualitative research methods/data analysis. Qualitative/quantitative data, collaborative research/analysis. Relationship between research/policy.

MDP 5003 Field Study Pre-Departure Seminar (1.0 cr.; Student Option No Audit; prereq MDP grad student or #)  
Preparation for international field experience. Identify arrangements for summer field experience in consultation with faculty leader of seminar/MDP advisers. Feedback on colleagues’ plans.

MDP 5100 International Field Seminar (1.0 cr.; A-F Grade Basis; prereq MDP grad student or #)  
Debriefing/identifying important learning from field experiences. Complete final report on field project. Build upon skills in peer review/feedback developed in 5003.

MDP 5200 Capstone Workshop in Development Practice (3.0 cr.; A-F Grade Basis; prereq MDP grad student or #)  
Learning from field experiences. Analytical/practical skills developed in academic training. Apply skill/experiences to "real world" problem provided by local or international development-focused organization. Reflective practice.

Materials Science (MATS)  
Institute of Technology

MATS 1001 Advances in Chemical Engineering and Materials Science (1.0 cr.; S-N or Audit; prereq = ChEn 1001; Recommended for [chemical engineering, materials science/engineering] majors)  
Introduction to chemical engineering, materials science/engineering. Practical examples of important advances in both fields. Design problems, career opportunities. Lectures, demonstrations, interactive exercises.

MATS 3041 Industrial Assignment I (2.0 cr.; A-F Grade Basis; prereq MatS upper div, completion of required courses in MatS program through fall sem of 3rd yr, GPA of at least 2.80, regis in co-op program)  
Industrial work assignment in engineering co-op program. Formal written report.

MATS 3045 Materials Science and Engineering Industrial Internship (1.0-2.0 cr.; A-F Grade Basis)  
Industrial internship, three to eight months. Requirements for grade are a proposed plan approved by supervisor and Faculty Internship Co-Op Coordinator (Fl/CC), and report describing engineering work completed, signed by industrial supervisor prior to submission to faculty internship co-op coordinator.

MATS 3801 Structural Characterization Lab (4.0 cr.; A-F Grade Basis; prereq [3011, MatS upper div] or %)  

MATS 3851W Materials Properties Lab (4.0 cr.; A-F or Audit; prereq [3801, 4013, MatS upper div] or %)  

MATS 4041 Industrial Assignment II (2.0 cr.; A-F Grade Basis; 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 4212 Ceramics (3.0 cr.; A-F or Audit; prereq [3011, 4001 or CHEN 3101], [MatS or ChEn upper div]) or #)  

MATS 4214 Polymers (3.0 cr.; A-F or Audit; prereq [3011, 4001 or CHEN 4101], [upper div MatS or ChEn] or #)  

MATS 4221 Materials Performance (4.0 cr.; A-F Grade Basis; 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,
MATS 4512 Corrosion and Electrochemistry of Corrosion (4.0 cr.; Student Option; prereq MatS 3011 or #, upper div CSE 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 (1.0-3.0 cr.; Student Option No Audit; prereq Upper div mat sci)
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 4593 Directed Study in Materials Science (1.0-4.0 cr.; A-F Grade Basis; 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 (1.0-3.0 cr.; Student Option No Audit; prereq Upper div mat sci)
Research 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. May be used for upper division Honors Program experience if arranged with professor.

MATS 5533 Electron Microprobe Theory and Practice (3.0 cr.; Student Option; prereq [One yr chem, one yr physics] or #) Characterizing solid materials with electron beam instrumentation, including reduction of X-ray data to chemical compositions.

MATS 5517 Electron Microscopy (3.0 cr.; A-F or Audit)
Transmission electron microscope, scattering and diffraction, electron sources, lenses, apertures and resolution, specimen preparation, diffraction patterns, kikuchi diffraction, planar defects, strain fields, high resolution imaging, X-ray spectrometry.

MATS 5518 Imaging and Diffraction in the Scanning Electron Microscope (1.0 cr.; A-F or Audit; prereq #) Theory/practice of scanning electron microscopy. Classroom sessions cover how instrument works, best-use practices. Practical sessions allow students to hone skills.

MATS 5519 Basic Transmission Electron Microscopy (1.0 cr.; A-F or Audit; prereq #) Theory/practice of transmission electron microscope. Classroom sessions cover how instrument works, best-use practices. Practical sessions allow students to hone skills.

MATS 5520 Basic Analytical Electron Microscopy (1.0 cr.; A-F or Audit; prereq 5518, 5119) Theory/practice of analytical electron microscopy. Classroom sessions cover techniques, best-use practices. Practical sessions allow students to hone skills.

MATS 5531 Electrochemical Engineering (3.0 cr.; Student Option; prereq MatS 3011 or #, upper div CSE or grad) Fundamentals of electrochemical engineering. Topics include electrochemical mass transfer, electrokinetics, thermodynamics of cells, modern sensors, formation of thin films and microstructured materials. Computer-based problems will be assigned.

MATS 5771 Colloids and Dispersions (3.0 cr.; A-F or Audit; prereq Physical chemistry) Preparation, stability, coagulation kinetics, or colloidal solutions. DLVO theory, electrokinetic phenomena. Properties of micelles, other microstructures.

Mathematics (MATH) Institute of Technology

MATH 1001 Excursions in Mathematics (3.0 cr.; Student Option; prereq 3 yrs high school math or placement exam or [grade of at least C- in PSTL 731 or 732]) Introduction to the breadth and nature of mathematics and the power of abstract reasoning, with applications to topics that are relevant to the modern world, such as voting, fair division of assets, patterns of growth, and opinion polls.

MATH 1031 College Algebra and Probability (3.0 cr.; Student Option; 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/functions, transformations of graphs; linear, quadratic, polynomial, and rational functions, with applications; inverses/ composition of functions; exponential and logarithmic functions, with applications; basic probability rules, conditional probability, binomial probabilities.

MATH 1038 College Algebra and Probability Submodule (1.0 cr.; A-F or Audit; 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 Precalculus I (3.0 cr.; Student Option; 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 1142 Short Calculus (4.0 cr.; Student Option; prereq Satisfactory score on placement test or grade of at least C- in [1031 or 1051]) A streamlined one-semester tour of differential and integral calculus in one variable, and differential calculus in two variables. No trigonometry/does not have the same depth as MATH 1271-1272. Formulas and their interpretation and use in applications.

MATH 1151 Precalculus II (3.0 cr.; Student Option; 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,

MATH 1471H Honors Calculus IIA for Secondary Students (3.0 cr.; Student Option; prereq 1473H)
Accelerated honors sequence. Linear Algebra from geometric viewpoint. First-order systems of differential equations.

MATH 1571H Honors Calculus I (4.0 cr.; A-F Grade Basis; prerequisite Honors student and permission of University Honors Program) Differential/Integral calculus of functions of a single variable, including Taylor's series, power series with applications.

MATH 1572H Honors Calculus II (4.0 cr.; A-F Grade Basis; prerequisite 1571H, honors student, permission of University Honors Program) Continuation of 1571. Infinite series, differential calculus of several variables, introduction to linear algebra.

MATH 2001 Actuarial Science Seminar (1.0 cr.; S-N or Audit; prerequisite 1272 or equivalent) Emphasizes aspects related to prime factorization. Modular arithmetic with applications.

MATH 2142 Elementary Linear Algebra (1.0-4.0 cr.; Student Option) Not taught: merely provides credit for transfer students who have taken a sophomore-level differential equations class that does not contain enough linear algebra to qualify for credit for 2243.

MATH 2143 Linear Algebra and Differential Equations (4.0 cr.; Student Option; prerequisite [1272 or 1282 or 1372 or 1572] w/grade of at least C-)

MATH 2374 CSE Multivariable Calculus and Vector Analysis (4.0 cr.; Student Option; prerequisite [1272 or 1282 or 1372 or 1572] w/grade of at least C-, CSE or pre-Bio Prod/Biosys Eng) Derivative as linear map. Differential/integral calculus of functions of several variables, including change of coordinates using Jacobians. Line/surface integrals. Gauss, Green, Stokes theorems. Use of computer technology.

MATH 2474 Advanced Topics for Secondary Students (3.0 cr.; Student Option; prerequisite 2473H)
Topics may include linear algebra, combinatorics, advanced differential equations, probability/statistics, numerical analysis, dynamical systems, topology, geometry. Emphasizes concepts/explorations.

MATH 2573H Honors Calculus III (4.0 cr.; A-F Grade Basis; prerequisite 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 (4.0 cr.; A-F Grade Basis; prerequisite 2573H, honors student and permission of University Honors Program) Advanced linear algebra, differential equations. Additional topics as time permits.

MATH 3113 Topics in Elementary Mathematics I (4.0 cr.; Student Option; prerequisite Grade of at least C- in [1031 or PSTL 1006] or placement exam) Emphasizes concepts/explorations. Counting, building on techniques from college algebra. Graph theory. Integers, rational numbers. Emphasizes aspects related to prime factorization. Modular arithmetic with applications.

MATH 3116 Topics in Elementary Mathematics II: Short Course (2.0 cr.; A-F or Audit; prerequisite Grade of at least C- in 3113) Probability/Statistics, vector geometry, real/complex numbers. Meets during first half of semester only.

MATH 3118 Topics in Elementary Mathematics II (4.0 cr.; Student Option; prerequisite Grade of at least C- in 3113) Probability/statistics, vector geometry, real/complex numbers, finite fields building on previously learned modular arithmetic, trees.

MATH 3283W Sequences, Series, and Foundations: Writing Intensive (4.0 cr.; Student Option; prerequisite &2243 or &2263 or &2373 or &2374) w/grade of at least C-)

MATH 2373 CSE Linear Algebra and Differential Equations (4.0 cr.; Student Option; prerequisite [1272 or 1282 or 1372 or 1572] w/grade of at least C-, CSE or pre-Bio Prod/Biosys Eng) Linear algebra: basis, dimension, eigenvalues/eigenvectors. Differential equations: linear equations/systems, phase space, forcing/resonance, qualitative/numerical analysis of nonlinear systems, Laplace transforms. Use of computer technology.
to differential equations, Newton's method.

Writing-intensive component.

MATH 3584H Honors Calculus IV: Advanced Placement (5.0 cr.; Student Option; prereq [2583 or 3583 or office approval] Advanced linear algebra, differential equations. Introduction to complex analysis.

MATH 3592H Honors Mathematics I (5.0 cr.; A-F Grade Basis; prereq %; for students with mathematical talent) First semester of three-semester sequence. Focuses on multivariable calculus at deeper level than regular calculus offerings. Rigorous introduction to sequences/series. Theoretical treatment of multivariable calculus. Strong introduction to linear algebra.

MATH 3593H Honors Mathematics II (5.0 cr.; A-F or Audit; prereq 3592H or #) Second semester of three-semester sequence. Focuses on multivariable calculus at deeper level than regular calculus offerings. Rigorous introduction to sequences/series. Theoretical treatment of multivariable calculus. Strong introduction to linear algebra.

MATH 4066 Theory of Interest (4.0 cr.; A-F Grade Basis; prereq 1272 or 1372 or 1572) Time value of money, compound interest and general annuities, loans, bonds, general cash flows, basic financial derivatives and their valuation. Primarily for students who are interested in actuarial mathematics.

MATH 4067W Actuarial Mathematics in Practice (3.0 cr.; A-F Grade Basis; prereq 4065, ACCT 2050, ECON 1101, ECON 1102) Real world actuarial problems that require integration of mathematical skills with knowledge from other disciplines such as economics, statistics, and finance. Communication and interpersonal skills are enhanced by teamwork/presentations to the practitioner actuaries who co-instruct.

MATH 4113 Topics in Elementary Mathematics I (4.0 cr.; Student Option; prereq [Grade of at least C- in 1031] or placement exam) Arithmetic/geometric sequences. Counting, building on techniques from college algebra. Graph Theory. Integers, rational numbers; emphasizes aspects related to prime factorization. Modular arithmetic with applications. Grading standard one-third higher than 3113.

MATH 4116 Topics in Elementary Math II: Short Course (2.0 cr.; A-F or Audit; prereq Grade of at least C- in 4113) Probability/Statistics, vector geometry, real/complex numbers. Meets during first half of semester only. Grading standard one-third higher than 3116.

MATH 4118 Topics in Elementary Mathematics II (4.0 cr.; Student Option; 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 4152 Elementary Mathematical Logic (3.0 cr.; Student Option; 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 4242 Applied Linear Algebra (4.0 cr.; Student Option; prereq 2243 or 2374 or 2573) Systems of linear equations, vector spaces, subspaces, bases, linear transformations, matrices, determinants, eigenvalues, canonical forms, quadratic forms, applications.

MATH 4281 Introduction to Modern Algebra (4.0 cr.; Student Option; 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 4428 Mathematical Modeling (4.0 cr.; Student Option; prereq 2243 or 2373 or 2573) Modeling techniques for analysis/decision-making in industry. Optimization (sensitivity analysis, Lagrange multipliers, linear programming). Dynamical modeling (steady-states, stability analysis, eigenvalue methods, phase portraits, simulation). Probabilistic methods (probability/statistical models, Markov chains, linear regression, simulation).

MATH 4512 Differential Equations with Applications (3.0 cr.; Student Option; prereq 2243 or 2373 or 2573) Laplace transforms, series solutions, systems, numerical methods, plane autonomous systems, stability.

MATH 4567 Applied Fourier Analysis (4.0 cr.; Student Option; prereq 2243 or 2373 or 2573) Fourier series, integral/transform. Convergence. Fourier series, transform in complex form. Solution of wave, heat, Laplace equations by separation of variables. Sturm-Liouville systems, finite Fourier, fast Fourier transform. Applications. Other topics as time permits.

MATH 4603 Advanced Calculus I (4.0 cr.; Student Option; prereq [[2243 or 2373; [2263 or 2374 or 2577]] 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 4604 Advanced Calculus II (4.0 cr.; Student Option; prereq 4603 or 5615 or #) Sequel to MATH 4603. Topology of n-dimensional Euclidean space. Rigorous treatment of multivariable differentiation and integration, including chain rule, Taylor's Theorem, implicit function theorem, Fubini's Theorem, change of variables, Stokes' Theorem.

MATH 4606 Advanced Calculus (4.0 cr.; Student Option; prereq [2263 or 2374 or 2573], [2283 or 2574 or 3283 or #]; Credit will not be granted if credit has been received for 5615]) 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 4653 Elementary Probability (4.0 cr.; Student Option; prereq [2263 or 2374 or 2573], [2283 or 2574 or 3283] recommended) Probability spaces, distributions of discrete/continuous random variables, conditioning. Basic theorems, calculation methodology.

Examples of random sequences. Emphasizes problem-solving.

MATH 4707 Introduction to Combinatorics and Graph Theory (4.0 cr.; Student Option; prereq 2243, [2283 or 3283]) Existence, enumeration, construction, algorithms, optimization. Pigeonhole principle, bijective combinatorics, inclusion-exclusion, recursions, graph modeling, isomorphism. Degree sequences and edge counting. Connectivity, Eulerian graphs, trees, Euler's formula, network flows, matching theory. Mathematical induction as proof technique.

MATH 4990 Topics in Mathematics (1.0-4.0 cr.; Student Option)

MATH 4991 Independent Study (1.0-4.0 cr.; Student Option)

MATH 4992 Directed Reading (1.0-4.0 cr.; Student Option) TBD

MATH 4993 Directed Study (1.0-4.0 cr.; Student Option) TBD

MATH 4995 Senior Project for CLA (1.0 cr.; A-F or Audit; 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 4997W Senior Project (Writing Intensive) (1.0 cr.; A-F or Audit; 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 (4.0 cr.; Student Option; 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 5068 Actuarial Mathematics II (4.0 cr.; Student Option; prereq 5067) Multiple decrement insurance, pension valuation. Expense analysis, gross premium, reserves. Problem of withdrawals. Regulatory reserving systems. Minimum cash values. Additional topics at instructor's discretion.

MATH 5075 Mathematics of Options, Futures, and Derivative Securities I (4.0 cr.; Student Option; 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 (4.0 cr.; A-F or Audit; 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.

**MATH 5165 Mathematical Logic I** (4.0 cr.; Student Option; prereq 2283 or 3283 or Phi 5201 or CSci course in theory of algorithms or #)

**MATH 5166 Mathematical Logic II** (4.0 cr.; Student Option; prereq 5165)

**MATH 5248 Cryptology and Number Theory** (4.0 cr.; Student Option)

**MATH 5251 Error-Correcting Codes, Finite Fields, Algebraic Curves** (4.0 cr.; Student Option; prereq 2 sems soph math)

**MATH 5258H Honors: Fundamental Structures of Algebra I** (4.0 cr.; Student Option; 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 5268H Honors: Fundamental Structures of Algebra II** (4.0 cr.; Student Option; prereq 5285)
Ring/module theory, including ideals, quotients, homomorphisms, domains (unique factorization, euclidean, principal ideal), fundamental theorem for finitely generated modules over euclidean domains, Jordan canonical form. Introduction to field theory, including finite fields, algebraic transcendental extensions.

**MATH 5335 Geometry I** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], & [2263 or & 2374 or & 2574])
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 5336 Geometry II** (4.0 cr.; Student Option; prereq 5335)
Projective geometry, including: relation to Euclidean geometry, finite geometries, fundamental theorem of projective geometry. N-dimensional Euclidean geometry from a vector viewpoint. Emphasizes N=3, including: polyhedral, spheres, isometries.

**MATH 5345H Honors: Introduction to Topology** (4.0 cr.; A-F Grade Basis; prereq [2263 or 2374 or 2573], [2283 or &2574 or &3283])
Rigorous introduction to general topology. Set theory. Euclidean/metric spaces, compactness/conectedness. May include Urysohn metrization, Tychonoff theorem or fundamental group/covering spaces.

**MATH 5376 Differential Geometry** (4.0 cr.; Student Option; prereq [2263 or 2374 or 2573], [2243 or 2573 or 2574]; [2283 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** (4.0 cr.; Student Option; prereq [2263 or 2374 or 2573], [2243 or 2573 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 5445 Mathematical Analysis of Biological Networks** (4.0 cr.; Student Option; prereq Linear algebra, differential equations) Development/analysis of models for complex biological networks. Examples taken from signal transduction networks, metabolic networks, gene control networks, and ecological networks.

**MATH 5447 Theoretical Neuroscience** (4.0 cr.; Student Option; prereq 2243 or 2373 or 2574)

**MATH 5467 Introduction to the Mathematics of Image and Data Analysis** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], [2283 or 2574 or 3283])
Contains background sections for students with proven achievement in theoretical or %; intended for mathematically-talented students with proven achievement in theoretical mathematics courses.

**MATH 5475 Introduction to Computational Algebraic Geometry** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], [2283 or 3283])
Rigorous introduction to general topology. Set theory. Euclidean/metric spaces, compactness/conectedness. May include Urysohn metrization, Tychonoff theorem or fundamental group/covering spaces.

**MATH 5525 Introduction to Ordinary Differential Equations** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], [2283 or 2574 or 2574])

**MATH 5553 Dynamical Systems and Chaos** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], [2283 or 2574 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** (4.0 cr.; Student Option; prereq 2 sems soph math [including [2263 or 2374 or 2573], [2283 or 3283]] recommended)

**MATH 5587 Elementary Partial Differential Equations I** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], [2263 or 2374 or 2574])
Emphasizes partial differential equations with physical applications, including heat, wave, Laplace's equations. Interpretations of boundary conditions. Characteristics, Fourier series, transforms, Green's functions, images, computational methods. Applications include wave propagation, diffusions, electrostatics, shocks.

**MATH 5588 Elementary Partial Differential Equations II** (4.0 cr.; A-F or Audit; prereq [2243 or 2373 or 2573], [2263 or 2374 or 2574], 5587 or #)

**MATH 5594H Honors Mathematics - Topics** (4.0 cr.; A-F or Audit; prereq [3593H 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** (4.0 cr.; Student Option; prereq [2243 or 2373 or 2573], [2283 or 3283])
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

MTHE 5355 Mathematics for Diverse Learners (3.0 cr.; Student Option; prereq Teaching license or student in elem ed or special ed 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 (3.0 cr.; Student Option)

Technology--including computers, programmable and graphing calculators, and video--as instructional tools in mathematics; design and evaluation of technology-based mathematics lessons; the effect of technology on the mathematics curriculum; managing the technology-enriched classroom.

MTHE 5596 Student Teaching in Mathematics (1.0-8.0 cr.; S-N Grading Basis; prereq MEd/initial licensure student or #)

Student teaching in secondary school mathematics classes.

MTHE 5993 Directed Studies in Mathematics Education (2.0 cr.; S-N or Audit; prereq Math ed MEd student, #)

Secondary school classroom teaching project to improve specific teaching skills, planned by student, approved/directed by student's adviser.

ME 1 Refresher Course for Mechanical Engineers (0.0 cr.; S-N or Audit)


ME 2011 Introduction to Engineering (4.0 cr.; A-F or Audit; prereq CSE 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 (2.0 cr.; A-F or Audit; 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 (1.0-4.0 cr.; Student Option; prereq %)

Specialized topics within various areas of mechanical engineering. Topics vary each semester.

ME 3221 Design and Manufacturing I: Engineering Materials and Manufacturing Processes (4.0 cr.; A-F or Audit; prereq 2011, AEM 3031, MatS 2001, ME upper div)


ME 3222 Design and Manufacturing II (4.0 cr.; A-F or Audit; prereq [3221 or &3221], [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 develop new machines that fulfill customer specifications.

ME 3281 System Dynamics and Control (4.0 cr.; A-F or Audit; prereq AEM 2021, [Math 2243 or Math 2373], ME upper div)

Dynamics of mechanical, electrical, thermal, fluid, and hybrid systems. System response using Laplace transform and numerical integration. Fourier transform and convolution. Transfer functions and frequency response. Introduction to classical control.

ME 3324 Introduction to Thermal Science (3.0 cr.; A-F or Audit; prereq Chem 1021, Math 2243, Phys 1301, [CSE student or COAFES pre-BAE major])


ME 3331 Thermal Sciences I (3.0 cr.; A-F Grade Basis; prereq Chem 1021, Phys 1301, CSE student)


ME 3332 Thermal Sciences II (3.0 cr.; A-F Grade Basis; prereq Math 2243, 3331, ME upper div)

Mass, momentum conservation principles. Fluid statics, Bernoulli equation. Control volume analysis, dimensional analysis, internal/external viscous flow. Momentum and energy considerations. Introduction to hydrodynamic and thermal boundary layers.

ME 3333 Thermal Sciences III (3.0 cr.; A-F Grade Basis; prereq 3332, ME upper div)


ME 4031W Basic Mechanical Measurements Laboratory (4.0 cr.; A-F or Audit; prereq IE 4521, upper div ME)

Experimental methods, statistical estimates of experimental uncertainty, calibration, signal conditioning, selected transducers for mechanical measurements, data acquisition/processing. Temperature, pressure, humidity, stress-strain, force, velocity, flow/radiative properties.

ME 4042 Industrial Assignment II (2.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F Grade Basis; 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.

ME 4044 Industrial Assignment III (2.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; prereq 3211, 3222, 3281, 3331, 3332, 3333, 4031W, AEM 2021, AEM 3031, EE 3005, ME upper div)

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 completed work at design show.

ME 4080 Topics in Mechanical Engineering (1.0-4.0 cr.; Student Option; prereq ME upper div)

Topics vary each semester.

ME 4081H Mechanical Engineering Honors Thesis I (2.0 cr.; A-F; Audit; 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 (2.0 cr.; A-F; Audit; 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 4090 Advanced Engineering Problems (1.0-4.0 cr.; Student Option; prereq ME upper div, #)

Independent research project with faculty 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 4131W Thermal Environmental Engineering Laboratory (4.0 cr.; A-F or Audit; prereq 3332, 3333, 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 (4.0 cr.; A-F or Audit; 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 4232 Fluid Power Control Lab (4.0 cr.; A-F or Audit; prereq 3281, 4031W, ME upper div)

ME 4233 Vibration Engineering Laboratory

ME 4331 Thermal Energy Engineering Laboratory
(4.0 cr.; A-F or Audit; prereq 3331, 3332, 3333, 4031W) (ME upper div or grad student) Measurement/analysis of heat transfer in single phase, multiphase, reacting environments. Experimental measurements relevant to thermal/fluid systems, statistical design of experiments/uncertainty analysis. Heat exchange.

ME 4431W Energy Conversion Systems Laboratory
(4.0 cr.; A-F or Audit; prereq 3333, 4031W) (ME upper div or grad student) Analyze operation/control of engines, power plants, heating/ventilation systems. Performance characteristics of devices, measurement techniques. Interpretation of experimental data. Presentation of results.

ME 5070 Topics in Mechanical Engineering
(1.0-4.0 cr.; Student Option; prereq CSE upper div or grad student) Specialized topics within areas of mechanical engineering. Emphasis on topics of current interest. Topics vary each semester.

ME 5101 Vapor Cycle Systems
(4.0 cr.; A-F or Audit; prereq CSE upper div or grad student) Vapor compression and absorption refrigeration systems; heat pumps; vapor power cycle analysis, regeneration, reheate, compound cycle modifications, combines gas turbine–vapor cycle systems.

ME 5103 Thermal Environmental Engineering
(4.0 cr.; A-F or Audit; prereq 3331 or 3332, 3333, CSE upper div or grad) 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
(4.0 cr.; A-F or Audit; prereq 5103, [CSE 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
(4.0 cr.; A-F or Audit; prereq CSE 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
(4.0 cr.; A-F or Audit; prereq CSE 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 gas and particulate emissions. Cyclones, electrostatic precipitators, wet and dry scrubbers, combustion modification.

ME 5116 Cleanroom Technology and Particle Monitoring
(4.0 cr.; A-F or Audit; prereq CSE upper div or grad student) Fundamentals of cleanroom technology for microelectronics manufacturing; airborne and liquid-borne particulate contaminants; particle monitors: optical and condensation particle counters, wafer surface scanner, microscopy; filter performance and testing; cleanroom design and operation; high purity systems; particle detection in processing equipment.

ME 5133 Aerosol Measurement Laboratory
(4.0 cr.; A-F or Audit; prereq CSE upper div or grad student) Principles of aerosol measurement. Single particle analysis by optical and electron microscopy. Aerosol samplers and inertial collectors. Integral mass concentration and number concentration detectors. Size distribution by laser particle counter and differential mobility particle sizer. Aerosol generation and instrument calibration.

ME 5211 Human Factors and Work Analysis
(4.0 cr.; A-F or Audit; prereq Upper division CSE or grad student) Human factors engineering (ergonomics), methods engineering, work measurement. Displays, controls, instrument layout. Supervisory control. Anthropometry, work physiology, biomechanics. Noise, illumination, toxicology. Operations analysis, motion study, time standards.

ME 5221 Computer-Assisted Product Realization

ME 5223 Materials in Design
(4.0 cr.; Student Option; prereq 3221, ME upper division or grad student) Fundamental properties of engineering materials. Fabrication, treatment. Physical/corrosive properties. Failure mechanism, cost/value analysis as related to material selection/specification.

ME 5228 Introduction to Finite Element Modeling, Analysis, and Design
(4.0 cr.; A-F or Audit; prereq CSE upper div or grad, 3221, AEM 3031, CSci 1113, MatS 2001) Finite elements as principal analysis tool in computer-aided design (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
(4.0 cr.; A-F or Audit; prereq 3222, CSci 1113 or equiv, CSE upper div or grad) 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
(4.0 cr.; A-F or Audit; prereq CSE 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 kinetoelastodynamic analysis and synthesis of mechanisms. Computerized design for function, path, and motion generation based on Burmeister theory.

ME 5247 Stress Analysis, Sensing, and Transducers

ME 5248 Vibration Engineering
(4.0 cr.; Student Option; prereq CSE 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 5281 Analog and Digital Control
(4.0 cr.; Student Option; prereq 3281) Continuous and discrete time feedback control systems. Frequency response, stability, poles and zeros; transient responses; Nyquist and Bode diagrams; root locus; lead-lag and PID compensators. Nichols-Ziogler design method. Digital implementation aliasing; computer-aided design and analysis of control system.

ME 5286 Robotics
(4.0 cr.; A-F or Audit; prereq [3281 or equiv] (upper div ME or AEM or CSci or grad student)) Manipulator forward/inverse kinematics, homogeneous transformations, coordinate frames, Jacobian/velocity control, task primitives/programming, computational issues. Determining path trajectories. Reaction forces, manipulator dynamics/control. Vehicle kinematics, dynamics, and guidance. Lab project demonstrates concepts.

ME 5312 Solar Thermal Technologies


ME 5348 Heat Transfer in Electronic Equipment (4.0 cr.; Student Option; prereq 3333 or 3324) Technology trends and packaging needs of microelectronic components. Thermal characteristics, heat transfer mechanisms, thermal failure modes of electronic/microelectronic equipment. Reliability prediction. Thermal stress/stain in layered structures and solder joints.

ME 5351 Computational Heat Transfer (4.0 cr.; A-F or Audit; prereq 3333, CSE upper div or grad student) Numerical solution of heat/conduction/analogue physical processes. Develop/use computer program to solve complex problems involving steady/unsteady heat conduction, flow/heat transfer in ducts, flow in porous media.

ME 5361 Plasma-Aided Manufacturing (4.0 cr.; A-F or Audit; prereq [3331, 3332, 3333] or equiv. CSE upper div or grad) Properties of plasmas as a processing medium, process control and system design considerations using specific examples of plasma spray coating, welding, and microelectronics processing.

ME 5381 Biological Transport Processes (4.0 cr.; A-F or Audit; prereq [3332, 3333] or CHEN 5103) or #, CSE upper div or grad student, transport course) Fluid, mass, and heat transport in biological systems. Mass transfer across membranes, fluid flow in capillaries, interstitium, veins and arteries. Biotransport issues in single cells and tissues, artificial organs, membrane oxygenators, and drug delivery applications.

ME 5446 Introduction to Combustion (4.0 cr.; A-F or Audit; prereq 3331, 3332, 3333, CSE upper div or grad student) Thermodynamics, kinetics, energy and mass transport, pollutants in reacting systems. Reactors, laminar and turbulent flames. Ignition, quenching, and flame stability. Diffusion flames. Combustion in reciprocating engines, furnaces, and turbines, with emphasis on internal combustion engine performance and emissions.

ME 5461 Internal Combustion Engines (4.0 cr.; A-F or Audit; prereq CSE upper div or grad student, C or better in [3332, 3333] 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/complementary labs.

ME 5462 Gas Turbines (4.0 cr.; A-F or Audit; prereq 3331, 3332, 3333, CSE upper div or grad student) Gas turbine cycles, regeneration, recuperation, reheating, intercooling, combined cycle plants, and thermochemical regeneration. Axial and radial flow compressors and turbines; combustor designs, energy analysis, emissions, and noise. Turbojet, fanjet, turboprop engine performance. Stationary power plants, vehicular propulsion, hybrid vehicles.

ME 5666 Modern Thermodynamics (4.0 cr.; A-F Basis; 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 5589 Medical Technology Evaluation and Market Research (2.0 cr.; A-F Grade Basis) Hands-on experience in creating a value proposition for new medical technologies. Leadership pathways in medical technology, insurance, and delivery industries. Personal input from industry leaders: United Health Group, Medtronic, and Mayo Clinic.

MILI 5990 The Healthcare Marketplace (3.0 cr.; A-F Grade Basis) Physician services, hospital services, insurance, long-term care, pharmaceuticals and medical devices, and information technology. Lectures, discussions, and presentations from healthcare business leaders.

MILI 5995 Medical Industry Valuation Laboratory (2.0 cr.; A-F Grade Basis; prereq #) Interdisciplinary student teams create rapid evaluation of actual cases in the medical device, pharmaceutical industry, and biotechnology areas. Hands-on experience in creating a value proposition for new medical technologies. Leadership pathways in medical technology, insurance, and delivery industries. Personal input from industry leaders: United Health Group, Medtronic, and Mayo Clinic.

MILI 5999 Independent Study (1.0-8.0 cr.; A-F Grade Basis) Independent study.

Medicinal Chemistry (MEDC)

College of Pharmacy

MEDC 5185 Principles of Biomolecular Simulation (3.0 cr.; Student Option; prereq Chem 3502 or #) Molecular simulation for students in medicinal chemistry, pharmaceutics, biochemistry, and chemical physics

MEDC 5202 Research and Development Process of Pharmaceutical Products (2.0 cr.; S-N or Audit) New drug development process in the U.S. pharmaceutical industry

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
Fall of Rome through end of Middle Ages (ca. 300-1500 A.D.). Topics specified in Class Schedule.

MEST 3993 Directed Studies in Medieval Studies (1.0-3.0 cr.; Student Option; prereq Previous work in a medieval studies discipline, #) Directed study with one of the core faculty members of Medieval Studies program.

MEST 4610 Intermediate Topics in Medieval Studies (3.0-4.0 cr.; Student Option) Topics between fall of Roman Empire and end of Middle Ages (ca. 300-1500 A.D.). Topics specified in Class Schedule.

MEST 5610 Advanced Topics in Medieval Studies (3.0-4.0 cr.; Student Option; prereq One yr work in some area of Middle Ages, reading knowledge of appropriate language, #) From late antiquity through end of Middle Ages (circa 300-1500 A.D.). Topics specified in Class Schedule.

MEST 5993 Directed Studies in Medieval Studies (1.0-3.0 cr.; Student Option; 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) College of Biological Sciences

MICE 5309 Biocatalysis and Biodegradation (3.0 cr.; Student Option; prereq chemistry through organic chemistry; knowledge of word processing, e-mail, access to World Wide Web, access to college-level science library recommended) Assessing validity of information on biocatalysis and biodegradation; fundamentals of microbial catalytic metabolism as it pertains to biodegradation of environmental pollutants; biocatalysis for specialty chemical synthesis; display of this information on the World Wide Web.

MICE 5355 Advanced Fermentation and Biocatalysis Laboratory (1.0 cr.; S-N Grading Basis; prereq [3301 or BIOL 3301], [grad student in microbial engineering or upper-div major in [microbiology or chem engineering or biochemistry]], #) Methods in industrial microbiology, lab, and pilot scale fermentation/biocatalysis engineering. Lab experiments carried out in fermentation pilot plant. Operation of bench/pilot scale bioreactors. Designing bioreactors. Process optimization, monitoring, and control. Scale-up experiments, data analysis.

Microbiology (MICB) Medical School

MICB 3301 Biology of Microorganisms (5.0 cr.; A-F or Audit; prereq [BIOL 1002 or BIOL 1009 or BIOL 2003], [CHEM 2301 or BIOC 2331]) Taxonomy, anatomy, physiology, biochemistry, pathogenesis, immunology, ecology of microbes. Molecular structure in relation to bacterial function/disease. Includes lab.

MICB 3303 Biology of Microorganisms (3.0 cr.; A-F Grade Basis; prereq [BIOL 1002 or BIOL 1009 or BIOL 2003], [CHEM 2301 or BIOC 2331])

Text continued...
University of Minnesota Twin Cities Undergraduate Catalog

Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that force contemporary Iranian society to world civilization. Works of Hedavi (especially Blind Owl), Chubak, Al-i Ahmad, Denezhvar, and Behrangy are analyzed/interpreted.

Military Science (MIL)
Undergraduate Education Administration

MIL 103 MS I Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq &1101) Army ROTC leadership and personal development lab.

MIL 104 MS I Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq &1102) Army ROTC leadership and personal development lab.

MIL 203 MS II Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq &1201) Army ROTC leadership and personal development lab.

MIL 204 MS II Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq &1202) Army ROTC leadership and personal development lab.

MIL 303 MS III Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3301) Army ROTC leadership and personal development lab.

MIL 304 MS III Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3302) Army ROTC leadership and personal development lab.

MIL 403 MS IV Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3401) Army ROTC leadership and personal development lab.

MIL 404 MS IV Zero Credit Lead Lab (0.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3402) Army ROTC leadership and personal development lab.

MIL 1003 Military Science I Leadership Lab (1.0 cr.; A-F Grade Basis; prereq &1201) Basic skills. Preview advanced course. Team-building leadership skills.

MIL 1005 Military Science III Leadership Lab (1.0 cr.; Student Option; 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 1007 Military Science IV Leadership Lab (1.0 cr.; Student Option; 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 1010 Leadership and Personal Development (1.0 cr.; A-F Grade Basis) Introduces cadets to the personal challenges and competencies that are critical for effective leadership. Cadets learn how the personal development of life skills such as critical thinking, goal setting, time management, physical fitness, and stress management relate to leadership, officership, and the Army profession.

MIL 1102 Introduction to Tactical Leadership (1.0 cr.; A-F Grade Basis) Leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Cadets explore dimensions of leadership attributes and core leader competencies in the context of practical, hands-on, and interactive exercises.

MIL 1104 MS I One Credit Lead Lab (1.0 cr.; A-F Grade Basis; prereq &1102) Army ROTC leadership and personal development lab.

MIL 1201 Innovative Team Leadership (2.0 cr.; A-F Grade Basis; prereq &lab) 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 (2.0 cr.; A-F Grade Basis; 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 (1.0 cr.; A-F Grade Basis; prereq &1201) Army ROTC leadership and personal development lab.

MIL 1204 MS II One Credit Lead Lab (1.0 cr.; A-F Grade Basis; prereq &1202) Army ROTC leadership and personal development lab.

MIL 3301 Adaptive Tactical Leadership (3.0 cr.; A-F Grade Basis; prereq Two yrs of ROTC or equiv established by U.S. Army, must see Army ROTC dept officials, &lab) Challenges cadets to study, practice, and evaluate adaptive leadership skills as they are presented with challenging scenarios related to squad tactical operations. Cadets receive systematic and specific feedback on their leadership attributes and actions. Based on such feedback, as well as their own self-evaluations, cadets continue to develop their leadership and critical thinking abilities.

MIL 3302 Applied Team Leadership (3.0 cr.; A-F Grade Basis; prereq Two yrs of ROTC or equiv established by U.S. Army, must see Army ROTC dept officials, &lab) Uses increasingly intense situations applying team leadership challenges to build cadet awareness and skills in leading tactical operations at the small unit level. Cadets receive systematic and specific feedback on their leadership attributes and actions. Based on such feedback, as well as their own self-evaluations, cadets continue to develop their leadership and critical thinking abilities.

MIL 3303 MS III One Credit Lead Lab (1.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3301) Army ROTC leadership and personal development lab.

MIL 3304 MS III One Credit Lead Lab (1.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3302) Army ROTC leadership and personal development lab.

MIL 3401 Developing Adaptive Leaders (3.0 cr.; A-F Grade Basis; prereq Completed all other military courses or Army equiv, &lab) Cadets learn duties and responsibilities of an Army staff officer and apply the military decision making process, Army writing style, and the Army MQY/14s principles of training and training management cycle during weekly training meetings to plan, execute, and assess battalion training events. Cadets learn about the special trust proposed by the U.S. Constitution to Army officers--a trust above and beyond other professions.

MIL 3402 Leadership in a Complex World (3.0 cr.; A-F Grade Basis; prereq Completion of all other military courses or Army equiv, &lab) Explores dynamics of leading in complex situations of current military operations in the contemporary operation environment (COE). Cadets examine differences in customs and courtesies, principles of war, and rules of engagement in the face of international terrorism and aspects of interacting with non-government organizations, civilians on the battlefield, and host nation support.

MIL 3403 MS IV One Credit Lead Lab (1.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3401) Army ROTC leadership and personal development lab.

MIL 3404 MS IV One Credit Lead Lab (1.0 cr.; A-F Grade Basis; prereq Completion of basic courses, &3402) Army ROTC leadership and personal development lab.

MIL 3501 Marksmanship Training Programs (2.0 cr.; A-F Grade Basis) Uses a laser-simulated Army rifle to train on how to fire weapons accurately. Students learn how to operate the computer-based simulation system as well as practical exercises of firing at targets on a video screen.

MIL 3502 Marksmanship Training Programs (2.0 cr.; A-F Grade Basis) Basic rifle marksmanship skills. Students instruct/train other students.

MIL 3970 Military History (3.0 cr.; A-F Grade Basis) General overview of all wars fought by United States from the 18th century Revolutionary War to today’s War on Terror. Military tactics as well as war’s impact on society. Two exams, two papers to write, readings.

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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 (1.0 cr.; A-F Grade Basis; 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 (1.0 cr.; A-F Grade Basis; prereq [3171 or 3171], 3061, mortuary science major) Practices/procedures of chemically preserving/restoring human remains.

MORT 3171 Human Anatomy Laboratory (2.0 cr.; A-F or Audit; prereq 4 cr of biology, 3 cr of human anatomy) Study of gross human anatomy using cadavers. Anatomical structures, post-mortem examination, embalming, pathology, restorative art, forensic science.

MORT 3370 Death and Dying Across Cultures and Religions (3.0 cr.; A-F Grade Basis) How people of differing racial, ethnic, and cultural backgrounds understand meaning of death. How disposition of human remains occurs.

MORT 3379 Clinical Funeral Service Rotation (1.0-4.0 cr.; S-N or Audit; prereq 3021W, 3051, 3061, 3151, 3161, 3171, 3370, mortuary science major) Practical experience working in clinical settings related to funeral service. What it means to be a funeral director in contemporary American society.

MORT 3380 Funeral Service Practicum (8.0 cr.; S-N or Audit; prereq Mortuary science major who has completed all other coursework) Practical experience during one academic term in a funeral home as assigned by the program.

Moving Image Studies (MIMS) College of Liberal Arts

MIMS 5002 Advanced Film Analysis (0.0-4.0 cr.; A-F Grade Basis; prereq Grad student status) 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.

MIMS 5910 Topics in Moving Image Studies (2.0-4.0 cr.; A-F Grade Basis) Special topics in moving image studies.

Multidisciplinary Studies (MDS) College of Continuing Education

MDS 3001W Introduction to Multidisciplinary Studies (3.0 cr.; A-F Grade Basis; prereq Admitted to multidisciplinary studies) University study at a major research institution, its history/theory and expectations/outcomes. Students design their degree and select areas/courses. Institutional/student perspectives.

MDS 3093 Directed Study (1.0-15.0 cr.; Student Option; prereq #) Independent, directed study.

MDS 3101 Project Development (1.0 cr.; A-F Grade Basis; prereq 3001W, MdS major, adviser referral, permission number, basic computer/internet skills) Development, completion, approval of MdS project proposal. Steps/techniques of academic project design/development including academic research/writing. Library data base searching methods/citation styles.

MDS 3201 Project Registration 1 (3.0 cr.; Student Option No Audit; prereq 3001W, MdS major, C- or above in 3101, approved project proposal, permission number, basic computer and internet skills) Complete project developed in MdS 3101 by conducting research, accomplishing project outcome(s), securing narrative evaluation from project adviser/evaluator.

MDS 3202 Project Registration 2 (3.0 cr.; Student Option No Audit; prereq 3001W, MdS major status, C- or above in 3101, approved project proposal, permission number, basic computer/internet skills) Complete project developed in MdS 3101 by conducting research, accomplishing project outcome(s), securing narrative evaluation from project adviser/evaluator.

MDS 3203 Project Registration 3 (3.0 cr.; Student Option No Audit; prereq 3001W, MdS major, C- or above in 3101, approved project proposal, permission number, basic computer/internet skills) Complete project developed in MdS 3101 by conducting research, accomplishing project outcome(s), securing narrative evaluation from project adviser/evaluator.

Museum Studies (MST) College of Design

MST 5011 Museum History and Philosophy (3.0 cr.; A-F or Audit; prereq #) Historical and philosophical roots of museum development in Europe and North America from the Renaissance to modern day museums and history centers. Emerging philosophical issues faced by museums today.

MST 5012 Museum Practices (3.0 cr.; A-F or Audit; prereq 5011 or #) Practical aspects of museum work. Standards, practices, responsibilities, and issues, all set in greater museum context. Curatorial and educational duties, collections management, security, funding, boards, public relations, installation, and budgeting.

MST 5020 Internship (1.0-6.0 cr.; S-N or Audit; prereq 5011, 5012, %) Students arrange to perform a professional-level task in a museum of good standing under close supervision of a member of the museum's professional staff. Instructor must approve a work plan and report.

Music (MUS) College of Liberal Arts

MUS 440 Chamber Ensemble Registration (0.0 cr.; No Grade Associated) Registration mechanism for chamber ensembles.

MUS 901 Junior Recital (0.0 cr.; A-F or Audit; prereq Music major, & applied music, #, %) Preparation for senior recital. Student will be supervised by major applied instructor.

MUS 951 Senior Recital (0.0 cr.; A-F or Audit; prereq Music major, & applied music, #, %) Preparation for senior recital. Student will be supervised by major applied instructor.

MUS 1001 Fundamentals of Music (3.0 cr.; Student Option; prereq For non-music majors) Study of music notation and fundamental concepts underlying musical structure. Intervals, clefs, chords, scales, cadences, harmonic analysis; rhythm and meter. Emphasis on active participation: playing the piano, singing, clapping rhythms, aural perception. Weekly lab assignments in vocal and piano performance.


MUS 1013 Rock I: The Historical Origins and Development of Rock Music to 1970 (3.0 cr.; A-F or Audit) Musical, cultural, historical, social, and political evolution of rock music, from its traceable antecedents in mid-19th century America through the early 1970s. Emphasizes manner in which African, European, and other ethnic traditions combined in a uniquely American manner.


MUS 1021 Introduction to Music (3.0 cr.; Student Option) Survey of European/American "art," "popular" music in context of those cultures. Aural analyses of musical styles/forms.

MUS 1051 Class Piano for Nonmusic Majors I (2.0 cr.; Student Option No Audit) 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 (2.0 cr.; Student Option No Audit) 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 (2.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; prereq #) Functional skills such as reading, transposing, harmonizing, improvising, and playing by ear. Keyboard theory, technique, and repertoire.

MUS 1155 Keyboard Skills I (2.0 cr.; A-F or Audit; prereq Keyboard major or music major with extensive keyboard background or #) Reading, transposing, harmonizing, improvising, playing by ear. Keyboard theory, technique, music learning skills.

MUS 1260 Voice Class (2.0 cr.; Student Option; prereq Basic musicianship for learning and performing simple songs) The fundamentals of speech and singing including 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 (2.0 cr.; A-F or Audit) Fundamentals for the beginning guitarist; progressive development of skills. Basic strumming techniques, harmonizations in basic keys. Students must furnish acoustic guitar.

MUS 1472 Guitar: Class Lessons II (2.0 cr.; A-F or Audit; prereq 1471I or #) Fundamentals for the beginning guitarist; progressive development of skills. Advanced strumming techniques, bass runs, finger-picking strums. Students must furnish acoustic guitar.

MUS 1501 Theory and Analysis of Tonal Music I (2.0 cr.; A-F or Audit; prereq %) Common-practice tonal harmony, part-writing, music analysis in various contexts.

MUS 1502 Theory and Analysis of Tonal Music II (2.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; prereq %) Ear-training, sight-singing of tonal music.

MUS 1512 Ear-Training and Sight-Singing II (1.0 cr.; A-F or Audit; prereq [[1501, 1511] with grade of at least C-] or diagnostic exam administered by School of Music) [music major or #]

MUS 1801W Music, Society, and Cultures (3.0 cr.; A-F orAudit; 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 (3.0 cr.; Student Option) 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 (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

MUS 1904 Freshman Seminar (3.0 cr.; A-F Grade Basis) Topics vary.

MUS 1905 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

MUS 1907W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

MUS 1908W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

MUS 1910W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

MUS 3021 Introduction to Music (3.0 cr.; Student Option) Survey of European and American art and popular music in the context of those cultures; aural analyses of musical styles and forms.

MUS 3029 American Music Cultures (3.0 cr.; Student Option) Explore folk, country, gospel, blues, polka, klezmer, powwow, mariachi, and salsa to understand the ways in which ethnic identities coalesce and find expression in sound. Music cultures of nationally prominent European-, African-, Asian-, and Latin-American ethnic groups, and local communities in the Twin Cities metropolitan area.


MUS 3200 Campus Singers (2.0 cr.; Student Option) Campus Singers is a non-auditioned ensemble and open to all members of the University community, including students, faculty, staff, and alumni. The Campus Singers sing diverse repertoire from various periods/cultures.

MUS 3230 Chorus (1.0-2.0 cr.; Student Option; prereq Choral and/or instrumental music background, audition, #) Includes the University Women's Chorus, Men's Chorus, Concert Choir, and Choral Union. Chorios 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 and community performances.

MUS 3241 Vocal Literature (German Lieder) and Pedagogy (1.0 cr.; A-F or Audit; 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 speaking/singing. Vocal anatomy/physiology, process/methods/techniques, care. Listening assignments.

MUS 3242 Vocal Literature (French Melodie) and Pedagogy (1.0 cr.; A-F or Audit; prereq [Vocal music or accompanying major]; 2 yrs of music theory/history) French Mélodie: 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 (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; prereq Voice or choral music major, concurrent enrollment in applied voice) Principles and practice of French lyric diction for classical vocal music. Transcriptions of French mélodie 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 3331 Jazz Improvisation I (2.0 cr.; A-F or Audit; 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 3340 Jazz Ensemble (1.0 cr.; A-F or Audit; prereq Audition, #) A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.

MUS 3350 Jazz Combo (1.0 cr.; A-F or Audit; 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 3380 Gospel Choir (2.0 cr.; A-F Grade Basis) Performance ensemble. Students explore history of gospel music through experiential/
MUS 3400 University and Campus Bands (2.0 cr.; Student Option) Lab course.

MUS 3401 Basic Conducting (2.0 cr.; A-F or Audit; prereq 1502, music major)
Beginning course in basic conducting techniques and role of the conductor.

MUS 3410 University Wind Bands (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; 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 (2.0 cr.; Student Option; 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/performed.

MUS 3440 Chamber Ensemble (1.0 cr.; A-F or Audit; prereq #)
Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and voices.

MUS 3480 Marching Band (2.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; prereq #)
Athletics bands for men's hockey, men's basketball, and men's soccer. Repertoire of jazz idioms at elementary and intermediate levels.

MUS 3501 Theory and Analysis of Tonal Music III (2.0 cr.; A-F or Audit; prereq [[1501, 1502, 1511, 1512] with grade of at least C-])
Harmony and voice-leading. Diatonic and basic chromatic chords. Analysis of music from 18th/19th centuries.

MUS 3502 Theory and Analysis of Tonal Music IV (2.0 cr.; A-F or Audit; prereq [[3501, 3511] with grade of at least C-])
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 3508 Review of Tonal Theory (2.0 cr.; Student Option; prereq Theory placement exam)
Fast-paced review of 1501, 1502, and 3501. Focuses on diatonic and basic chromatic procedures, part-writing, and analysis.

MUS 3509 Review of Tonal Theory IV (2.0 cr.; Student Option; prereq Grad music student or #)

MUS 3511 Ear-Training and Sight-Singing III (1.0 cr.; A-F or Audit; prereq [[1501, 1511] with grade of at least C-] or diagnostic test administered by School of Music, [music major or #])

MUS 3512 Ear-Training and Sight-Singing IV (1.0 cr.; A-F or Audit; prereq [[3501, 3511] with grade of at least C-] or diagnostic test administered by School of Music, [music major or #])

MUS 3518 Review of Ear-Training and Sight-Singing (1.0 cr.; Student Option; prereq Theory Placement Exam)

MUS 3519 Review of Ear-Training and Sight-Singing (1.0 cr.; Student Option; prereq Grad student in music or #)

MUS 3511W History of Western Music I (3.0 cr.; A-F or Audit; prereq %)
History of European art-music tradition, its social contexts from antiquity to 1700: composers, styles, structures, social institutions.

MUS 3501W History of Western Music III (3.0 cr.; A-F or Audit; prereq %)
History of European art-music tradition, its social contexts from antiquity to 1700: composers, styles, structures, social institutions.

MUS 3601W History of Western Music I (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (1.0-3.0 cr.; Student Option)
Each offering focuses on a single topic. Topics specified in Class Schedule.

MUS 3950H Topics in Music: Honors (1.0-3.0 cr.; Student Option; prereq Honors)
Focuses on a single topic. Topics specified in Class Schedule.

MUS 3993 Directed Studies (1.0-4.0 cr.; A-F or Audit; prereq #, %, @)
Guided individual reading or study.

MUS 3995 Major Project (1.0 cr.; A-F or Audit; 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 4502 18th-Century Counterpoint (3.0 cr.; A-F or Audit; prereq [[3501, 3508] or pass basic skills exam)

MUS 4504 Intensive Theory and Analysis of 20th-Century Music (2.0 cr.; A-F or Audit; prereq [3502, 3512] or #)
Theory/analysis of art music in various styles developed in 20th century.

MUS 4505 Jazz Theory (3.0 cr.; A-F or Audit; prereq [3501, 3511] with grades of at least C-)
Beginning through advanced techniques for chord construction. Extended chords. Nomenclature in jazz idiom.

MUS 4514 Ear-Training and Sight-Singing for 20th-Century Music (1.0 cr.; A-F or Audit; prereq Completion of [3502, 3512] with grade of at least C-)
Developing aural skills relevant to 20th-century Western art music. Focuses on pitch relations, rhythm, techniques and form, and to a lesser degree, timbre and texture.

MUS 4590 Topics in Music (1.0-3.0 cr.; Student Option)
Each offering focuses on a single topic. Topics specified in Class Schedule.

MUS 5101 Piano Pedagogy I (2.0 cr.; Student Option; 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 5102 Piano Pedagogy II (2.0 cr.; Student Option; 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 5150 Body Awareness in Activity: The Alexander Technique for Musicians (2.0 cr.; Student Option)
Alexander technique with specific applications to music performance. Emphasis on body/mind awareness to promote technical ease and freedom.

MUS 5151 Organ Literature I (3.0 cr.; A-F or Audit; 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 5152 Organ Literature II (3.0 cr.; A-F or Audit; prereq 3502, 3603, sr or grad or #)
Organ literature of J. S. Bach and of other 19th- and 20th-century composers. Influence
of organ design of various periods and national schools on the literature and its performance.

MUS 5160 Instrumental Accompanying Skills and Repertoire (2.0 cr.; A-F or Audit; prereq Accompanying)
Performance class in accompanying skills particular to orchestral reductions and non-senata instrumental accompanying. Repertoire to include, but not be limited to, classical and romantic string concerti, and "encore" pieces.

MUS 5181 Advanced Piano Literature I (2.0 cr.; A-F or Audit; prereq grad piano major or #)
Literature for piano from late Baroque period to mid-20th century.

MUS 5182 Advanced Piano Literature II (2.0 cr.; A-F or Audit; prereq grad piano major or #)
Literature for piano from late Baroque period to mid-20th century.

MUS 5230 Chorus (1.0-2.0 cr.; Student Option; 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 and community performances.

MUS 5240 University Singers (1.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq [12 cr in MusA 1104 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 5250 Opera Workshop and Ensemble (2.0 cr.; A-F or Audit; prereq audition, #)
Preparation and performance of operatic arias, choruses, and scenes. Participation in fully staged or workshop productions of music theatre repertoire.

MUS 5271 Diction for Singers I (2.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; 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 5280 Opera Theatre (2.0 cr.; A-F or Audit; prereq audition, #)

MUS 5331 Jazz Improvisation I (2.0 cr.; A-F or Audit; 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. Each term.

MUS 5333 Post-tonal Theory and Analysis II (3.0 cr.; A-F Grade Basis; prereq [4504 with a C- or better] or equiv diagnostic test)
Art music composed since 1945. Develop skills in analyzing and interpreting this literature.

MUS 5336 Jazz Arranging (3.0 cr.; A-F or Audit; prereq 3502 or #)
Beginning techniques of arranging for jazz combo and jazz ensemble; vocal and instrumental.

MUS 5410 University Wind Bands (1.0 cr.; A-F or Audit; prereq audition, #)
A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.

MUS 5380 Gospel Choir (1.0 cr.; A-F Grade Basis)

MUS 5400 University and Campus Bands (1.0 cr.; Student Option)
Lab course.

MUS 5410 University Wind Bands (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; prereq audition, #)
Symphony orchestra performs standard repertory and major works with chorus; concerts and tour appearances. Players from all colleges may participate.

MUS 5421 Suzuki Violin Pedagogy I (2.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; prereq [5424 or & 5425], grad music student) or #, grad consent)
Supervised teaching of both individual and group lessons. Instructor provides periodic critiques from observation of live or videotaped lessons.

MUS 5424 Advanced Suzuki Violin Pedagogy I (2.0 cr.; A-F or Audit; prereq 5422 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 5425 Advanced Suzuki Violin Pedagogy II (2.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; prereq audition, #)
Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and/or voices.

MUS 5450 Orchestral Repertoire (1.0-3.0 cr.; A-F or Audit; prereq #)
Investigation of practical and performance problems in standard orchestral repertoire with regard to style and interpretation.

MUS 5460 World Music Ensemble: Afro-Brazilian Carnaval (1.0-2.0 cr.; Student Option)
Afro-Brazilian popular repertories, especially samba, tropicalia/MPB, and bossa nova. Planned master classes/clinics with local artists complement regularly scheduled rehearsals/performances. No audition required.

MUS 5461 Guitar Literature I: History and Repertoire before 1900 (2.0 cr.; Student Option)
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 (2.0 cr.; Student Option)
Repertoire/composers, concert/recording artists, and instrumental innovation of Segovia/post-Segovia eras.
University of Minnesota Twin Cities Undergraduate Catalog

MUS 5464 Cello Pedagogy (2.0 cr.; A-F or Audit)
Concentrated study of cello teaching methods. Provides students with the strategies for teaching cello privately, develops analytical skills, and increases knowledge of cello repertoire. For practical application in conjunction with string technique course.

MUS 5471 Woodwind Literature and Pedagogy I (2.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; 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 5480 University Brass Choir (1.0 cr.; Student Option; prereq audition; #)
The University Brass Choir is an ensemble of 16 brass and percussion players exploring unique literature that spans 400 years. From the rich antiphonal music of Giovanni Gabrieli (1557-1612) to the works of the 20th century. The Brass Choir performs in Twin Cities churches and concert halls.

MUS 5481 Trumpet Pedagogy (2.0 cr.; Student Option; prereq Sr or grad in music or #)
Principles of trumpet pedagogy. Discussion of literature, history, and current teaching aids.

MUS 5485 Transcription for Winds (2.0 cr.; Student Option; 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 5490 Percussion Ensemble (1.0 cr.; A-F or Audit; prereq #)
Practice and performance of standard and contemporary compositions for percussion instruments in various combinations.

MUS 5491 Percussion Literature I (2.0 cr.; A-F or Audit; 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 5492 Percussion Literature II (2.0 cr.; A-F or Audit; 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 5533 Music Since 1945 (3.0 cr.; A-F Grade Basis; prereq 4504, #)
Art music composed since 1945. Skills in analyzing and interpreting this literature.

MUS 5541 16th-Century Counterpoint (3.0 cr.; A-F or Audit; prereq [3501, 3508] or pass basic skills exam)
Polyphonic counterpoint in modal style of Renaissance. Writing exercises in species counterpoint and in two, three, and four parts. Cantus firmus techniques, mixed values, invertible counterpoint, canon. Representative works by Josquin, Lassus, Palestrina, Victoria, and others. Renaissance treatises by Artusi, Banchieri, Diruta, Morley, Zarlino, and others.

MUS 5550 Class Composition (2.0 cr.; A-F or Audit; prereq [4504, 4514] [with C- or better] or #)
Original works in various forms. Development of individual compositional style in a post-tonal idiom. Various forms, performing forces, techniques.

MUS 5551 Orchestration I (3.0 cr.; A-F or Audit; 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 5552 Orchestration II (3.0 cr.; A-F or Audit; prereq 5551)
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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq 3502 or Theory IV Exam or #; [4504 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 chromatic harmony, form, and orchestration.

MUS 5574 Wagner’s Ring: Conception, Coherence, Consequence (3.0 cr.; A-F Grade Basis; prereq 3502 or equiv)
Enrich process of listening to Wagner’s Ring by providing analytic insight into Wagner’s compositional technique and the dramatic, tonal, and motivic structure of the work. Analytic approach broadened with a number of interdisciplinary forays.

MUS 5576 Baroque Music and Its Contexts (3.0 cr.; A-F Grade Basis; prereq Grad student or #)
A study of selected music traditions from 5 to 7 world cultures. Genres, social institutions, concepts, styles, instruments, and usages.

MUS 5590 Topics in Music (1.0-4.0 cr.; Student Option)
Guided individual reading or study.

MUS 5615 Grad Student Recital (2.0-4.0 cr.; A-F or Audit; prereq %)
Organized recital presented by graduate music students.

MUS 5621 Baroque Music and Its Contexts (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; prereq 3603 or equiv, 5501 or equiv, 12 undergrad 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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, etc.)

MUS 5804 Folk and Traditional Musics: Selected Cultures of the World (3.0 cr.; A-F or Audit; prereq 1801 or 1804 or music grad or #)
A study of selected music traditions from 5 to 7 world cultures. Genres, social institutions, concepts, styles, instruments, and usages.

MUS 5950 Topics in Music (1.0-4.0 cr.; Student Option)
Each offering focuses on a single topic. Topics specified in Class Schedule.

MUS 5993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #, %)
Guided individual reading or study.

Music Applied (MUSA)
College of Liberal Arts

MUSA 1101 Piano: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1102 Harpsichord: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1103 Organ: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1104 Voice: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1105 Violin: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1106 Flute: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1107 Cello: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1108 Double Bass: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1109 Flute: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1111 Oboe: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1112 Clarinet: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1113 Saxophone: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1114 Bassoon: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1115 French Horn: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1116 Trumpet: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1117 Trombone: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1118 Euphonium: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1119 Tuba: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.

MUSA 1201 Piano: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1203 Organ: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1204 Voice: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1205 Violin: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1206 Viola: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1207 Cello: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1208 Double Bass: Music Education and BA (2.0 cr.; A-F Grade Basis)
Private instruction.

MUSA 1209 Flute: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1211 Oboe: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1212 Clarinet: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1213 Saxophone: Music Ed and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1214 Bassoon: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1215 French Horn: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1216 Trumpet: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1217 Trombone: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1218 Euphonium: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1219 Tuba: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1220 Piano: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1221 Percussion: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1222 Harp: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1223 Guitar: Music Education and BA (2.0 cr.; A-F Grade Basis; prereq [Music education or BA applied] major, %)
Private instruction.

MUSA 1306 Viola: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1307 Cello: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1308 Double Bass: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1309 Flute: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1311 Oboe: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1312 Clarinet: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1313 Saxophone: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1314 Bassoon: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1315 French Horn: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1316 Trumpet: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1317 Trombone: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1318 Euphonium: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1319 Tuba: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1321 Percussion: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1322 Harp: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1323 Guitar: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.

MUSA 1401 Piano: Music Major Secondary (undergraduate) (2.0-4.0 cr.; A-F or Audit; prereq Music Major, %)
Private instruction.

MUSA 1402 Harpsichord: Music Major Secondary (undergraduate) (2.0-4.0 cr.; A-F or Audit; prereq Music Major, %)
Private instruction.

MUSA 1403 Organ: Music Major Secondary (undergraduate) (2.0-4.0 cr.; A-F or Audit; prereq Music Major, %)
Private instruction.

MUSA 1404 Voice: Music Major Secondary (undergraduate) (2.0-4.0 cr.; A-F or Audit; prereq Music Major, %)
Private instruction.
<table>
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<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Grade Basis</th>
<th>Prerequisites</th>
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<tr>
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<td>Cello: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
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<td>MUSA 1408</td>
<td>Double Bass: Music Major Secondary</td>
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<td>MUSA 1409</td>
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<td>Private instruction.</td>
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<td>MUSA 1411</td>
<td>Oboe: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
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<td>MUSA 1412</td>
<td>Clarinet: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
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<td>MUSA 1413</td>
<td>Saxophone: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
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<td>MUSA 1414</td>
<td>Bassoon: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1415</td>
<td>French Horn: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1416</td>
<td>Trumpet: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1417</td>
<td>Trombone: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1418</td>
<td>Euphonium: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1419</td>
<td>Tuba: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1421</td>
<td>Percussion: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1422</td>
<td>Guitar: Music Major Secondary</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1901</td>
<td>Piano: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1902</td>
<td>Harpsichord: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1903</td>
<td>Organ: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1904</td>
<td>Voice: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1905</td>
<td>Violin: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1906</td>
<td>Viola: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1907</td>
<td>Cello: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1911</td>
<td>Clarinet: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1912</td>
<td>Saxophone: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1913</td>
<td>Bassoon: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1914</td>
<td>Trombone: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1915</td>
<td>Euphonium: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1916</td>
<td>Harpsichord: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1917</td>
<td>Trumpet: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1918</td>
<td>Organ: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1919</td>
<td>Piano: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1920</td>
<td>Harp: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1921</td>
<td>Percussion: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1922</td>
<td>Harpsichord: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 1923</td>
<td>Guitar: Music Major Transfer</td>
<td>2.0-4.0</td>
<td>A-F or Audit</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2201</td>
<td>Piano: Music Ed and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2203</td>
<td>Piano: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2204</td>
<td>Voice: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2205</td>
<td>Violin: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2206</td>
<td>Viola: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2207</td>
<td>Cello: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2208</td>
<td>Bass: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2209</td>
<td>Flute: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2211</td>
<td>Oboe: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2212</td>
<td>Clarinet: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2213</td>
<td>Saxophone: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2214</td>
<td>Bassoon: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2215</td>
<td>French Horn: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2216</td>
<td>Trumpet: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2217</td>
<td>Trombone: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2218</td>
<td>Euphonium: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2219</td>
<td>Tuba: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2221</td>
<td>Percussion: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2222</td>
<td>Harp: Music Education and BA</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2301</td>
<td>Piano: Music Major</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
<tr>
<td>MUSA 2302</td>
<td>Harpsichord: Music Major</td>
<td>2.0</td>
<td>A-F Grade Basis</td>
<td>Private instruction.</td>
</tr>
</tbody>
</table>
MUSA 2303 Organ: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2304 Voice: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2305 Violin: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2306 Viola: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2307 Cello: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2308 Double Bass: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2309 Flute: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2310 Oboe: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2311 Bassoon: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2312 Clarinet: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2313 Saxophone: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2314 Trombone: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2315 French Horn: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2316 Trumpet: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2317 Trombone: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2318 Euphonium: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2319 Tuba: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2320 Harp: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2321 Percussion: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2322 Harp: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 2323 Guitar: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %)
Private instruction.
MUSA 3101 Piano: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.
MUSA 3102 Harpsichord: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.
MUSA 3103 Organ: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.
MUSA 3104 Voice: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.
MUSA 3105 Violin: Elective (non-major in music) (2.0-4.0 cr.; A-F or Audit; prereq %)
Private instruction.
MUSA 3316 Trumpet: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 3317 Trombone: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 3318 Euphonium: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 3319 Tuba: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 3321 Percussion: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 3322 Harp: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 3323 Guitar: Music Major (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5101 Piano: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5102 Harpsichord: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5103 Organ: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5104 Voice: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5105 Violin: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5106 Viola: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5107 Cello: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5108 Double Bass: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5109 Flute: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5110 Oboe: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5111 Clarinet: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5112 Saxophone: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5114 Bassoon: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5115 French Horn: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5116 Trumpet: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5117 Trombone: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5118 Euphonium: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5119 Tuba: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5121 Percussion: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5123 Guitar: Elective (graduate non-major in music) (2.0 cr.; A-F or Audit; prereq %) Private instruction.
MUSA 5401 Piano: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5402 Harpsichord: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5403 Organ: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5404 Voice: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5405 Violin: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5406 Viola: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5407 Cello: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5408 Double Bass: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5409 Flute: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5410 Oboe: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5412 Clarinet: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5413 Saxophone: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5414 Bassoon: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5415 French Horn: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5417 Trombone: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5418 Baritone: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5419 Tuba: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5421 Percussion: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUSA 5423 Guitar: Music Major Secondary (graduate) (2.0-4.0 cr.; A-F or Audit; prereq Audition, %) Private instruction.
MUED 3301 Music in Childhood (3.0 cr.; Student Option) Learning each child's interests, needs, and abilities. Integrate music with other classroom subjects. Written/oral discussions, music making, micro-teaching, lesson presentations. Taught from arts perspective.
MUED 3101 Improvisation and Creativity in the Music Classroom (2.0 cr.; A-F Grade Basis; prerequisites: MUS 3502, music education major) Emphasizes music-theoretical/sociocultural modes of understanding. Creative practices characteristic of various Western/non-Western forms, including jazz and Minnesota American Indian music. Hybrid workshop format.
MUED 3303 General Music I (3.0 cr.; A-F or Audit; prereq MUS 3502, MUS 3512, Indian music. Hybrid workshop format. 214
MUED 3302 General Music II (3.0 cr.; A-F or Audit; prereq 3301 with a 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, guitar instruction, applications of technology. Peer/field teaching.

MUED 3415 Choral Conducting and Methods I (3.0 cr.; A-F Grade Basis; prereq MUS 3502, MUS 3512, [music education major or #], successful completion of soph proficiency exam) Choral conducting skills, rehearsal techniques. Diction for singing. Repertoire/arranging for various choral ensembles. Teaching secondary general music: interdisciplinatory issues, keyboard, guitar, Adolescent voice. Applications of technology.

MUED 3416 Choral Conducting and Methods II (3.0 cr.; A-F or Audit; prereq 3415 with grade of at least C-, MUS 3502, MUS 3512, [music education major or #]) Choral conducting skills, rehearsal techniques. Interpretation of choral compositions. Methods, materials, and curriculum for school choral ensembles. Diction for singing. Secondary general music methodology.

MUED 3417 Style, Pedagogy, and Diction in the Choral Music Classroom I (2.0 cr.; A-F Grade Basis; prereq Music education major, two semesters of applied voice at college level) Vocal styles. Lyric diction, vocal pedagogy. Performance in vocal jazz, musical theater, and classical styles. How to apply style concepts in school setting. SMARTMUSIC software.

MUED 3418 Style, Pedagogy, and Diction in the Choral Music Classroom II (2.0 cr.; A-F Grade Basis; prereq Music education major, two semesters of applied lessons at college level) Vocal styles. Lyric diction, vocal pedagogy. Performance in vocal jazz, musical theater, and classical styles. How to apply style concepts in school setting. SMARTMUSIC software.


MUED 3516 Instrumental Methods and Conducting I (3.0 cr.; A-F or Audit; prereq 1201, 3502, 3503, 3504, 3505, music education major, successful completion of sophomore proficiency) How to deliver/administer instrumental instruction for beginning, second, and third year students (elementary, early middle school). Observations, school-based experiences.

MUED 3517 Instrumental Methods and Conducting II (3.0 cr.; A-F or Audit; prereq 3516, MUS 3502, MUS 3512, music education major, %) Students develop knowledge/skills/methods necessary to effectively deliver/administer a comprehensive, advanced instrumental music program (late middle school and high school). Observations and school-based experiences.

MUED 3519 Advanced Conducting and Repertoire (Instrumental) (2.0 cr.; A-F Grade Basis; 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 3520 String Techniques and Teaching (2.0 cr.; A-F or SMARTMUSC software) Conducting/baton technique, non-verbal communication skills, rehearsal techniques, score study habits. Aural/diagnostic skills to rehearse a choral ensemble. Selection of age-appropriate repertoire.

MUED 3522 Guitar I for Music Education and Music Therapy Majors: Developing Group Songleading Skills (2.0 cr.; A-F Grade Basis; 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.

MUED 3524 Guitar II for Music Education and Music Therapy Majors: Developing Group Songleading Skills (2.0 cr.; A-F Grade Basis; 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 3807 Percussion Techniques for Music Therapists (2.0 cr.; A-F or Audit) Design, implement, and facilitate percussion into music therapy session. Variety of music therapy percussion instruments/how to successfully implement them into clinical practice with children, adolescents, and adults who are differently-abled.

MUED 3900 Lab Ensemble (1.0 cr.; A-F Grade Basis) 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 (3.0 cr.; Student Option; prereq Elementary educ foundations major) Fundamentals of music, methods, and materials for incorporating singing, rhythmic activities, classroom instruments, movement, listening, appreciation, and creation in context of classroom curriculum.

MUED 5313 Youth Music: Preferences, Influences, and Uses (3.0 cr.; A-F or Audit; prereq Grad student in music or music education or #) Youth music preferences and their determinants. How music influences youth behavior. Students/teachers’ uses of commercial styles.

MUED 5530 Student Teaching in Classroom Music (4.0-8.0 cr.; A-F or Audit; 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 5540 Student Teaching in Vocal Music (4.0-8.0 cr.; A-F or Audit; 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 5550 Student Teaching in Instrumental Music (4.0-8.0 cr.; A-F or Audit; 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 5621 African Performing Arts in Education (3.0 cr.; A-F Grade Basis; prereq Grad student in [music or other arts or education] or #) Representation of African performing arts in educational settings outside Africa. Performance practices, principles, techniques. Analyzing, listening, playing instruments, dancing. Performing with master artists, developing educational materials, reviewing resources, designing integrated arts projects.
MUED 5647 Teaching the Percussion Instruments (2.0 cr.; A-F or Audit)
Contemporary approaches for teaching percussion in the schools; development of curricular materials and practice in performance techniques.

MUED 5650 Student Teaching Seminar (2.0 cr.; A-F or Audit; prereq At least C- in all required [music, music education, professional education] courses)
Reflective practice during student teaching. Developing materials for professional employment (e.g., resume, portfolio).

MUED 5664 Teaching Music with Technology (3.0 cr.; A-F or Audit)
Home page development techniques, software/materials, audio/video utilities, research applications.

MUED 5669 Psychology of Music (3.0 cr.; A-F or Audit; 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 (1.0-4.0 cr.; A-F or Audit; prereq Grad student in [music education/therapy or education] or #)
Focuses on single topic, specified in Class Schedule.

MUED 5800 Group Music Leadership Skills (3.0 cr.; A-F or Audit; 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 5805 Therapeutic Management in Music Settings (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; prereq 5800 or #)
Methods/procedures for developing basic music therapy competencies/professionals. 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 (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; prereq 5805 or #)
Ethics, grant writing, resume/CV preparation, supervision, board certification, professional responsibilities. Students design evidence-based music therapy program, present their proposals to class/community.

MUED 5807 Psychiatric Music Therapy (3.0-4.0 cr.; A-F Grade Basis; 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 (3.0-4.0 cr.; A-F Grade Basis; prereq Grad music therapy major or #)
Role of music therapy in medical treatment. Medical diagnoses. How to program appropriate music therapy interventions to address patient needs.

MUED 5855 Music Therapy Internship (1.0-13.0 cr.; S-N or Audit; prereq Music therapy major, #)
Six-month resident internship in music therapy at an affiliated, approved hospital or clinic.

MUED 5991 Independent Study (1.0-4.0 cr.; A-F or Audit; prereq [Grad 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 (1.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit)
Naval 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 (3.0 cr.; A-F or Audit)
Historical influences on development of U.S. Navy, from American Revolution to present. Critical, contemporary issues.

NAV 2000 Professional Training in Naval Science (1.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit)

NAV 3000 Professional Training in Naval Science (1.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F or Audit; prereq 3301)
Great military leaders of history. Development of warfare, dawn of recorded history to present. Focuses on effect of major military theorists, strategists, tacticians, technological developments.

NAV 4000 Professional Training in Naval Science (1.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit)

NAV 4402W Leadership and Ethics (3.0 cr.; A-F or Audit; prereq NAV 4401W)
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 (3.0 cr.; A-F or Audit)
Development of amphibious doctrine, its expansion in Pacific Campaign of World War II. Detailed case studies of Tarawa, Iwo Jima, Okinawa illustrate amphibious planning.

Neurology (NEUR)
Medical School

NEUR 5121 Descriptive Neurology (2.0 cr.; O-N or Audit; prereq enrolled OT or PT)
Central and peripheral nervous system. Correlation of neuroanatomy, neurophysiology, clinical neurology, and pathology of the nervous system.

NEUR 5230 Cerebrovascular Hemodynamics and Diseases I (4.0 cr.; A-F Grade Basis; prereq [PHSL 3051 or PHSL 3063], [MATH 1271 or MATH 1371], [MATH 1272 or MATH 1372], [PHYS 1210W or PHYS 1301W], [PSI or [grad student, [PHSL 5061 or #]])
Principles of cerebrovascular disease/ pathophysiology, hemodynamics, diagnostic imaging, and endovascular devices. Bench-to-bedside experiments. Clinical trials, including design constraints and biostatistics.

NSC 5240 Cerebrovascular Hemodynamics and Diseases II (4.0 cr.; A-F Grade Basis; prereq NSC 5230, [PSI or [grad student, [PHLS 5061 or #]])

Neuroscience (NSC)
Medical School

NSC 4185 Itasca Summer Neurobiology Laboratory (3.0 cr.; A-F or Audit; prereq #)
Concepts in cellular neurosciences. Basis of membrane properties, including ionic/molecular mechanisms of resting, action, and synaptic potentials. State-of-the-art equipment and contemporary techniques used to examine experimental evidence.

NSC 5031W Perception (3.0 cr.; Student Option; prereq Psy 3031 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 (3.0 cr.; Student Option; prereq Psy 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.

NSC 5040 Brain Networks: From Connectivity to Dynamics (4.0 cr.; A-F or Audit)
Brain networks. Application of emerging science of complex networks to studies of the brain. Network approaches that provide fundamental insights into the integrative nature of brain function and its relation to the brain structure. Organization of brain networks and dynamics at multiple spatial scales, ranging from the microscale of single neurons and synapses, to mesoscale of anatomical cell groupings and their projections, and to the macroscale of brain regions and pathways. Experimental studies, including electrophysiology, voltage-sensitive dye imaging, electrophysiology, magnetoencephalography, and functional magnetic resonance imaging, that allow mapping network elements and structural/functional connectivity between them at different temporal and spatial scales will be considered. Experimental/theoretical perspectives.

NSC 5201 Computational Neuroscience I: Membranes and Channels (3.0 cr.; Student Option; prereq calculus through differential equations)
Comprehensive examination of membrane and ion channels using UNIX workstations to simulate their properties. Hodgkin-Huxley model, nonlinear dynamic systems, voltage- and ligand-gated ion channels, impulse propagation.

NSC 5202 Theoretical Neuroscience: Systems and Information Processing (3.0 cr.; Student Option; prereq [3101, 3102W] recommended)

NSC 5203 Basic and Clinical Vision Science (3.0 cr.; Student Option; prereq #)
Basic and clinical vision science.

NSC 5461 Cellular and Molecular Neuroscience (4.0 cr.; A-F or Audit; prereq NSC grad student or #)
Lectures by team of faculty, problem sets in important physiological concepts, discussion of original research papers.

NSC 5462 Neuroscience Principles of Drug Abuse (2.0 cr.; Student Option; 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.

NSC 5481 Invertebrate Neurobiology (3.0 cr.; A-F or Audit)
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 Neuroscience (2.0 cr.; A-F or Audit; 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 (4.0 cr.; S-N or Audit; 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 immuno/histochemical studies in experimental preparations.

NSC 5561 Systems Neuroscience (4.0 cr.; A-F or Audit; prereq NSC grad student or #)

NSC 5661W Behavioral Neuroscience (3.0 cr.; A-F or Audit; 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 5667 Neurobiology of Disease (2.0-3.0 cr.; S-N or Audit; prereq #)
Basic clinical/pathological features, pathogenic mechanisms. Weekly seminar course.

NSC 5668 Neurodegeneration and Repair (2.0 cr.; Student Option; prereq #)
Pathogenic mechanisms of neuronal death, neurodegenerative disease, neuronal repair. Weekly seminar course.

Neuroscience Department (NSCI)
Medical School

NSCI 1001 Fundamental Neuroscience: Understanding Ourselves (3.0 cr.; A-F Grade Basis)
Assessing objectively the neuroscience information presented to public at-large across various media outlets. Explaining the potential importance of these discoveries.

NSCI 1100 Human Neuroanatomy (4.0 cr.; Student Option)
Introduction to the nervous system. Structure/function of neurons and the major anatomical parts of the nervous system. Processes that underlie many bodily functions and diseases. Lectures/lab exercises.

NSCI 3001W Neuroscience and Society (4.0 cr.; A-F Grade Basis)
Ethical implications. Readings, personal reflections, class discussions, debates, and formal writing. Development of logical arguments, writing skills, oral presentation skills, and teamwork. Students present/argue both their own personal views and those of others. What it is like to have altered mentation, i.e., a brain disease or disability. Readings/multimedia reports from primary neuroscience literature as well as philosophy, policy, and law literature and popular media.

NSCI 3101 Introduction to Neuroscience I: From Molecules to Madness (3.0 cr.; A-F or Audit; prereq BIOC 3021 or BIOC 4331)
Basic principles of cellular/molecular neurobiology and nervous systems.
NSCI 3102W Introduction to Neuroscience II: Biological Basis of Behavior (3.0 cr.; A-F or Audit; prereq 3101; grade of at least B+ in 3101 recommended) 
Organization of neural systems/subsystems underlying sensory/motor aspects of behavior. Writing intensive.

NSCI 4100 Development of the Nervous System: Cellular and Molecular Mechanisms (3.0 cr.; A-F Grade Basis; prereq BIOC 3021 or BIOC 4331) 
How nervous system develops. General cellular/molecular mechanisms. Experimental data demonstrating mechanisms.

NSCI 4105 Neurobiology Laboratory I (3.0 cr.; A-F or Audit; prereq 3101, #) 
Principles, methods, and laboratory exercises for investigating neural mechanisms and examining experimental evidence.

NSCI 4151 Advanced Topics in Neuroscience (3.0 cr.; A-F or Audit; prereq =: Phsl 4151; Biol/NSc/Phsl 3101 or #) 
In-depth study of aspects of neurodevelopment, neurochemistry/molecular neurosciences, sensory systems, motor control, and behavioral neuroscience. Primarily for undergraduates majoring in neuroscience or related areas.

NSCI 4167 Neuroscience in the Community (1.0-3.0 cr.; A-F or Audit; 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 (1.0-6.0 cr.; S-N or Audit; 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 (1.0-6.0 cr.; S-N or Audit; 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 (1.0-7.0 cr.; S-N or Audit; 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 (1.0-6.0 cr.; S-N or Audit; 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 (3.0 cr.; A-F or Audit; 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 5110 Dental Neuroscience for Graduate Students (2.0 cr.; A-F or Audit; prereq =: 6110; Biol 3021, Biol 4004, #; intended for grad students who require a comprehensive grad-level neuroscience course) 
Structure/function of human nervous system. Lectures and reading assignments emphasize topics pertinent to dentistry.

NSCI 5111 Medical Neuroscience for Graduate Students (5.0 cr.; A-F or Audit; prereq #: 6111; Biol 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 (2.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq [Elementary or middle school or high school or preservice] 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 5914 BrainU 202: Neuroscience in the Classroom (3.0 cr.; A-F or Audit; prereq [5913 or Biol 5190], #, application) 
One-week summer workshop. Focuses on critiquing previously implemented neuroscience class activities, developing assessment tools, learning peer mentoring, and expanding neuroscience content knowledge. Follow-up activities held during academic year include BrainU staff/faculty classroom presentations, use of training materials, and peer mentoring sessions.

NSCI 5915 BrainU 303: Neuroscience in the Classroom (2.0 cr.; A-F or Audit; prereq [5913 or Biol 5190], #, 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.

NSCI 5916 BrainU 301: Neuroscience in the Classroom (3.0 cr.; A-F or Audit; prereq #: intended for high school teachers) 

Medical School

NSU 5667 Neurobiology in Disease (2.0-3.0 cr.; Student Option) 
Basic clinical/pathological features, pathogenic mechanisms. Weekly seminar.

Norwegian (NOR)

College of Liberal Arts

NOR 1001 Beginning Norwegian (5.0 cr.; Student Option) 
Emphasis on developing 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 (5.0 cr.; Student Option; 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 Norwegian culture.

NOR 1003 Intermediate Norwegian (5.0 cr.; Student Option; 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.

NOR 1004 Intermediate Norwegian (5.0 cr.; Student Option; prereq 1103) 
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.

NOR 4001 Beginning Norwegian (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student) 
Meets concurrently with 1001. See 1001 for description.

NOR 4002 Beginning Norwegian (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student) 
Meets concurrently with 1002. See 1002 for description.

NOR 4003 Intermediate Norwegian (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student) 
Meets concurrently with 1003. See 1003 for description.

NOR 4004 Intermediate Norwegian (2.0 cr.; Student Option; prereq 1004 in another language or passing score on LPE or grad student) 
Meets concurrently with 1004. See 1004 for description.

Nursing (NURS)

School of Nursing

NURS 777 School of Nursing Professional Active Status (0.0 cr.; No Grade Associated; prereq MN or DNP student) 
Limited to two enrollments during school career.

NURS 1020 Challenge of Nursing (1.0 cr.; S-N or Audit)

NURS 3800 Nursing Topics (1.0-4.0 cr.; Student Option; prereq #) Topics not included in regular courses.

NURS 3801 Patient Centered Care of Adults/Older Adults I (3.0 cr.; A-F Grade Basis; 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. Comprehension of patient needs and planning nursing care.

NURS 3802 Patient Centered Care: Nursing Care of Families I (3.0 cr.; A-F Grade Basis; prereq Enrolled in School of Nursing) Introduction to nursing care of childbearing/childrearing families. Family theory, family-centered care, and family culture in the context of home and community settings.

NURS 3802H Nursing Care of Families I (Honors) 4.0 cr.; A-F Grade Basis; prereq Enrolled nursing student) Nursing care of childbearing/childrearing families. Family theory, family-centered care, family culture in the context of home and community settings and therapeutic communication between nurse and patients/families.

NURS 3803 Application of Genetics in Nursing (2.0 cr.; A-F or Audit; prereq Enrolled in nursing major) Application of genetics to the practice of professional nursing.

NURS 3806 Nurse as Professional (2.0 cr.; A-F or Audit; prereq Admitted to nursing BSN program) Basic nursing concepts, role development, competencies, therapeutic use of self, and communication skills for person-centered care as a professional teamwork, beginning development of own nursing philosophy; career exploration.

NURS 3806H Nurse as Professional: Honors (3.0 cr.; A-F Grade Basis; prereq [Undergrad nursing student, Univ of Minn Honors program] or #) Students begin online course the first day of class. Weekly readings/activities. Students need adequate access to a computer with web access.

NURS 3999 Clinical Internship (0.0-3.0 cr.; S-N or Audit; prereq Completed jr yr of baccalaureate nursing program, accepted into approved clinical internship program) Application of nursing theory/research based knowledge in clinical practice.

NURS 4104 Ethical Sensitivity and Reasoning in Health Care (2.0 cr.; A-F Grade Basis; prereq Nursing undergrad student or #) Developing sensitivity to the range/complexity of ethical issues/dilemmas in health care. Using ethical principles and theories to reason about ethical problems. Key ethical concepts in addressing specific morally troubling issues in health care settings.

NURS 4106 Nurse as Collaborator (2.0 cr.; A-F Grade Basis; prereq Enrolled in nursing program) Examination of evidence-based teamwork systems and processes to improve communication and collaboration among health care professionals.


NURS 4203 Nursing Fundamentals II: Assessment and Intervention (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 4205W Nursing Theory and Research (3.0 cr.; A-F or Audit; 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 4301 Person Centered Care of Adults and Older Adults II (4.0 cr.; A-F Grade Basis; prereq 3801, 3802, 3703, 3705, enrolled in School of Nursing) Person-centered evidence based nursing care for adults with complex physical and mental health illnesses. Critical analysis of multiple complex patient needs. Planning nursing care.

NURS 4303 Practicum: Person Centered Care of Adults in Acute Care (3.0 cr.; A-F Grade Basis; prereq 3801, 3802, 3703, 3801, [3802 or 3802H], enrolled in nursing) Clinical reasoning is applied to the nursing care of young through older adults in acute care. Evidenced based practice and clinical reasoning to provide person centered care within the health system environment.

NURS 4305 Practicum: Community-based Care of Families Across Life Span (3.0 cr.; A-F Grade Basis; prereq 3703, 3705, 3801, [3802 or 3802H], enrolled Nurs student) Examine an evidence-based teamwork system to improve communication and teamwork skills among health care professionals.

NURS 4312 Patient Centered Care: Nursing Care of Families II (4.0 cr.; A-F Grade Basis; prereq 3802, enrolled nursing student) Family centered care theory applied to care of childbearing, childrearing families in acute care setting. High risk pregnancy. Child response to illness/hospitalization.

NURS 4320 Psychiatric and Mental Health Nursing (5.0 cr.; A-F or Audit; prereq BSN student or permission of instructor)

**NURS 4321 Public Health Nursing** (2.0 cr.; A-F or Audit; prereq jr nursing student)


**NURS 4322 Population-based Public Health Nursing** (5.0 cr.; A-F or Audit; 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** (3.0 cr.; Student Option; prereq Nursing student or #)

Influence of culture on nursing care delivery/role of nurse in providing culturally appropriate care for increasingly diverse populations. Global health issues and factors affecting the health status of populations.

**NURS 4325 Cultural Immersion and Service Learning in Public Health Nursing** (2.0-3.0 cr.; A-F Grade Basis; prereq Jr nursing student or #)

Compare public health systems and population health approaches to management of diabetes across North American countries. Prepare for culturally competent nursing at the international level through a service learning experience, exchanging faculty and students across Canada, Mexico, and United States.

**NURS 4326 Nursing Care of Older Adults** (3.0 cr.; A-F or Audit; prereq Human Experience of Health and Illness, Introduction to Ethics, Introduction to Nursing, Therapeutic Communication, Nursing Fundamentals, Complex Nursing Interventions, Family Focused Care Across the Lifespan: I) Nursing care for older adults across the health/illness continuum. Focuses on promoting healthy aging, functional health, management of symptoms/chronic conditions. Biopsychosocial changes. Specialized assessment of older adults, impact/management of common chronic conditions.

**NURS 4402 Taking Ethical Action in Health Care** (1.0 cr.; A-F Grade Basis; 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** (4.0 cr.; A-F or Audit; 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 4404V Honors: Applied Research and Research Utilization** (3.0 cr.; A-F Grade Basis; prereq Honors student in School of Nursing, Nurs 4205V, upper division statistics course)

Systematic inquiry in interpreting/evaluating research. Implement study proposed in NURS 4205V. Write scholarly research report, which will serve as honors research thesis.

**NURS 4408 Nursing Care of Infants, Children, and Adolescents** (4.0 cr.; A-F or Audit; 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 4430 Immunization Tour** (1.0 cr.; S-N or Audit; 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 in community partnerships.

**NURS 4502 Clinical Immersion** (6.0 cr.; A-F or Audit; prereq Nursing student or #)

Nurse as leader/manager in client care and as colleague. Status, structure, environment, and operations of healthcare systems. Social, economic, technologic, and political factors influencing nursing care and health quality, access, and cost.

**NURS 4502W Nursing Leadership and Health Care Systems** (4.0 cr.; A-F or Audit; prereq Nursing student or #)

Nurse as leader/manager in client care and as colleague. Status, structure, environment, and operations of healthcare systems. Social, economic, technologic, and political factors influencing nursing care and health quality, access, and cost.

**NURS 4502V Honors: Applied Research and Research Utilization** (4.0 cr.; A-F Grade Basis; prereq Nursing student or #)

Credit will not be granted if the student has already completed NURS 4302)

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. Preceptor professional internship in a selected setting.

**NURS 4504 Professional Issues** (2.0 cr.; A-F or Audit; 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/communities. Preparing for transition from student to novice nurse.

**NURS 4505 Managing Chronic Health Conditions of Elders: a Study Abroad Practicum** (3.0 cr.; A-F or Audit; prereq 4100, 4101, 4102, 4103, 4104, 4200, 4202, 4205, 4210, 4300, 4302, 4414)

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 4703 Specialty Focused Practicum I** (6.0 cr.; A-F or Audit; prereq Nursing student in School of Nursing)

Person-centered nursing care that is safe, effective, holistic, culturally sensitive.

**NURS 4705 Specialty Focused Practicum II** (6.0 cr.; A-F or Audit; prereq 4703, sr in good standing in BSN)

Synthesis of previous learning while providing to high quality nursing care that is safe, ethical, evidence-based, holistic, culturally sensitive, and person-centered in selected clinical specialty. Application of professional nursing values to clinical practice. Preceptor led.

**NURS 4706 Transition to Practice** (1.0 cr.; A-F or Audit; prereq Sr in BSN program)

Professional and legal issues necessary to the transition into nursing practice: strategies for lifelong learning and nursing career trajectories in preparation for entry into practice in a complex health care system.

**NURS 4707 Nursing Leadership: Professional Practice in Complex Systems** (2.0 cr.; A-F Grade Basis; prereq Sr enrolled in BSN program)

Leadership skills for safe effective practice as a new graduate nurse; issues affecting nursing practice: leadership attributes, e.g., creating effective teams, confident interaction with others, resolving conflict, managing resources, leadership for assuring patient safety and quality care.

**NURS 4777W Senior Project in the Nursing Major** (3.0 cr.; A-F Grade Basis; prereq &4703, [4205W or 4205V])


**NURS 4800 Nursing Topics** (0.0-16.0 cr.; Student Option; prereq #)

Exploration of a topic to meet individual student needs.

**NURS 4801 Research Topics** (1.0-16.0 cr.; Student Option)

Exploration of research topic to meet individual student needs.

**NURS 5010 Foundations of Interprofessional Communication and Collaboration** (1.0 cr.; S-N Grading Basis; prereq Nursing student)

First of three phases of the interprofessional 1HEALTH curriculum: teamwork, professionalism, and basic ethical concepts.

**NURS 5011 Interprofessional Diabetes Experience** (2.0 cr.; A-F Grade Basis; prereq 2nd or 3rd year in nursing curriculum)

Explore diabetes mellitus through active, hands-on learning in an interprofessional environment. Week-long simulated experience of living with diabetes. Online learning activities focused on interprofessional teamwork for optimal care to patients with diabetes.

**NURS 5016 Critical Reading of Scientific Literature in Adolescent Health** (1.0 cr.; Student Option; 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 5029 Introduction to Nursing Interventions** (4.0 cr.; A-F Grade Basis; prereq
University of Minnesota Twin Cities Undergraduate Catalog

Admission to master of nursing (MN) program,
&5030) Evidence-based interventions for safe, culturally appropriate, and ethical nursing practice. Exploration of learning activities in laboratory and clinical settings build skills in assessment, planning, implementation, and evaluation.

NURS 5030 Foundational Concepts of Professional Nursing (3.0 cr.; A-F or Audit; prereq Admission to master’s in nursing program) Foundation of knowledge for culturally appropriate, ethical, evidence-based nursing practice across the life span. Research/theory that underlie the art/science of professional nursing. Concepts of person, environment, health, and nursing.


NURS 5033 Population Response to Health and Mental Illness (5.0 cr.; A-F or Audit; 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 5035 Practical Nursing Care for Complex Health Conditions (4.0 cr.; A-F or Audit; prereq Nursing postbaccalaureate certificate program or master of nursing program) Clinical decision-making, comprehensive nursing care of clients with complex health problems. In collaboration with a clinical preceptor and a faculty adviser, students develop an individualized learning contract.

NURS 5040H Seeking Solutions to Global Health Issues (3.0 cr.; A-F Grade Basis; 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 (2.0 cr.; S-N or Audit) 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 (3.0 cr.; A-F or Audit) Implications of informatics for practice, including nursing, public health, and health care in general. Electronic health record issues. Ethical, legislative, political, and global/future informatics issues.

NURS 5116 Consumer Health Informatics (1.0 cr.; A-F Grade Basis; prereq Grad student or #) Examines issues from consumer’s perspective in acquisition, understanding, use or provision of health information. Online strategies for improving health. Impact on consumer-provider relationships/ethical and legal issues.

NURS 5117 Consumer Health Informatics Practicum (1.0 cr.; S-N Grading Basis; prereq [Grad student, [5116 or &5116]] or #) Applies student knowledge to analysis of health needs and consumer health principles, theories, and research to a consumer health informatics project.

NURS 5120 Palliative Care for Children (1.0 cr.; Student Option; prereq #) Physical, psychosocial, and spiritual needs of children with life-limiting conditions. Family centered approach. Holistic assessment/intervention for child/family, within interdisciplinary health care team.

NURS 5170 Research Topics (1.0-16.0 cr.; Student Option) Exploration of research topic to meet individual student needs.

NURS 5172 Decision Making in Health Care (2.0 cr.; Student Option; prereq Grad student, #) Selected classical conceptual models of decision making and 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 5183 Scholarly Leadership (1.0 cr.; S-N or Audit; prereq Advanced doctoral nursing student, #) Application of dissertation research on advancing science, clinical practice, and leadership in nursing and health care. Principles of scholarly collaboration.

NURS 5190 Essentials of Holistic Health Assessment (3.0 cr.; A-F Grade Basis; 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.

NURS 5200 Holistic Health Assessment and Therapeutics for Advanced Practice Nurses (3.0 cr.; Student Option; 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 populations/illnesses.

NURS 5204 Population Focused Assessment and Intervention (2.0 cr.; Student Option; prereq Grad nursing major, #) Population focused assessment in health planning. Models of assessment for communities, organizations, other aggregates. Skill development in conducting/analyzing/using assessment in planning population focused interventions.

NURS 5205 Comprehensive Assessment of the Older Adults (3.0 cr.; A-F Grade Basis; prereq Grad student, #) Assessment of the biological, physical, functional, cognitive, psychological, and social changes of aging.

NURS 5221 Refugee Health: Trauma, Stress, and Coping (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option) 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 (4.0 cr.; Student Option; prereq Nurs grad or #) Advanced concepts from nursing theory and research, social sciences, neuropsychology, and neurophysiology 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 5225 Psychopharmacology Advanced Practice Psychiatric/Mental Health Nursing (3.0 cr.; Student Option; prereq 5228 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 (2.0 cr.; A-F or Audit; 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 (2.0-4.0 cr.; Student Option; prereq 5222, [5228 or PHAR 5800], DNP student, #) Pharmacokinetics, pharmacodynamics, therapeutic dosages for various age groups. Client patterns of drug use. Prescriptive privileges. Prescription writing for advanced practice nurses.
NURS 5241 Nursing Leadership for Effective Practice (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; prereq Grad or #)
Interdisciplinary course examines 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 5310 Interprofessional Teamwork for Health Professionals (1.0 cr.; S-N or Audit; prereq Student in [nursing or dentistry or medicine or pharmacy or public health or master's in health care administration])
Introductory experience to interprofessional teamwork skills. Focuses on patient-centered care.

NURS 5340 Group as a Health-Care Intervention (2.0 cr.; Student Option; 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 (1.0-2.0 cr.; S-N or Audit; 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 (1.0-2.0 cr.; S-N or Audit; prereq Grad student)
Women's health issues from multidisciplinary perspective. Sexual/reproductive health issues across life span. Sociocultural issues affecting health, such as poverty/violence.

NURS 5604 Advanced Health Assessment and Interventions with Adolescents (2.0 cr.; Student Option; prereq CPNs 5030 or equiv or #)
Integrates knowledge from nursing, public health, health behavior, and adolescent development framework for developing health assessment/intervention strategies for clinical practice with adolescents.

NURS 5800 Nursing Topics (1.0-4.0 cr.; Student Option; 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 5901 Policymaking, Health Policy, Political Action and Nursing (3.0 cr.; Student Option)
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 5903 Transcultural Nursing: Theories and Issues (2.0 cr.; Student Option; 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 (1.0 cr.; S-N or Audit; prereq Undergrad nursing student or grad student in health sciences or health professional)
Scientific/theoretical foundations/practice of 'm' technique, a touch therapy for promoting relaxation by topically administering essential oils. Appropriate applications. Demonstration/practice of technique. Interdisciplinary course.

NURS 5806 Theoretical Foundations and Experiential Learning in Complementary/Alternative Therapies (2.0-3.0 cr.; Student Option; prereq #)
Overview of complementary therapies. Demonstration of selected therapies. Theoretical/scientific knowledge supporting use of therapies.

NURS 5808 American Indian Health and Health Care (2.0 cr.; Student Option; prereq Upper div or grad student or #)
Examines health of native nations in Minnesota within historical/cultural contexts. Epidemiology of major health conditions, health services, traditional Indian medicine, health beliefs. Opportunities for contact with Native American community.

NURS 5812 Global Health Through Study Abroad (2.0-3.0 cr.; S-N Grading Basis; prereq #)
Nursing as a global profession and the issues that impact health of populations worldwide.

NURS 5820 Foundations of Infection Control (3.0 cr.; Student Option; 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 (1.0-6.0 cr.; Student Option; prereq Grad nursing major, #)
Independent study or faculty seminar on special clinical topic.

NURS 5900 Introduction to Principles and Practice of Anesthesia (6.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; prereq 5900)
Students apply principles of anesthesia to formulate nurse anesthesia care plans for care of adults undergoing anesthesia.

NURS 5910 Nurse Anesthesia Care: Patients With Cardiothoracic Problems (2.0 cr.; A-F Grade Basis; prereq 5222, 5224, 5228, 5901, Phil 5115)
First in series of three courses. Delivering anesthesia to complex patients. Focuses on anesthesia for patients undergoing cardiothoracic procedures.

NURS 5920 Nurse Anesthesia Care: Advanced Principles for Special Populations (6.0 cr.; A-F or Audit; prereq 5910)
Examination/application of principles used to deliver anesthesia by nurse anesthetists to special populations.

NURS 5925 Grant Writing and Critique (1.0 cr.; Student Option; prereq Grad student or #)
Self-paced course. Online modular format. How to write/complete grants. Students select a research or program grant to critique, applying knowledge obtained through learning modules.

NURS 5940 Contemporary Issues in Nurse Anesthesia (2.0 cr.; S-N Grading Basis; prereq 5930)
Analysis of economic, legal, political, ethical, and social factors that influence the practice and profession of CRNAs.

NURS 5941 Nurse Anesthesia Practicum A (5.0 cr.; S-N or Audit; prereq 5930)
First of a series of three clinical courses that focus on developing proficiency in nurse anesthesia practice. Emphasizes incorporating current research and demonstrating increasing autonomy in decision making and case management.

NURS 5942 Nurse Anesthesia Practicum B (5.0 cr.; S-N or Audit; prereq 5941)

NURS 5943 Nurse Anesthesia Practicum C (5.0 cr.; S-N or Audit; prereq 5942)
Third of a series of three. Evaluating impact of research on clinical practice, on achieving a level of safe beginning practice as a nurse anesthetist, and on demonstrating expertise in operating room. Increasing autonomy in decision-making. Case management for various patient populations.

NURS 5995 Research Dissemination (2.0 cr.; Student Option; prereq Doctoral student or #)
Knowledge dissemination skills for advancement of health/nursing science/practice. Emphasizes interpretation/diffusion of research findings to health professional and scientific audiences in various venues and communication modalities.

Nutrition (NUTR)
College of Food, Agricultural and Natural Resource Sciences

NUTR 5622 Vitamin and Mineral Biochemistry (3.0 cr.; Student Option; prereq BioC 3021, Phsl 3051, FSCN 4612)
Nutritional, biochemical, and physiological aspects of vitamins/essential minerals in human/experimental-animal models.

NUTR 5624 Nutrition and Genetics (2.0 cr.; Student Option; prereq Biochemistry)
Overview of gene-diet interactions and relevant technologies used to study such interactions. Nutrigenomics, epigenetics, transcriptomics,
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

OT 5313 Therapeutic Occupation (4.0 cr.; A-F; or Audit; prereq enrolled OT student or #)

OT 1003 Orientation to Occupational Therapy (1.0 cr.; S-N or Audit)
Survey of the profession through lectures, films, demonstrations, and tours. For students investigating the field of occupational therapy.

OT 5121 Issues in Mental Health (1.0 cr.; S-N or Audit; prereq: One course gen psych, one course abnormal psych.)
Psychiatric/neuropsychological assessment/treatment. Issues related to medical/community management and to roles of OT/PT with respect to clients with mental health needs. Interaction between physical/mental health and disability.

OT 522 Descriptive Neurology (2.0 cr.; A-F or Audit; prereq OT student or #)
Relates neuroanatomical/neurophysiological principles to neurological conditions commonly seen in occupational/physical therapy practice.

OT 5161 Theory of Physical Medicine and Rehabilitation Applied to Medical Sciences (2.0 cr.; A-F or Audit; prereq OT student or #)
Diagnostic procedures. Medical, surgical, and rehabilitation management of patient problems in orthopedics, surgery, pediatrics, dermatology, medicine, cancer, and speech. Correlation to current practice. Presentation of patients.

OT 5182 Functional Neuroanatomy and Neurophysiology (4.0 cr.; A-F or Audit; prereq Registered occupational therapy student or #)
Neuroanatomic structures as functional systems, basic neurophysiologic concepts. Emphasizes applications for understanding/treating physical dysfunctions.

OT 5300 Concepts for Occupational Therapy Practice (4.0 cr.; A-F or Audit; prereq enrolled OT student or #)
Critical thinking, ethics, professional resources/organizations, patient-therapist relationship. Level I fieldwork experience.

OT 5313 Therapeutic Occupation (4.0 cr.; A-F or Audit; prereq enrolled OT student or #)

OT 5341 Introduction: Evaluation and Intervention I (4.0 cr.; A-F or Audit; prereq 5393 or #)
Assessment concepts/techniques. Application to patient populations with both mental health/physical disabilities. Treatment planning/documentation.

OT 5342 Compensatory Rehabilitation: Evaluation and Intervention II (4.0 cr.; A-F or Audit; prereq 5300, 5313 or #)
Assessment of daily living performance areas; adaptation techniques to compensate for performance deficits. Level I fieldwork experience.

OT 5343 Specialty Topics: Evaluation and Intervention III (4.0 cr.; A-F or Audit; prereq 5342 or #)
Applies critical thinking model to assessment/intervention of selected patient populations with mental/physical problems requiring specialized approaches. Focus on habilitation/rehabilitation of populations with multiple performance component deficits. Fieldwork.

OT 5344 Neurorehabilitation: Evaluation and Intervention IV (5.0 cr.; A-F or Audit; prereq 5343 or #)
Assessment/intervention related to perception, cognition, reflexes, sensory integration, and motor control. Application to individuals with multiple performance component deficits.

OT 5360 Dynamics of Group Models (2.0 cr.; A-F or Audit; prereq 5313 or #)
Application of group/team dynamics in diverse professional settings.

OT 5370 Theory of Occupation (1.0 cr.; A-F or Audit; prereq enrolled OT student or #)
Occupational therapy frames of reference, role of activity, and historical development of profession.

OT 5375 Community Resources and Health-Care Issues (2.0 cr.; A-F or Audit; prereq [5300, 5342] or #)
Analysis of community health-care systems, including cultural/family influences on individual health and decision making. Students identify current trends in health care and determine responses to them at social, political, or legislative level.

OT 5376 Adult Education and Planning (1.0 cr.; A-F or Audit; prereq 5313 or #)
Skills needed to plan, implement, and evaluate adult educational programs/materials for patient/family education, peer/professional education, and education of others in order to carry out therapeutic interventions. Student teaching unit, community based activity.

OT 5380 Management of Occupational Therapy Services (3.0 cr.; A-F or Audit; prereq [5360, 5375, 5376] or #)
Administration/management of occupational therapy services within managed care environment. Issues in Medicare, HMOs, TQM, consultation, human resources, promotion of profession. Emphasizes program development in current organizational structures.

OT 5391 Occupation Across the Life Span (3.0 cr.; A-F or Audit; prereq [5375, 5376] or #)
The well elderly, school therapy, work-related injuries/industrial rehabilitation. Fieldwork.

Off-Campus Study (OCS)

OCS 520 Off-Campus Study (0.0 cr.; S-N Grading Basis; prereq %)

OCS 550 National Student Exchange: Off-Campus Study (0.0 cr.; S-N Grading Basis; prereq %)

OCS 1550 National Student Exchange: Off-Campus Study (1.0-15.0 cr.; S-N Grading Basis; prereq %)

OCS 3500 Domestic Off-Campus (1.0-15.0 cr.; S-N Grading Basis; prereq %)
Domestic off-campus study. (Do not publish.)

OCS 4941H Honors Topics (2.0-3.0 cr.; A-F Grade Basis)

OT 5392 Research in Occupational Therapy (3.0 cr.; A-F or Audit; prereq 5313 or #)
Analysis of scientific literature, development of research proposals.

OT 5393 Functional Anatomy and Kinesiology (4.0 cr.; A-F or Audit; prereq enrolled OT student or #)
Gross human anatomy emphasizing skeletal, muscular, circulatory, and peripheral nervous systems of the extremities and trunk. Includes cadaver lab prostecutions. Analyzing functional human movement from a biomechanical perspective.

OT 5394 Orthotics (3.0 cr.; A-F or Audit; prereq 5341 or #)
Analysis, design, and construction of orthotic devices.

OT 5395 Independent Study in Occupational Therapy (1.0-4.0 cr.; Student Option; prereq Enrolled OT student or #)
Independent Study in Occupational Therapy

Ojibwe (OJIB)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

**OPH 1101** Beginning Ophthalmic
teachers (5.0 cr.; Student Option)
- Speaking, grammar, writing systems.
- Prerequisite: OPH 1101.

**OPH 1102** Beginning Ophthalmic
teachers (5.0 cr.; Student Option)
- Speaking, grammar, writing systems.
- Prerequisite: OPH 1101.

**OPH 3103** Intermediate Ophthalmic
teachers (5.0 cr.; Student Option)
- Speaking, grammar, story-telling, oral history.
- Translation projects.

**OPH 3104** Intermediate Ophthalmic
teachers (5.0 cr.; Student Option)
- Speaking, grammar, story-telling, oral history.
- Translation projects.

**OPH 3127** Ophthalmic Language for Teachers
- 3.0 cr.; A-F Grade Basis; prerequisite.
  - How to learn Ophthalmic outside classroom and teach it in formal/informal learning settings, including second language classrooms, immersion schools, language tables, and immersion camps.

**OPH 4101** Beginning Ophthalmic
teachers (3.0 cr.; Student Option)
- Speaking, grammar, writing systems.
- Prerequisite: OPH 1004 in another language or passing score on LPE or grad student.

**OPH 4102** Beginning Ophthalmic
teachers (3.0 cr.; Student Option)
- Speaking, grammar, writing systems.
- Prerequisite: OPH 1004 in another language or passing score on LPE or grad student.

**OPH 4103** Intermediate Ophthalmic
teachers (3.0 cr.; Student Option)
- Speaking, grammar, story-telling, oral history.
- Translation projects.

**OPH 4104** Intermediate Ophthalmic
teachers (3.0 cr.; Student Option)
- Speaking, grammar, story-telling, oral history.
- Translation projects.

**OPH 4106** Advanced Ophthalmic
teachers (3.0 cr.; A-F or Audit)
- Focuses on immersion method.

**OPH 4109** Advanced Ophthalmic
teachers (3.0 cr.; A-F or Audit)
- Focuses on immersion method.

**OPH 5106** Advanced Ophthalmic
teachers (3.0 cr.; A-F or Audit)
- Focuses on immersion method.

**OPH 5109** Advanced Ophthalmic
teachers (3.0 cr.; A-F or Audit)
- Focuses on immersion method.

**Ophthalmology (OPH)**
- Medical School

**OPH 1101** Academic Studies for Ophthalmic Technicians
- 7.0 cr.; S-N or Audit; prerequisite:
  - Enrolled in ophthalmic technician certificate program.
  - Academic studies.

**OPH 1201** Basic Science for Ophthalmic Technicians
- 8.0 cr.; S-N or Audit; prerequisite:
  - For ophthalmic technician certificate.

**OPH 1301** Basic Science for Ophthalmic Technicians
- 7.0 cr.; S-N or Audit; prerequisite:
  - For ophthalmic technician certificate.

**OPH 1401** Clinical Assisting for Ophthalmic Technicians
- 8.0 cr.; S-N or Audit; prerequisite:
  - For ophthalmic technician certificate.

**OPH 1501** Ophthalmic Technician Externship
- 15.0 cr.; S-N or Audit; prerequisite:
  - Externship rotation.

**OPH 1601** Ophthalmic Technician Externship
- 15.0 cr.; S-N or Audit; prerequisite:
  - Externship rotation.

**OPH 1701** Ophthalmic Technician Externship
- 15.0 cr.; S-N or Audit; prerequisite:
  - Externship rotation.

**OPH 1702** Ophthalmic Technician Externship
- 15.0 cr.; S-N or Audit; prerequisite:
  - Externship rotation.

**Organizational Leadership, Policy, and Development (OLPD)**
- College of Education and Human Development

**OLPD 1301W** Personal Leadership in the University
- 3.0 cr.; A-F Grade Basis
  - Students examine their own views of leadership, differences between personal/positional leadership, leadership ethics/values, and their own leadership strengths/skills.

**OLPD 1302** Personal Leadership in the University
- 3.0 cr.; A-F Grade Basis
  - Students examine their own views of leadership, differences between personal/positional leadership, characteristics of leaders within University, importance of personal development.

**OLPD 1303** Understanding Southeast Asia:
An Intercultural/Interdisciplinary Policy Perspective
- 3.0 cr.; Student Option

**OLPD 1305** Leadership, You, and Your Community
- 3.0 cr.; A-F Grade Basis
  - How do effective leaders create positive systemic change within complex systems? What is community and how does it shape the work of leadership? Students examine leadership from a multi-dimensional/multicultural perspective and critically examine leadership through the interdisciplinary lens of future studies.

**OLPD 1306** Special Topics in Leadership
- 1.0-3.0 cr.; A-F or Audit
  - For topic, see Class Schedule.

**OLPD 1496** Supervised Career and Technical Education Teaching
- 4.0 cr.; S-N or Audit; prerequisite:
  - Supervised teaching for beginning teachers, or teaching activities for preservice teachers.

**OLPD 1801** Introduction to Career and Technical Education Teaching
- 2.0 cr.; A-F or Audit; prerequisite:
  - 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.

**OLPD 1905** Freshman Seminar
- 1.0-3.0 cr.; Class Option; prerequisite:
  - Interdisciplinary seminar. Topics specified in Class Schedule.

**OLPD 1909W** Freshman Seminar:
International Perspectives and Writing Intensive
- 1.0-3.0 cr.; Class Option; prerequisite:
  - Interdisciplinary seminar. Topics specified in Class Schedule.

**OLPD 1942** Freshman Seminar:
Technology and Society
- 1.0-3.0 cr.; Class Option; prerequisite:
  - Interdisciplinary seminar. Topics specified in Class Schedule.

**OLPD 2811** Societies of the Future: Changing Work Contexts
- 3.0 cr.; A-F or Audit
  - Ongoing evolution of social contexts and work through the interdisciplinary lens of future studies.

**OLPD 2811H** Societies of the Future: Changing Work Contexts, Honors
- 3.0 cr.; A-F or Audit; prerequisite:
  - Ongoing evolution of social contexts and work through the interdisciplinary lens of future studies.

**OLPD 3201** Adult Education Overview
- 1.0 cr.; A-F or Audit
  - Theory/practice of adult learning/development.

**OLPD 3202** Introduction to Strategies for Teaching Adults
- 3.0 cr.; A-F or Audit; prerequisite:
  - Quality Matters certified
  - Theories of adult learning, teaching/learning styles, methods/perspectives of teaching, applications of teaching in various settings.

**OLPD 3301** Understanding Southeast Asia:
An Intercultural/Interdisciplinary Policy Perspective
- 3.0 cr.; Student Option

**OLPD 3302** Leadership, You, and Your Community
- 3.0 cr.; A-F Grade Basis; prerequisite:
  - [1301W or 1302 or PA 1961W or CFAN 1101 or CFAN 3480], grade of at least C
  - How do effective leaders create positive systemic change within complex systems? What is community and how does it shape the work of leadership? Students examine leadership from a multi-dimensional/multicultural perspective and critically examine leadership through the interdisciplinary lens of future studies.
OLPD 3304 Strategic Leadership for Future Societies (3.0 cr.; Student Option) Emerging leadership implications of selected short-/long-range trends. Construction of context-relevant effective leadership scenarios for selected institutions in real/hypothetical societies.

OLPD 3305 Learning About Leadership Through Film and Literature (3.0 cr.; Student Option) Readings from leadership studies, literature, and film. Ethical dilemmas. Different styles of leadership and their consequences. Intersection of public/private in exercising leadership. Competing loyalties/pressures felt by leaders/followers. Fundamental questions about nature/desirability of leadership.

OLPD 3306 Leadership Minor: Field Experience (3.0 cr.; A-F Grade Basis; prereq 3302 with grade of at least C) Students apply/integrate leadership theory in a community experience, think critically about their positional leadership roles, extrapolate the experience to future leadership issues within their specific fields, and work through challenges of positional leadership.

OLPD 3307 History of U.S. Higher Education (3.0 cr.; A-F or Audit) 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.

OLPD 3310 Special Topics for Undergraduates (1.0-3.0 cr.; Student Option) Inquiry into educational policy and administration problems and issues.

OLPD 3318 Introduction to Project Management (3.0 cr.; Student Option) Project management for business and industry. Project lifecycles, deliverables, and processes as they are commonly used in the workplace.

OLPD 3320 Maximizing Study Abroad Through Culture and Language Strategies: Pre-Departure Preparation (1.0 cr.; Student Option) Preparation for overseas sojourn: understanding culture, ways cultures differ in values, seeing oneself as a member of a culture or cultures.

OLPD 3321 Introduction to Historical Foundations of Modern Education (3.0 cr.; Student Option) Analysis/interpretation of important elements in modern education derived from pre-classical sources: Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, Industrial Revolution.

OLPD 3323 Introduction to History of Western Educational Thought (3.0 cr.; Student Option) Great educational classics of Western civilization: Plato, Aristotle, Quintillian, Montaigne, Milton, Locke, Rousseau, others.

OLPD 3330 Global Identity: Connecting Your International Experience to Your Future (1.0 cr.; S/N Grading Basis; prereq [3320 or EDPA 3102 or #], studying abroad the semester student is enrolled in course) Reflect on activities/readings of study abroad experiences overseas. E-journaling, written activities, group interaction using various formats.

OLPD 3335 Religion, Ethics, and Educational Policy (3.0 cr.; Student Option) American religious pluralism in relationship to ethics and educational policy. History of religious belief/expression in K-12 and higher education. Students interact with community leaders. Legal issues, religion/science, sexuality, religious alternatives, policy topics.

OLPD 3340 Maximizing Study Abroad Through Culture and Language Strategies: Re-Entry (1.0 cr.; Student Option; prereq 3330 or EDPA 3103) Reflect upon personal study abroad experience through readings/activities to ease transition back into the United States and to maximize learning from study abroad experience.

OLPD 3380 Developing Intercultural Competence (3.0 cr.; A-F or Audit) Past/current research on intercultural leadership. Students share their understanding/experiences within intercultural framework.

OLPD 3401 Teaching Marketing Promotion (3.0 cr.; A-F or Audit) Materials, methods, and approaches to teaching marketing promotion. Advertising, promotion, public relations, direct selling, visual merchandising, and direct marketing.

OLPD 3424 Sales Training (3.0 cr.; A-F or Audit) Strategies and techniques for developing effective sales people.

OLPD 3451 Technical Development: Advanced (1.0-32.0 cr.; Student Option; prereq #) Work experience in business/industry.

OLPD 3461 Professional Sales Management (3.0 cr.; A-F or Audit) 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.

OLPD 3493 Directed Study: Business and Industry Education (1.0-4.0 cr.; Student Option) Self-directed study preceded by classroom instruction in basic research procedures.

OLPD 3496 Profession and Practice of Business and Marketing Education (2.0 cr.; A-F Grade Basis; prereq Undergrad student, BME major) Career development. Develop skills to advance career development. Requirements/processes associated with the internship course, OLPD 4496.

OLPD 3601 Introduction to Human Resource Development (3.0 cr.; A-F or Audit) Human resource development theories, principles, concepts, and practices.

OLPD 3620 Introduction to Training and Development (3.0 cr.; A-F or Audit) Processes to carry out theoretically sound training/development practices, within the context of systemic relationship with host organization or system.

OLPD 3640 Introduction to Organization Development (3.0 cr.; A-F or Audit) Organization development theories, principles, concepts, and practices. How development is used to direct change in an organization.

OLPD 3696 Profession and Practice of Human Resource Development (2.0 cr.; A-F or Audit; prereq 3202 or ADED 3101, 3601 or HRD 3001, 3620 or HRD 3201, 3640 or HRD 3301, HRD BS major) Explores strategies and enhances skills necessary for HRD internships and careers.


OLPD 3805 Introduction to Strategic Planning Through Human Resources (3.0 cr.; A-F or Audit; prereq 3601 or HRD 3001) Processes organizations use when engaged in strategic planning. How to participate in planning, implementing, and evaluating strategic initiatives to improve performance.

OLPD 3808 Foundations of Student and Trainee Assessment (2.0 cr.; A-F or Audit) Developing tests of knowledge, affect, and processes for programs focused on instruction of skills associated with business/industry. Developing learning-progress reporting systems. Evaluating instructional effectiveness. Applying tests and other evaluation instruments to assess/report learning in business/industry and in career/technical education fields.

OLPD 3820 Principles of Supervisory Management (3.0 cr.; Student Option) Introduction to the principles of supervision in education, business, industry, government, and service organizations.

OLPD 3828 Diversity in the Workplace (3.0 cr.; A-F or Audit) Diversity in the workplace. Issues of recruiting and selection, management, and performance.

OLPD 3829 Foundations of Course Development for Business and Industry (2.0 cr.; A-F or Audit) Designing instructional programs/courses focused on helping learners develop desired competence. Designing instruction for performance-based training and vocational/technical education. Developing course syllabus components that clarify broad course expectations. Developing academic/community-based elements that complement course goals.

OLPD 3861 Foundations of Instructional Methods for Business and Industry (2.0 cr.; A-F or Audit) 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.

OLPD 4301 Global Youth Leadership and Community Engagement (6.0 cr.; A-F Grade Basis)
Six-credit course over three semesters. Students take courses at the U of M (spring and fall) and at FLASCO University in Buenos Aires, Argentina, (four weeks in August). Theory and practice of youth-engagement/empowerment to address issues that affect their lives, their communities, and the broader global society.

OLPD 4303W Leadership for Global Citizenship (3.0 cr.; A-F Grade Basis; prereq 3306 or EDPA 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.

OLPD 4318 Advanced Project Management (3.0 cr.; A-F or Audit; prereq 3318 or EDPA 3218)
Project management for business and industry. Advanced aspects and techniques in project management, project lifecycles, deliverables, and processes as they are commonly used in the workplace.

OLPD 4400 Education for Small Business Entrepreneurship (3.0 cr.; A-F or Audit)
Process of starting a small business. Helps students identify the skills necessary to operate the business.

OLPD 4401 E-Marketing (3.0 cr.; A-F or Audit; prereq BME major recommended)
Basic understanding and personal experience with how e-marketing can be used as part of an overall marketing and promotion plan.

OLPD 4420 Practicum in Nonprofit Organizations (2.0 cr.; A-F or Audit; prereq course)
Opportunity to work in all aspects of nonprofit organization. Fundraising, managing events, marketing, conducting outreach programs.

OLPD 4426 Strategic Customer Relationship Management (3.0 cr.; A-F or Audit)
Principles of customer relationship management, brand identity, and integrated marketing communications. Comprehensive framework for how organizations interact with their various publics to create goodwill/loyalty.

OLPD 4496 Internship: Business and Marketing Education (1.0-4.0 cr.; A-F or Audit; prereq course)
Opportunity to work in business, industry. Marketing or sales. Integrative paper.

OLPD 4602 Managing Work Teams (3.0 cr.; A-F or Audit)
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.

OLPD 4608 Introduction to International Human Resource Development (3.0 cr.; A-F or Audit; prereq 3601 or HRD 3001 or 3620 or HRD 3201 or 3640 or HRD 3301)
International/cross-cultural aspects of HRD. Practices/impact of economic, social, and cultural influences on HRD programs/interventions.

OLPD 4627 Management and Supervisory Training and Development (3.0 cr.; A-F or Audit)
Problems, practices, programs, and methodologies relating to the training and development of managers and supervisors, including needed competencies, needs assessment, delivery modes, and evaluation.

OLPD 4696 Internship: Human Resource Development (1.0-4.0 cr.; S-N Grading Basis; prereq HRD major; OLPD 3696)
Students apply/contract for human resource development positions. Contracts describe specific HRD responsibilities to be fulfilled during internship and theory-to-practice learning outcomes.

OLPD 4870 Introduction to Integrating Human Rights into Organizational Leadership (3.0 cr.; A-F or Audit)
Forum to explore local and international policies/practices for integrating human rights into organizational leadership and management.

OLPD 5001 Formal Organizations in Education (3.0 cr.; Student Option)
Classical/current theories of organizations. Applications to education and related fields.

OLPD 5011 Leading Organizational Change: Theory and Practice (3.0 cr.; Student Option)
How theory is incorporated, affects the change process, and can improve schools/organizations of higher education. Characteristic elements that impact change processes/outcomes. Leadership/policy effects.

OLPD 5021 Historical Foundations of Modern Education (3.0 cr.; Student Option)
Analysis and interpretation of important elements in modern education derived from pre-classical sources: Greeks, Romans, Middle Ages, Renaissance, Reformation, Enlightenment, and Industrial Revolution.

OLPD 5028 Education Imagery in Europe and America (3.0 cr.; Student Option)
Imagery/ideals 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.

OLPD 5041 Sociology of Education (3.0 cr.; Student Option)
Structures and processes within educational institutions; linkages between educational organizations and their social contexts, particularly related to educational change.

OLPD 5044 Introduction to the Economics of Education (3.0 cr.; Student Option)
Costs and economic benefits of education, with a focus on K-12; educational markets, prices, and production relationships; investment and cost-benefit analysis.

OLPD 5048 Cross-Cultural Perspectives on Leadership (3.0 cr.; Student Option)
Introduction to cultural variables of leadership that influence functioning of cross-cultural groups. Lectures, case studies, discussion, problem-solving, simulations. Intensive workshop.

OLPD 5056 Case Studies for Policy Research (3.0 cr.; A-F or Audit)
Qualitative case study research methods and their applications to educational policy and practice. Emphasis on designing studies that employ open-ended interviewing as primary data collection technique.

OLPD 5057 Research in International Education (3.0 cr.; Student Option)

OLPD 5061 Ethnographic Research Methods (3.0 cr.; Student Option)
Practice in aspects of field methodology below the level of full field study: detailed reading; analysis of studies in anthropology and education for methodological content.

OLPD 5080 Special Topics: Educational Policy and Administration (1.0-3.0 cr.; Student Option)
Topical issues in educational policy/administration.

OLPD 5087 Seminar: Educational Policy and Administration (1.0-3.0 cr.; Student Option)
Shared responsibility of students/instructor in presentation of topics.

OLPD 5095 Problems: Educational Policy and Administration (1.0-3.0 cr.; Student Option)
Course or independent study on specific topic within department program emphasis.

OLPD 5096 Internship: Educational Policy and Administration (1.0-9.0 cr.; Student Option)
Internship in elementary, secondary, general, or postsecondary administration, or other approved field related setting.

OLPD 5102 Knowledge Constructions and Applications in International Development (3.0 cr.; Student Option)
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.

OLPD 5103 Comparative Education (3.0 cr.; Student Option)
Examination of systems and philosophies of education globally with emphasis upon African, Asian, European, and North American nations. Foundations of comparative study with selected case studies.

OLPD 5104 Strategies for International Development of Education Systems (3.0 cr.; A-F or Audit; 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.

OLPD 5121 Educational Reform in International Context (3.0 cr.; Student Option)
Critical policy analysis of educational innovation and reform in selected countries. Use theoretical perspectives and a variety of policy analysis approaches to examine actual educational reforms and their implementation.

OLPD 5124 Critical Issues in International Education and Educational Exchange (3.0 cr.; Student Option)
OLPD 5128 Anthropology of Education (3.0 cr.; Student Option)
Insights from educational anthropology for educators to address issues of culture, ethnicity, and power in schools.

OLPD 5132 Intercultural Education and Training: Theory and Application (3.0 cr.; Student Option)
Examination of intercultural education; formal and nonformal education programs intended to teach about cultural diversity, promote intercultural communication and interaction skills, and teach students from diverse backgrounds more effectively.

OLPD 5141 Global Youth Policy and Leadership: Comparative Youth Policy and Leadership (3.0 cr.; A-F Grade Basis)
Comparative approach to public responses at global level to youth development and leadership issues. Social systems such as education, health, employment, and recreation. Role of individuals, communities, governments, and international organizations in providing programs/services.

OLPD 5142 Youth Futures in International and Global Contexts (3.0 cr.; A-F Grade Basis; prerequisite 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.

OLPD 5144 Cultural Models, Simulations, and Games (3.0 cr.; Student Option; prerequisite 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.

OLPD 5200 Special Topics in Adult Education (1.0-8.0 cr.; Student Option)
Exploration of issues, methods, and knowledge in areas of adult education. Content varies.

OLPD 5201 Strategies for Teaching Adults (3.0 cr.; A-F or Audit; prerequisite 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.

OLPD 5202 Perspectives of Adult Learning and Development (3.0 cr.; Student Option)
Emphasis on major adult development theorists, theories, and current applications. Transformative learning, self-directed learning, experiential learning, and cooperative learning provide theoretical framework for exploring physiological, psychological, sociological, and cultural aspects of adult development through the life span.

OLPD 5203 Methods of Teaching Adult Literacy (3.0 cr.; Student Option)

OLPD 5204 Designing the Adult Education Program (3.0 cr.; A-F or Audit)
Designing and implementing educational programs for adults. Application of concepts, theories, and models in different adult learning situations.

OLPD 5211 Introduction to the Undereducated Adult (1.0 cr.; A-F or Audit)
Definitions of literacy in workplace, community, and family. Issues: poverty/welfare, ethnicity, cultural diversity, social class, language/learning, immigrants.

OLPD 5212 Introduction to Adult Literacy in the Workplace (1.0 cr.; A-F or Audit; prerequisite OLPD 5121 or 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.

OLPD 5213 Introduction to Adult Literacy in the Community (1.0 cr.; A-F or Audit; prerequisite OLPD 5121 or 5211)
Programs in United States. Literacy building. Family literacy skills. Correctional education in reintegrating offenders back into community. Integrating people with disabilities through community literacy programs. Literacy/development in developing countries. Reaching/recruiting indigenous, migrant, immigrant groups. Social action approaches to literacy education.

OLPD 5224 Formal Assessment of Adult Literacy (1.0 cr.; A-F or Audit; prerequisite OLPD 5211 or 5211)
Assessment of adult English/literacy skills for work, family, community, and continuing education. Formal testing policy, techniques, standardized tests. Assumptions about testing, cultural bias, and interpretation of formal tests. Test preparation programs.

OLPD 5225 Informal Assessment of Adult Literacy (1.0 cr.; A-F or Audit; prerequisite OLPD 5211 or 5211)
Informal assessment of adult English/literacy skills for work, family, community, and further education. Informal testing techniques, setting educational goals, formal versus informal assessment.

OLPD 5226 Advanced Assessment of Adult Literacy (1.0 cr.; A-F or Audit; prerequisite OLPD 5211 or 5211)
Applications/case studies. Educational planning for work, family, community.

OLPD 5233 Methods of Teaching Beginning Adult Literacy (1.0 cr.; A-F or Audit; prerequisite OLPD 5211 or 5211)
Learning English/literacy as an adult. Initial approaches to teaching reading, writing, and communications skills. Theories of learning/curriculum design. Technology as teaching tool. Teaching students with disabilities or with cultural/gender differences.

OLPD 5234 Methods of Teaching Intermediate Adult Literacy (1.0 cr.; A-F or Audit; prerequisite OLPD 5211 or OLPD 5211; prerequisites ADED 5211, ADED 5233)
Learning English/literacy as an adult. Approaches to teaching reading, writing, and communications skills. Communication/comprehension in oral/written English. English reading/oral communication skills for workplace. Evaluating commercial materials/software.

OLPD 5235 Methods of Teaching Advanced Adult Literacy (1.0 cr.; A-F or Audit; prerequisite OLPD 5211 or OLPD 5211)
Approaches to teaching reading, writing, study, communication skills. Preparing students for college/continuing education.English in workplace/on Internet. Problem solving, analytical thinking. Technology as teaching tool. Evaluating commercial material/software.

OLPD 5296 Field Experience in Adult Education (3.0-6.0 cr.; S-N or Audit)
Supervised fieldwork and practice. Presentations and evaluations of adult education practices.

OLPD 5302 Educational Policy: Context, Immediacy, and Issues (3.0 cr.; Student Option)
Review of social science concepts/research in considering educational policies/issues, process of inquiry that affect policy development, implementation, evaluation. Focus on pre-K-12. Role of educational leaders, administrators.

OLPD 5310 Data-Driven Decision Making I (1.0 cr.; Student Option; prerequisite 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.

OLPD 5311 Data-driven Decision Making II (1.0 cr.; Student Option; prerequisite [5310 or EdPA 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.

OLPD 5321 The Principal as Leader of High-Performing Schools (3.0 cr.; Student Option)
Role of principal: qualifications, duties, problems.

OLPD 5322 Leaders in the Superintendency and Central Office (3.0 cr.; Student Option)
Role/responsibility of superintendent in school district. Real life experiences, leadership potential as CEO. Purposes, power, politics, practices of position. Interplay of internal school forces, community forces. Leadership in public, high-profile appointment.

OLPD 5323 Women in Leadership (3.0 cr.; Student Option; prerequisite Technology access)
Women in leadership, in context of larger systems and their own lives. Supporting equity/equality across areas of difference.

OLPD 5324 Strategic Financial Planning and Policy for Educational Leaders (3.0 cr.; Student Option; prerequisite Grad student pursuing licensure as elementary-secondary [principal or superintendent])
OLPD 5332 Leadership Development Seminar (3.0 cr.; Student Option)  
Assessment and development of skills required of the educator in planning, decision making, and human relations. Introduction to contemporary issues in educational administration.

OLPD 5341 The American Middle School (3.0 cr.; Student Option)  
Focus on the uniqueness of the early adolescent and appropriate learning situations. For educators working with middle-level students.

OLPD 5344 School Law (3.0 cr.; Student Option)  
Legal foundations of elementary/secondary education. Statutory themes, relevant case law, emergent policy issues. Implications for educational organizations and for administrative practice.

OLPD 5346 Politics of Education (3.0 cr.; A-F or Audit; 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.

OLPD 5348 Leaders of Human Resources Administration (3.0 cr.; Student Option; prereq Designed for students working on licensure for [dir of community educ or superintendent or K-12 principal or dir of special edu])  
Skills for administrator/leader. Human resources administration, employee recruitment, selection, orientation/support, supervision, performance appraisal of school district personnel.

OLPD 5356 Disability Policy and Services (3.0 cr.; Student Option)  
Policy, research, and current practices related to education, health, and social services that support children, youth, and adults with special needs, and that support their families. Federal, state, and local perspectives.

OLPD 5361 Project in Teacher Leadership (3.0 cr.; S-N or Audit; 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.

OLPD 5364 Context and Practice of Educational Leadership (3.0 cr.; A-F or Audit)  
Current research/practice on educational leadership. Focuses on creating school cultures conducive to continuous improvement/change. Strategies for personal/organizational leadership in PK-12 settings.

OLPD 5368 Leadership for Special Education Services (3.0 cr.; Student Option; 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.

OLPD 5372 Youth in Modern Society (3.0 cr.; Student Option)  
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.

OLPD 5374 Leadership for Professional Development (4.0 cr.; Student Option; prereq Postbaccaleaureate, at least 3 yrs teaching experience)  
Designing, implementing, evaluating staff development in preK-12 settings. Research-based standards for effective staff development. Need for embedded time for collaborative learning, evaluating staff/student outcomes.

OLPD 5381 The Search for Children and Youth Policy in the U.S. (3.0 cr.; Student Option)  
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.

OLPD 5385 Licensure Seminar: Program Policies and Inclusionary Leadership (1.0 cr.; S-N or Audit)  
Preparation for licensure program. Program overview, preassessment, reflective practice, APA writing, exit panel review, administrative employment interview.

OLPD 5386 Leadership Portfolio Seminar (1.0 cr.; S-N or Audit; prereq 5385 or A5385 or EDPA 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.

OLPD 5387 Leadership for Teaching and Learning (2.0 cr.; Student Option; prereq Undergrad degree)  
Administration of inclusive/coherent systems of teaching/learning. Design principles, best practices, exemplary programs. School/district administrator roles as leaders of learning systems.

OLPD 5388 Leadership for Master(ful) Scheduling (2.0 cr.; Student Option; prereq 5387 or EDPA 5387)  
Work of high-performing professional learning communities. Implications for moving from building a master schedule to leadership for master(ful) scheduling of time, space, motion, and people. Hands-on work with infinite campus software/scheduling-building logic.

OLPD 5389 Community Education Leadership (3.0 cr.; Student Option)  
Competencies of leadership, community relations, communication, community assessment, program development, program evaluation. Philosophy/administration of community/alternative education programs.

OLPD 5391 Special Education Law for Leaders (1.0 cr.; Student Option; 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.

OLPD 5392 Special Education Finance: Program Models, Policy, and Law (2.0 cr.; Student Option; prereq [5324 or &5324 or EDPA 5324 or &EDPA 5324], knowledge of special education)  
How special education revenue is a resource to accomplish student-related objectives. Revenue sources, compliance, budget monitoring. Key policy, case law, program models from perspective of director of special education.

OLPD 5393 Leading School Finance Elections (1.0 cr.; S-N or Audit)  
Comprehensive planning model for conducting school finance elections. Emphasizes systems, strategies, and campaign tactics.

OLPD 5394 Leadership in Community Education Finance and Law (1.0 cr.; S-N or Audit; prereq [5324 or EDPA 5324])  
Interplay between finance and laws directly applicable to community education. MN Statute 124D, revenues/expenditures, and UFARS approached from frame of resource development.

OLPD 5396 Field Experience in PK-12 Administration: Authentic Practice in Leadership (3.0 cr.; S-N or Audit; 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.

OLPD 5402 Education and Human Resource Development Through Tourism (3.0 cr.; A-F or Audit)  
Policies/practices of education and human resource development in tourism industry.

OLPD 5403 Tourism Studies Capstone Seminar (3.0 cr.; S-N or Audit; prereq Tourism studies major)  
Students present, critique, and discuss implications of supporting programs for tourism.

OLPD 5404 The Business of Tourism (3.0 cr.; A-F or Audit)  
Introduction to major theories, concepts, skills, and techniques influencing tourism business/industry.

OLPD 5405 Critical Issues in Business and Industry (3.0 cr.; Student Option)  
Identification and analysis of major current issues in business and industry education.

OLPD 5411 Teaching Marketing Promotion (3.0 cr.; A-F or Audit)  
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.

OLPD 5452 Methods of Teaching Business and Marketing Concepts (3.0 cr.; A-F or Audit)  
Recent research/developments in teaching business concepts related to economics, business organization/management, business law, entrepreneurship, marketing, international
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<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Description</th>
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<tbody>
<tr>
<td>OLPD 5454</td>
<td>Technical Development: Specialized (1.0-12.0 cr.; A-F or Audit; prereq #)</td>
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<td>Students select/study technical processes/principles based on subjects they plan to teach, integrate specialized technical instruction in advanced/ emerging areas.</td>
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<tr>
<td>OLPD 5457</td>
<td>Methods of Teaching Business Employment and Marketing Employment</td>
<td>(3.0 cr.; A-F or Audit)</td>
<td>Recent research/developments in teaching for business employment. Administrative support positions, accounting, information processing, marketing, sales, computer operations, other occupations using desktop computing.</td>
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<tr>
<td>OLPD 5475</td>
<td>Curriculum Development for Business and Marketing Education</td>
<td>(3.0 cr.; A-F or Audit)</td>
<td>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.</td>
</tr>
<tr>
<td>OLPD 5476</td>
<td>Field Based Projects in Business and Industry</td>
<td>(1.0-4.0 cr.; S-N or Audit)</td>
<td>Curricular, instructional, developmental, or evaluative problems and projects applicable to local school or business and industry situations.</td>
</tr>
<tr>
<td>OLPD 5480</td>
<td>Special Topics in Business and Industry Education</td>
<td>(1.0-4.0 cr.; Student Option)</td>
<td>Content varies by offering.</td>
</tr>
<tr>
<td>OLPD 5493</td>
<td>Directed Study in Business and Industry</td>
<td>(1.0-4.0 cr.; Student Option)</td>
<td>In-depth individual inquiry in the content areas related to business and industry.</td>
</tr>
<tr>
<td>OLPD 5496</td>
<td>Occupational Experience in Business and Industry</td>
<td>(1.0-10.0 cr.; S-N or Audit; prereq #)</td>
<td>Observation/employment in business/industry to develop technical/occupational competencies. Includes 100 clock hours of supervised work experience per credit.</td>
</tr>
<tr>
<td>OLPD 5501</td>
<td>Principles and Methods of Evaluation</td>
<td>(3.0 cr.; Student Option)</td>
<td>Introduction to program evaluation. Planning an evaluation study, collecting and analyzing information, reporting results; evaluation strategies; overview of the field of program evaluation.</td>
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<tr>
<td>OLPD 5502</td>
<td>Theory and Models of Evaluation</td>
<td>(3.0 cr.; Student Option; prereq 5501 or EPSY 5243 or introductory program evaluation course)</td>
<td>Evaluation theories/models currently available to practitioners. Communication with clients about value/utility of program. Systems theory.</td>
</tr>
<tr>
<td>OLPD 5521</td>
<td>Cost and Economic Analysis in Educational Evaluation</td>
<td>(3.0 cr.; Student Option)</td>
<td>Use and application of cost-effectiveness, cost-benefit, cost-utility, and cost-feasibility in evaluation of educational programs and programs.</td>
</tr>
<tr>
<td>OLPD 5524</td>
<td>Evaluation Colloquium</td>
<td>(1.0 cr.; S-N or Audit; prereq [5501 or EDPA], [5501 or EPSY 5243])</td>
<td>Informal seminar of faculty/students. Issues/problems of program evaluation.</td>
</tr>
<tr>
<td>OLPD 5526</td>
<td>Focus Group Interviewing</td>
<td>(3.0 cr.; Student Option)</td>
<td>Skills needed to conduct focus group interviews. Students conduct focus group study and report results at final class session.</td>
</tr>
<tr>
<td>OLPD 5601</td>
<td>Foundations of Human Resource Development</td>
<td>(1.0 cr.; Student Option)</td>
<td>Introduction to human resource development as a field of study and practice.</td>
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<tr>
<td>OLPD 5602</td>
<td>Economic Foundation of Human Resource Development</td>
<td>(1.0 cr.; Student Option; prereq 5601 or HRD 5101)</td>
<td>Introduction to economics as core discipline supporting theory/practice of human resource development.</td>
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<tr>
<td>OLPD 5603</td>
<td>Psychological Foundations of Human Resource Development</td>
<td>(1.0 cr.; Student Option; prereq 5601 or HRD 5101)</td>
<td>Introduction to psychology as core discipline supporting theory/practice of human resource development.</td>
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<tr>
<td>OLPD 5604</td>
<td>Systems Foundation of Human Resource Development</td>
<td>(1.0 cr.; Student Option; prereq 5101)</td>
<td>Introduction to system theory as a core discipline supporting the theory and practice of human resource development.</td>
</tr>
<tr>
<td>OLPD 5605</td>
<td>Strategic Planning through Human Resources</td>
<td>(3.0 cr.; A-F or Audit; prereq 5607 or 5615 or HRD 5201 or HRD 5301)</td>
<td>Strategic nature of organizations. How HRD can align its goals with those of organization. Strategic planning, systems thinking. Ways HRD managers can become strategic players in organization.</td>
</tr>
<tr>
<td>OLPD 5606</td>
<td>Evaluation in Human Resource Development</td>
<td>(3.0 cr.; A-F or Audit)</td>
<td>Evaluation of human resource development efforts from the perspective of impact on organizations, work processes, and individuals, plus four courses.</td>
</tr>
<tr>
<td>OLPD 5607</td>
<td>Organization Development</td>
<td>(3.0 cr.; A-F or Audit; prereq Grad student only)</td>
<td>Introduction to major concepts, skills, and techniques for organization development/ change.</td>
</tr>
<tr>
<td>OLPD 5610</td>
<td>Survey of Research Methods and Emerging Research in Human Resource Development</td>
<td>(3.0 cr.; A-F or Audit; prereq [Registered, in attendance] at conference of Academy of HRD)</td>
<td>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.</td>
</tr>
<tr>
<td>OLPD 5611</td>
<td>Facilitation and Meeting Skills</td>
<td>(1.0 cr.; Student Option)</td>
<td>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.</td>
</tr>
<tr>
<td>OLPD 5612</td>
<td>International Human Resource Development</td>
<td>(3.0 cr.; Student Option; prereq Grad students only; ugrd seniors with instr consent)</td>
<td>Problems, practices, programs, theories, and methodologies in human resource development as practiced internationally.</td>
</tr>
<tr>
<td>OLPD 5615</td>
<td>Training and Development of Human Resources</td>
<td>(3.0 cr.; A-F or Audit; prereq Grad student only)</td>
<td>Training/development of human resources in organizations. Process phases of analysis, design, development, implementation, and evaluation.</td>
</tr>
<tr>
<td>OLPD 5616</td>
<td>Training on the Internet</td>
<td>(3.0 cr.; Student Option; prereq Grad student only)</td>
<td>Major concepts, skills, and techniques for giving and receiving training on the Internet.</td>
</tr>
<tr>
<td>OLPD 5619</td>
<td>Planning and Decision-Making Skills</td>
<td>(1.0 cr.; Student Option)</td>
<td>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.</td>
</tr>
<tr>
<td>OLPD 5625</td>
<td>Technical Skills Training</td>
<td>(3.0 cr.; Student Option)</td>
<td>Analyzing technical skills training practices in business and industry. Systems and process analysis and trouble-shooting of work behavior; design methods and developing training materials.</td>
</tr>
<tr>
<td>OLPD 5670</td>
<td>Special Topics in Human Resource Development</td>
<td>(1.0-4.0 cr.; Student Option)</td>
<td>Issues, methods, and knowledge in HRD areas. Topics vary.</td>
</tr>
<tr>
<td>OLPD 5671</td>
<td>Internship: Human Resource Development</td>
<td>(1.0-10.0 cr.; S-N or Audit; prereq [3901 or HRD 3601, [3696 or HRD 3196], [3620 or 3640 or HRD 3201 or HRD 3301], [3202 or ADED 3101], undergrad or [5607 or 5615 or HRD 5201 or HRD 5301], [5801 or WHRE 5001], grad student]], #)</td>
<td>Students apply/contract for human resource development positions.</td>
</tr>
<tr>
<td>OLPD 5697</td>
<td>International Field Study in Human Resource Development</td>
<td>(3.0 cr.; A-F Grade Basis; prereq 5001)</td>
<td>Engage in international travel/study for one week with an HRD faculty leader. Visit a variety of sites in business and industry to become aware of how HRD is practiced outside the United States.</td>
</tr>
<tr>
<td>OLPD 5701</td>
<td>U.S. Higher Education</td>
<td>(3.0 cr.; Student Option)</td>
<td>U.S. higher/postsecondary education in historical/contemporary perspective. Emphasizes structure, history, and purposes of system as a whole.</td>
</tr>
<tr>
<td>OLPD 5704</td>
<td>College Students Today</td>
<td>(3.0 cr.; Student Option)</td>
<td>Issues involving population of students in colleges/universities. College student development theory, students' expectations/interests. How college affects student outcomes. Role of curricular/extracurricular activities. Student-faculty interaction.</td>
</tr>
</tbody>
</table>
| OLPD 5721     | Race and Ethnicity in Higher Education                                     | (3.0 cr.; Student Option) | Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
OLPD 5724 Leadership and Administration of Student Affairs (2.0-3.0 cr.; Student Option)
Scope, administration, coordination, and evaluation of programs in college and university student affairs.

OLPD 5728 Two-Year Postsecondary Institutions (2.0-3.0 cr.; Student Option)
Present status, development, functions, organization, curriculum, and trends in postsecondary, but nonbaccalaureate, institutions.

OLPD 5732 The Law and Postsecondary Institutions (3.0 cr.; Student Option)
Analysis of court opinions and federal regulations affecting postsecondary educational institutions.

OLPD 5734 Institutional Research in Postsecondary Education (2.0-3.0 cr.; A-F or Audit; prereq [5701, [EPSY 5231 or EPSY 8261], grad student] or #)
Scope, role, administration, research strategies, and evaluation of institutional research in postsecondary institutions. Methodologies, disciplinary foundations of research. Use of institutional, state, and national databases in addressing institutional missions/functions.

OLPD 5736 Public Engagement and Higher Education (3.0 cr.; A-F Grade Basis)
Study/practice of public engagement in higher education. Civic roles of post-secondary education institutions.

OLPD 5795 Plan B Research Design (3.0 cr.; A-F or Audit; prereq Grad student)
Foundation to design Plan B research project relevant to student's professional interests. Literature review strategies to establish conceptual framework for project. Relates research question to design alternatives and to associated qualitative/quantitative analysis techniques. Issues such as human subjects and APA guidelines for preparing research papers.

OLPD 5801 Survey: Human Resource Development and Adult Education (3.0 cr.; Student Option; prereq Grad student only)
Overview of fields of human resource development and adult education. Societal context, theories, processes, definitions, philosophies, goals, sponsoring agencies, professional roles, participants, and resources. Unique characteristics and ways fields overlap and enhance one another.

OLPD 5804 Leadership in WHRE (2.0 cr.; Student Option)
Leadership, leadership roles/responsibilities. Application to work and human resource education.

OLPD 5806 Philosophy and Practice of Career and Technical Education (2.0 cr.; A-F or Audit)

OLPD 5808 Student and Trainee Assessment (2.0 cr.; A-F or Audit)

OLPD 5811 Education for Work (3.0 cr.; Student Option)
Examination of contextual bases underlying education for work; implications for practice.

OLPD 5812 Managing and Consulting in Human Resource Development and Adult Education (3.0 cr.; Student Option; prereq 5801 or WHRE 5001)

OLPD 5813 Enhancing Work-based Learning Through Collaboration (2.0 cr.; Student Option)
Interdisciplinary planning issues/practices relating to special populations for educational, business, and human service organization personnel, family members, and advocates.

OLPD 5814 Developmental Writing and the College Student: Theory and Practice (3.0 cr.; Student Option; prereq Bachelor's degree)

OLPD 5815 Research in Postsecondary Developmental Education (3.0 cr.; Student Option; prereq Bachelor's degree, courses in [intro psychology, basic statistics])
Strategies for conducting three types of research that are central to developmental education: test validation, program evaluation, and classroom research. Students read examples and learn what constitutes best practices in each type.

OLPD 5816 Distance Learning in Adult Education and Training (3.0 cr.; A-F or Audit)
Distance learning concepts, theory, history, present practice, delivery systems, course design, major issues, future directions.

OLPD 5819 Evaluating and Using Research in Organizations and Education (3.0 cr.; A-F or Audit; prereq Grad student)

OLPD 5822 Work-Based Learning Practices (3.0 cr.; Student Option)

OLPD 5823 Work-Based Learning Policies (2.0 cr.; Student Option)
Aims/purposes of federal, state, and local policies, related to work-based learning.

OLPD 5824 Diversity and Organizational Transformation in Work and Human Resource Education (3.0 cr.; Student Option)
Developing models for understanding impact of diversity on individual, organizational, and community outcomes. Discussing organizational change in relation to diversity.

OLPD 5825 Diversity Issues and Practices in Work and Human Resource Education Settings (3.0 cr.; Student Option)
Nature of diverse populations, their unique learning/training needs. Exemplary programs. Collaborative efforts among persons representing work and human resource education settings.

OLPD 5829 Course Development for Business and Industry (2.0 cr.; A-F or Audit)
Designing instructional programs/courses that help learners develop desired competencies. Designing instruction for performance based training and vocational/technical education. Developing course syllabus components that clarify course expectations. Developing academic/community-based elements that complement course goals. Reflect on and compare performance-based instruction with other curriculum models for the field.

OLPD 5841 Evaluation of WHRE (3.0 cr.; Student Option)
Designing/conducting project, program, and systems evaluations in work and human resource education contexts/settings.

OLPD 5842 Global Program Delivery Techniques and Technology of Extension (3.0 cr.; A-F or Audit)
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.

OLPD 5851 Methods for Change in Developing Countries (3.0 cr.; A-F or Audit)
Sociological and cultural parameters as they pertain to promoting the adoption of improved practices in rural, community, and agricultural development, including formal and informal education institutions. Project planning, implementation, and evaluation related to actual change and development situations in developing countries.

OLPD 5861 Instructional Methods for Business and Industry (2.0 cr.; Student Option)
Theory/practice in instructional methods for career/technical education (CTE) instructors and human resources/development (HRD) professionals. How to select various teaching methods and plan for their delivery. Preparing an instructional methods plan to clarify course content, teaching methods selected, rationale for their selection, and how a student organization might facilitate student learning.

OLPD 5871 Teaching Entrepreneurship: Small Business Management (3.0 cr.; Student Option)
Methods, organization, curriculum development and modification, and implementation of educational programs for entrepreneurs.

OLPD 5890 Special Topics in Work and Human Resource Education (1.0-4.0 cr.; Student Option)
OTOL 5101 Introduction to the Basic Sciences in Otolaryngology I: Ear (2.0 cr.; A-F or Audit; prereq Otolaryngology major or #) Multidisciplinary introduction to the basic sciences of the ear. Acoustics and psychoacoustics, temporal bone anatomy, external and middle ear mechanisms, cochlear physiology, auditory neurophysiology, ear embryology, ear biochemistry, immunology, fine structures, vestibular mechanisms and measurement. S-N grading option for nonmajors only.

OTOL 5102 Introduction to the Basic Sciences in Otolaryngology II: Head and Neck (2.0 cr.; A-F or Audit; prereq Otol major or #) Multidisciplinary introduction to the basic sciences of the head and neck. Laryngeal anatomy and physiology, nasal anatomy and physiology, immune biology, embryology of head and neck. S-N grading option for nonmajors only.

OTOL 5993 Directed Studies (1.0-12.0 cr.; Student Option; prereq #) Directed readings and preparation of reports on selected topics.

PHCL 5300 Pharmacology for Pre-Med and Life Science Students (2.0 cr.; A-F or Audit; prereq College-level biology, biochemistry or physiology recommended) Principles/mechanisms of drug action. Major drug categories for different organ systems.


PHCL 4003 Anti-infective drugs: Drugs that kill invaders (2.0 cr.; A-F or Audit; prereq College-level biology) Principles/mechanisms of anti-infective drugs, and treatments of infectious diseases.

PHCL 4010 Current Research Topics in Pharmacology (1.0 cr.; A-F Grade Basis; prereq Upper div or #) Cutting-edge research projects in pharmacology. Research seminars, literature studies, discussion sessions, oral presentations.

PHCL 4993 Directed Studies (1.0-3.0 cr.; S-N Grading Basis; prereq #, %) Individual study ("dry lab" experience) on selected topics in pharmacology/biomedical science with faculty from the Pharmacology Department or other biomedicine disciplines. Readings and use of scientific literature.

PHCL 4994 Directed Research (1.0-3.0 cr.; S-N Grading Basis; prereq #, %) Laboratory research ("wet lab" experience) in the areas of pharmacological/biomedical research.

PHCL 5101 Pharmacology for Pharmacy Students I (3.0 cr.; A-F Grade Basis; prereq 2nd yr pharmacy student or #) Action/fate of drugs. Lectures, lab.

PHCL 5102 Pharmacology for Pharmacy Students II (2.0 cr.; A-F Grade Basis; prereq 5101 or #) Action/fate of drugs.

PHCL 5103 Pharmacology for Dental Students (3.0 cr.; Student Option; prereq enrolled dental student or #) Pharmacological principles/actions of drugs.

PHCL 5109 Problems in Pharmacology (1.0-18.0 cr.; Student Option; prereq Upper div or grad student or #) Research projects and special problems by arrangement.

PHCL 5110 Introduction to Pharmacology (3.0 cr.; A-F or Audit; prereq Grad student or #) Basic principles of Pharmacology. Focuses on molecular mechanisms of drug action.

PHCL 5111 Pharmacogenomics (3.0 cr.; A-F or Audit; prereq Grad student or #) Human genetic variation, its implications. Functional genomics, pharmacogenomics, toxicogenomics, proteomics. Interactive, discussion-based course.

PHCL 5112 A Graduate Toolkit I: An Introduction to the Scientific Research Lab (1.0 cr.; A-F Grade Basis; prereq #) Basic operating principles/techniques of scientific research lab. Personnel structure, professionalism, authorship/publication. Recombinant protein production/purification, DNA/RNA purification/methods, molecular biology methods, microscopy, model systems/ bioinformatics.

PHCL 5113 A Graduate Toolkit II: Scientific Speaking and Writing for Graduate Students (2.0 cr.; A-F Grade Basis; prereq Completion of one yr of a grad program) Guidance on PowerPoint design, public speaking, question/answer sessions at scientific talks. Practice sessions are videotaped/analyzed to highlight strategies for improvement. Guidance in writing thesis research topic.

PHCL 5210 Pharmacology (1.0 cr.; A-F or Audit; prereq Grad student or #) Principles of pharmacology. Meets with INMD 6818.

PHCL 5211 Pharmacology (2.0 cr.; A-F or Audit; prereq 5210 or #) Meets with 6808/6809. Major classes of drugs.

PHCL 5212 Pharmacology (3.0 cr.; A-F or Audit; prereq 5211 or #) Meets with INMD 6810/6811.
PHAR 1 CoP - Philosophy Neighborhood Clinic (0.0 cr.; No Grade Associated; prereq Current Student Pharmacist in the College of Pharmacy) 
Teaching laboratories to community/clinical-based interprofessional patient care model at Phillips Neighborhood Clinic.

PHAR 1001 Orientation to Pharmacy (2.0 cr.; Student Option) 
Overview of profession of pharmacy.

PHAR 1002 Health Sciences Terminology (2.0 cr.; Student Option) 
Students analyze/build terminology by using/combing forms, suffixes, and prefixes.

PHAR 1003 Non-Prescription Medications and Self-Care: Treating Minor Conditions (2.0 cr.; Student Option) 
Non-prescription medications and self-care available to treat many different medical conditions. Becoming an informed consumer of over-the-counter medications and testing devices.

PHAR 1004 Common Prescription Drugs and Diseases (2.0 cr.; Student Option) 
Frequently prescribed medications, how they work and are chosen, what conditions they are intended to treat, and why some medications cannot be used by certain people.

PHAR 1005 Introduction to Drug Therapies of Addiction: Medicine or Menace? (2.0 cr.; Student Option; prereq Medical terminology recommended) 

PHAR 1006 Orientation to Health Literacy and Communication (2.0 cr.; A-F Grade Basis; prereq Knowledge of medical terminology recommended) 
Issues associated with health literacy. Dimensions associated with misunderstandings that occur in health-related communication.

PHAR 2320 Issues in Health Literacy and Communication (3.0 cr.; A-F Grade Basis; prereq Knowledge of medical terminology recommended) 
Issues associated with health literacy. Dimensions associated with misunderstandings that occur in health-related communication.

PHAR 3207 Directed Study: Leadership in Health Care (3.0 cr.; A-F Grade Basis) 
Leadership skills/theories to create positive change in health care settings.

PHAR 3601 Basic Human Physiology for the Health Professions (3.0 cr.; A-F Grade Basis; prereq Medical terminology and anatomy) 
Normal functions/physiology of major human organ systems/diseases/pathophysiology in those systems.

PHAR 3700 Fundamentals of Pharmacotherapy (3.0 cr.; A-F Grade Basis; prereq Medical terminology) 
Drug therapy/pharmacology. Recognition of brand/generic drug names. Therapeutic classes, common uses. How to review medication lists and other forms of health communication/documentation.

PHAR 3800 Pharmacotherapy for the Health Professions (3.0 cr.; A-F or Audit; prereq Anatomy/physiology, nursing or respiratory care) 
Drug therapy. Implications in patient care.

PHAR 4200W Drugs and the U.S. Health Care System (3.0 cr.; A-F Grade Basis; prereq #) 
How to be informed/responsible participant in debates related to medication use within US health care system.

PHAR 4248 Drugs of Abuse (2.0 cr.; A-F Grade Basis) 

PHAR 4293 Directed Research I - Undergraduate (1.0-5.0 cr.; A-F Grade Basis; prereq Undergrad, #) 
Students work with College of Pharmacy faculty.

PHAR 4294 Directed Study I for Undergraduates (1.0-5.0 cr.; Student Option; prereq Undergrad, #) 
Individualized study. Students work with faculty on special projects.

PHAR 5200 Drugs and the U.S. Health Care System (3.0 cr.; A-F Grade Basis; prereq grad or professional student) 
How to be informed/responsible participant in debates related to medication use.

PHAR 5201 Applied Health Sciences Terminology (2.0 cr.; Student Option; prereq Basic knowledge of human anatomy/physiology) 
Identify/describe various medical conditions/processes. Medical abbreviations, surgical procedures, medical terminology. Analyzing words at roots.

PHAR 5205 Obesity: More than Just a Prescription (2.0 cr.; A-F Grade Basis) 
Information necessary for the prevention, treatment, and management of obesity, from individual adipose cell to entire public health community.

PHAR 5206 Applied Health Literacy and Communication (3.0 cr.; A-F Grade Basis; prereq Knowledge of medical terminology recommended) 
Issues associated with health literacy. Dimensions associated with misunderstandings that occur in health-related communication.

PHAR 5207 Directed Study: Leadership in Health Care (3.0 cr.; A-F Grade Basis; prereq advanced undergraduates, professional health care students, graduate students) 
Leadership skills-theories to create positive change in health care settings.

PHAR 5210 Diminishing Health Disparities Through Cultural Competence: Community Engagement (2.0 cr.; A-F Grade Basis) 
Various dynamics of health disparities, cultural competencies. Uses sociological framework.

PHAR 5212 Survey of Pediatric Metabolic, Genetic, and Oncologic Disease (2.0 cr.; A-F Grade Basis; prereq Second year or higher in College of Pharmacy or #) 
Appraisal of major genetic/metabolic disorders and oncologic diseases of childhood. Disease state epidemiology, pharmacotherapy, monitoring, practical applications.

PHAR 5270 Therapeutics of Herbal and Other Natural Medicinals (2.0 cr.; A-F or Audit; prereq organic chemistry, pathophysiology of disease states, 3rd or 4th yr PHAR) 

PHAR 5800 Pharmacotherapy for the Health Professions (3.0 cr.; A-F Grade Basis; prereq Nursing grad program) 
Drug therapy, its implications in patient care.

PHIL 1001 Introduction to Logic (4.0 cr.; Student Option) 
Application of formal techniques for evaluating arguments.

PHIL 1001H Honors Course: Introduction to Logic (4.0 cr.; Student Option; prereq =: 1021) 
Application of formal techniques for evaluating arguments.

PHIL 1002V Honors: Introduction to Philosophy (4.0 cr.; A-F Grade Basis) 

PHIL 1002W Introduction to Philosophy (4.0 cr.; Student Option) 
Problems. methods, historical/contemporary schools of philosophy.

PHIL 1003V Honors: Introduction to Ethics (4.0 cr.; Student Option) 
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 (4.0 cr.; Student Option) 
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 1004V Honors: Introduction to Political Philosophy (4.0 cr.; A-F Grade Basis) 
Central concepts, principal theories of political philosophy.

PHIL 1004W Introduction to Political Philosophy (4.0 cr.; Student Option)
Central concepts, principal theories of political philosophy.

PHIL 1005 Scientific Reasoning (4.0 cr.; Student Option; prereq [1st 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 (4.0 cr.; Student Option; prereq [1st 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 1006W Philosophy and Cultural Diversity (4.0 cr.; Student Option)
Central problems/methods of philosophy through culturally diverse texts. Focus is critical/comparative, reflecting range of U.S. philosophical traditions.

PHIL 1007 Introduction to Political Philosophy Practicum (1.0 cr.; Student Option; prereq & 1004W)
Students do at least two hours a week of community service and connect their service activities in writing to issues discussed in 1004.

PHIL 1021 Accelerated Introduction to Logic (3.0 cr.; Student Option)
Application of formal techniques for evaluating arguments.

PHIL 1026W Philosophy and Cultural Diversity (3.0 cr.; Student Option)
Central problems/methods of philosophy through culturally diverse texts. Focus is critical/comparative, reflecting a range of U.S. philosophical traditions.

PHIL 1102 Introduction to Philosophy (4.0 cr.; Student Option)
Problems, methods, historical/contemporary schools of philosophy.

PHIL 1103 Introduction to Ethics (4.0 cr.; Student Option)
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 1905 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

PHIL 1910V Honors Freshman Seminar (3.0 cr.; Student Option; prereq Fr or fewer than 30 cr)
Topics specified in Class Schedule.

PHIL 1910W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

PHIL 3001 V Honors General History of Western Philosophy: Ancient Period (4.0 cr.; Student Option)
Major developments in ancient Greek philosophic thought: pre-Socratics, Socrates, Plato, Aristotle, Hellenistic thinkers.

PHIL 3001W General History of Western Philosophy: Ancient Period (4.0 cr.; Student Option)
Major developments in ancient Greek philosophic thought: pre-Socrates, Socrates, Plato, Aristotle, Hellenistic thinkers.

PHIL 3003 General History of Western Philosophy: Medieval Period (3.0 cr.; Student Option)
Survey of several major figures (e.g., Augustine (pre-medieval), Anselm, Maimonides, Aquinas, Ockham, Cusanus).

PHIL 3005V General History of Western Philosophy: Modern Period (4.0 cr.; Student Option; prereq honors)
Major developments in philosophic 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 (4.0 cr.; Student Option)
Major developments in philosophic thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3010W Classical Ancient Text (3.0 cr.; Student Option)
Introduction to and in-depth analysis of Plato's Republic.

PHIL 3100 Value Theory Practicum (1.0 cr.; Student Option; prereq & 3301 or &3302W or &3304 or &3307 or &3308, #)
Combines issues in ethics/political philosophy courses to needs of people in Twin Cities through community service. At least 26 hours of community service for semester is required.

PHIL 3101 General History of Western Philosophy: Ancient Period (4.0 cr.; Student Option)
Major developments in ancient Greek philosophic thought: pre-Socrates, Socrates, Plato, Aristotle, Hellenistic thinkers.

PHIL 3105 General History of Western Philosophy: Modern Period (4.0 cr.; Student Option)
Major developments in philosophic thought of the modern period: renaissance beginnings, Descartes through Hume. Some attention to Kant.

PHIL 3231 Philosophy and Language (4.0 cr.; Student Option)
Philosophical issues concerning the nature and use of human language.

PHIL 3301 Environmental Ethics (4.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
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 3304 Law and Morality (4.0 cr.; Student Option)
A study of the relationship among law, morality, and our role as citizens.

PHIL 3305 Medical Ethics (4.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
Exploration of concepts of justice, charity, equality, freedom, community service in connection with current social issues. 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 (4.0 cr.; Student Option)
Nature and justification of moral judgments and moral principles; analysis of representative moral views.

PHIL 3322W Moral Problems of Contemporary Society (3.0 cr.; Student Option)
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 3402 Moral Problems of Contemporary Society (4.0 cr.; Student Option)
How do we determine what is right and wrong? How should we live our lives? What do we owe others? Moral/ethical thought applied to problems and public disputes (e.g., capital punishment, abortion, affirmative action, animal rights, same-sex marriage, environmental protection).

PHIL 3502W Introduction to Aesthetics (3.0 cr.; Student Option)
Development of aesthetic theories with applications to specific aesthetic problems.

PHIL 3521 Philosophy of Religion (3.0 cr.; Student Option)
Conceptual problems that arise from attempts to provide rational justification for religious belief.

PHIL 3601W Scientific Thought (4.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit)
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 (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq honors enroll, 6 crs of 3xxx-5xxx philosophy courses)
Topics of contemporary interest varying from semester to semester.

PHIL 3993 Directed Studies (1.0-3.0 cr.; Student Option; prereq #, %, @)
Guided individual reading or study.

PHIL 4010 Ancient Philosophers (3.0 cr.; Student Option; 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 4040 Rationalists (3.0 cr.; Student Option; 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 4055 Kant (3.0 cr.; Student Option; prereq 3005 or 4004 or #)
Major work (e.g., Critique of Pure Reason).

PHIL 4070 Selected 19th- or Early to Middle 20th-Century Philosophy (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3005 or 4231 or #)
Major work (e.g., Philosophical Investigations).

PHIL 4100 Value Theory Practicum (1.0 cr.; Student Option; prereq 4230 or &4320 or &4321 or or &4330 or &4342 or 4441), #)
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 (3.0 cr.; Student Option; prereq One course in history of philosophy or #)
Philosophical theories concerning nature of reality.

PHIL 4105W Epistemology (3.0 cr.; A-F or Audit; prereq 1001 or #)
Theories of nature/sources of knowledge/evidence.

PHIL 4231 Philosophy of Language (3.0 cr.; Student Option; prereq 1001 or 5201 or #)
Theories of reference, linguistic truth, relation of language/thought, translation/synonymy.

PHIL 4310W Survey of Moral Theories (3.0 cr.; Student Option; prereq 1003 or #)
Issues in western moral philosophy from classical age to present.

PHIL 4320W Intensive Study of an Historical Moral Theory (3.0 cr.; Student Option; prereq 1003 or #)
Intensive consideration of an author or theory in the history of moral or political philosophy.

PHIL 4321W Theories of Justice (3.0 cr.; Student Option; prereq 1003 or 1004 or #)
Philosophical accounts of concept/principles of justice.

PHIL 4325 Education and Social Change (4.0 cr.; A-F or Audit)
Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.

PHIL 4326 Lives Worth Living: Questions of Self, Vocation, and Community (6.0 cr.; Student Option; prereq #)
Immersion experience. Students live together as a religious community of learners. Works of philosophy, history, and literature form backdrop for exploring such questions as How is identity constructed? What is vocation? What experiences of community are desirable in a life? Each student creates a life-hypothesis for a life worth living.

PHIL 4330 Contemporary Moral Theories (3.0 cr.; Student Option; prereq 1003 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 (2.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 1004 or #)
Survey of historical/contemporary works in political philosophy.

PHIL 4510 Philosophy of the Individual Arts (3.0 cr.; Student Option; prereq 3502)
Aesthetic problems that arise in studying or practicing an art.

PHIL 4605 Space and Time (3.0 cr.; Student Option; prereq Courses in [philosophy or physics] or #)
Philosophical problems concerning nature/structure of space, time, and space-time.

PHIL 4607 Philosophy of the Biological Sciences (3.0 cr.; Student Option; prereq Courses in [philosophy or biology] or #)

PHIL 4615 Minds, Bodies, and Machines (3.0 cr.; Student Option; prereq one course in philosophy or #)
Mind-body problem. Philosophical relevance of cybernetics, artificial intelligence, computer simulation.

PHIL 4622 Philosophy and Feminist Theory (3.0 cr.; Student Option; prereq 8 crs in [philosophy or women's studies] 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 4760 Selected Topics in Philosophy (3.0 cr.; Student Option; prereq 3 [3xxx-5xxx] cr in philosophy or #)
Philosophical problems of contemporary interest. Topics specified in Class Schedule.

PHIL 4993 Directed Studies (1.0-3.0 cr.; Student Option; prereq #, %, @)
Guided individual reading or study.

PHIL 4995 Senior Project (Directed Studies) (1.0 cr.; A-F Grade Basis; prereq #, %)
Guided individual study leading to research paper that satisfies senior project requirement.

PHIL 4995H Honors Senior Project (1.0 cr.; A-F Grade Basis; prereq #, %)
Guided individual study leading to research paper that satisfies senior project requirement.

PHIL 5010 Ancient Philosophers (3.0 cr.; Student Option; prereq 3001 or #)
Major work of selected ancient philosophers (e.g., Plato's Parmenides, Plato's Sophist, Aristotle's Metaphysics). Works discussed vary.

PHIL 5040 Rationalists (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3005 or 4231 or #)
Major work (e.g., Philosophical Investigations).

PHIL 5201 Symbolic Logic I (4.0 cr.; Student Option; prereq 1001 or #)
Study of syntax and semantics of sentential and first-order logic. Symbolization of natural-language sentences and arguments. Development of deductive systems for first-order logic. Metatheoretic proofs and methods, including proof by mathematical induction and proof of consistency and completeness.

PHIL 5202 Symbolic Logic II (4.0 cr.; Student Option; prereq 5201 or #)
Elements of set theory, including the concepts of enumerability and nonenumerability. Turing machines and recursive functions; the results of Church, Godel, and Tarski and the philosophical significance of those results.

PHIL 5211 Modal Logic (4.0 cr.; Student Option; prereq 5201 or #)
Axiomatic and semantic treatment of propositional and predicate modal logics; problems of interpreting modal languages.

PHIL 5221 Philosophy of Logic (3.0 cr.; Student Option; prereq 5202 or #)
Attempts to answer, "What is logic?" Scope of logic. Disputes about alternative logics. Theories concerning logical truth (e.g., conventionalism: view that logical truths are contingent).

PHIL 5222 Philosophy of Mathematics (3.0 cr.; Student Option; 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
PHIL 5232 Education and Social Change (4.0 cr.; A-F or Audit)  
Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.

PHIL 5326 Lives Worth Living: Questions of Self, Vocation, and Community (6.0 cr.; Student Option; prereq #)  
Immersion experience. Works live together as a residential community of learners. Works of philosophy, history, and literature form backdrop for exploring such questions as How is identity constructed? What is vocation? What experiences of community are desirable in a life? Each student creates a life-hypothesis for a life worth living.

PHIL 5350 Catching Lives Worth Living: Participation in the Growth of a Living-Learning Community (1.0-3.0 cr.; Student Option; 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 5415 Philosophy of Law (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3502)  
Aesthetic problems that arise in studying or practicing an art.

PHIL 5601 History of the Philosophy of Science (3.0 cr.; Student Option; 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 5602 Scientific Representation and Explanation (3.0 cr.; Student Option; prereq #)  
Contemporary issues concerning representation and explanation of scientific facts.

PHIL 5605 Space and Time (3.0 cr.; Student Option; prereq Courses in [philosophy or physics] or #)  
Philosophical problems concerning nature/structure of space, time, and space-time.

PHIL 5606 Philosophy of Quantum Mechanics (3.0 cr.; Student Option)  
Problems of interpretation in ordinary (nonrelativistic) quantum mechanics. Two-slit experiment, Schrodinger cat paradox (measurement problem), Einstein-Podolsky-Rosen paradox. Leading approaches to interpretation (Copenhagen, hidden variables, universal wave function) and their connections with philosophical issues.

PHIL 5622 Philosophy and Feminist Theory (3.0 cr.; Student Option; prereq 8 crs in [philosophy or women's studies] or #)  
Encounters between philosophy/feminism.

PHIL 5760 Selected Topics in Philosophy (3.0 cr.; Student Option; prereq 3xxx-5xxx course in philosophy or #)  
Philosophical problems of contemporary interest. Topics specified in Class Schedule.

PHIL 5993 Directed Studies (1.0-3.0 cr.; Student Option; prereq #, %, @)  
Guided individual reading or study.

**Physical Education (PE)**  
College of Education and Human Development

**PE 1004 Diving: Springboard**  
(1.0 cr.; Student Option No Audit; prereq 1007 or equiv or #)  

**PE 1007 Beginning Swimming**  
(1.0 cr.; Student Option No Audit)  
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**  
(1.0 cr.; Student Option No Audit)  

**PE 1014 Conditioning**  
(1.0 cr.; Student Option No Audit)  
Fundamentals of personal fitness. Principles of fitness; health and motor skill components of fitness; principles of training/conditioning programs; nutrition; weight control; common fitness injuries; motivation and consistency in fitness programs; stress management.

**PE 1015 Weight Training**  
(1.0 cr.; Student Option No Audit)  
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**  
(1.0 cr.; Student Option No Audit)  
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**  
(1.0 cr.; Student Option No Audit)  
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**  
(1.0 cr.; Student Option No Audit)  
Basic sabre techniques, movement, an overview of fencing as a recreational sport and an Olympic sport, and the history of fencing.

**PE 1032 Badminton**  
(1.0 cr.; Student Option No Audit)  
Fundamentals including etiquette, terminology, game rules for singles and doubles, footwork, shot selection, and strategy.

**PE 1033 Foil Fencing**  
(1.0 cr.; Student Option No Audit)  
Fencing fundamentals, including basic foil techniques, movement, a general overview of fencing as a recreational sport and an Olympic sport, and the history of fencing.

**PE 1034 Judo**  
(1.0 cr.; Student Option No Audit)  
Basic skills for throwing, falling, grappling (matwork), choking, arm and neck techniques; contest judo from Ju-Jitsu; fundamental rules and scoring of contests. Videotapes used for technique instruction and contest appreciation.

**PE 1035 Karate**  
(1.0 cr.; Student Option No Audit)  
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 (kumite) and forms (kata).

**PE 1036 Racquetball**  
(1.0 cr.; Student Option No Audit)  
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**  
(1.0 cr.; Student Option No Audit)  
Enter-level technique, basic equipment, international dimension courts, and fitness.

**PE 1038 Beginning Tennis**  
(1.0 cr.; Student Option No Audit)  
Fundamental strokes, including forehands, backhands, volleys, lobs, overheads, and serves; introduction to doubles play; terminology, rules, and etiquette.

**PE 1043 Beginning Horse Riding**  
(1.0 cr.; Student Option No Audit)  
Techniques, styles, and communication of English riding. Students will learn riding techniques at a walk, trot, canter, and jumping.

**PE 1044 Self-Defense**  
(1.0 cr.; Student Option No Audit)  
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**  
(1.0 cr.; Student Option No Audit; 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**  
(1.0 cr.; Student Option No Audit)  
Fundamentals of Tae Kwon Do. Principles of martial arts, body mechanics of Tae Kwon Do, practical self-defense.

**PE 1048 Bowling**  
(1.0 cr.; Student Option No Audit)  
Fundamentals, including stance, approach and delivery, scoring, bowling terminology, and etiquette.
Course listings in this catalog are current as of January 1, 2012. For up-to-date information, visit the University of Minnesota Twin Cities Undergraduate Catalog.

### Physical Education Courses

**PE 1053 Ice Skating** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit; 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** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- Rolls, handstands, cartwheels, extensions, handsprings, tucks (flips). Spotting techniques.
- Skills on bars, vault, and beam.

**PE 1067 Basketball** (1.0 cr.; Student Option No Audit)
- Fundamental skills and rules of basketball, with emphasis on basic court movement and different offensive and defensive strategies.

**PE 1071 Beginning Cricket** (1.0 cr.; Student Option No Audit)
- Fundamentals of Cricket. Laws of Cricket, bowling/batting techniques, competitive/recreational Cricket opportunities.

**PE 1072 Soccer** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- Development of basic skills for lifetime involvement.

**PE 1074 Beginning Volleyball** (1.0 cr.; Student Option No Audit)
- Basic skills, team play, rules, officiating, and strategy.

**PE 1075 Ice Hockey** (1.0 cr.; Student Option No Audit; prereq 1053 or equiv or #)
- Offensive/defensive strategies/techniques, goal tending, scrimmage play. Students need their own equipment.

**PE 1076 Flag Football** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- Introduction to ultimate disc, techniques, field positions, rules, regulations. Students participate in vigorous exercise activities including running, throwing, and catching.

**PE 1079 Rugby (Non-contact)** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit)
- 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** (1.0 cr.; Student Option No Audit; prereq 1007 or equiv, proficient ability to swim 100 meters or #)
- Intermediate swimming skills. Fundamentals of swimming and hydrodynamics.

**PE 1129 Intermediate Handball** (1.0 cr.; Student Option No Audit; prereq 1029 or #)
- Hand/eye coordination, footwork. Skills in practice/game conditions.
- Strategies of service/rally.

**PE 1133 Intermediate Foil Fencing** (1.0 cr.; Student Option No Audit; prereq 1033 or equiv or #)

**PE 1135 Intermediate Karate** (1.0 cr.; Student Option No Audit; prereq 1035 or equiv or #)
- Techniques of Japanese traditional Shotokan Karate taught through Ippon Kumite (one step sparring), San Kumite (three step sparring), and Heian Shodan Kata/Nidan Kata (forms).
- Testing for orange belt is optional.

**PE 1137 Intermediate Squash** (1.0 cr.; Student Option No Audit; prereq 1037 or #)
- Stroke mechanics, shot placement, changing pace. Court movement/positioning.
- Fitness requirements, joint/muscle stresses. Weight training for squash. On-court etiquette.

**PE 1146 Intermediate Tae Kwon Do** (1.0 cr.; Student Option No Audit; prereq 1046, previous Tae Kwon Do experience (World Tae Kwon Do Federation sanctioned), basic white Tae Kwon Do uniform)

**PE 1154 Figure Skating** (1.0 cr.; Student Option No Audit; prereq 1053 or equiv or #)
- Terminology, rules. Basic moves, jumps, spins.
- On/off-ice assignments.

**PE 1157 Intermediate Skiing** (1.0 cr.; Student Option No Audit; 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** (1.0 cr.; Student Option No Audit; prereq [1074 or equiv], #)
- Volleyball systems of play. Incorporating offensive/defensive formations. Team play, transition, coaching, officiating.

**PE 1205 Scuba and Skin Diving** (1.0 cr.; Student Option No Audit; 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** (1.0 cr.; Student Option No Audit; prereq [PE 1007, PE 1107, PE 1306, 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 1252 Marathon Training** (3.0 cr.; Student Option No Audit; 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** (1.0 cr.; Student Option No Audit; 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 1720 Special Activities in Physical Education** (1.0-3.0 cr.; Student Option No Audit)
- Activities or related opportunities not normally available through regular course offerings.

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**Physical Therapy (PT)**

**PT 1002 Orientation to Physical Therapy** (1.0 cr.; S-N or Audit)
- Introduction to the profession of physical therapy through lectures, discussions, patient presentations, clinic visit, videotapes, and exposure to treatment equipment.

**Physics (PHYS)**

**PHYS 1001 Energy and the Environment** (4.0 cr.; Student Option; prereq 1 yr high school algebra)
- Fundamental principles governing physical world in context of energy/environment. Lab.
PHYS 1011 Physical World (3.0 cr.; A-F or Audit; prereq 1 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 1101W Introductory College Physics I (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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/qualitative problem solving techniques to understand natural phenomena. Lecture content, recitation, lab.

PHYS 1201W Introductory Physics for Biology and Pre-medicine I (5.0 cr.; Student Option; prereq High school or college calculus, trigonometry, algebra)
Fundamental principles of physics. Description of motion, forces, conservation principles, structure of matter. Applications to mechanical systems, including fluids, waves, heat. Lab.

PHYS 1202W Introductory Physics for Biology and Pre-medicine II (5.0 cr.; Student Option; prereq 1201W)
Fundamental principles of physics. Motion, forces, conservation principles, structure of matter. Applications to electromagnetic phenomena, including optics, atomic structure. Lab.

PHYS 1301W Introductory Physics for Science and Engineering I (4.0 cr.; Student Option; prereq & Math 1271 or & Math 1371 or & Math 1571)
Use of fundamental principles to solve quantitative problems. Motion, forces, conservation principles, structure of matter. Applications to mechanical systems.

PHYS 1302W Introductory Physics for Science and Engineering II (4.0 cr.; Student Option; prereq 1301W, & Math 1272 or Math 1372 or Math 1572)
Use of fundamental principles to solve quantitative problems. Motion, forces, conservation principles, fields, structure of matter. Applications to electromagnetic phenomena.

PHYS 1401V Honors Physics I (4.0 cr.; A-F Grade Basis; prereq honors student and permission of University Honors Program)
Comprehensive, calculus-level general physics. Emphasizes use of fundamental principles to solve quantitative problems. Description of motion, forces, conservation principles. Structure of matter, with applications to mechanical systems.

PHYS 1402V Honors Physics II (4.0 cr.; A-F Grade Basis; prereq 1401V, honors student or permission of University Honors Program)
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 (1.0-3.0 cr.; A-F or Audit; prereq freshman) Topics vary. See Class Schedule.

PHYS 1904 Freshman Seminar: International Perspective Fresh Semester I (1.0-3.0 cr.; A-F or Audit; prereq freshman) Topics vary. See Class Schedule.

PHYS 1905 Freshman Seminar (1.0-3.0 cr.; A-F or Audit; prereq Fr) Topics vary. See Class Schedule.

PHYS 1910W Freshman Seminar: Writing Intensive (1.0-3.0 cr.; A-F or Audit; prereq freshman) Topics vary. See Class Schedule.

PHYS 2201 Introductory Thermodynamics and Statistical Physics (3.0 cr.; Student Option; prereq [1302W or 1402V], [MATH 1272 or MATH 1372 or MATH 1572H]) Thermodynamics, its underlying statistical nature.

PHYS 2303 Physics III: Physics of Matter (4.0 cr.; Student Option; prereq 1302, [MATH 1272 or MATH 1372 or MATH 1572H], [MatSci or EE] student) Thermodynamics, mechanical/electromagnetic waves, optics, quantum theory. Applications of quantum nature of solids.

PHYS 2311 Modern Physics (4.0 cr.; Student Option; prereq [1302 or 1402], Chem 1022, Math 2243) Broad overview of physical concepts developed in twentieth century. Special relativity, wave-particle duality, Schrodinger equation, Bohr atom, hydrogen atom in wave mechanics, many-electron atoms, x-rays, nuclear structure, radioactivity, nuclear reactions, statistical physics.

PHYS 2403H Honors Physics III (4.0 cr.; A-F Grade Basis; 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 2503 Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr.; Student Option; prereq 1302W, [MATH 1272 or MATH 1372 or MATH 1572H])
Third semester of introductory physics. Mechanical/electromagnetic waves, optics, special relativity.

PHYS 2601 Quantum Physics (4.0 cr.; Student Option; prereq [2403H or 2503], [Math 2243 or 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 (3.0 cr.; Student Option; prereq & 2601)
Laboratory experiments in atomic, solid state, and nuclear physics offered in conjunction with 2601.

PHYS 3022 Introduction to Cosmology (3.0 cr.; Student Option; prereq 2601)

PHYS 3071W Laboratory-Based Physics for Teachers (4.0 cr.; Student Option; prereq College algebra; no credit for CSE students) 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 (1.0-5.0 cr.; Student Option; prereq #, dept consent) Directed study in Physics in areas arranged by the student and a faculty member.

PHYS 3994 Directed Research (1.0-5.0 cr.; Student Option; prereq #) Independent, directed study in physics in areas arranged by the student and a faculty member.

PHYS 4001 Analytical Mechanics (4.0 cr.; Student Option; prereq [2303 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 (4.0 cr.; Student Option; prereq [2303 or 2601 or Chem 3501 or Chem 3502], two sems soph math) Classical theory of electromagnetic fields using vector algebra and vector calculus.

PHYS 4041 Computational Methods in the Physical Sciences (4.0 cr.; Student Option; 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.

PHYS 4051 Methods of Experimental Physics I (5.0 cr.; Student Option; prereq 2605 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 (5.0 cr.; Student Option; 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 4071 Concepts in Physics (3.0 cr.; Student Option; prereq 2201, 2303)
PHYS 4101 Quantum Mechanics (4.0 cr.; Student Option; prereq [2303 or 2601 or Chem 3502], two sems soph math) Mathematical techniques of quantum mechanics. Schrodinger Equation and simple applications. General structure of wave mechanics. Operator methods, perturbation theory, radiation from atoms.

PHYS 4121 History of 20th-Century Physics (3.0 cr.; Student Option; prereq general physics or #) Experimental and theoretical discoveries in 20th-century physics (birth of modern physics, special theory of relativity, old and new quantum theories, nuclear physics to WWII) within the context of concurrent educational, institutional, and political developments in Europe and the United States.

PHYS 4201 Statistical and Thermal Physics (3.0 cr.; Student Option; prereq 2601) Principles of thermodynamics and statistical mechanics. Selected applications such as kinetic theory, transport theory, and phase transitions.

PHYS 4211 Introduction to Solid-State Physics (3.0 cr.; Student Option; 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 Electrodynamics and Waves (3.0 cr.; Student Option; prereq 4001, 4002) Analytical mechanics. Electricity/magnetism, including mechanical/electromagnetic wave phenomena. Physical/geometrical optics.

PHYS 4501 Experimental Project (1.0-5.0 cr.) Student Option; prereq 4052. # Research project in physics area of contemporary interest. Project must be approved by faculty coordinator before registration.

PHYS 4511 Introduction to Nuclear and Particle Physics (3.0 cr.; Student Option; prereq 4101) Fundamental particles and Standard Model. Symmetries (quarks, models of nuclei), interactions between particles/nuclei, tests of conservation laws, fission/fusion.


PHYS 4621 Introduction to Plasma Physics (3.0 cr.; Student Option; 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 4911 Introduction to Biopolymer Physics (3.0 cr.; Student Option; prereq [2303, 2403H, 2503] or Chem 3501 or #) Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials. Elements of thermodynamics and statistical mechanics are presented as needed.

PHYS 4950H Senior Thesis (1.0-3.0 cr.; S-N or Audit; prereq #) Independent project with adviser.

PHYS 4960H Honors Seminar (1.0 cr.; Student Option No Audit; 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 (1.0-5.0 cr.; Student Option; prereq #) Directed study in Physics in areas arranged by student and faculty member.

PHYS 4994 Directed Research (1.0-5.0 cr.; Student Option; prereq #) Independent, directed study in physics in areas arranged by student and a faculty member.

PHYS 5001 Quantum Mechanics I (4.0 cr.; Student Option; prereq 4101 or equiv or #) Schrodinger equation: bound state and scattering problems in one dimension. Spherically symmetric problems in three dimensions, angular momentum, and the hydrogen atom. Approximation methods for stationary states. Time-dependent perturbation theory. Operators and state vectors: general formalism of quantum theory.

PHYS 5002 Quantum Mechanics II (4.0 cr.; Student Option; prereq 5001 or equiv) 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 5011 Classical Physics I (4.0 cr.; Student Option; prereq 4001, 4002 or #) Classical mechanics: Lagrangian/Hamiltonian mechanics, orbital dynamics, rigid body motion, special relativity.

PHYS 5012 Classical Physics II (4.0 cr.; Student Option; prereq 5011 or #) Classical electromagnetism; electrostatics, magnetostatics, Maxwell's equations, electromagnetic waves, radiation, interaction of charged particles with matter.

PHYS 5022 Relativity, Cosmology, and the Universe (4.0 cr.; Student Option; prereq 2601 or #) Large-scale structure and history of universe. Introduction to Newtonian and relativistic world models. Physics of early universe. Cosmological tests. Formation of galaxies.

PHYS 5041 Mathematical Methods for Physics (4.0 cr.; Student Option; prereq 2601 or grad student) Survey of mathematical techniques needed in analysis of physical problems. Emphasizes analytical methods.

PHYS 5042 Analytical and Numerical Methods of Physics II (4.0 cr.; Student Option; prereq 5041 or #) Survey of mathematical techniques, both analytic and numerical, needed for physics. Application to physical problems.

PHYS 5071 Physics for High School Teachers: Experimental Foundations and Historical Perspectives (3.0 cr.; Student Option; prereq Gen physics, #; no cr for physics grad or grad physics minor) In-depth examination of a conceptual theme in physics, its experimental foundations and historical perspectives. Kinematics and dynamics from Aristotle through Einstein; nature of charge and light; energy and thermodynamics; electricity, magnetism, and quantized fields; structure of matter.

PHYS 5072 Best Practices in College Physics Teaching (1.0-3.0 cr.; Student Option) Pedagogies for introductory physics classes. Topics from educational research/practice as applied to classroom.

PHYS 5081 Introduction to Biopolymer Physics (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq 1302 or 1402) Signal analysis, medical imaging, medical x-rays, tomography, radiation therapy, nuclear medicine, MRI, and similar topics.

PHYS 5621 Introduction to Plasma Physics (3.0 cr.; Student Option; prereq CSE grad student, working knowledge of waves/ electromagnetism) Basic properties of collisionless, magnetized plasmas, single particle motion, plasmas as fluids, magnetohydrodynamics, waves in plasmas, equilibrium, instabilities, kinetic theory/shocks.

PHYS 5701 Solid-State Physics for Engineers and Scientists (4.0 cr.; Student Option; prereq Grad or advanced undergrad in physics or engineering or the sciences) Crystal structure and binding; diffusion; phonons; thermal and dielectric properties of insulators; free electron model; band structure; semiconductors.
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

PHYS 5702 Solid State Physics for Engineers and Scientists (4.0 cr.; Student Option; prereq 5701 or #)
Diamond magnetism and paramagnetism; ferromagnetism and antiferromagnetism; optical phenomena; lasers; superconductivity; surface properties: ferroelectricity.
PHYS 5950 Colloquium Seminar (1.0 cr.; S-N or Audit; prereq [Grad student or advanced undergrad in physics], %)
Colloquium of School of Physics and Astronomy.
PHYS 5970 Physics Journal Club (1.0-3.0 cr.; S-N Grading Basis; prereq 2601, 2605 or equiv; intended for 2nd-yr grad students in physics)
Weekly student-led presentation, discussion, and critical analysis of important papers.

PHYS 5980 Introduction to Research Seminar (1.0 cr.; S-N or Audit; prereq Grad or upper div phys major)
Introduction to the research activities of the School of Physics and Astronomy.
PHYS 5993 Directed Studies (1.0-5.0 cr.; Student Option; prereq #, %)
Independent, directed study in physics in areas arranged by the student and a faculty member.
PHYS 5994 Directed Research (1.0-5.0 cr.; Student Option; prereq Jr, %)
Problems, experimental or theoretical, of special interest to students. Written reports.

Physiology (PHSL)
Medical School

PHSL 3050 Physiology From Cells to Systems (3.0 cr.; A-F Grade Basis; prereq BIOL 1009 or equiv [including eukaryotic cellular biology], [CHM 1021, CHM 1022] or 1 yr of college-level chemistry]
Basic physiology of human cells and organ systems, including nerve, muscle, cardiovascular, respiratory, renal, digestive, endocrine, metabolic and reproductive systems. Critical thinking about physiological concepts through active learning exercises involving analysis and manipulation of ideas. Apply concepts in basic research or clinical settings.

PHSL 3051 Human Physiology (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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, renal, cardiac, and peripheral and central nervous systems), cellular transport processes, and scaling in biology.

PHSL 3062W Research Paper for Physiology Majors (1.0 cr.; A-F or Audit; prereq 3061, 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 (1.0-5.0 cr.; Student Option; prereq & college physiology, premed student)
Individualized study in physiology. Students address a selected problem in physiology through library or lab research, supervised by physiology faculty.

PHSL 3701 Physiology Laboratory (2.0 cr.; A-F or Audit; prereq Physiology major)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

PHSL 4021 Advanced Physiology and Bioengineering: Bionic Human (3.0 cr.; A-F Grade Basis; prereq 3061 or 3063 or 5061 or #)

PHSL 4031 Physiological Discussions: Contemporary Topics (2.0 cr.; A-F Grade Basis; prereq 3061 or 3063 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 (2.0-4.0 cr.; A-F or Audit; prereq &3061, physiology honors candidate, approval of director of undergrad studies in physiology)
Students pursue a selected topic in physiology through library or lab research supervised by physiology faculty.

PHSL 4700 Cell Physiology (3.0 cr.; A-F Grade Basis; prereq [3051 or 3061 or BIOL 3211], [CHEM 1022 or equiv], [MATH 1272 or equiv])
Critical cell functions. Regulation of pH, volume, intracellular electrolyte composition, calcium signaling, membrane potential dynamics, motility, aspects of intercellular communication.

PHSL 4900 Advanced Physiology Teaching Laboratory (1.0-6.0 cr.; A-F Grade Basis; prereq [3051 or [3061, 3071]], #)
Teaching in undergrad physiology labs. Instructional sessions, hands-on teaching experiences.

PHSL 5051 Principles of Physiology for Biomedical Engineering (4.0 cr.; Student Option; 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 (1.0-5.0 cr.; Student Option; prereq #)
Independent lab research project in physiology, supervised by physiology faculty.

PHSL 5095 Problems in Physiology (1.0-5.0 cr.; Student Option; prereq #)
Individualized study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.

PHSL 5096 Integrative Biology and Physiology Research Advances (1.0 cr.; S-N Grading Basis; prereq #)
Attend/participate in IBP Fall/Spring seminar series. Seminars given by faculty, invited speakers, students. Exposure to key topics. How to present seminars.

PHSL 5101 Human Physiology (5.0 cr.; Student Option; prereq Grad student)

PHSL 5115 Clinical Physiology I (3.0 cr.; A-F or Audit; prereq #)
Cellular mechanisms, disease states and clinical applications of excitatable tissues: cellular transport, neurophysiology, skeletal muscle physiology, cardiovascular physiology.

PHSL 5116 Clinical Physiology II (3.0 cr.; A-F or Audit; prereq #)
Cellular mechanisms, disease states and clinical applications of metabolic systems; respiratory physiology, renal physiology, acid base physiology, metabolism, gastrointestinal physiology, endocrine physiology, physiology of pregnancy and labor.

PHSL 5197 Stress Physiology (1.0 cr.; A-F Grade Basis; prereq #, grad student standing or physiology undergraduate major are recommended. Undergraduates are strongly encouraged to have taken 3061 or equivalent.)

PHSL 5201 Computational Neuroscience I: Membranes and Channels (3.0 cr.; Student Option; prereq calculus through differential equations)
Neural excitation (ion channels, excitation models, effects of neural morphology) using UNIX workstations to simulate empirical results. Includes the Hodgkin-Huxley model, nonlinear dynamic systems analysis, voltage and ligand gated ion channels, ion transport theories, and impulse initiation and propagation.

PHSL 5350 Humans in Extreme Environments (2.0 cr.; Student Option; prereq [3061 or equiv], #)
Physiological systems, human factors, psychological reactions. Countermeasures to enhance performance and prevent negative health consequences. Readings, required paper, final exam.

PHSL 5444 Muscle (3.0 cr.; Student Option; prereq 3061 or 3071 or 5061 or BioC 3021 or BioC 4331 or #)

PHSL 5510 Advanced Cardiac Physiology and Anatomy (2.0-3.0 cr.; Student Option; prereq #)
Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops,
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

**Plant Biology (PBIO)**

**PBIO 1212 Plant Biotechnology and Society**
(3.0 cr.; Student Option)
Importance of plants to humans. How human interaction with plants has profoundly affected human societies, how human technology has changed our interaction with plants and affected the environment. Development of transgenic plants. Biofuels.

**PBIO 4321 Minnesota Flora**
(3.0 cr.; Student Option; prereq One semester college biology)

**PBIO 4404 Developmental Plant Anatomy**
(3.0 cr.; Student Option; 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.

**PBIO 4511 Fruiting Plant Diversity**
(3.0 cr.; Student Option; prereq BIOL 1001 or 1009 or 1099H or 2002)

**PBIO 4516W Plant Cell Biology: Writing Intensive**
(3.0 cr.; Student Option; prereq [Biol 2022 or Biol 3002 or Biol 3007], [BIOC 3021 or Biol 3021 or Biol 4003])

**PBIO 4531 Plant Genetics**
(1.0-2.0 cr.; Student Option; prereq [Two semesters of physics/chemistry, calculus, one semester of systems-level physiology] or #)
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.

**PBIO 5500 Cell Physiology**
(4.0 cr.; A-F Grade Basis; prereq [Two quarters 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.

**PBIO 5501 Physiology Laboratory**
(1.0-2.0 cr.; A-F or Audit; prereq #)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

**PBIO 5511 Advanced Neuroumuscular Junction Physiology**
(2.0-3.0 cr.; Student Option; prereq; fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

**PBIO 5525 Anatomy and Physiology of the Pelvis and Urinary System**
(1.0-2.0 cr.; A-F Grade Basis; prereq One undergrad anatomy course, one undergrad physiology course, #) Two-day intensive course. Pelvis, perineum, and urinary system with cadaveric dissection. Structure/function of pelvic and urinary organs, including common dysfunction and pathophysiology. Laboratory dissections, including kidneys, ureters, urinary bladder, pelvic viscera and perineum (male or female), pelvic floor, vascular and nervous structures. Grand rounds section.

**PBIO 5540 Advanced Exercise Medicine: Physiological and Bioenergetic**
(1.0-2.0 cr.; Student Option; 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.

**PBIO 5700 Cell Physiology**
(4.0 cr.; A-F Grade Basis; 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.

**PBIO 5701 Physiology Laboratory**
(1.0-2.0 cr.; A-F or Audit; prereq #)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

**PBIO 5710 Plant Biology**
(1.0-2.0 cr.; A-F or Audit; prereq #)
Experiments in physiology. Emphasizes quantitative aspects, including analysis of organ systems.

**PLPA 2001 Introductory Plant Pathology**
(3.0 cr.; Student Option; prereq BIOL 1009 or equiv) Biology of the major groups of plant pathogens, symptoms and signs of plant disease, plant disease diagnosis, and principles of disease management. Lecture, laboratory.

**PLPA 3003 Diseases of Forest and Shade Trees**
(3.0 cr.; Student Option)
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**
(1.0-4.0 cr.; Student Option)
Assignment of special problems to undergraduates desiring opportunity for independent research in plant pathology.

**PLPA 4096 Professional Experience Program: Internship**
(1.0-3.0 cr.; S-N or Audit; prereq COAFES undergrad, complete internship contract available in COAFES Career Services before registering; UC only) Supervised practicum with professional experience in plant pathology and related industries including the Plant Disease and "Dial-U" clinics. Evaluative reports and
PLPA 5003 Diseases of Forest and Shade Trees (3.0 cr.; Student Option)
Diseases of trees in urban and forested areas. Biology, ecology, and control of tree diseases. Identifying disease agents, integrated control procedures. Laboratory.

PLPA 5090 Issues in Plant Pathology (1.0-4.0 cr.; Student Option)
See Class Schedule or department for current offerings.

PLPA 5103 Plant-Microbe Interactions (3.0 cr.; Student Option; prereq Intro course in plant pathology, molecular biology or equiv.)

PLPA 5202 Field Plant Pathology (2.0 cr.; Student Option)
Characteristics of a variety of plant diseases. Field trips to observe symptoms and effects of diseases, and to learn about prevention and control of diseases in field, forest, golf course, greenhouse, nursery, orchard, and urban environments.

PLPA 5203 Introduction to Fungal Biology (3.0 cr.; Student Option; prereq BIOL 1009 or equiv)
Fungi are a critical component of the diversity and function of terrestrial ecosystems, affecting decomposition, plant nutrient uptake, and agricultural practices. Key components of fungal biology, including ecology, genetics, life cycles and diversity. Labs provide hands on experience with a diverse range of organisms.

PLPA 5300 Current Topics in Molecular Plant Pathology (1.0-2.0 cr.; S-N Grading Basis; prereq #)
Interactive class. Students read, discuss, and critique publications in molecular plant pathology. Focus on articles, examining from different dimensions (underlying principles, experimental strategies, data analysis, impact on the broader discipline).

PLPA 5301 Plant Genomics (3.0 cr.; Student Option; prereq Intro course in genetics or #)
Plants and model organisms. DNA sequencing, comparative genomics, genome structure and function; DNA chips/microarrays, RNA expression, gene-knockout systems, genome databases, sequence comparison/clustering algorithms, and visualization tools.

PLPA 5444 Ecology, Epidemiology, and Evolutionary Biology of Plant-Microbe Interactions (3.0 cr.; A-F or Audit; prereq Intro plant pathology or advanced biology coursework recommended)
Concepts and recent research in the ecology, epidemiology, and evolutionary/coevolutionary biology of plant-microbe interactions spanning the range from parasitic to mutualistic in agricultural and natural habitats.

PLPA 5480 Principles of Plant Pathology (3.0 cr.; Student Option; prereq BIOL 1009 or equiv)
Diseases that affect plants, microbiology and microbial and plant interactions. Mycology and select diseases caused by fungi within Ascomycota, Basidiomycota, and the fungal-like Oomycota. Diseases caused by bacteria, nematodes, viruses, parasitic plants and abiotic damage. Lecture and Lab.

PLPA 5660 Plant Disease Resistance and Applications (3.0 cr.; A-F Grade Basis; prereq 2001, BIOL 4003)
Fundamentals of disease resistance in plants and the genetics of host-parasite interactions as they relate to the sustainable control of plant diseases. Examples explored at the Mendelian, populational, and molecular level of organization.

PLPA 5999 Special Topics in Plant Pathology (1.0-4.0 cr.; Student Option)
Workshops on topics in plant pathology. See Class Schedule or department for current offerings.

Polish (PLSH)

PLSH 1101 Beginning Polish (5.0 cr.; Student Option)
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.

PLSH 1102 Beginning Polish (5.0 cr.; Student Option; 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.

PLSH 3001 Intermediate Polish (5.0 cr.; Student Option; 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.

PLSH 3002 Intermediate Polish (5.0 cr.; Student Option; 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.

PLSH 4101 Beginning Polish (3.0 cr.; Student Option; prereq Fourth sem course in another language or grad student)
Listening, speaking, reading, writing, Polish culture.

PLSH 4102 Beginning Polish (3.0 cr.; Student Option; prereq 4101, [fourth sem course in another language or grad student])
Listening, speaking, reading, writing, Polish culture.

PLSH 4103 Intermediate Polish (3.0 cr.; Student Option; prereq 4102, [fourth sem course in another language or grad student])
Conversation, composition, advanced grammar, translation, and readings in appropriate literature.

PLSH 4104 Intermediate Polish (3.0 cr.; Student Option; prereq 4103, [fourth sem course in another language or grad student])
Conversation, composition, advanced grammar, translation, and readings in appropriate literature.

PLSH 5900 Topics (1.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

PLSH 5993 Directed Studies (1.0-3.0 cr.; Student Option)
Guided individual reading or study in Polish language, literature, and culture.

Political Science (POL)

POL 1001 American Democracy in a Changing World (4.0 cr.; Student Option)
Introduction to politics/government in the United States. Constitutional origins/development, major institutions, parties, interest groups, elections, participation, public opinion. Ways of explaining politics, nature of political science. Emphasizes recent trends.

POL 1001H Honors Course: American Democracy in a Changing World (4.0 cr.; A-F Grade Basis)
Introduction to politics/government in the United States. Constitutional origins/development, major institutions, parties, interest groups, elections, participation, public opinion. Ways of explaining politics, nature of political science. Emphasizes recent trends.

POL 1019 Indigenous Peoples: A Global Perspective (3.0 cr.; A-F or Audit)
Colonial experiences of selected indigenous peoples in Americas, Euroasia, Pacific Rim.

POL 1025 Global Politics (4.0 cr.; Student Option)
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 (4.0 cr.; Student Option)
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 1054 Politics of Countries Around the World (4.0 cr.; Student Option)
Political life. Repression, democracy, rights, corruption, gender, and political change. Guest lectures by political science professors who are experts on different parts of the world.

POL 1054H Honors: Politics of Countries Around the World (4.0 cr.; A-F Grade Basis; prereq Honors student)
Political life. Repression, democracy, rights, corruption, gender, and political change. Guest lectures by political science professors who are experts on different parts of the world.

POL 1201 Political Ideas and Ideologies (4.0 cr.; Student Option)
Analysis of key concepts and ideas (e.g., freedom, equality, democracy) as they are constructed by major theories and ideologies (liberalism, conservatism, socialism, etc.).

POL 1234 Citizen U: Building Tomorrow's Citizens Today (3.0 cr.; A-F Grade Basis)
Questions of public engagement and higher education. Focuses on U as public space for citizen action/discussion. History of U, its ongoing initiatives in public engagement. Core
Department of Political Science

A-F Grade Basis; prereq Pol sci major, %)

Faculty-supervised research related to work in political or governmental organizations.

Internship with government or community organizations arranged by the department and awarded competitively each spring semester.

A-F Grade Basis; prereq Honors student)


POL 3410 Topics in Comparative Politics (3.0 cr.; Student Option)
Topics of current analytical or policy importance to comparative politics. Topics vary.

POL 3451W Politics and Society in the New Europe (3.0 cr.; Student Option)
Changing politics/society of Europe. Generational change/values, political parties, welfare state, future of European integration, political stability, democratization.

POL 3464 Politics of Inequality (3.0 cr.; A-F or Audit)
Causes/consequences of economic inequality in the USA and Europe. America and European countries in contrast to one another. What differences there are and whether they matter.

POL 3465 Theories of Political Economy (3.0 cr.; A-F or Audit)

POL 3475 Islamist Politics (3.0 cr.; A-F or Audit)

POL 3477 Political Development (3.0-4.0 cr.; Student Option)
Political processes/problems associated with economic development. Political economy of underdevelopment/development. Problems of state building, development of political institutions.

POL 3479 Latin American Politics (3.0 cr.; Student Option)

POL 3701 American Indian Tribal Governments and Politics (3.0 cr.; A-F or Audit)

POL 3739 Politics of Race, Class, and Ethnicity (3.0 cr.; Student Option)
How race/ethnicity/class interact in political process. Political conflict through comparative analysis of United States, South Africa, Brazil.
POL 3752 Chicano Politics (3.0 cr.; Student Option)  
Foundations/contradictions of contemporary Chicano politics. Policy issues that concern Latinos, success/failures of Latino empowerment strategies, electoral impact of Latino votes. Question of whether there is a Latino political/community.

POL 3766 Political Psychology of Mass Behavior (3.0 cr.; Student Option)  
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 (3.0 cr.; A-F or Audit)  
Intersections of politics, personality, and social psychology. Focuses on political leaders and elites. Usefulness of psychological theories for conducting political analysis. Role of individual, of group processes, of political/social cognition, and of context in political decision-making.

POL 3769 Public Opinion and Voting Behavior (3.0 cr.; Student Option)  
Major factors influencing electoral decisions and political attitude formation/change. Data analysis lab required.

POL 3785 Persuasion and Political Propaganda (3.0 cr.; A-F or Audit)  
Introduction to persuasion and political propaganda. Persuasion theories relevant to designing effective political propaganda. Applying theories to analyze WWII/WWIII propaganda posters, films, and political campaign commercials. Use of fiction as propaganda tool.

POL 3785H Persuasion and Political Propaganda (3.0 cr.; A-F Grade Basis)  
Persuasion theories relevant to designing effective political propaganda. Applying theories to analyze WWW propaganda posters, films, and political campaign commercials. Use of fiction as propaganda tool.

POL 3810 Topics in International Relations and Foreign Policy (3.0 cr.; Student Option)  
Analysis of selected issues in contemporary international relations. Topics vary.

POL 3833 The United States and the Global Economy (3.0 cr.; Student Option)  
Domestic and international politics of the United States, foreign economic policy (trade, aid, investment, monetary, and migration policies). Effects of policies and international economic relations on the U.S. economy and U.S. politics.

POL 3835 International Relations (3.0 cr.; Student Option)  
Introduction to theoretical study of international relations. How theoretical perspectives shape one’s understandings of structure/practices of global politics.

POL 3872W Global Environmental Cooperation (4.0 cr.; Student Option)  
Emergence of environment as key aspect of global political agenda. Non-governmental/ governmental international organizations. Politics of protection of atmosphere, rain forest, seas, other selected issues. International security, environment.

POL 3873V Global Citizenship and International Ethics (3.0 cr.; A-F Grade Basis)  
Case studies of ethics in intervention, war, weapons, foreign aid, environmental practices, and human rights are used to examine global ethical responsibilities of individual citizens and public officials. Effectiveness of transnational social movements in influencing policy at domestic/international levels.

POL 3873W Global Citizenship and International Ethics (3.0 cr.; Student Option)  
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 (3.0 cr.; A-F or Audit)  
Topics in political theory.

POL 4253 Modernity and Its Discontents: Late Modern Political Thought (3.0-4.0 cr.; Student Option; prereq Suggested 1201, [3225 or 3251 or 3252])  

POL 4275 Contemporary Political Thought (3.0 cr.; Student Option; 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 community, feminism, postcolonialism, postmodernism, socialism.

POL 4280 Topics in Political Theory (3.0-4.0 cr.; Student Option)  
Topics in historical, analytical, or normative political theory. Topics vary.

POL 4310 Topics in American Politics (3.0 cr.; Student Option; prereq 1001 or equiv or #)  
See Class Schedule for description.

POL 4315W State Governments: Laboratories of Democracy (4.0 cr.; Student Option; prereq 1001 or equiv, non-pol sci grad major 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 (3.0 cr.; Student Option)  
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 (3.0 cr.; Student Option; 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 4331 Thinking Strategically in Domestic Politics (3.0-4.0 cr.; Student Option)  
A survey of applications of rational-choice and game theories to important features of domestic politics in the United States and elsewhere.

POL 4403W Comparative Constitutionalism (3.0 cr.; Student Option)  
Theory/practice of constitutionalism in different countries. Conceptual inquiry into the interplay between constitutionalism, rule of law, and democracy. Origins/role of constitutions. Relevance of courts with constitutional review powers: U.S., Germany, Japan, Hungary, Russia, South Africa, Nigeria.

POL 4410 Topics in Comparative Politics (3.0 cr.; Student Option)  
Topics of current analytical or policy importance to comparative politics. Topics vary.

POL 441W European Government and Politics (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 1025 or 1054 or equiv)  
Cuban Revolution. Leadership/strategy. Perspectives of Cubans/leaders.

POL 4465 Southeast Asian Politics (3.0 cr.; Student Option)  
Southeast Asia’s increasingly important role in global political/economic affairs. U.S. involvement in region. Progress toward and resistance to democratic political systems. Economic development.

POL 4473W Chinese Politics (3.0 cr.; Student Option)  
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 (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>POL 4481</td>
<td>Governments and Markets (3.0-4.0 cr.; Student Option; prereq 1054 or #) Connection between democracy and markets.</td>
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<tr>
<td>POL 4485</td>
<td>Human Rights and Democracy in the World (3.0 cr.; Student Option; prereq One 1xxx or 3xxx course in pol sci)</td>
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<tr>
<td>POL 4487</td>
<td>The Struggle for Democratization and Citizenshiphip (4.0 cr.; Student Option) Origins of democratic process. Emphasizes how disenfranchised fought to become included. History of democratic movement from its earliest moments to present. Attempts to draw a balance sheet.</td>
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<tr>
<td>POL 4489W</td>
<td>Citizens, Consumers, and Corporations (3.0 cr.; Student Option) How ordinary people can act collectively to hold corporations accountable for their activities have on communities/nations. Mobilizing as citizens through mass protests, lobbying politicians, and pursing claims through court system. Mobilizing as consumers through purchasing decisions.</td>
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<tr>
<td>POL 4492</td>
<td>Law and (In)Justice in Latin America (3.0 cr.; A-F or Audit) How law and justice function in contemporary Latin America. Similarities/differences within/ between countries and issue areas. Causes behind varied outcomes. Effectiveness of different reform efforts. Transitional justice, judicial review, judicial independence, access to justice, criminal justice (police, courts, and prisons), corruption, non-state alternatives. Issues of class, race/ethnicity, and gender.</td>
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<tr>
<td>POL 4494W</td>
<td>US-Latin American Relations (3.0 cr.; A-F or Audit) US foreign policy toward Latin America. Immigration, trade policy, relations with Cuba, drug war, relations with Venezuela.</td>
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<tr>
<td>POL 4495</td>
<td>Politics of Family, Sex, and Children (3.0 cr.; A-F or Audit) Political fights over volatile issues of family, sex, and children. Diversity of family life in the United States as a source of disharmony and inequality. Same-sex couples, interracial families, polygamous communities, reproductive equality for people with disabilities, targeting of immigrant children, teen sex &amp; pregnancy, working mothers. å‡¿åŒ‡ç¹½å£å¢¾å£åœåˆ©. Citizen efforts aimed at reconciling communities with harshly clashing beliefs.</td>
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<tr>
<td>POL 4501W</td>
<td>The Supreme Court and Constitutional Interpretation (3.0 cr.; Student Option) Historical/analytical approaches to Court's landmark decisions. Techniques of judicial review. Relates court's authority to wider political/social context of American government.</td>
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<tr>
<td>POL 4502W</td>
<td>The Supreme Court, Civil Liberties, and Civil Rights (3.0 cr.; Student Option) Supreme Court's interpretation of Bill of Rights, 14th amendment. Freedom of speech, press, religion; crime/punishment; segregation/desegregation, affirmative action; abortion/privacy.</td>
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<tr>
<td>POL 4507</td>
<td>Law, Sovereignty, and Treaty Rights (3.0 cr.; Student Option) History of American Indian law and the post-contact effects of colonial and U.S. law on American Indians through the 20th century.</td>
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<tr>
<td>POL 4525W</td>
<td>Federal Indian Policy (3.0 cr.; A-F or Audit) 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.</td>
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<tr>
<td>POL 4561</td>
<td>Comparative Legal Systems (3.0 cr.; Student Option; prereq Jr or Sr 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.</td>
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<tr>
<td>POL 4766</td>
<td>American Political Culture and Values (3.0 cr.; Student Option; prereq suggested prereq 1001 or equiv) Empirical analysis of basic political values. Individualism, freedom, equality, Democratic principles, materialism, capitalism, citizenship, patriotism, heroism.</td>
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<tr>
<td>POL 4771</td>
<td>Racial Attitudes and Intergroup Conflict (3.0 cr.; Student Option) 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.</td>
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<tr>
<td>POL 4773W</td>
<td>International Politics and Global Trade and Money (3.0-4.0 cr.; Student Option; prereq 3835 or non-pol sci grad or #) Study the politics of international trade and monetary affairs including north-south and east-west relations</td>
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<tr>
<td>POL 4867W</td>
<td>United States Foreign Policy Toward the Middle East (4.0 cr.; Student Option; prereq Jr or Sr) U.S. foreign policy toward Israeli-Palestinian issue in Turkey, Iran, Iraq, etc. Middle east politics, debates, actions. Rationales for U.S. engagement with region. Readings of Middle East authors.</td>
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<tr>
<td>POL 4878W</td>
<td>Israeli-Palestinian Situation (4.0 cr.; Student Option) Situation as clash 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.</td>
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<tr>
<td>POL 5252</td>
<td>Ancient and Medieval Political Thought (4.0 cr.; Student Option) 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.</td>
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Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
POL 5253 Modernity and its Discontents: Late Modern Political Thought (4.0 cr.; Student Option; prereq =: 3253)

Theoretical responses to and rival interpretations of Western economy, society, politics, and democratic culture in the modern age; theories of history; class struggle; end of metaphysics and death of God; technology and bureaucracy; psychology of culture in Hegel, Marx, Tocqueville, Mill, Nietzsche, Weber, Freud.

POL 5275 Contemporary Political Thought (3.0 cr.; Student Option; prereq =: 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, Fanon, Foucault, Habermas, Rawls, Sartre, Said. Ideas may include communitarianism, feminism, postcolonialism, postmodernism, socialism.

POL 5280 Topics in Political Theory (3.0-4.0 cr.; Student Option; prereq =: 4280; grad student)

Topics in historical, analytical, or normative political theory. Topics vary, see Class Schedule.

POL 5306 Presidential Leadership and American Democracy (3.0 cr.; Student Option; prereq grad student or #)

Examines whether president's political and constitutional powers are sufficient to satisfy citizens' high expectations and whether president should be expected to dominate American politics.

POL 5308 Congressional Politics and Institutions (3.0 cr.; Student Option; prereq grad student 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 5309 Justice in America (3.0 cr.; Student Option; prereq =: 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 5310 Topics in American Politics (3.0 cr.; Student Option; prereq grad student or #)

See Class Schedule for description.

POL 5315 State Governments: Laboratories of Democracy (4.0 cr.; Student Option; 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 5322 Rethinking the Welfare State (3.0-4.0 cr.; Student Option; prereq =: 4322; grad student)

Competing arguments about welfare states in advanced industrial countries. Whether welfare states result from sectional interests, class relations, or citizenship rights. Compares American social policy with policies in other western countries.

POL 5327 Politics of American Cities and Suburbs (3.0 cr.; Student Option; prereq =: 4327; [1001 or 1002], [non-pol sci grad major or equiv] or #)


POL 5331 Thinking Strategically in Domestic Politics (3.0-4.0 cr.; Student Option; prereq =: 4331; grad student)

Applications of rational-choice and game theories to important features of domestic politics in the United States and elsewhere.

POL 5403 Comparative Constitutionalism (3.0 cr.; Student Option)


POL 5410 Topics in Comparative Politics (3.0 cr.; Student Option; prereq grad student)

Topics of current analytical or policy importance. Topics vary, see Class Schedule.

POL 5461W European Government and Politics (4.0 cr.; Student Option; prereq grad student or #)


POL 5465 Southeast Asian Politics (3.0 cr.; Student Option)

U.S. involvement in region. Progress toward and resistance to democratic political systems and economic development.

POL 5473 Chinese Politics (3.0 cr.; Student Option; prereq =: 4473, EAS 4473; grad student)

Fundamental conflicts in Chinese society. Democracy movement, human rights, class divisions, gender struggles, environmental issues, capitalist vs socialist development strategies. Secondary topics include Chinese foreign relations and domestic/foreign political issues in Taiwan.

POL 5477 Struggles and Issues in the Middle East (4.0 cr.; Student Option; prereq =: 4477; 1054 or 3051 or non-pol sci grad student 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 Persian/Arabian Gulf, human rights.

POL 5478 Contemporary Politics in Africa and the Colonial Legacy (4.0 cr.; Student Option; prereq 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 and prospects for effective democracy.

POL 5479 Latin American Politics (3.0-4.0 cr.; Student Option; prereq grad student or #)


POL 5481 Governments and Markets (3.0 cr.; Student Option; prereq 1054 or 3051 or non-pol sci grad student or #)

Connection between democracy and markets. Focuses on countries in North America, Europe.

POL 5485 Human Rights and Democracy in the World (3.0 cr.; Student Option; prereq grad student or #)

History of ideas about human rights and democracy. Economic, political, psychological, and ideological explanations for repression.

POL 5487 Struggle for Democratization and Citizenship (4.0 cr.; Student Option; prereq grad student)

History of democratic movement from its earliest moments in history to present. Attempts to draw balance sheet. Emphasizes how disenfranchised fought to become included.

POL 5501 Supreme Court and Constitutional Interpretation (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq =: 4502; 1001 or 1002 or equiv or non-pol sci grad student or #)


POL 5525 Federal Indian Policy (3.0 cr.; A-F or Audit; prereq =: 4525, AMin 4525; grad student)

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 5561 Comparative Legal Systems (3.0 cr.; Student Option; prereq grad student or #)

Survey of principal legal systems of Western world. Role of legal system in relation to various political/economic systems. Contrast between common law and civil law traditions.

POL 5737 American Political Parties (3.0 cr.; Student Option; prereq grad student or #)


POL 5766 American Political Culture and Values (3.0-4.0 cr.; Student Option; 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 5767 Public Opinion and Voting Behavior (3.0 cr.; Student Option; prereq Grad student or #) Major factors influencing electoral decisions. Political attitude formation/change. Data analysis lab required.

POL 5810 Topics in International Politics and Foreign Policy (3.0 cr.; Student Option; prereq Grad student or advanced undergrad) Selected issues in contemporary international relations. Topics vary, see Class Schedule.

POL 5833 The United States in the Global EconomyUS For Econ Policy (3.0-4.0 cr.; Student Option; prereq =: 4833; grad student; 3835 recommended) Domestic/international politics of United States. Foreign economic policy (trade, aid, investment, monetary, migration policies). Effects of policies and international economic relations on U.S. economy/politics.

POL 5883 Global Governance (3.0 cr.; Student Option; prereq =: 4883: 3835 or non-pol sci grad student or #) Rise/role of inter-governmental organizations such as United Nations, non-governmental organizations. Peacekeeping, trade, development, human rights, security and arms control, self-determination, refugees, health, environment. Seminar discussions, class simulations.

POL 5885 International Conflict and Security (3.0 cr.; Student Option; prereq grad student) Alternative theories of sources of militarized international conflict. Theories applied to past conflicts. Theories’ relevance to present.

POL 5887 Thinking Strategically in International Politics (3.0 cr.; A-F or Audit; prereq =: 4887; grad student) Applications of game theory to international politics. Conflict/cooperation, global environmental commons, deference/reputation.

POL 5889 Governments and Global Trade and Money (3.0 cr.; Student Option; 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 (1.0-4.0 cr.; Student Option; prereq #, %) Guided individual reading or study.

PORT 1103 Intermediate Portuguese (5.0 cr.; Student Option; prereq 1102 or #) Emphasizes speaking, comprehension. Reading/writing skills based on Portuguese-language materials. Cultures of Portugal, Brazil, or Lusophone Africa.

PORT 1104 Intermediate Portuguese (5.0 cr.; Student Option; prereq 1103 or #) Emphasizes speaking, comprehension. Reading/writing skills based on Portuguese-language materials. Cultures of Portugal, Brazil, or Lusophone Africa. Grammar review. Compositions, short presentations.

PORT 1904 Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics specified in Class Schedule.

PORT 1905 Topic Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics specified in Course Guide.

PORT 1909W Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics specified in Course Guide.

PORT 3001 Portuguese for Spanish Speakers (4.0 cr.; Student Option; prereq [SPAN 1004 or SPAN 1014 or SPAN 1044, SPAN LPE pass] or #) Listening, reading, speaking, writing. Uses communicative approach.

PORT 3003 Portuguese Conversation and Composition (4.0 cr.; Student Option; prereq 1104 or 3001 or Port LPE) Development of oral/written skills. Cultural information from Portuguese-speaking world.

PORT 3501W Global Portuguese I (3.0 cr.; Student Option; prereq 3003) Expressions of medieval/renaissance Portuguese culture and colonial Brazilian culture through independence. Nineteenth century developments. Relation to new African empire, abolition of slavery, institution of Brazilian republic.

PORT 3502W Global Portuguese II (3.0 cr.; Student Option; prereq 3003) 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 (3.0 cr.; Student Option; 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 3603W Portuguese-speaking Cultures in Translation (3.0 cr.; Student Option) Portuguese-speaking world. Sociohistorical, geopolitical, and cultural foundations of Lusophone Africa, Brazil, and/or Portugal.

PORT 3800 Film Studies in Portuguese (3.0 cr.; A-F or Audit; prereq 3003 or # or %) Films from Portuguese-speaking world in their historical, (geo)political, and socioeconomic contexts. Films from Brazil, Portugal, or Lusophone Africa analyzed under interdisciplinary framework, noting aspects related to cinematography/rhetoric.

PORT 3910 Topics in Lusophone Literatures (3.0 cr.; Student Option; prereq 3003) Issues studied through literature, visual, sound, media culture from one or more Portuguese-speaking countries. Topics may include gender/sexuality, postcolonialism/globalization, transatlantic studies.

PORT 3920 Topics in Lusophone Cultures (3.0 cr.; Student Option; prereq [1101, 1102, 1103, 1104] or [3001, 3003] or equiv) Critical studies of various aspects of Portuguese-speaking cultures (Portugal, Brazil, or Lusophone Africa). Topics may include popular music, visual/media culture, religion, diaspora, Amazon.

PORT 3970 Directed Readings (1.0-4.0 cr.; Student Option; prereq [3501 or 3502 or 3910 or 3910, %] Guided individual reading or study.

PORT 4001 Portuguese for Spanish Speakers (4.0 cr.; Student Option; prereq [SPAN 1004 or SPAN 1014 or SPAN 1044, SPAN LPE pass] or #) Listening, reading, speaking, writing. Uses communicative approach.

PORT 4101 Beginning Portuguese (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1101. See 1101 for course description.

PORT 4102 Beginning Portuguese (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1102. See 1102 for course description.

PORT 4103 Intermediate Portuguese (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1103. See 1103 for course description.

PORT 4104 Intermediate Portuguese (2.0 cr.; Student Option; prereq Grad student) Meets concurrently with 1104. See 1104 for course description.

PORT 5520 Portuguese Literary and Cultural Studies (3.0 cr.; Student Option; prereq Grad student or #) Origins/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 problems pertaining to Portugal as well as fundamental literary texts.

PORT 5530 Brazilian Literary and Cultural Studies (3.0 cr.; Student Option; prereq Grad student or #) 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 problems pertaining to Brazil as well as fundamental literary texts.

PORT 5540 Literatures and Cultures of Lusophone Africa (3.0 cr.; Student Option; prereq Grad student or #) Origins/development of Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, Sao Tome/Principe). Literature, cultural/literary criticism, history, sociology, and various media (film, art, music, Internet). Main cultural problems pertaining to Lusophone Africa as well as fundamental literary texts.

PORT 5910 Topics in Lusophone Cultures and Literatures (3.0 cr.; Student Option; prereq Grad student or #) Cultural manifestations in Portuguese-speaking world (Portugal, Brazil, Lusophone Africa). Literature, history, film, intellectual thought, critical theory, popular culture. Topics may
PSTL 722 Introductory Algebra (Computer) (0.0 cr.; Student Option; 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) (0.0 cr.; Student Option; prereq [4 cr equiv or grade of at least C in [0731 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 1004 Statistics (4.0 cr.; Student Option; prereq Intermediate algebra or equiv or placement exam) Collection, analysis, interpretation of quantitative data. Organization/presentation, summary statistics, probability, distributions, estimation, correlation, hypothesis testing, contingency tables, chi-square. Uses groups and computers.

PSTL 1006 Mathematical Modeling and Prediction (3.0 cr.; Student Option; prereq [Three yrs high school math or grade of at least C+ in [0731 or 0732] or placement test score or #]) Math modeling, including linear, polynomial, rational, exponential, and logarithmic functions, counting and probability. Excel or calculators used to develop equations/graphs from theoretical/real interdisciplinary data. Projects enable students to use models to examine trends, make predictions.

PSTL 1051 Editing for Writers (2.0 cr.; Student Option) Editing one's own writing. Linguistic features of standard written English. Styles/language utilized in academic writing. Small-group activities, individual/peer conferencing.

PSTL 1081 Integrated Learning in the Social Sciences (2.0 cr.; A-F Grade Basis; 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 Sciences (2.0 cr.; A-F Grade Basis; prereq Concurrent registration in science course, adviser approval) Intensive support for mastering concepts/skills in companion science course. Scientific research methods, field-specific vocabulary, core concepts, writing/presentation styles associated with disciplinary content.

PSTL 1086 The First-Year Experience (2.0 cr.; A-F or Audit) 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 (4.0 cr.; Student Option) 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 (4.0 cr.; Student Option) Biodiversity/classification, genetics, evolution, ecology, and life cycles. Empirical/theoretical foundations. How scientific information and inquiry skills are relevant to daily lives.

PSTL 1135 Essentials of Human Anatomy and Physiology (4.0 cr.; Student Option) 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 (4.0 cr.; Student Option) Lecture/lab introductory class. Forces, energy, and small particle theory. Performing experiments similar to real scientific investigations. Nature of science knowledge and learning about science.

PSTL 1171 Earth Systems and Environments (4.0 cr.; Student Option) 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 (4.0 cr.; A-F or Audit) 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 (4.0 cr.; Student Option) 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 (4.0 cr.; Student Option) 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 1246 Multicultural Contexts: Engaging Citizenship and Democracy (3.0 cr.; Student Option) 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 (4.0 cr.; Student Option) Historical development of political, social, and diplomatic systems in cultures/nations. Growing interdependence between nations/cultures, resulting transformation of modern societies.

PSTL 1281 Principles of Psychology (4.0 cr.; Student Option; 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 1312 Creating Identities Through Art and Performance (4.0 cr.; Student Option) 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 1365W Literatures of the United States: Multicultural Perspectives (4.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Questions about American identity within social, historical, political, and literary contexts. Diversity of form, perspective, and style. Literary analysis, interpretation. Close reading of texts, class discussion.

PSTL 1367W Literatures of the World: International Perspectives (4.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Comparative readings in international fiction, poetry, drama, or memoir. Literary analysis. How stories draw us into deeper understanding of world around us. Lecture, discussion.

PSTL 1371 Reading Short Stories (3.0 cr.; Student Option) Current short story format from diverse communities within North America, Africa, the Caribbean, and Europe. Emphasizes written literature inspired by oral "storytelling," storytelling as "theatre," and storytelling as communal endeavor.
PSTL 1461 Multicultural Perspectives in Public Speaking (3.0 cr.; Student Option) How to confidently communicate thoughts/ideas in a public forum. Students present speeches on socially significant topics in multicultural environments. Focuses on ethics, citizenship, voice, and language.

PSTL 1485 Creativity: Photography (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option) Role of business in economic/social life of the United States. Symbiotic relationship between business activity and broader aspects of society. Environmentalism, consumerism, cultural diversity, economic systems, ethics, management, marketing, accounting/finance, legal issues.

PSTL 1525V First-Year Inquiry: Multidisciplinary Ways of Knowing (4.0 cr.; Student Option) Writing intensive multidisciplinary approach to addressing the common question, "How can one person make a difference?" Students read a common book/work collaboratively to produce a final project. Active learning strategies to develop students' skills in critical reading, thinking, and writing.

PSTL 1525W First-Year Inquiry: Multidisciplinary Ways of Knowing (4.0 cr.; A-F Grade Basis) Writing intensive multidisciplinary approach to addressing the common question, "How can one person make a difference?" Students read a common book/work collaboratively to produce a final project. Active learning strategies to develop students' skills in critical reading, thinking, and writing.

PSTL 1571 Computer Literacy and Problem Solving (4.0 cr.; Student Option) Competencies in computer technologies used in social sciences and in business to solve problems. Using advanced word processing technologies to create complex written documents such as reports. Using electronic spreadsheet to analyze data and present it graphically. Using database management program to store, organize, and query data. Using presentation software to communicate ideas/findings in multimedia format to larger groups.

PSTL 1901 Freshman Seminar: Environmental Issues (3.0 cr.; Student Option; prereq freshman) Reading, discussion, critical analysis, and writing about environmental issues. Intensive, small-group setting.

PSTL 1902 Freshman Seminar: Diversity and Social Justice in the United States (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about diversity and social justice in the United States. Intensive, small-group setting.

PSTL 1903 Freshman Seminar: Civic Life and Ethics (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about civic life and ethics. Intensive, small-group setting.

PSTL 1904 Freshman Seminar: Global Perspectives (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about global perspectives. Intensive, small-group setting.

PSTL 1905 Freshman Seminar: Writing about Social Justice in the United States (3.0 cr.; Student Option; prereq freshman) Reading, discussion, writing, and critical analysis. Intensive, small-group setting.

PSTL 1906W Freshman Seminar: The Environment (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about the environment. Intensive, small-group setting.

PSTL 1907W Freshman Seminar: Diversity and Social Justice in the United States (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about diversity and social justice in the United States. Intensive, small-group setting.

PSTL 1908W Freshman Seminar: Civic Life and Ethics (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about civic life and ethics. Intensive, small-group setting.

PSTL 1909W Freshman Seminar: International Perspectives (3.0 cr.; Student Option; prereq freshman) Reading, discussion, critical analysis, and writing about international perspectives. Intensive, small group setting.

PSTL 1910W Freshman Seminar (3.0 cr.; Student Option; prereq freshman) Reading, discussion, writing, critical analysis. Intensive, small-group setting.

PSTL 1942 Freshman Seminar: Technology and Society (3.0 cr.; Student Option; prereq Fr) Reading, discussion, critical analysis, and writing about technology and society. Intensive, small-group setting.

PSTL 1990 Special Topics (1.0-8.0 cr.; Student Option; prereq @) Topics related to instructor's areas of expertise.

PSTL 1993 Directed Study (1.0-8.0 cr.; Student Option; prereq @) Student-initiated project in consultation with faculty mentor. Student determines topic, sets goals, designs a course of study, and finds an appropriate faculty member to work with collaboratively.

PSTL 1996 Internship (1.0-8.0 cr.; Student Option; prereq @) Skills, techniques, and research in disciplinary content associated with college teaching. Goals/functions of public/community agencies. Career goals. Internship supervised by faculty mentor and site supervisor.

PSTL 2214W Community Learning (4.0 cr.; A-F Grade Basis) Students spend 40 hours serving a demographic group or physical site, working with a government, nonprofit, or grassroots organization. Research on volunteer experience and historical, socioeconomic, and political factors influencing community.

PSTL 2215 Leadership, Power, and Collaboration (4.0 cr.; A-F or Audit) Theories/practices in leadership, power, collaboration, and communication in culturally diverse settings. Emphasizes connecting frameworks to community engagement experiences.

PSTL 3050 Exploring Facilitated Peer Learning Groups (1.0 cr.; S-N or Audit; prereq 30 cr) Peer learning groups, factors that enhance their effectiveness. Facilitating learning process. Integrating learning skill development, content knowledge acquisition. Applying theories of learning.

PSTL 3214 Community Action (4.0 cr.; A-F Grade Basis; prereq 2214W or #) Students design/implement collaborative projects that fulfill community-identified needs. Community-based learning/action, project planning, outcomes.

PSTL 4216 Solving Complex Problems: Community-based Approaches (4.0 cr.; A-F Grade Basis; prereq 3214 or #) Students examine one pressing social issue from multidisciplinary perspectives and develop/implement action plans. Focuses on different community-based challenge each semester.

PSTL 4217 Inquiry and Assessment for Citizen Scholars (4.0 cr.; A-F Grade Basis; prereq 3214 or #) Modes of inquiry and epistemological underpinnings of qualitative/quantitative research within diverse communities. Students articulate their questions, identify research methods, and do a complete IRB application.

PSTL 4218W Senior Capstone (4.0 cr.; A-F Grade Basis; prereq 4217 or #) Students conduct research on a community-focused issue. The research is disseminated to and evaluated by key stakeholders.

PSTL 5001 Modeling Instruction: Introductory Science Courses (3.0 cr.; Student Option; prereq [Teaching or preparing to teach] intro science courses) Use of model-centered, guided inquiry method of teaching introductory science. Making better use of resources for science education. Strengthening local institutional support for participants as learning community of leaders in disseminating standards-based reform.

PSTL 5010 Diverse Learners in Postsecondary Education (1.0-3.0 cr.; Student Option) Theories of teaching, learning, student development to diverse student populations in post-secondary settings.

PSTL 5020 Directed Study: Postsecondary Teaching and Learning (1.0-6.0 cr.; Student Option) Directed study in postsecondary teaching and learning.

PSTL 5050 Reflecting on Professional Development Through Facilitating Peer Learning Groups (1.0 cr.; S-N or Audit; prereq 90 cr) Personal/professional development that occurs through facilitating peer learning groups. Power of peer learning environments on students.
and on those who serve as facilitators. Direct instruction, directed learning tasks, intense reflective activities.

PSTL 5105 Increasing Access and Success in Undergraduate Classrooms (3.0 cr.; A-F or Audit)
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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; S-N Grading Basis; 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 (3.0 cr.; A-F Grade Basis; 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/weaknesses of different approaches to classroom research.

Ethical issues.

PSTL 5212 Multicultural Theories of College Student Development Applied to Teaching and Learning (3.0 cr.; A-F Grade Basis; 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.

Product Design (PDES) College of Design

PDES 3701 Creativity, Idea Generation, and Innovation (2.0 cr.; A-F Grade Basis)
Half semester course. Introduction to a variety of creativity and idea generation tools with an emphasis on innovative product concept development. Students apply different tools to an ongoing project. Starting with a general theme, students explore problems and concepts, practice using a variety of idea generation tools, and learn methods of evaluating/selecting concepts. Customer needs, benchmarking, and intellectual property.

PDES 3702 Concept Sketching and Rendering (2.0 cr.; A-F Grade Basis)
Sketching and marker rendering for communication of conceptual product design. Free-hand 2-point perspective. Weekly drawing assignments/presentations. Students keep a sketchbook to develop ideas/drawings.

PDES 3703 Product Form and Model Making (4.0 cr.; A-F Grade Basis)

PDES 3711 Toy Product Design (4.0 cr.; A-F Grade Basis)
Product design process with a focus on creativity and designing for play. Project-centric. Students work in small teams of 5-6 members to design and prototype new toys with the help of local industry and children.

PDES 4193 Directed Study in Product Design (1.0-4.0 cr.; A-F or Audit; prereq Undergrad. #) Independent study in product design under tutorial guidance.

PDES 5170 Topics in Product Design (1.0-4.0 cr.; A-F or Audit; prereq Jr or sr or grad student) In-depth investigation of specific topic, announced in advance.

PDES 5193 Directed Study in Product Design (1.0-4.0 cr.; A-F or Audit; prereq Grad. #) Independent study in product design under tutorial guidance.

PDES 5701 Creativity, Idea Generation, and Innovation (2.0 cr.; A-F Grade Basis) Half semester course. Introduction to a variety of creativity and idea generation tools with an emphasis on innovative product concept development. Students apply different tools to an ongoing project. Starting with a general theme, students explore problems and concepts, practice using a variety of idea generation tools, and learn methods of evaluating/selecting concepts. Customer needs, benchmarking, and intellectual property.

PDES 5702 Concept Sketching and Rendering (2.0 cr.; A-F Grade Basis)
Sketching and marker rendering for communication of conceptual product design. Free-hand 2-point perspective. Weekly drawing assignments/presentations. Students keep a sketchbook to develop ideas/drawings.

PDES 5703 Product Form and Model Making (4.0 cr.; A-F Grade Basis)

PDES 5711 Toy Product Design (4.0 cr.; A-F Grade Basis)
Product design process with a focus on creativity and designing for play. Project-centric. Students work in small teams of 5-6 members to design and prototype new toys with the help of local industry and children.

Program for Individualized Learning (PIL) College of Continuing Education

PIL 3200 Continuing Studies (1.0-2.0 cr.; S-N or Audit; prereq PIL student, %) Students complete work for another PIL course in which an incomplete was received.
students compile a graduation dossier for presentation to preliminary review committee. Dossier consists of criteria summary, introduction, transcripts, illustrative materials, project proposals, degree plan.

PSY 3091 Graduation Preparation (4.0 cr.; S-N or Audit; prereq Admitted PIL student) Students complete draft dossier.

PSY 4299 Graduation Review (5.0 cr.; S-N or Audit; prereq PIL student, %) Students revise graduation dossier, present it to graduation review committee for BA or BS degree recommendation.

Psychology (PSY)

College of Liberal Arts

PSY 1001 Introduction to Psychology (4.0 cr.; Student Option) Scientific study of human behavior. Problems, methods, findings of modern psychology.

PSY 1001H Honors Introduction to Psychology (4.0 cr.; A-F Grade Basis; prereq Honors) Scientific study of human behavior. Problems, methods, findings of modern psychology.

PSY 1902 Freshman Seminar (3.0 cr.; Student Option; prereq Fr) Topics specified in Class Schedule.

PSY 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr) Topics specified in Class Schedule.

PSY 1907W Freshman Seminar (3.0 cr.; A-F or Audit; prereq freshman) Topics specified in Class Schedule.

PSY 1910W Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr) Topics specified in Class Schedule.

PSY 3001V Honors Introduction to Research Methods (4.0 cr.; A-F Grade Basis; prereq [1001, [2081/3801 or equiv]] or %, 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 (4.0 cr.; Student Option; prereq [1001, [2801 or 3801 or equiv]] or %) 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq PSY 1001) Psychological, biological, and physical bases of sensory experience in humans and animals. Emphasizes senses of vision/hearing.

PSY 3051 Introduction to Cognitive Psychology (3.0 cr.; Student Option; 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 3052H Honors Introduction to Cognitive Psychology (3.0 cr.; Student Option; prereq 1001 or BIOL 1009 or NSci 1100) Neuropsychology/neuroanatomy, neural mechanisms of motivation, emotion, sleep-wakefulness cycle, learning/memory in animals/humans. Neural basis of abnormal behavior, drug abuse.

PSY 3101 Introduction to Personality (3.0 cr.; Student Option; prereq 1001) Major theories, issues, facts about personality and personality assessment. Review of important historical/contemporary perspectives (e.g., psychoanalysis, humanistic psychology, trait psychology, behaviorism, evolutionary psychology) on human nature/individuality.

PSY 3135 Introduction to Individual Differences (3.0 cr.; Student Option; prereq [1001, [2801/3801 or equiv]] or #) Overview of theories/research in social psychology. Attitudes/persuasion, social judgment, the self, social influence, aggression, prejudice, helping, and applications.

PSY 3201 Introduction to Social Psychology (3.0 cr.; Student Option; prereq 1001 or #) Typical 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 3206 Introduction to Health Psychology (3.0 cr.; Student Option; prereq 1001) Concepts/procedures used to conduct/evaluate research, especially in social sciences. Benefits/limitations of traditional research methods. Evaluating scientific claims.

PSY 3301 Introduction to Cultural Psychology (3.0 cr.; A-F or Audit; prereq 1001) Theories/research on how 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 (3.0 cr.; Student Option; prereq 1001) History, theories, and research related to counseling psychology. Development/application of counseling theories to diverse populations. Psychological research on counseling process. Psychological mechanisms that promote change in people's lives.

PSY 3604 Introduction to Abnormal Psychology (3.0 cr.; Student Option; prereq 1001) Diagnosis, classification, etiologies of behavioral disorders.

PSY 3617 Introduction to Clinical Psychology (3.0 cr.; Student Option; prereq 3604 or 5604H) Historical developments, contemporary issues. Trends in psychological assessment methods, intervention strategies, and clinical psychology research. Theories behind, empirical evidence for, usefulness of psychological intervention strategies.

PSY 3633S: Integrating Research Across Psychological Sciences (3.0 cr.; Student Option; prereq 3001W or 3001V or #) Nature of human happiness/fulfillment. Insights from cognitive, personality, and social psychology, and from biology and economics. Integrative approach to feelings that make life worth living.

PSY 3666 Human Sexuality (3.0 cr.; Student Option; prereq 1001) Overview of theories/research and contemporary issues in human sexual behavior from an interdisciplinary perspective. Sexual anatomy/physiology, hormones/sexual differentiation, cross-cultural perspectives on sexual development, social/health issues, and sexual dysfunction/therapy.

PSY 3711 Psychology in the Workplace (3.0 cr.; Student Option; prereq 1001, [2801/3801 or equiv] or SCO 2550 or #) Application of psychological theory/research to recruitment, personnel selection, training/development, job design, work group design, work motivation, leadership, performance assessment, job satisfaction measurement.

PSY 3801 Introduction to Psychological Measurement and Data Analysis (4.0 cr.; Student Option; 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 (4.0 cr.; A-F Grade Basis; prereq [1001 or equiv], high school algebra, honors; intended for students who plan to major in psychology) Descriptive/basic inferential statistics in psychology. Measures of central tendency, variability, t tests, one-way ANOVA, correlation, regression, confidence intervals, effect sizes. Psychological measurement. Graphical data presentation. Statistical software.

PSY 3902W Major Project in Psychology (3.0 cr.; A-F Grade Basis; prereq [3801 or equiv], [3801W], completion of five courses from three distribution areas, PSY major, sr) Completion of undergraduate major project.

PSY 3960 Undergraduate Seminar in Psychology (1.0-5.0 cr.; Student Option; prereq 1001) Undergraduate seminars in subjects of current interest in psychology.
PSY 3993 Directed Study (1.0-6.0 cr.; Student Option; prereq #, @)
Independent reading leading to paper or to oral or written exam.

PSY 3996 Undergraduate Fieldwork and Internship in Psychology (1.0-6.0 cr.; Student Option; prereq 1001, #, @)
Supervised fieldwork/internship in community/industry pertinent to formal academic training in psychology.

PSY 4011 Applied Behavior Analysis (3.0 cr.; Student Option; prereq 3011 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 (4.0 cr.; A-F or Audit; 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 4032 Psychology of Music (3.0 cr.; Student Option; prereq Grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or #)

PSY 4036 Perceptual Issues in Visual Impairment (3.0 cr.; Student Option; prereq 1001 or #)
Challenges/capabilities of people who are blind or have low vision. Reading, space perception, mobility. Strengths/weaknesses of adaptive technology.

PSY 4501 Psychology of Women and Gender (3.0 cr.; Student Option; 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 (1.0-6.0 cr.; A-F or Audit; prereq Honors, #, %)
Critical literature review or empirical study.

PSY 4960 Seminar in Psychology (1.0-4.0 cr.; Student Option; prereq [1001, psych major] or #)
Seminars in subjects of current interest in Psychology.

PSY 4993 Direct Research: Special Areas of Psychology and Related Sciences (1.0-6.0 cr.; Student Option; prereq #, %)
Directed research projects in psychology.

PSY 4994V Honors Research Practicum (4.0 cr.; A-F Grade Basis; prereq [3001W or 3001V], psych major, honors)
Practical experience conducting psychological research. Preparation for completion of honors thesis. Research ethics, practical aspects of conducting psychological research, writing research reports. Students assist faculty and advanced graduate students in research.

PSY 4996H Honors Internship/Externship (1.0-6.0 cr.; A-F Grade Basis; prereq Honors, #, %)
Supervised internship/externship experience in a community service or industrial setting relevant to formal academic training/objectives.

PSY 5102 Learning and Cognition in Animals (4.0 cr.; Student Option; prereq 3011 or 4011 or honors or grad student or #)
Review/evaluation of key questions, methods, theories, and data about forms of learning and elementary cognitive processes. Emphasizes animal models. Implications for human learning/behavior.

PSY 5104 Psychology of Human Learning and Memory (3.0 cr.; Student Option; prereq 3011 or 3051 or honors or grad student or #)

PSY 5151Cognition, Computation, and Brain (3.0 cr.; Student Option; prereq Honors or grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or #)
Human cognitive abilities (perception, memory, attention) from different perspectives (e.g., cognitive psychological approach, cognitive neuroscience approach).

PSY 5018H Mathematical Models of Human Behavior (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq [3031 or 3051], [Math 1272 or equiv]) 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 5057 Psychology of Hearing (3.0 cr.; Student Option; prereq [MATH 1271, 3031 or 3051 or 3061] or grad student)
Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech. Clinical/other applications.

PSY 5038W Introduction to Neural Networks (3.0 cr.; Student Option; prereq [3061 or NSCI 3102], [MATH 1282 or 2243]) 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 5054 Psychology of Language (3.0 cr.; Student Option; prereq Grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or #)
Theories/experimental evidence in past/present conceptions of psychology of language.

PSY 5062 Cognitive Neuropsychology (3.0 cr.; Student Option; prereq Grad or [jr or sr], [3011 or 3031 or 3051 or 3061] or #)

PSY 5063 Introduction to Functional MRI (3.0 cr.; A-F Grade Basis; prereq Jr or sr or grad or #)
How to understand and perform a brain imaging experiment. Theory and practice of functional MRI experimental design, execution, and data analysis. Students develop experimental materials/acquire and analyze their own functional MRI data. Lectures/lab exercises.

PSY 5064 Brain and Emotion (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; prereq [3801 or equiv], [3061 or NSCI 3101], #)
Basic neuroimaging techniques/functional magnetic resonance imaging (fMRI). First half of semester covers basic physical principles. Second half students design/execute fMRI experiment on Siemens 3 Tesla scanner.

PSY 5101 Personality Psychology (3.0 cr.; Student Option; prereq [3001W or equiv], [honors undergrad or grad student])
Current theory and research on personality functioning and personality structure. Descriptive, biological, evolutionary, cognitive, developmental, cultural, and narrative perspectives on personality.

PSY 5135 Psychology of Individual Differences (3.0 cr.; Student Option; prereq [3001W or equiv] or [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 (3.0 cr.; Student Option; prereq [3001W or 3001V], [3135 or 5135], [5862 or equiv] or #)
Theory, methods, and applications of research in human abilities. Intelligence, aptitude,
PSY 5707: Introduction to Behavioral Genetics (3.0 cr.; Student Option; prereq 3001W or equiv or #)

PSY 5137: Psychology of Aging (3.0 cr.; Student Option; prereq 3001W or equiv)

PSY 5136: Psychology of Personality (3.0 cr.; Student Option; prereq 3001W or equiv)

PSY 5862: Psychological Measurement: Theory and Methods (3.0 cr.; Student Option; prereq 3801H or MATH 1271 or grad student)

PSY 5865: Advanced Psychological and Educational Measurement (4.0 cr.; Student Option; prereq 5862 or #)

PSY 5993: Research Laboratory in Psychology (3.0 cr.; Student Option; prereq #; Student Option)

PA 1907W: Freshman Seminar: Cultural Diversity (1.0-3.0 cr.; Student Option; prereq freshman)

PA 1900W: Student Option (1.0-3.0 cr.; Student Option)

PA 1961W: Personal Leadership in the University (3.0 cr.; A-F Grade Basis)

PA 1962: Leadership and Management (3.0 cr.; A-F Grade Basis)

PA 252: Leadership and Management (3.0 cr.; A-F Grade Basis)

PA 3991: Independent Study (1.0-3.0 cr.; Student Option; prereq)
PA 4101 Nonprofit Management and Governance (3.0 cr.; Student Option) Managing/governing nonprofit/public organizations. Theories, concepts, real-world examples. Governance systems, strategic management practices, effect of different funding environments, management of multiple constituencies.

PA 4190 Topics in Public and Nonprofit Leadership and Management (3.0 cr.; Student Option) Topics in public/nonprofit leadership/management.

PA 4200 Urban and Regional Planning (3.0 cr.; Student Option) 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 (1.0-3.0 cr.; Student Option) Topics in social policy.

PA 4414 Child Human Rights: Work and Education (3.0 cr.; Student Option) 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 4490 Topics in Social Policy (1.0-3.0 cr.; Student Option) Topics in social policy.

PA 4961W Leadership for Global Citizenship (3.0 cr.; A-F Grade Basis; prereq 3971 or EdPA 3402 or OLPD 3306) Leadership theory/practice. Experience working with diverse leaders. Mapping political contexts/planning global leadership path.


PA 5002 Introduction to Policy Analysis (1.5 cr.; A-F or Audit; prereq Major in public policy or science/technology/environmental policy or #) Process of public policy analysis from problem structuring to communication of findings. Commonly used analytical methods. Alternative models of analytical problem resolution.

PA 5003 Introduction to Financial Analysis and Management (1.5 cr.; A-F or Audit; prereq Development practice major or public policy major or public affairs major or grad liberal studies major or grad nonprofit mgmt cert or #) Finance/accounting concepts/tools in public/nonprofit organizations. Fund accounting. Balance sheet and income statement analysis. Cash flow analysis. Public/nonprofit sector budgeting processes. Lectures, discussions, cases.

PA 5004 Introduction to Planning (3.0 cr.; A-F or Audit; 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 Management of Organizations (3.0 cr.; A-F or Audit; 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 Theories of Public Affairs (3.0 cr.; A-F or Audit; 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 Audit; 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 (3.0 cr.; A-F or Audit; 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 (1.5-3.0 cr.; A-F or Audit; 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 5031 Empirical Analysis I (4.0 cr.; A-F or Audit; prereq Major in dev practice or pub pub policy or [sci, tech, and environ policy] or urban/regional planning or #) Basic statistical tools for empirical analysis of public policy alternatives. Frequency distributions, descriptive statistics, elementary probability and probability distributions, statistical inference. Estimation and hypothesis testing. Cross-tabulation and chi-square distribution. Analysis of variance, correlation. Simple/multiple regression analysis.

PA 5032 Intermediate Regression Analysis (2.0 cr.; A-F or Audit; prereq [5031 or equiv], major in [public policy or [sci, tech, and environ policy] or #] or [5032 or equiv] recommended) Bivariate/multivariate models of regression analysis. Assumptions behind them. Problems using these models when such assumptions are not met.

PA 5033 Multivariate Techniques (2.0 cr.; A-F or Audit; 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 Audit; 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 (2.0 cr.; A-F Grade Basis; prereq Major in public policy or [sci, 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 (2.0 cr.; A-F Grade Basis; 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 (2.0 cr.; A-F Grade Basis; prereq Major in public affairs or public affairs leadership certificate 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 (2.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F Grade Basis; 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 5051 Cohort Leadership I (2.0 cr.; A-F Grade Basis; prereq Major in public affairs (cohort) or public affairs certificate (cohort); 5051-5052 must be taken in same academic yr) Leadership theories, tools, and strategies in global context for the mid-career student.

PA 5052 Cohort Leadership II (2.0 cr.; A-F Grade Basis; prereq Major in public affairs (cohort) or public affairs certificate (cohort);
PA 5053 Cohort Policy Analysis I (2.0 cr.; A-F Grade Basis; prereq Major in public affairs (cohort) or public affairs certificate (cohort); 5053-5054 must be taken in same academic yr)
Process of public policy analysis, including problem formulation, problem-solving, and communication of findings. Commonly used analytical methods. Use of multimedia mini-cases, including readings, cases, and simulation exercises.

PA 5054 Cohort Policy Analysis II (2.0 cr.; A-F Grade Basis; prereq Major in public affairs (cohort) or public affairs certificate (cohort); 5053-5054 must be taken in same academic yr)
Continues 5053. Process of public policy analysis, including problem formulation, problem-solving, and communication of findings. Commonly used analytical methods. Use of multimedia mini-cases, including readings, cases, and simulation exercises.

PA 5055 Cohort Quantitative Analytics I (2.0 cr.; A-F Grade Basis; prereq Major in public affairs (cohort) or public affairs certificate (cohort); 5055-5056 must be taken in same academic yr)

PA 5056 Cohort Quantitative Analytics II (2.0 cr.; A-F Grade Basis; prereq Major in public affairs (cohort) or public affairs certificate (cohort); 5055-5056 must be taken in same academic yr)

PA 5080 Capstone Preparation Workshop (1.0 cr.; S-N Grading Basis; prereq 48081)
Project management, qualitative research, and critical framework to complete Capstone course. Students write draft of client project group norms and client contract.

PA 5011 Management and Governance of Nonprofit Organizations (3.0 cr.; Student Option; prereq Grad student 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 5102 Organization Performance and Change (3.0 cr.; Student Option; prereq Grad student or #)

PA 5103 Leadership and Change in an Innovation Society (3.0 cr.; Student Option; prereq Grad student 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 (3.0 cr.; A-F or Audit; prereq Grad student 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 (3.0 cr.; Student Option No Audit; prereq Grad student 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 (1.0 cr.; Student Option No Audit; 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 5107 Leadership, Reflective Practice, and Critical Theory: A Practicum (2.0 cr.; Student Option; prereq Grad student or #)
For students immersed in a cultural shift, organization, or leadership form who wish to learn how to negotiate international, cross-cultural/political contradictions. Critical approach to understanding adult learning. How to perceive and challenge dominant ideology, unmask power, contest hegemony, overcome alienation, and practice democracy.

PA 5111 Financial Management in Public and Nonprofit Organizations (3.0 cr.; Student Option; prereq 5003 or #)

PA 5112 Public Budgeting (3.0 cr.; Student Option; prereq Grad student or #)

PA 5113 State and Local Public Finance (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 5123 Philanthropy in America: History, Practice, and Trends (3.0 cr.; Student Option; prereq Grad student or #)

PA 5132 Mediation Training (3.0 cr.; Student Option; 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 debriefing, critique. Cases.

PA 5190 Topics in Public and Nonprofit Leadership and Management (1.0-3.0 cr.; Student Option; prereq Grad student or #)
Selected topics.

PA 5203W Geographical Perspectives on Planning (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq Major in urban/regional planning or #)
Behavioral theories of internal spatial arrangement, functioning, and characteristics of cities at macro level and how they produce 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 (3.0 cr.; Student Option; 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 5212 Managing Urban Growth and Change (3.0 cr.; Student Option; prereq Grad student or #)
Theory/practice of planning, promoting, and controlling economic growth/change in urban areas. Economic development tools available to state/local policymakers, historic context of their use in the United States. Legal, social, and economic implementation constraints. Interactions among economic, social, and demographic trends.

PA 5213 Introduction to Site Planning (3.0 cr.; Student Option; prereq Grad student or #)
Analyzing/paring graphic plans for development or redevelopment of property. Site planning issues, process, opportunities, details, and techniques. Hands-on preparation of a site plan. Site visits, lectures, research, presentations, exam, in-class exercises.

PA 5215 Computer Applications in Land Use Planning (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 5231 Transit Planning and Management (3.0 cr.; Student Option; prereq Grad student or #)

PA 5232 Transportation Policy, Planning, and Deployment (4.0 cr.; Student Option; 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 5242 Environmental Planning, Policy, and Decision Making (3.0 cr.; A-F Grade Basis; prereq Grad or #)
Theory and practice. Ethical, legal, and institutional frameworks relative to a range of environmental issues. Innovative environmental decision making informed by collaboration, conflict resolution, adaptive management, and resilience thinking.

PA 5251 Strategic Planning and Management (3.0 cr.; A-F or Audit; 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 5253 Designing Planning and Participation Processes (3.0 cr.; A-F Grade Basis; prereq Major in urban/regional planning or #)

PA 5261 Housing Policy (3.0 cr.; A-F or Audit; prereq Grad or #)

PA 5271 Geographic Information Systems: Applications in Planning and Policy Analysis (3.0 cr.; Student Option; prereq Major in urban/regional planning or #)

PA 5281 Immigrants and Cities (3.0 cr.; A-F or Audit; prereq Grad student or #)
Impact of contemporary immigration in the United States on urban planning and public affairs. Social, political, and economic experiences of immigrants once they arrive in the United States. Immigrant assimilation theory by drawing on literature from demography, sociology, economics, political science, and public affairs.

PA 5290 Topics in Planning (1.0-4.0 cr.; Student Option; prereq Grad student or #)
Selected topics.

PA 5301 Population Methods & Issues for the United States & Global South (3.0 cr.; Student Option; prereq Grad student or #)

PA 5311 Program Evaluation (3.0 cr.; Student Option; 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 5390 Topics in Advanced Policy Analysis Methods (1.0-4.0 cr.; Student Option; prereq Grad student or #)
Topics in advanced policy analysis methods.

PA 5401 Poverty, Inequality, and Public Policy (3.0 cr.; Student Option; prereq Grad or #)
Nature/extent of poverty/inequality in the United States, causes/consequences, impact of government policies/policies. Extent/causes of poverty/inequality in other developed/developing countries.

PA 5405 Public Policy Implementation (3.0 cr.; A-F or Audit)
Theory, tools, and practice of the implementation of public policy, particularly in areas involving public, private, and nonprofit organizations. Analytical approach focuses on multiple levels in policy fields to pinpoint and assess implementation challenges and levers for improvement.

PA 5412 Aging and Disability Policy (3.0 cr.; Student Option; 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 5414 Child Human Rights: Work and Education (3.0 cr.; Student Option; 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 5421 Racial Inequality and Public Policy (3.0 cr.; Student Option; 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 5422 Diversity and Public Policy (3.0 cr.; A-F Grade Basis; prereq Grad student or #)

PA 5431 Public Policies on Work and Pay (3.0 cr.; Student Option; prereq [[PA 5031 or equiv], grad student] 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 5441 Education Policy and the State Legislature (3.0 cr.; Student Option; prereq Grad or #)

PA 5442 Policy Design for Education and Human Development (3.0 cr.; Student Option; 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 (3.0-4.0 cr.; A-F Grade Basis; 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 (3.0 cr.; Student Option; prereq Grad student or #)
How to employ an analytical framework to analyze a current immigration policy proposal. Topics vary (e.g., guest worker proposal, democratic alternative proposals).

PA 5480 Topics in Race, Ethnicity, and Public Policy (1.0-3.0 cr.; Student Option; prereq Jr or Sr 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, health care, and education.

PA 5490 Topics in Social Policy (1.0-4.0 cr.; Student Option; prereq Grad student or #)
Selected topics.

PA 5501 Theories and Policies of Development (3.0 cr.; Student Option; prereq Grad student or #)
What makes some countries wealthier than others, one group of people healthier and more educated than another? How does the behavior of rich nations affect poor nations? Origins of development thought, contemporary frameworks and policy debates. Economic, human, and sustainable development.

PA 5511 Community Economic Development (3.0 cr.; Student Option; prereq Grad or #)
Contexts/motivations behind community economic development activities. Alternative strategies for organizing/initiating economic development projects. Tools/techniques for economic development analysis/planning (market analysis, feasibility studies, development plans). Implementation at local level.

PA 5521 Development Planning and Policy Analysis (4.0 cr.; Student Option; prereq 5031 or equiv recommended or #)
Techniques of development planning/policy analysis at national, regional, and project levels/levels of external shocks and government interventions on national/regional economies. Macroeconomic modeling, input/output analysis, social accounting matrices/multipliers, project evaluation.

PA 5522 International Development Policy, Families, and Health (3.0 cr.; Student Option; prereq Grad student or #)

PA 5561 Gender and International Development (3.0 cr.; Student Option; prereq Grad or #)
Women and men are affected differently by development and participate differently in policy formulation and implementation. Gender-sensitive perspective. Historical, political context. Global South. Policy, practice, and experience (theory and measurement; international, national, local stakeholders; effects of policy and practice on development).

PA 5590 Topics in Economic and Community Development (1.0-3.0 cr.; Student Option; prereq Grad student or #)
Selected topics.

PA 5601 Survey of Women, Law, and Public Policy in the United States (3.0 cr.; Student Option; prereq Grad or #)

PA 5621 Board Service in Women and Public Policy (1.0 cr.; S-N Grading Basis; 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 (1.0-3.0 cr.; Student Option; prereq Grad student or #)
Selected topics.

PA 5701 Science and State (3.0 cr.; Student Option; prereq Grad or #)

PA 5711 Science and Technology Policy (3.0 cr.; Student Option; 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 5715 Survey of Current Issues in Science, Technology, and Environmental Policy (1.5 cr.; A-F Grade Basis; prereq Grad or #)
Current topics in science, technology, and environmental policy. Techniques of development planning/planning, analysis, feasibility studies, development plans. Implementation at local level.

PA 5721 Energy and Environmental Policy (3.0 cr.; Student Option; 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 5722 Environmental and Resource Economics Policy (3.0 cr.; Student Option; prereq Grad student or #)

PA 5723 Water Policy (3.0 cr.; Student Option; prereq Grad student or #)
Sociocultural, legal, economic, and environmental forces affecting supply/use of water by individuals, sectors, and governance institutions. Historical trends; water laws in United States and internationally. Institutional structures for managing water at federal, state, and local levels. Current water-related issues/policies.

PA 5731 Emerging Technologies and Society (3.0 cr.; A-F Grade Basis; prereq Grad student or #)
Legal, public policy, social, economic, and ethical implications of emerging technologies (such as nanotechnology). Perspective of stakeholders (federal agencies, public, industry, environment, international organizations) and public policies. Statutory objectives/regulatory. Diversity of policy problems. Research methodologies.

PA 5741 Risk Analysis and Policy (3.0 cr.; Student Option; prereq Grad student or #)
Interplay between risk analysis, decision making, and risk policy. Role of S&T. Assessment methods; risk management processes, issues and methods; role/treatment of uncertainty; factors in decision making; risk-based rule making; public values; risk communication and perception. Scientific, technical, social, political, and ethical issues.

PA 5790 Topics in Science, Technology, and Environmental Policy (1.0-3.0 cr.; Student Option; prereq Grad or #)
Selected topics.

PA 5801 Global Public Policy (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq Major in [public affairs or public policy] or #)
Economic logic of globalization, national policy objectives, international finance/financial institutions, international trade and agreements including regional pacts and the WTO, global environmental and resource governance, immigration and emigration, and development challenges.

PA 5821 Humanitarianism (3.0 cr.; Student Option; prereq Grad student or #)
Foundations, logic, dynamics, dilemmas, and consequences of humanitarianism, a form of governance that operates in the name of—and for—the international community.

PA 5822 International Security (3.0 cr.; A-F Grade Basis; prereq Grad student or #)

PA 5841 Women, Violence, and Armed Conflict (3.0 cr.; A-F Grade Basis; prereq Grad student or #)
Role of women in recent armed conflicts/how women are affected by wartime as combatants, civilians, victims, and perpetrators of war violence. Conflicts in Sierra Leone, Liberia and El Salvador, where women participated in fighting forces in large numbers.
as well as women’s roles in the Abu Ghraib scandal, female suicide bombers, wartime sexual violence. Policy solutions offered by policymakers and NGOs to deal with problems of gender-based violence.

PA 5890 Topics in Foreign Policy and International Affairs (1.0-5.0 cr.; Student Option; prereq Grad student or #) Selected topics.

PA 5910 Developing Your Public Service Career (1.0 cr.; S-N or Audit; prereq [Major in [public affairs or public policy or urban/ regional planning] or [science, technology/ environmental policy] or development practice]] or #) Students investigate/analyze interests, skills, and abilities and combine them in a career plan. Develop tools to demonstrate abilities, document experiences/knowledge, and explore public service career options.

PA 5912 Politics of Public Affairs and Civic Engagement (3.0 cr.; A-F Grade Basis; 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 (0.5-4.0 cr.; Student Option; prereq Grad student or #) Topics on public policy or planning skills. Topics specified in Class Schedule.

PA 5941 Leadership for the Common Good (4.0 cr.; A-F Grade Basis; prereq [Major in development practice or public affairs] or public affairs leadership certificate or #) Personal, team, organizational, visionary, political, and ethical aspects of leadership. Building/experiencing a learning community.

PA 5952 Global Commons Seminar II (2.0 cr.; A-F Grade Basis; 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 specialist in the subject area.

PA 5981 American Institutions in Historical Perspective (1.5 cr.; Student Option; prereq Grad student or #; basic US history course recommended) History of churches, fraternal organizations, charities, and institutions more directly related to government.

PA 5990 Topics: Public Affairs--General Topics (0.0-3.0 cr.; Student Option; prereq Grad student or #) General topics in public policy.

Public Health (PUBH) School of Public Health

PUBH 20 Community Engagement (0.0 cr.; No Grade Associated; prereq Academic faculty adviser consent) Registration for course is officially documented on transcript.

PUBH 1001 Success Over Stress (SOS) (1.0 cr.; Student Option; prereq Undergrad or PSEO student) Increases students’ understanding of stress/how to manage it and empower them to help others manage their stress. Holistic health perspective/impact of stress on all aspects of life. Causes, effects, and consequences of stress for students and society at large. Tools and resources to manage stress during college and throughout life.

PUBH 1003 Alcohol and College Life (1.0 cr.; Student Option No Audit; prereq Fr or soph or PSEO) How alcohol affects college life. Personal prevention strategies. Maximizing campus safety. Students receive instructions at their umnedu e-mail accounts on how to access start course and due dates for assignments.

PUBH 1004 Sexuality Matters (1.0 cr.; Student Option; prereq Undergrad or PSEO student) Knowledge/skills to lead healthy sexual lives. Unbiased, medically accurate, evidence-based information/programs. Communication skills. Dispel sexuality/relationships myths.

PUBH 1005 Sleep, Eat, and Exercise (1.0 cr.; Student Option; prereq [Undergrad or PSEO]) 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 (0.5-4.0 cr.; Student Option) New courses or topics of interest in public health.

PUBH 3001 Personal and Community Health (2.0 cr.; Student Option) Fundamental principles of health conservation and disease prevention.

PUBH 3003 Fundamentals of Alcohol and Drug Abuse (2.0 cr.; Student Option) Scientific, sociocultural, and attitudinal aspects of alcohol and other drug abuse problems. Emphasizes incidence, high-risk populations, prevention, and intervention.

PUBH 3004 Basic Concepts in Personal and Community Health (4.0 cr.; Student Option) Scientific, sociocultural, and attitudinal aspects of communicable and degenerative diseases, environmental and occupational health hazards, and alcohol and drug problems. Role of education in health conservation, disease control, and drug abuse.

PUBH 3005 Fundamentals of Alcohol and Drug Abuse for Teacher Education (1.0 cr.; Student Option; prereq Undergrad in agricultural educ or business/marketing educ or career/technical educ or foundations of educ or [kinesiology, pre-PE] or technology educ or music educ) Scientific/socio-cultural aspects of alcohol/drug problems. Emphasizes role of education in health conservation and drug abuse prevention.

PUBH 3010 Public Health Approaches to HIV/ AIDS (2.0 cr.; Student Option) Primary, secondary, and tertiary prevention. Community responses to HIV/AIDS in Minnesota. Medical, social service, and political responses.

PUBH 3040 Dying and Death in Contemporary Society: Implications for Intervention (2.0 cr.; Student Option; prereq Jr or sr or #) Concepts, attitudes, ethics, and lifestyle management in relation to dying, death, grief, and bereavement. Emphasizes intervention/educational aspects for community health/helping professionals and educators.

PUBH 3050 Practicum in Peer Education I (2.0 cr.; A-F or Audit; prereq Selected to serve as a hth advocate, #) 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 3055 Practicum in Peer Education II (2.0 cr.; A-F or Audit; prereq Undergrad student, demonstrated hlth sci or hlt ed interest, selected to serve as a hth advocate, #) Multiple factors that influence health. Through health promotion strategies, students gain/build skills such as public speaking, needs assessments, program planning, interpersonal communication, and program evaluation.

PUBH 3100 Topics: Environmental Health (2.0 cr.; Student Option No Audit) Topics of interest in environmental health.

PUBH 3102 Issues in Environmental and Occupational Health (3.0 cr.; Student Option) 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 3104 Environmental Health Effects: Introduction to Toxicology (2.0 cr.; Student Option; prereq Basic science coursework; undergrad coursework in [biology, chemistry, biochemistry] recommended) Environment as determinant of disease in humans. Identifying biological mechanisms/effects of chemical, biological, and physical agents on human health. Principles of toxicology applied to toxicant-human interactions.

PUBH 3106 Making Sense of Health Studies (2.0 cr.; Student Option) How to critically evaluate health news (and the health research reports on which they are based) to make good, well informed decisions about your health and well-being.

PUBH 3107 Global Public Health and the Environment (2.0 cr.; A-F Grade Basis; prereq [3001 or 3004 or 3202], [3106 or 3350], public health minor) Environmental determinants of health/wellbeing of populations. Role of environment in public health, resulting population burden of disease. Variation of environmental public health determinants across globe. Interconnectedness of activities/actions of people in different countries.

PUBH 3202 What is Public Health? (2.0 cr.; Student Option No Audit) Overview of public health: what it is, its origins, evolution, how it is structured/administered in the U.S. Mission, concepts, principles, and
practices of population-based public health.
Case studies. Career opportunities.

**PUBH 3300 Topics: Clinical Research (1.0-4.0 cr.; Student Option; prereq Jr or sr)**
Topics regarding health research in humans.

**PUBH 3315 Clinical Research from Lab to Bedside to Populations (2.0 cr.; A-F Grade Basis; 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 3350 Epidemiology: People, Places, and Disease (2.0 cr.; Student Option; prereq Undergrad statistics course is recommended)**
How diseases are distributed among us. Epidemiology terminology, methods, critical thinking, and analysis. Intended for students interested in a health science career or in a career that may need to evaluate epidemiologic evidence such as health journalism or public policy or litigation.

**PUBH 3390 Topics: Epidemiology (1.0-4.0 cr.; Student Option; prereq Jr or sr or #)**
New course offerings or topics.

**PUBH 3600 Topics: Maternal and Child Health (1.0-6.0 cr.; Student Option; prereq Undergrad student)**
New course offerings or topics of interest pertaining to maternal/child health.

**PUBH 3601 Maternal and Child Health Global Public Health Issues (2.0 cr.; A-F Grade Basis; prereq Public Health minor requirements or #; [3202 or 3001 or 3004], [3350 or 3106])**

**PUBH 3639 Prevention: Theory, Practice, and Application in Public Health Services (3.0 cr.; Student Option; prereq Course on microeconomics, course on basic statistics) Economics of health care markets. Problems faced by consumers/health care services. Builds on principles of supply/demand for health, health care/insurance, and role of government. Theoretical/empirical models/applications.**

**PUBH 3810 Health Economics and Policy (3.0 cr.; Student Option; prereq Course on microeconomics, course on basic statistics) Economics of health care markets. Problems faced by consumers/health care services. Builds on principles of supply/demand for health, health care/insurance, and role of government. Theoretical/empirical models/applications.**

**PUBH 3893 Directed Study: Health Services Research and Policy (1.0-4.0 cr.; Student Option; prereq #)**
tbd

**PUBH 3900 Topics: Public Health Nutrition (1.0-6.0 cr.; Student Option; prereq Undergrad student)**
Topics pertaining to public health nutrition.

**PUBH 3905 Nutrition for Public Health Promotion and Disease Prevention (2.0 cr.; Student Option; prereq Jr or sr or #)**

**PUBH 3940 Concepts and Controversies in Public Health Nutrition and Health Promotion (1.0 cr.; Student Option; prereq Jr or sr or #)**
Societal issues around public health nutrition and health promotion. Socioecological framework. Levels of influence on dietary intake, food choices, related health outcomes. Policy initiatives related to public health nutrition, health promotion and disease prevention.

**PUBH 5230 Topics: Public Health Practice (2.0 cr.; Student Option No Audit)**
Topics.

**RTT 2001 Radiation Therapy: Radiation Exposure, Imaging, Safety, and Basic Care (1.0 cr.; A-F or Audit; prereq BAS student in radiation therapy program, %)**

**RTT 3121 Radiation Physics II (3.0 or 6.0 cr.; A-F or Audit; 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 3131 Radiation Therapy: Principles of Oncology II (3.0 cr.; A-F or Audit)**
General principles of radiation oncology. Imaging procedures, concept of disease, disease factors, disease management, treatment results.

**RTT 3140 Radiation Therapy: Radiobiology (2.0 cr.; A-F or Audit)**
Principles of cell response to radiation/hyperthermia.

**RTT 3150 Radiation Therapy: Brachytherapy (1.0 cr.; A-F or Audit)**
Principles of radioactivity, its medical uses.

**RTT 3160 Radiation Therapy: Methods of Patient Care (1.0 cr.; A-F or Audit)**

**RTT 3172 Radiation Therapy: Clinical Radiation II (5.0 cr.; A-F or Audit)**
Hands-on clinical experience in a working environment.

**RTT 3551 Radiation Oncology Physics (3.0 cr.; A-F Grade Basis; prereq BAS RTT student)**
General physics principles. Radiation properties, production/control, measurement of emission, attenuation, transmission.

**RTT 3596 Clinical Practicum II (3.0 cr.; A-F or Audit; 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 4511 Dosimetry and Treatment Planning (4.0 cr.; A-F or Audit; 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 4581 Principles and Practices of Radiation Therapy II (4.0 cr.; A-F or Audit; prereq 3581, BAS RTT student)**
Advanced principles of applying virtual simulations, three dimensional planning, conformal treatments, including intensity modulated radiation therapy. Natural history, diagnosis/management of cancer disease sites. Technical issues relating to simulation, treatment techniques, electronic record keeping.

**RTT 4596 Clinical Practicum III (6.0 cr.; A-F or Audit; prereq 3596, 3696)**

**RTT 4601 Project (1.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq 3596, 3696, 4596)**
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 4796 Clinical Practicum V (3.0 cr.; A-F or Audit; prereq 3596, 3696, 4596, 4696, BAS RTT student)

RTT 5281 Scientific Foundations (3.0 cr.; A-F or Audit; prereq Registered rehab science or PT student)

Radiology (RAD)
Medical School

RAD 120 X-Ray Conference (0.0 cr.; Student Option)
RAD 121 Medical Roentgenologic Conference (0.0 cr.; Student Option)
RAD 123 Surgical Roentgenologic Conference (0.0 cr.; Student Option)
RAD 124 Neurosurgical-Roentgenologic Conference (0.0 cr.; Student Option)
RAD 125 Cardiac Roentgenologic Conference (0.0 cr.; Student Option)
RAD 126 Roentgenologic Conference on Chest Diseases (0.0 cr.; Student Option)
RAD 220 Nuclear Medicine: Clinical Conference (0.0 cr.; Student Option)

Recreation Resource Management (RRM)
College of Food, Agricultural and Natural Resource Sciences

RRM 1001 Orientation and Information Systems (1.0 cr.; A-F or Audit)
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 periodic index systems.

RRM 1101 Recreation and the Quality of Life (3.0 cr.; Student Option)
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 (1.0 cr.; Student Option; prereq freshman)
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

RRM 1905 Freshman Seminar (1.0-3.0 cr.; Student Option; prereq freshman)
In-depth study of issues/topics related to natural resources and the environment. Topics vary each semester.

RRM 3101 Park and Protected Area Tourism (3.0 cr.; A-F or Audit)
Interaction of resource based tourism with cultural/natural environments. Impacts of tourism on environment.

RRM 3201 Introduction to Travel and Tourism (3.0 cr.; A-F Grade Basis)
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. Examine 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 3301 International Tourism (3.0 cr.; Student Option; prereq Soph)

RRM 3480 Topics in Recreation Resource Management (1.0-4.0 cr.; Student Option)
Lectures by visiting scholar or regular faculty member. Topics specified in Class Schedule.

RRM 4200H Honors Seminar (1.0 cr.; A-F or Audit; prereq RRM upper div honors, #)
Current topics presented by faculty/students. Lectures, discussions.

RRM 4232W Managing Recreational Lands (4.0 cr.; A-F or Audit)

RRM 4293 Directed Study (1.0-5.0 cr.; Student Option; 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 5101 Park and Protected Area Tourism (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq Grad student or #)

RRM 5232 Managing Recreational Lands (4.0 cr.; A-F or Audit; prereq Grad student or #)

RRM 5259 Visitor Behavior Analysis (3.0 cr.; Student Option; prereq Major or ESPM major or grad student or #)
Social science theory/methods to behavioral research. Recreation/nature-based tourism/environmental management. Analysis of surveys/observations/focus groups/interviews. Implications for sustainable resource management, visitor experiences, and environmental stewardship. Course is online or in-person, depending on semester.

RRM 5301 International Tourism (3.0 cr.; Student Option; prereq Sr or grad student)

RRM 5480 Topics in Recreation Resource Management (1.0-4.0 cr.; Student Option)
Lectures by visiting scholar or regular faculty member. Topics specified in Class Schedule.

Recreation, Park, and Leisure Studies (REC)
College of Education and Human Development

REC 1501 Orientation to Leisure and Recreation (3.0 cr.; Student Option)
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 1901 Freshman Seminar: Environmental Issues (3.0 cr.; Student Option No Audit; prereq Fr)
Reading, discussion, critical analysis, and writing about environmental issues. Intensive, small-group setting.

REC 1905 Freshman Seminar (1.0-3.0 cr.; Student Option No Audit; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

REC 2151 Outdoor and Camp Leadership (3.0 cr.; A-F or Audit)
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 (4.0 cr.; A-F or Audit)
Basic techniques; emphasis on social research and evaluation methodology; survey of present status of recreation and park research and evaluation.

REC 3541W Recreation Programming (3.0 cr.; A-F or Audit)
Various methods, skills, materials needed for planning, developing, implementing, evaluating professional recreation programs for diverse populations in various settings.

REC 3551 Administration and Finance of Leisure Services (4.0 cr.; A-F or Audit; prereq [3541W or #], rec major)
Principles/practices of financing/managing leisure service agencies in public/private sector.

REC 3601W Leisure and Human Development (3.0 cr.; Student Option)
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
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.

REC 5461 Foundations of Sport Management (3.0 cr.; A-F or Audit; prereq Kin or Rec postbac or grad student or #)

Theories/techniques in administering/managing sport enterprises. Organizational theory/policy. Practical examples of sport management skills/strategies.

REC 5511 Sport and Gender (3.0 cr.; A-F Grade Basis)

Critically examines women's involvement in contribusions to sport, physical activity, and leisure.

REC 5601 Sport Management Ethics and Policy (3.0 cr.; A-F or Audit; 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.

REC 5631 Programming and Promotion in Sport (3.0 cr.; A-F or Audit; prereq Kin or Rec grad student or #)

Introduction to marketing concepts as they apply to sport industry. Consumer behavior, market research, marketing mix, corporate sponsorship, licensing concepts. Discussion, practical application.

REC 5701 Positive Youth Development Programming (3.0 cr.; A-F Grade Basis; prereq Upper div undergrad or grad student or #)


REC 5801 Legal Aspects of Sport and Recreation (4.0 cr.; A-F or Audit; prereq 3551 or 5461 or #)

Legal issues related to recreation, park, and sport programs/facilities with public/private sectors.

REC 5900 Special Topics: Contemporary Issues in Leisure Services (1.0-12.0 cr.; Student Option)

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.

REC 5981 Research Methodology in Kinesiology, Recreation, and Sport (3.0 cr.; A-F or Audit; 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 methodologies as alternatives to traditional scientific paradigm.

REC 5992 Readings: Recreation (1.0-9.0 cr.; A-F Grade Basis, prereq REC major, #)

Independent study under tutorial guidance by faculty member on topic(s) not covered in regular coursework.
models, forward/inverse dynamics solutions, hypotheses to describe whole body/joint kinetics. Lectures, lab, discussion.

RSC 5294 Independent Study in Rehabilitation Science (1.0-3.0 cr.; Student Option; prereq Rehabilitation science student or program approval) Independent exploration into topics related to rehabilitation science.

RSC 5814 Age, Exercise, and Rehabilitation (2.0 cr.; Student Option; prereq Rehabilitation science student or program permission) Overview of normal physiological responses to exercise in the elderly. Comparison of exercise-induced responses of physiological systems throughout aging process. Focuses on importance of exercise from rehabilitation perspective. Offered Fall semesters of even-numbered years.

RSC 5841 Rehabilitation Science Instrumentation and Methodology (4.0 cr.; A-F or Audit; prereq [] Phys 1031, Phys 1032 or equiv.). #, #, [rehabilitation science student or program permission]] Theory/application of kinesiological EMG and other common instruments used to measure human motion.

RSC 5901 Scholarly Inquiry in Health Sciences (4.0 cr.; A-F or Audit; prereq Three credits of undergraduate statistics. #, #) How research evidence is developed, disseminated, utilized in health sciences. Qualitative/quantitative scholarly project proposal. Critique studies/peer proposals. Explore conduct of research.

Religious Studies (RELS)
College of Liberal Arts

RELS 1001 Introduction to the Religions of the World (3.0 cr.; Student Option) 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 Religions in America (3.0 cr.; Student Option) Pluralistic character of religion in United States. Methods, problems, materials, views of sacred/religious practices. Religion’s role in gender, race, science.


RELS 1034 Introduction to Jewish History and Civilization (3.0 cr.; Student Option) 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 1082 Jesus in History (3.0 cr.; Student Option) 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.

RELS 1082H Honors Course: Jesus in History (4.0 cr.; Student Option; prereq honors) Jesus of Nazareth in his original setting. Modern approaches to historical Jesus. Perspectives/needs of early gospel writers, effects of portrayals of Jesus. Shifting representations of Jesus in new historical/cultural situations. Meets with 1082.


RELS 1905 Freshman Seminar (3.0 cr.; Student Option) Topics specified in Class Schedule.


RELS 3034 Introduction to Jewish History and Civilization (3.0 cr.; Student Option) 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 3035 Introduction to Christianity (3.0 cr.; A-F or Audit; prereq =1035) Christian traditions throughout history. Emphasizes recurrent themes: reform/renewal, relations between church/society, varieties of spiritual formation, elusive pursuit of Christian unity.

RELS 3070 Topics in Religious Studies (3.0 cr.; Student Option) Topics specified in Class Schedule and Course Guide.


RELS 3071H Honors Course: Greek and Hellenistic Religions (4.0 cr.; Student Option) Greek religion from the 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.

RELS 3072 The New Testament (3.0 cr.; Student Option) Early Jesus movement in its cultural and historical setting; origins in Judaism; traditions about Jesus; Paul, his controversies and interpreters; questions of authority, religious practice, and structure; emergence of the canon of scripture. Contemporary methods of New Testament study.


RELS 3074 Age of Constantine the Great (3.0 cr.; Student Option) Change/continuity in Roman Empire from 2nd-century zenith through 3rd-century crisis, first Christian emperor (306 to 337 A.D.), and beyond. Replacement of classical paganism by Christianity. Beginnings of monasticism. Superpower relations between Roman, Persian empires.

RELS 3076 The Apostle Paul: Life, Letters, and Legacy (3.0 cr.; Student Option) How/what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.


RELS 3079 Muslims and Jews: Conflict and Coexistence in the Middle East and North Africa since 1700 (3.0 cr.; Student Option) 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 contentious.

RELS 3111 Too Jewish? The Complex Construction of the Jewish American Psyche in Literature, Art, and Film (3.0 cr.; A-F or Audit) Questions about image/location of Jews in American arts and pop culture. Examples from literature, music, film.

RELS 3115 Midrash: Jewish Biblical Interpretation (3.0 cr.; Student Option)
RELS 3126 Judaism in the Modern World (3.0 cr.; Student Option)

RELS 3201 The Bible: Context and Interpretation (3.0 cr.; Student Option)

RELS 3202 Prophecy in Ancient Israel (3.0 cr.; Student Option; prereq 1001 or 1201 or 3201 RELA 3201 or #)

RELS 3203 The Bible: Wisdom, Poetry, and Apocalyptic (3.0 cr.; Student Option)

RELS 3204 Dead Sea Scrolls (3.0 cr.; Student Option; prereq 1001 or 1201)
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 3321 American Indian Philosophies (4.0 cr.; Student Option)

RELS 3322 Pre-Columbian Art of the Americas (3.0 cr.; Student Option)
Art/architecture of native peoples of Americas from twelfth century B.C. until arrival of Europeans. Ways that people living in South America/Mesoamerica prior to Spanish conquest produced, shaped, used art/ architecture.

RELS 3371 Buddhism (3.0 cr.; Student Option)
Historical and contemporary account of the Buddhist religion in Asia/world in terms of its rise, development, various schools, practices, philosophical concepts, and ethics. Current trends in the modern faith and the rise of "socially engaged" Buddhism.

RELS 3372 Reading Asian Cultures (3.0 cr.; A-F or Audit)

RELS 3373 Religion and Society in Imperial China (3.0 cr.; Student Option)

RELS 3415W Art of India (4.0 cr.; Student Option)
Indian sculpture, architecture, and painting, from prehistoric Indus Valley civilization to present.

RELS 3501 Ancient Israel: The Origins of Israel in Biblical Traditions (3.0 cr.; Student Option; prereq Hebrew not required)

RELS 3502 Ancient Israel: From Conquest to Exile (3.0 cr.; Student Option; 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 3503 History and Development of Israelite Religion I (3.0 cr.; Student Option; prereq No knowledge of Hebrew required)
Survey of the evolution of Israelite religion. Cultic practices, law and religion, prophecy, religion and historiography. Relationship to surrounding religious systems.

RELS 3504 Development of Israelite Religion II (3.0 cr.; Student Option)
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 3520 History of the Holocaust (3.0 cr.; Student Option)

RELS 3521W History of the Holocaust (3.0 cr.; Student Option)

RELS 3535 Death and the Afterlife in the Ancient World (3.0 cr.; Student Option)
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 (3.0 cr.; Student Option)
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 3542 The Age of Justinian and Muhammad (c.500-c.700 A.D.) (3.0 cr.; Student Option)
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.

RELS 3611 Eastern Orthodoxy: History and Culture (3.0 cr.; Student Option)

RELS 3612 Baroque Rome: Art and Politics in the Papal Capital (3.0 cr.; Student Option)
Center of baroque culture--Rome--as city of spectacular and pageantry. Urban development. Major works in painting, sculpture, and architecture. Ecclesiastical/private patrons who transformed Rome into one of the world's great capitals.

RELS 3621 The Christian Right and Left in America: Protestant Liberals, Evangelicals, and Fundamentalists (3.0 cr.; Student Option)
Religious, historical, social, and scientific thought/practice across three main U.S. Protestant groups since 1820. Historical processes that brought about diverse understandings of Christianity, theologies, and worship. Theological left/right views of views of society, history, and science, that influence public debates.

RELS 3622 'Sinners, Saints, and Savages': Religion in Early America (3.0 cr.; Student Option; prereq Non-fr or #)

RELS 3623 Religion and the U.S. Founding: Contests Then and Now Over the Place of Religion in Politics (3.0 cr.; Student Option)

RELS 3671 Hinduism (3.0 cr.; Student Option)
Development of Hinduism. Sectarian trends, modern religious practices, myths/rituals, pilgrimage patterns, religious festivals.

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

REL 3709 Ancient Iran (3.0 cr.; Student Option) Development of ancient Iranian culture under Achaemenians and Sassanians. Impact of Zoroastrian religion on Iranians, on Hellenism, and on domains such as Bactria. Iran's contribution to cultures of Silk Road.

REL 3712 Islam: Religion and Culture Islam (3.0 cr.; Student Option) Religion of Islam, faith, practices, sectarian splintering, expansion outside original home to status of world religion, institutions, status in world societies: Asia, Europe, Americas.

REL 3713 Modern Iran: Nationalism, Religion, and the Struggle to Create Modern Iran (3.0 cr.; Student Option) Iranian history from the fall of the Sassanids (7th C. CE) to the present. Shi'ite Islam in a world context. Iranian dynasties. Iran's entrance into modern world politics.

REL 3714 Islam and the West (3.0 cr.; Student Option) 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.

REL 3715 History of the Crusades (3.0 cr.; Student Option) Crusading spirit in Europe. Results of classic medieval crusades ca 1095-1285. States established by crusaders in Near East. Internal European crusades. Chronological prolongation of crusading phenomenon.

REL 3716 Gender and the Family in the Islamic World (3.0 cr.; A-F Grade Basis; prereq At least soph) Experiences of Muslim women/families from a historical/comparative perspective. Gender/family power relations in colonial representations, sexual politics, family, education/health, paid work, human rights, and Islamic feminism.

REL 3717 Christians, Muslims, and Jews in the Middle Ages (3.0 cr.; Student Option) Muslim/Christian expansion, jihad/crusade, anti-Jewish violence/persecution. Trade, intellectual exchange, religious dialogue.

REL 3801 Philosophy of Religion (3.0 cr.; Student Option) Conceptual problems that arise from attempts to provide rational justification for religious belief.

REL 3970 Supplemental Discussion in Religious Studies (1.0 cr.; Student Option) Extra discussion section attached to a religious studies course/event.

REL 3993 Directed Studies (1.0-4.0 cr.; Student Option) Student works with faculty on a subject decided upon by both.

REL 4003 Medieval Philosophy (3.0 cr.; Student Option; prereq Grad student or upper div) Major figures of medieval Christian synthesis (e.g., Augustine, Anselm, Aquinas, Scotus, Ockham).

REL 4049 Religion and Culture (3.0 cr.; Student Option; prereq 1005 or ANTH 1003 or #) Religious beliefs and world views cross-culturally. Theories of origins, functions, and forms (e.g. myth, ritual, symbolism) of religion.

REL 4309 Prophets, Pundits, and Priests: Public Religion in the United States Today (3.0 cr.; Student Option; prereq 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 individuals. Views on issues such as race, poverty, the family, and sexuality.

REL 5001 Theory and Method in the Study of Religion: Critical Approaches to the Study of Religion (3.0 cr.; Student Option; prereq Sr or grad student or #) Theoretical/methodological issues in academic study of religion. Theories of origin, character, and function of religion as a human phenomenon. Psychological, sociological, anthropological, and phenomenological perspectives.

REL 5070 Topics in Religious Studies (3.0 cr.; Student Option) Topics specified in Class Schedule and Course Guide.


REL 5076 Apostle Paul: Life, Letters, and Legacy (3.0 cr.; Student Option) How/what can we know about Paul. What his message was. What he was fighting. How he was later understood by friends/foes.


REL 5080 New Testament Proseminar (3.0 cr.; Student Option; prereq 1082 or RELA 1082 or 3072 or equiv) Discussion seminar. Specific aspect of New Testament, related literature. Topics specified in Class Schedule.

REL 5111 Problems in Historiography and Representation of the Holocaust (3.0 cr.; Student Option; prereq 3521 or 3541 or JwSt 3521 or #) Issues connected with Holocaust. Inclusiveness of other groups. Holocaust versus “Shoah,” historiographical conflicts about perpetrators. Problems of representation in literature/art. Problems of narrative theology after Auschwitz.

REL 5115 Midrash: Jewish Biblical Interpretation (3.0 cr.; Student Option) Jewish law studies as mirror of society and as way to actualize its value. Original socioreligious contexts, current applications. Selections include biblical interpretations addressing moral, theological, legal, and literary problems.

REL 5204 Dead Sea Scrolls (3.0 cr.; Student Option) 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.

REL 5255 Archaeology of Religion (3.0 cr.; Student Option) Evidence for origins of religion, its diverse roles in human societies over millennia. What constitutes religion, why it is constantly present in human history. How archaeologists reconstruct beliefs/practices of past peoples.

REL 5325 The Art of the Aztec Empire (3.0 cr.; Student Option) Art/architecture of Nahua-speakng Aztecs of Central Mexico, from first appearance in archaeological record until Spanish invasion in 1521. Major scholarly problems, theoretical/methodological approaches. Analysis of scholarly writing.

REL 5503 History and Development of Israelite Religion I (3.0 cr.; Student Option) Survey of the evolution of Israelite religion. Cultic practices, law and religion, prophecy, religion and historiography. Relationship to surrounding religious systems.

REL 5504 Development of Israelite Religion II (3.0 cr.; Student Option) Ancient Judaism from the Persian restoration (520 B.C.E.) to Roman times (2nd century C.E.). Religious, cultural, and historical developments are examined to understand Jewish life, work, and worship under a succession of foreign empires: Persian, Greek, Roman.

REL 5535 Death and the Afterlife in the Ancient World (3.0 cr.; A-F Grade Basis)
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 5614 Medieval Church (3.0 cr.; Student Option) 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.

RELS 5621 The Christian Right and Left in America: Protestant Liberals, Evangelicals, and Fundamentalists (3.0 cr.; Student Option) Religious, historical, social, and scientific thought/practice across three main U.S. Protestant groups since 1820. Historical processes that brought about diverse understandings of Christianity, theologies, and worship. Theological left/right views of views of society, history, and science that influence public debates.


RELS 5993 Directed Studies (1.0-4.0 cr.; Student Option; prereq #) TBD

Respiratory Care (RC)
College of Continuing Education

RC 2011 Foundations for Clinical Practice of Respiratory Care (2.0 cr.; A-F or Audit; prereq BAS respiratory care major) Respiratory care profession. Clinical roles, responsibilities, career options. Subspecialties, professional settings. Preparation for clinical practice in respiratory care within a hospital setting. Lab sessions, discussion, simulation, interviews, role-playing.

RC 2021 Patient Care Techniques (2.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; 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 (4.0 cr.; S-N or Audit; 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 (4.0 cr.; S-N or Audit; 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 (1.0 cr.; A-F or Audit; 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 (1.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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, pathophysiological manifestations, and treatment. Lab observations/measurement of normal and simulated abnormal cardiopulmonary physiology.

RC 3601 Clinical Research Concepts and Practice (3.0 cr.; A-F or Audit; 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 (2.0 cr.; A-F or Audit; 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 4203 Subspecialization in Respiratory Care: Cardiopulmonary Rehabilitation, Disease Prevention, Case Mgmt (1.0 cr.; A-F or Audit; prereq 3102, BAS RC student) Care for chronically ill patients with lung/heart disorders. Emphasizes respiratory care in the hospital, extended care, and the home. Clinical testing, exercise prescriptions, and practice guidelines for management. Case management and responsibilities unique to respiratory therapist. Preparation for role of certified asthma educator.

RC 4301 Seminar: Research Project and Publication (2.0 cr.; A-F or Audit; 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 Subspecialty Clinical Practicum in Advanced Respiratory Care I (3.0 cr.; S-N or Audit; 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 4996 Subspecialty Clinical Practicum in Advanced Respiratory Care II (3.0 cr.; S-N or Audit; prereq 3302, BAS RC student)
Continued 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 4611 Grand Rounds (2.0 cr.; A-F or Audit; prereq Respiratory care major)

RC 4993 Directed Study (1.0-4.0 cr.; Student Option; prereq Respiratory care major)
Independence project. Topic arranged with and supervised by respiratory care faculty.

Retail Merchandising (RM) College of Design

RM 1170 Topics in Retail Merchandising (1.0-4.0 cr.; A-F or Audit)
In-depth investigation of specific topic, announced in advance.

RM 1201 Fashion, Ethics, and Consumption (3.0 cr.; A-F Grade Basis)
Apparel business. Multiple steps in the process of creating/merchandising apparel, and the ethical positions reflected in decision making at each step.

RM 1203 Computer Literacy and Problem Solving (3.0 cr.; A-F Grade Basis; prereq Retail merchandising major or #)
Concepts/competencies in computer applications used to solve problems in social sciences and business.

RM 2196 Work Experience in Retail Merchandising (1.0-4.0 cr.; S-N Grading Basis; 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 (3.0 cr.; A-F or Audit; prereq 1201)
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 (1.0-4.0 cr.; A-F or Audit)
In-depth investigation of specific topic.

RM 3196 Field Study: National or International (1.0-4.0 cr.; A-F or Audit; prereq #)
Faculty-directed field study in national or international setting.

RM 3201 Career and Internship Preparation for Retail Merchandising (1.0 cr.; A-F Grade Basis; prereq Retail merchandising major)
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 (3.0 cr.; A-F or Audit; prereq [[1201 or DHA 1201], [2215 or DHA 2215 or 3245], [MATH 1031 or MATH 1051 or MATH 1142 or MATH 1151 or MATH 1215 or MATH 1271], [jr or sr], retail merchandising [major or minor? or #])
Principles/mathematics of merchandise inventory control, merchandise selection.

RM 3243 Visual Merchandising (3.0 cr.; A-F or Audit; prereq 2215, [DHA major or minor or #])
Retail store environment. Physical/ psychological effects that initiate/motivate consumer behavior. Merchandise display: creativity, department layout, fixturing, lighting, cross merchandising, visual resources, signing, maintenance.

RM 4117W Retail Environments and Human Behavior (3.0 cr.; A-F Grade Basis; prereq 2215 or DHA 2215, [jr or sr or grad student], [design major or minor or #])
Theory/research related to designed environments across retail channels.

RM 4123 Living in a Consumer Society (3.0 cr.; A-F Grade Basis; prereq Sr, retail merchandising major or minor)

RM 4124 Consumers of Design (3.0 cr.; A-F Grade Basis; prereq Rsr, retail merchandising major or minor)
Contemporary approaches to consumer behavior.

RM 4160H Honors Capstone Project (2.0 cr.; A-F Grade Basis; prereq Retail merchandising honors)
Individualizes honors experience by connecting aspects of major program with special academic interests.

RM 4193 Directed Study in Retail Merchandising (1.0-4.0 cr.; A-F or Audit; prereq Undergrad; #)
Independent study in retail merchandising under tutorial guidance.

RM 4196 Internship in Retail Merchandising (2.0 cr.; S-N or Audit; 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 related 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 (3.0 cr.; A-F or Audit; prereq Jr or sr or grad student), [design 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 (4.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq 2215, 3242 or DHA 2215, [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, markups, timing, and sourcing.

RM 5170 Topics in Retail Merchandising (1.0-4.0 cr.; A-F or Audit; prereq Jr or sr or grad student)
In-depth investigation of single specific topic, announced in advance.

Russian (RUSS) College of Liberal Arts

RUSS 1101 Beginning Russian I (5.0 cr.; Student Option)
Listening, speaking, reading, writing.

RUSS 1102 Beginning Russian II (5.0 cr.; Student Option; prereq 1101 or equiv)
Listening, speaking, reading, writing.

RUSS 1905 Freshman Seminar (3.0 cr.; A-F or Audit)
Topics specified in Class Schedule.

RUSS 3001 Intermediate Russian I (5.0 cr.; Student Option; prereq 1102 or #)
Conversation, composition, grammar review, translation, readings in literature.

RUSS 3002 Intermediate Russian II (5.0 cr.; Student Option; prereq 3001 or #)
Expansion of experience in speaking, reading, and understanding Russian. Reading contemporary texts.

RUSS 3101 Advanced Russian I (4.0 cr.; Student Option; prereq 3002 or #)
Advanced grammar, conversation, composition, reading.

RUSS 3102 Advanced Russian II (4.0 cr.; Student Option; prereq 3101 or #)
Advanced grammar, conversation, composition, and reading.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUSS 3311</td>
<td>Russian Major Project</td>
<td>3.0 cr.</td>
<td>Directed research and writing in student's chosen field.</td>
</tr>
<tr>
<td>RUSS 3311H</td>
<td>Honors Major Project in Russian</td>
<td>3.0-4.0 cr.</td>
<td>A-F or Audit; prereq Advanced Russian major. Directed research/writing in student's chosen field.</td>
</tr>
<tr>
<td>RUSS 3404</td>
<td>Tolstoy in Translation</td>
<td>3.0 cr.</td>
<td>Novels, stories, and philosophical writings of Leo Tolstoy.</td>
</tr>
<tr>
<td>RUSS 3407</td>
<td>Stories and Plays of Anton Chekhov in Translation</td>
<td>3.0 cr.</td>
<td>Study of literary devices and themes in selected stories and major plays using the intrinsic approach.</td>
</tr>
<tr>
<td>RUSS 3411</td>
<td>Dostoevsky in Translation</td>
<td>3.0 cr.</td>
<td>Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.</td>
</tr>
<tr>
<td>RUSS 3421</td>
<td>Literature: Middle Ages to Dostoevsky in Translation</td>
<td>3.0 cr.</td>
<td>Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.</td>
</tr>
<tr>
<td>RUSS 3512</td>
<td>Russian Art and Culture</td>
<td>3.0 cr.</td>
<td>Major trends in Russian visual arts in context of social, political, and ideological questions.</td>
</tr>
<tr>
<td>RUSS 3900</td>
<td>Topics in Russian Language, Literature, and Culture</td>
<td>1.0-4.0 cr.</td>
<td>Variable topics in Russian language, literature and culture. Consult department for details.</td>
</tr>
<tr>
<td>RUSS 4101</td>
<td>Beginning Russian I</td>
<td>3.0 cr.</td>
<td>Students; prereq Fourth sem course in another language or grad student.</td>
</tr>
<tr>
<td>RUSS 4102</td>
<td>Beginning Russian II</td>
<td>3.0 cr.</td>
<td>Students; prereq 4101, [fourth sem course in another language or grad student].</td>
</tr>
<tr>
<td>RUSS 4103</td>
<td>Intermediate Russian I</td>
<td>3.0 cr.</td>
<td>Students; prereq 4102, [fourth sem course in another language or grad student].</td>
</tr>
<tr>
<td>RUSS 4104</td>
<td>Intermediate Russian II</td>
<td>3.0 cr.</td>
<td>Students; prereq 4103, [fourth sem course in another language or grad student].</td>
</tr>
<tr>
<td>RUSS 5404</td>
<td>Tolstoy in Translation</td>
<td>3.0 cr.</td>
<td>Novels, stories, and philosophical writings of Leo Tolstoy.</td>
</tr>
<tr>
<td>RUSS 5407</td>
<td>Stories and Plays of Anton Chekhov in Translation</td>
<td>3.0 cr.</td>
<td>Novels, stories, and philosophical writings of Leo Tolstoy.</td>
</tr>
<tr>
<td>SCAN 1904</td>
<td>Topics: Freshman Seminar</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq freshman. Topics specified in Class Schedule.</td>
</tr>
<tr>
<td>SCAN 1905</td>
<td>Topics: Freshman Seminar</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Fr. Topics specified in Class Schedule.</td>
</tr>
<tr>
<td>SCAN 3011W</td>
<td>Readings in Scandinavian Languages</td>
<td>4.0 cr.</td>
<td>Students; 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.</td>
</tr>
<tr>
<td>SCAN 3501W</td>
<td>Scandinavian Culture Past and Present</td>
<td>3.0 cr.</td>
<td>Students; 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.</td>
</tr>
<tr>
<td>SCAN 3502</td>
<td>Scandinavian Myths</td>
<td>3.0 cr.</td>
<td>Students; 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.</td>
</tr>
<tr>
<td>SCAN 3503</td>
<td>Scandinavian Folklore</td>
<td>3.0 cr.</td>
<td>Students; Literary and folkloristic investigation of Scandinavian folktales and legends. Readings in translation for nonmajors.</td>
</tr>
<tr>
<td>SCAN 3504</td>
<td>The Immigrant Experience</td>
<td>3.0 cr.</td>
<td>Students; Issues of origin/language, immigration/settlement, traditions/values, culture/politics, and transgressions of boundaries from the old to the new studied through photos, diaries, letters, stories, and novels by Moberg, Rolvaag, Ager, and other pioneers. All readings in translation.</td>
</tr>
<tr>
<td>SCAN 3505</td>
<td>Scandinavian Fiction From 1890 to Present</td>
<td>3.0 cr.</td>
<td>Students; Modernity's search for new forms to represent changing historical situations. Ibsen, Strindberg, Hamsun, Selma Lagerlöf, Hjalmar Bergman, Paar Lagerkvist, Karen Blixen, Moa Martinson, Tarjei Vesaas, Edith Sodergran, Ingmar Bergman, Lars Gustafsson. All readings in translation.</td>
</tr>
<tr>
<td>SCAN 3601</td>
<td>Great Literary Works of Scandinavia</td>
<td>3.0 cr.</td>
<td>Students; Major literary works from the Middle Ages to the present. Readings in translation.</td>
</tr>
<tr>
<td>SCAN 3602</td>
<td>The Literary Fairy Tale in Scandinavia</td>
<td>3.0 cr.</td>
<td>Students; Literary fairy tales from Scandinavia, especially Hans Christian Andersen. Readings in translation for non-majors.</td>
</tr>
<tr>
<td>SCAN 3605</td>
<td>The Scandinavian Short Story</td>
<td>3.0 cr.</td>
<td>Students; 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.</td>
</tr>
<tr>
<td>SCAN 3613</td>
<td>Children's Literature in Scandinavia</td>
<td>3.0 cr.</td>
<td>Students; Analysis and discussion of representative works in Scandinavian children's literature from picture books to young adult books using a variety of critical methods of interpretation. Taught in English.</td>
</tr>
<tr>
<td>SCAN 3634</td>
<td>Scandinavian Women Writers</td>
<td>3.0 cr.</td>
<td>Students; 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.</td>
</tr>
<tr>
<td>SCAN 3670</td>
<td>Topics in Scandinavian Studies</td>
<td>3.0 cr.</td>
<td>Students; Study of topics specified in Class Schedule. Readings in English for nonmajors. May meet with 5670.</td>
</tr>
<tr>
<td>SCAN 3993</td>
<td>Directed Studies</td>
<td>1.0-4.0 cr.</td>
<td>Students; prereq #, %. Directed individual reading and study.</td>
</tr>
<tr>
<td>SCAN 4011</td>
<td>Readings in Scandinavian Languages</td>
<td>2.0 cr.</td>
<td>Students; Meets with 3011W. See 3011W for description.</td>
</tr>
<tr>
<td>SCAN 4614</td>
<td>Introduction to Kierkegaard</td>
<td>3.0 cr.</td>
<td>Students; The literary, philosophical, theological, and psychological dimensions of Kierkegaard's work. Kierkegaard's influence on 20th-century culture in general and existentialism in particular. Analysis and discussion of...</td>
</tr>
</tbody>
</table>
selections from Kierkegaard's entire oeuvre. Readings in English.

**SCAN 5501 Scandinavian Mythology** (3.0 cr.; Student Option)
Study of Scandinavian mythology based on primary sources represented by Saxo Grammaticus, Snorri Sturluson's Edda and Ynglinga Saga, and the Poetic Edda. Myths are analyzed using contemporary critical approaches. All readings in translation.

**SCAN 5502 The Icelandic Saga** (3.0 cr.; Student Option)
Study of the sagas written in 13th-century Iceland. Discussion includes cultural and historical information about medieval Iceland and analysis of a selection of saga texts using contemporary critical approaches. All readings in translation.

**SCAN 5613 Contemporary Scandinavian Literature** (3.0 cr.; Student Option)
An investigation of issues which emerged as extremely important after 1945 in Scandinavia, as articulated by writers and analyzed by researchers in social sciences. All readings in translation.

**SCAN 5615 Ibsen and the Beginnings of Modern Drama** (3.0 cr.; Student Option)
Close reading of Ibsen's major tragedies. From A Doll's House (1879) to When We Dead Awake (1899). Focus is on the dialectics between Ibsen and his society, and dramatic structure and staging conventions in the context of modern theater. Readings in English for nonmajors.

**SCAN 5634 Scandinavian Women Writers** (3.0 cr.; Student Option)
Issues important to women as articulated by Scandinavian women writers. Historical overview of women's writing in Scandinavia. In-depth investigation of texts by contemporary women writers. All readings in translation.

**SCAN 5670 Topics in Scandinavian Studies** (3.0 cr.; Student Option)
Topics may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in Class Schedule. Readings in English for nonmajors. May meet with 3670.

**SCAN 5701 Old Norse Language and Literature** (3.0 cr.; Student Option)
Acquisition of a reading knowledge of Old Norse; linguistic, philological and literary study of Old Norse language and literature.

**SCAN 5710 Topics in Old Norse Literature** (3.0 cr.; Student Option; 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.

**SCAN 5993 Directed Studies** (1.0-4.0 cr.; Student Option; prereq #, %, @)
Guided individual reading and study.

### Second Language Studies (SLS)

**SLS 1904 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
Topics vary. See Class Schedule.

**SLS 1905 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

**SLS 3001 Basics in Teaching English as a Second Language** (4.0 cr.; A-F Grade Basis; prereq Have studied another language.) Current theories/methods of English as second language (ESL) instruction. Methodologies for teaching/assessing listening, speaking, pronunciation, reading, writing skills. Contexts of teaching English to adults in United States/abroad. Internship at school or agency teaching ESL.

**SLS 3401 Introduction to Pronunciation and Grammar for ESL Teachers** (4.0 cr.; A-F Grade Basis; prereq Ling 3001 or Ling 3001H or Ling 5001 or EngL 3601 or Span 3107W or #)
Concepts/theories regarding English pronunciation/grammar. ESL textbooks, teaching activities, lesson plans, curriculum materials.

**SLS 3501 Practical Language Learning for International Communication** (3.0 cr.; Student Option)
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. Motivation to do specific language tasks.

**SLS 5101 Academic Writing in TESOL** (1.0 cr.; S-N or Audit; prereq [5721, grad ESL student] or #)
Research writing conventions in the profession. University rules on ethical use of human subjects, research paper rhetorical structure, literature sources/searches, literature review coherence, hedging markers, basic research methods, research result reporting, APA-formatted bibliographies, writing strategies.

**SLS 5401 Language Analysis for Teachers of English as a Second Language** (4.0 cr.; Student Option; 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.

**SLS 5402 Language Analysis for Teachers of English as a Second Language** (4.0 cr.; Student Option; prereq 5401, Ling 5001)
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** (3.0 cr.; Student Option; prereq Ling 5505 or #)
Key issues in second language acquisition/learning research. Focuses on learning a second or foreign language in the classroom.

**SLS 5721 Methods in Teaching English as a Second Language** (3.0 cr.; Student Option; prereq Ling 3001 or 5001 or #)
Introduction to methods for teaching English as a second language to adults at college or university level.

**SLS 5722 Practicum in Teaching English as a Second Language** (6.0 cr.; S-N or Audit; prereq [5401 or 65401], [5402 or 65402], 5721, ESL major or ESL minor or #)
Observation of, and practice in, teaching English as a second language to adults.

**SLS 5724 Intro to Language Assessment** (3.0 cr.; A-F or Audit)
How to engage in meaningful, appropriate, and fair second-language assessment practices; interpret test results; and construct new forms of assessment.

**SLS 5805 Basics of Second Language Acquisition for Teachers** (3.0 cr.; Student Option; prereq LING 3001 or 3001H or 5001 or #)

**SLS 5990 Topics in Second Language Learning and Teaching** (3.0 cr.; Student Option)
Topics vary. See Class Schedule.

**SLS 5910 Seminar in Teaching English as a Second Language** (3.0 cr.; Student Option)
Topics related to second language learning/teaching. Focuses on learning/teaching English as a second language. Topics specified in Class Schedule.

**SLS 5993 Directed Studies** (1.0-4.0 cr.; Student Option; prereq #, %, @)
Directed study for teaching English as a second language.

### Social Work (SW)

**College of Education and Human Development**

**SW 20 Community Engagement** (0.0 cr.; No Grade Associated; prereq MSW student, academic faculty adviser consent)
Students volunteer in clinic/agency predetermined by the School of Social Work. Registration for course is officially documented on transcript.

**SW 1001 Introduction to the World of Social Work: A Global Perspective** (3.0 cr.; Student Option)

**SW 1501 Introduction to Peace Studies** (3.0 cr.; A-F Grade Basis)
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** (1.0-3.0 cr.; Student Option; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

**SW 1910W Freshman Seminar** (1.0-3.0 cr.; Student Option; prereq Fr)
SW 501W Introduction to Social Justice (4.0 cr.; A-F Grade Basis)
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 3301 GLBT Social Movements (3.0 cr.; A-F Grade Basis)

SW 3501 Theories and Practices of Social Change: Organizing (4.0 cr.; A-F Grade Basis; prereq 2501W)

SW 3701 Introduction to Child Maltreatment: Intervention and Prevention (3.0 cr.; Student Option)

SW 3702 Introduction to Adult Intimate Partner Violence: Intervention and Prevention (3.0 cr.; Student Option)
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 Perspectives (3.0 cr.; Student Option)
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 (1.0-4.0 cr.; A-F or Audit)
Topics specified in Class Schedule.

SW 4501 Senior Seminar in Social Justice (4.0 cr.; A-F Grade Basis; prereq 2501, 3501) Capstone course. Students complete a social justice portfolio, do service learning in a social justice organization.

SW 4693 Directed Studies (1.0-10.0 cr.; Student Option; prereq #) Guided individual reading or study related to social issues, social work methods, or social work history.

SW 4684 Directed Research (1.0-10.0 cr.; Student Option; prereq #) Guided research related to social issues, social work methods, or social work history.

SW 5051 Human Behavior and the Social Environment (2.0-3.0 cr.; A-F or Audit; 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, culture, community, and society.

SW 5101 Historical Origins and Contemporary Policies and Programs in Social Welfare (3.0-4.0 cr.; A-F or Audit; prereq Grad or 8 sem cr 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 policy for social welfare programs and services. The emergence of the profession of social work also examined.

SW 5105 Women and Public Policy (3.0 cr.; Student Option) Study of feminist organizations; issues and conflicts within organizations and movements; methods and sources for studying feminism.

SW 5309 Case Management with Special Populations (3.0 cr.; Student Option; 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 5313 Social Work with Older Adults (2.0 cr.; Student Option; 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 5316 Brief Treatment and the Task-Centered Approach (2.0 cr.; Student Option; prereq Grad student or non-degree seeking student or #) Advant/prominence of brief-treatment models in work with individuals, families, and groups. Theoretical/empirical bases. Practice with diverse populations in managed care. Skill training, supervised practice.

SW 5318 Family Centered Home Based Services (2.0 cr.; Student Option; prereq = 8314; grad or non-degree seeking student or #) Ecological, multisystems approach focusing on the family system. Triadic theory, meta-neutrality, strengths-focus, case management and team treatment. Family-based services evaluated for high-risk, multi-problem families and as an alternative to foster placement.

SW 5319 Adolescents: Norms, Culture, and Health (2.0 cr.; Student Option) Relationships among familial, social, societal, political, economic, environmental, psychosocial, and cultural determinants of adolescent behavior that affect health; major public health issues and problems of adolescents.

SW 5482 Child Abuse Prevention II: Program Development, Evaluation, and Advocacy (3.0 cr.; Student Option; 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 5483 Child Abuse Prevention III: Skill Building I: Cultural and Legal Issues (3.0 cr.; Student Option; prereq Bachelor's degree or #) Risk factors, protective factors, resilience in cultural settings. Identifying/designing strategies appropriate to cultural characteristics. First course for level II child abuse prevention certification.


SW 5512 Developing and Managing an Agency Budget (1.0 cr.; Student Option; 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 (1.0 cr.; Student Option; prereq MSW student or #) Preparing/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 (1.0 cr.; Student Option; 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 5801 Policies and Programs in American Social Welfare (2.0 cr.; A-F or Audit) Major policies and programs of social welfare, distinguishing between programs of social insurance and public assistance. Develops skills for analyzing social problems/policies that respond to those problems. Concepts for defining and measuring poverty and social disparity.

SW 5802 Social Welfare History (1.0 cr.; A-F or Audit) Policies/programs in social welfare. Historical evolution, along with themes that have shaped
development over time. Contributions of population subgroups to the development of the welfare state, and the impact of policies and programs on such groups. History of social work profession, preparedness planning, termination of parental rights, child testimony, social worker testimony, adoption laws.

SW 5903 Substance Abuse and Social Work (2.0 cr.; Student Option; prereq Grad student or %)

Students gain skills in eliminating the detrimental impact of substance use disorders at multiple levels (families, groups, organizations, and communities) through an ability to identify, assess, intervene, and evaluate those struggling with substance abuse and dependency throughout the life span.

SW 5904 Facilitation & Conflict Mgmt: Humanistic Approach (2.0 cr.; Student Option)

Humanistic approach to facilitating meetings in small human service organizations and units within large bureaucratic structures. Managing conflict among individuals, groups, and communities in multiple settings.

SW 5905 Permanency in Child Welfare (2.0 cr.; Student Option; prereq Grad student or %)

Depth/breadth in knowledge/skill acquisition in achieving permanency for children receiving services within public, tribal, and private child welfare systems. Out-of-home/permanency placements, specific permanency interventions, and child/family responses to different permanency options.

SW 5906 Advanced Ethical Decision Making (1.0 cr.; Student Option; prereq Grad student or %)

Identify ethical issues, resolve ethical dilemmas, make ethical decisions when confronted with conflicting duties/choices that occur within the context of professional social work at all levels of practice.

SW 5907 School Social Work (1.0 cr.; Student Option; prereq Grad student or %)

Apply social work knowledge/skills in school settings through prevention, assessment, intervention, and evaluation from an ecological multilevel approach focused on students, families, and the school community.

SW 5908 Technology and Communication in Social Work (1.0 cr.; Student Option; prereq Grad student or %)

Online course explores the influence of technology in social work practice/society. Appropriate community or direct interventions using new technologies. Introduction to effective communication and public relations.

SW 5909 Social Work With Involuntary Clients (2.0 cr.; Student Option; prereq Grad or non-degree seeking student or %)

Includes theory, ethics, effectiveness, and intervention methods for work with client systems that experience involuntary contact with a social worker. Interventions at micro, mezzo, and macro levels are included. Practice in varied settings such as child welfare, mental health, corrections, and public schools as well as practice related to organizational responses to change.

SW 5911 Global Social Work and Social Development (2.0 cr.; Student Option)

Theories/strategies of social work and social development in international/developing countries. Applying international perspective and comparative framework to analyze basic human needs, social problems, and social work and social development strategies in different countries.

SW 5913 Working with Immigrant Populations (2.0 cr.; Student Option)


SW 5991 Independent Study in Social Work (1.0-4.0 cr.; Student Option)

Independent study in areas of special interest to students and faculty.

Social and Administrative Pharmacy (SAPH) College of Pharmacy

SAPH 5100 Pro-Seminar (1.0 cr.; A-F or Audit)

History, foundational frameworks, and key research domains for social and administrative pharmacy through examining landmark literature. Students think critically, reflect on important works, and create a cognitive map of the discipline and their own focus for study.

SAPH 5610 Pharmacoepidemiology (3.0 cr.; A-F Grade Basis)

Application of epidemiologic principles to study/use. Beneficial/adverse outcomes of drugs in human populations.

Sociology (SOC) College of Liberal Arts

SOC 1001 Introduction to Sociology (4.0 cr.; Student Option; prereq Soc majors/minors must register A-F)

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 1011V Honors: Introduction to Sociology (4.0 cr.; A-F Grade Basis; 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 1904 Freshman Seminar (3.0 cr.; A-F Grade Basis; prereq Fr or less than 30 cr)

Freshman seminar that meets CLE designation.

SOC 1905 Freshman Seminar (3.0 cr.; A-F Grade Basis; prereq Fr)

Topics specified in Class Schedule.

SOC 3003 Social Problems (3.0 cr.; A-F or Audit; 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 3090 Topics in Sociology (3.0 cr.; Student Option; prereq Soph or above or #; 1001 recommended; soc majors must register A-F; cr will not be granted if cr has been received for the same topics title)

Topics specified in Class Schedule.

SOC 3093 Directed Study (1.0-4.0 cr.; Student Option; prereq 1001, #, %; soc majors/minors must register A-F)

Guided individual reading or study at sophomore level.

SOC 3094 Directed Research (1.0-4.0 cr.; Student Option; prereq 1001, #; soc majors/minors must register A-F)

Guided research experience at sophomore level.

SOC 3101 Introduction to the American Criminal Justice System (3.0 cr.; A-F or Audit; prereq Soc majors/minors must register A-F)

Components, dynamics, and philosophical underpinnings of criminal justice and agencies (law enforcement, courts, corrections).

SOC 3102 Introduction to Criminal Behavior and Social Control (3.0 cr.; Student Option; prereq Soc majors/minors must register A-F)

Issues in science of crime as a social phenomenon. Creation/use of laws, patterns/causes of crime.

SOC 3201 Inequality: Introduction to Stratification (3.0 cr.; Student Option; prereq 1001 recommended; soc majors/minors must register A-F)


SOC 3211W American Race Relations (3.0 cr.; A-F or Audit; prereq Soc majors/minors must register A-F)


SOC 3221 Sociology of Gender (3.0 cr.; A-F or Audit; prereq 1001 recommended; soc majors/minors must register A-F)

Organization, culture, and dynamics of gender relations as major features of social life. Gender/racial inequalities in workplace. Relationships between gender/race, Gender and culture. Sexuality, gendered politics, and women’s movement.

SOC 3251W Sociological Perspectives on Race, Class, and Gender (3.0 cr.; A-F or Audit; prereq Soc 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

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

**SOC 3301W Politics and Society (3.0 cr.; A-F or Audit; prereq 1001 recommended; soc majors/minors must register A-F)**

Ideas of citizenship. Relationship between politics and society. Public sphere, civil society. Research practicum volunteering at policy-relevant site using participant observation methods.

**SOC 3322W Social Movements, Protests, and Change (3.0 cr.; Student Option; prereq 1001 or #; soc majors/minors must register A-F)**


**SOC 3411W Organizations and Society (3.0 cr.; A-F or Audit; 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 Consume This! The Sociology of Politics and Consumption (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit; prereq 1001 recommended; soc majors/minors must register A-F)**


**SOC 3451W Cities and Social Change (3.0 cr.; Student Option; prereq Soc majors/minors must register A-F)**


**SOC 3452 Education and Society (3.0 cr.; Student Option; prereq Soc majors/minors must register A-F)**


**SOC 3501 Sociology of Families (3.0 cr.; Student Option; 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 3505 Transnational Migration (3.0 cr.; A-F Grade Basis; prereq Soc majors/minors must register A-F)**

Current debates on transnationalism at this age of globalization.

**SOC 3511 World Population Problems (3.0 cr.; Student Option; 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 (3.0 cr.; A-F Grade Basis; 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 3651 Gender and the Family in the Islamic World (3.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F or Audit; 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 3721 Principles of Social Psychology (3.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq 1001 recommended; soc majors/minors 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 (4.0 cr.; Student Option; prereq intermediate algebra recommended)**

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 (3.0 cr.; Student Option; prereq Soph or above or #; 1001 recommended; soc majors/minors must register A-F; cr will not be granted if cr has been received for the same topics title)**

Topics specified in Class Schedule.

**SOC 4090W Topics in Sociology (3.0 cr.; Student Option; prereq Soc majors and minors must register A-F; credit not granted if credit has been received for the same topics title)**

Topics specified in Class Schedule.

**SOC 4093 Directed Study (1.0-4.0 cr.; Student Option; prereq #, @; soc majors/minors must register A-F)**

Guided individual reading or study at junior or senior level.

**SOC 4094W Directed Research: Senior Project (4.0 cr.; A-F or Audit; prereq Soc majors/minors must register A-F)**

Guided research experience at junior/senior level.

**SOC 4101W Sociology of Law (3.0 cr.; A-F or Audit; prereq [1001, 3101, 3102] or [3111, 3701] recommended; soc majors/minors must register A-F)**


**SOC 4102 Criminology (3.0 cr.; A-F or Audit; prereq 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)**


**SOC 4104 Crime and Human Rights (3.0 cr.; Student Option; prereq 1001, at least one Sxxx SOC or GLOS course recommended; soc majors/minors must register A-F)**

Serious violations of humanitarian and human rights law; criminalization. Impact of interventions on memories/future of cycles of violence. Case studies on the Holocaust, Balkan wars, Darfur, My Lai massacre, etc. Criminal justice, truth commissions, vetting, compensation programs.

**SOC 4105 Sociology of Punishment and Corrections (3.0 cr.; A-F or Audit; prereq 3101 or 3102 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.

**SOC 4108 Current Issues in Crime Control (3.0 cr.; Student Option; prereq Soc majors/minors must register A-F)**

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 (3.0 cr.; Student Option; prereq 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)**

SOC 4111 Deviant Behavior (3.0 cr.; A-F or Audit; prereq 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Definition/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 (3.0 cr.; Student Option; prereq 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Historical/current explanations for female criminality. Current trends in women's participation in crime, their treatment in the legal system.

SOC 4125 Policing American Society (3.0 cr.; A-F or Audit; prereq 3101 or 3102 or 3111 or #; [4161, 4162] recommended; soc majors/minors must register A-F)
Police organizations/operations from social science perspective. Formal/informal policing: role/functions, legal bases, accountability/ restraints, community relations, use of force, illegal practices.

SOC 4135 Sociology of White-Collar Crime (3.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)

SOC 4142 Juvenile Law (3.0 cr.; Student Option; prereq [3101 or 3102 or 3111 or #], or sr or grad student; soc majors/minors must register A-F)
Evolution of juvenile court. Organizational relationships among 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 4149 Killing (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3101 or 3102 or 3111 or #; soc majors/minors must register A-F)
Causes 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 (3.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq 1001 or 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 (3.0 cr.; Student Option; prereq 1001 or 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 4180 Topics in Sociology With Law, Criminology, and Deviance Emphasis (3.0 cr.; Student Option; prereq [1001, 3101 or 3102] recommended; soc majors/minors must register A-F)
Not cr will be granted if cr has been received for the same topics title
Topics specified in Class Schedule.

SOC 4246 Sociology of Health and Illness (3.0 cr.; A-F or Audit; prereq One sociology course or #; soc majors/minors must register A-F)

SOC 4305 Society and the Environment: A Growing Conflict (3.0 cr.; A-F or Audit; prereq 1001 or environmental course recommended; soc majors/minors must register A-F)
Societal causes/cures of ecological problems such as global warming, species extinction, and resource exhaustion.

SOC 4309 Prophets, Pundits, and Priests: Public Religion in the United States Today (3.0 cr.; Student Option; prereq 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 individuals. Views on issues such as race, poverty, the family, and sexuality.

SOC 4311 Race, Class, and the Politics of Nature (3.0 cr.; A-F Grade Basis)
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 (3.0 cr.; A-F or Audit; prereq Soc majors/minors must register A-F)

SOC 4411 Terrorist Networks and Counterterror Organizations (3.0 cr.; A-F Grade Basis; 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 4451 Sport and Society (3.0 cr.; Student Option; 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 Ethnic and Racial Conflict (3.0 cr.; Student Option; prereq 1001 recommended; soc majors/minors must register A-F)

SOC 4511 Sociology of Youth: The Transition to Adulthood (3.0 cr.; Student Option; prereq 1001 or #; soc majors/minors must register A-F)

SOC 4521 Love, Sex, and Marriage (3.0 cr.; Student Option; prereq 1001 or #; soc majors/minors must register A-F)

SOC 4551 Sociology of Sexualities (3.0 cr.; Student Option; prereq Soc majors 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 4703 Contemporary American Culture (3.0 cr.; Student Option; prereq 1001 or #; soc majors/minors must register A-F)
Key changes in cultural life in the United States and internationally. Theories that have been developed to understand them. Topics may include work, family, social movements, media and popular culture, and politics.

SOC 4966W Major-Project Seminar (4.0 cr.; A-F or Audit; prereq 1001, 3701, 3801, 3811, 12 cr upper div sociology; %)

SOC 4967W Advanced Senior Project Independent Study (1.0 cr.; A-F or Audit; prereq 3701, 3801, 3811, 12 additional upper div sociology cr; %)
Guided individual research for the sociology major's senior project requirement, conducted
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.

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<tbody>
<tr>
<td>SENG 5131</td>
<td>Distributed Application Design and Development</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SENG 5199</td>
<td>Topics in Software Engineering</td>
<td>2.0-3.0 cr.</td>
<td>A-F or Audit; prereq SEng grad student</td>
</tr>
<tr>
<td>SENG 5199</td>
<td>Artificial Intelligence</td>
<td>2.0-3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SENG 5511</td>
<td>Graphical User Interface Design</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SENG 5512</td>
<td>Graphical User Interface Toolkits</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq [4977V or #], 3701, 3801, 3811, at least 9 additional upper div soc cr, sr soc honors major, %</td>
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<tr>
<td>SENG 5551</td>
<td>Introduction to Intelligent Robotic Systems</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
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<tr>
<td>SENG 5570</td>
<td>The Principles of Database Systems</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SENG 5600</td>
<td>Software Engineering I</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SENG 5601</td>
<td>Software Engineering II: Software Design</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SENG 5602</td>
<td>Software Engineering II: Software Engineering</td>
<td>3.0 cr.</td>
<td>A-F or Audit; prereq Grad SEng major</td>
</tr>
<tr>
<td>SOIL 3416</td>
<td>Plant Nutrients in the Environment</td>
<td>4.0 cr.</td>
<td>A-F or Audit; prereq SOIL 1125 or equiv</td>
</tr>
<tr>
<td>SOIL 3417</td>
<td>Plant Nutrition</td>
<td>4.0 cr.</td>
<td>A-F or Audit; prereq SOIL 1125 or equiv</td>
</tr>
<tr>
<td>SOIL 1125</td>
<td>The Soil Resource</td>
<td>4.0 cr.</td>
<td>Student Option</td>
</tr>
<tr>
<td>SOIL 2125</td>
<td>Basic Soil Science</td>
<td>4.0 cr.</td>
<td>A-F or Audit; prereq [CHEM 1015, CHEM 1017] or CHEM 1021 or equiv</td>
</tr>
</tbody>
</table>

Courses in conjunction with enrollment in an upper division sociology course.

SOC 4977V Senior Honors Proseminar I (3.0 cr.; A-F or Audit; prereq 3701, 3801, 3811, 9 additional upper div sociology cr, sr soc honors major, %)


SOC 4978V Senior Honors Proseminar II (3.0 cr.; A-F or Audit; prereq [4977V or #], 3701, 3801, 3811, at least 9 additional upper div soc cr, sr soc honors major, %)

Developing the methodology of senior project, researching it, and writing the thesis. Students work individually or in small groups in consultation with seminar director and other faculty. Group discussion of individual projects.

SOC 5090 Topics in Sociology (1.0-3.0 cr.; Student Option; prereq Undergrad soc majors/minors must register A-F)

Topics specified in Class Schedule.

SOC 5455 Sociology of Education (3.0 cr.; Student Option; prereq 1001 or equiv or #; soc majors/minors must register A-F)

Structures/processes within educational institutions. Links between educational organizations and their social contexts, particularly as these relate to educational change.

SOC 5811 Intermediate Social Statistics (4.0 cr.; Student Option; prereq 3811 or equiv; primarily for 1st-yr soc grad students; soc majors/minors must register A-F)

Measurement, theory of probability, and bivariate statistics. Multiple regression analyses of sociological data.

Software Engineering (SENG)
Institute of Technology

SENG 5115 Graphical User Interface Design, Evaluation, and Implementation (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Design and implementation of interactive application interfaces, user- and task-centered approaches to design, guidelines for graphical design, interface evaluation techniques, current interface trends, including web interfaces and information visualization. Group projects that include designing, prototyping, and implementing an application interface.

SENG 5116 Graphical User Interface Toolkits (2.0-3.0 cr.; A-F or Audit; prereq Grad SEng major)

Toolkit-centered introduction to GUI implementation technology. Students learn to use a GUI toolkit to implement a graphical application. Introduction to advanced techniques, including constraint-based data management, 3D visualization tools, and toolkit structure and design.

SENG 5131 Distributed Application Design and Development (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Java programming, concurrent programming, workflow, distributed database, security, collaborative computing, object-oriented architecture/design, network publishing, messaging architecture, distributed object computing, and intranet.

SENG 5199 Topics in Software Engineering (2.0-3.0 cr.; A-F or Audit; prereq SEng grad student)

Topics specified in Class Schedule.

SENG 5511 Artificial Intelligence (2.0-3.0 cr.; A-F or Audit; prereq Grad SEng major)


SENG 5551 Introduction to Intelligent Robotic Systems (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Transformations, kinematics and inverse kinematics, dynamics, and control. Sensing (robot vision, force control, tactile sensing), applications of sensor-based robot control, robot programming, mobile robotics, and micro-robotics.

SENG 5570 The Principles of Database Systems (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Fundamental concepts; representing instances; prototypic model shapes; model evolution; interviewing user skills, reverse engineering; mapping to DBMS schema; database querying.

SENG 5708 Data Analytics (2.0-3.0 cr.; A-F or Audit; prereq Grad SEng major)


SENG 5801 Software Engineering I: Overview, Requirements, and Modeling (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Software engineering as a discipline. Preview of topics to be covered in subsequent courses in master of science in software engineering program; in-depth study of requirements engineering; modeling techniques applicable to requirements and specification, including UML and formal modeling.

SENG 5802 Software Engineering II: Software Design (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Software design quality, processes that produce quality design, graphical and textual representations, including UML, common problems and patterns that solve them, refactoring. Students develop fluency in object-oriented design, and ability to read, critique, and advocate design ideas. Students work in teams to complete a multiphase project.

SENG 5811 Software Testing and Verification (2.0 cr.; A-F or Audit; prereq 5801, grad SEng major)

Theoretical/practical aspects of testing software. Analyzing a requirements document for test conditions. Writing a test plan. Designing, creating, and executing test cases. Recording defects. Writing a test report.

SENG 5831 Software Development for Real-Time Systems (2.0-3.0 cr.; A-F or Audit; prereq Grad SEng major)

Analysis, design, verification, and validation of real-time systems. Periodic, aprioradic, and sporadic processes, scheduling theory. Pragmatic issues.

SENG 5841 Model-based Development (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Formal specification of software artifacts. Applicability of formal specifications. Methods such as Z, SCR, and Satecharts. Formal analysis. Theorem proving. Reachability analysis. Model checking. Tools such as PVS, Statemate, SPIN, and SMV.

SENG 5851 Software Project Management (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Concepts used to manage software projects. Project management cycle: initiation, planning/controlling, status reporting, review, post-project analysis. Leadership and motivation strategies. Lecture, discussion, individual/team presentations/projects.

SENG 5852 Quality Assurance and Process Improvement (3.0 cr.; A-F or Audit; prereq Grad SEng major)

Theory and application of capability maturity model: process assessment, modeling, and improvement techniques. Life cycle issues related to development and maintenance; quality, safety, and security assurance; project management; and automated support environments. Group projects and case studies.

SENG 5861 Introduction to Software Architecture (3.0 cr.; A-F or Audit; prereq 2nd year, MSSE grad student)

Software/systems architecture. Representation/design, how they fit into software engineering process. Description of architectures, including representation and quality attributes.

SENG 5899 Software Engineering Seminar (1.0 cr.; Student Option; prereq Grad SEng major, #)

Software engineering trends. Talks by invited speakers, selected readings.

SENG 5900 Directed Study (1.0-3.0 cr.; Student Option)

Directed study/research in software engineering. Topics/scope decided in collaboration with instructor.

Soil, Water, and Climate (SOIL)
College of Food, Agricultural and Natural Resource Sciences

SOIL 1125 The Soil Resource (4.0 cr.; Student Option)

Basic physical, chemical, and biological properties of soil. Soil genesis classification and principles of soil fertility. Soil survey information (WEB Soil Survey) used to make a land-use plan. WWW used for lab.

SOIL 2125 Basic Soil Science (4.0 cr.; A-F or Audit; prereq [CHEM 1015, CHEM 1017] or CHEM 1021 or equiv)

Basic physical, chemical, and biological properties of soil. Soil genesis classification, principles of soil fertility. Use of soil survey information to make a land-use plan. WWW used for lab preparation information.

SOIL 3416 Plant Nutrients in the Environment (3.0 cr.; Student Option; prereq 2125)

Fundamental concepts in soil fertility and plant nutrition. Discuss dynamics of mineral elements in soil, plants, and the environment.
SOIL 3225 Vadose Zone Hydrology (3.0 cr.; Student Option; prereq [Math 1271 or equiv], [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 5480 Special Topics in Land and Atmospheric Science (1.0-4.0 cr.; Student Option; prereq 4511 or equiv.)

Lectures by visiting scholar or regular staff member. Topics specified in Class Schedule.

SOIL 5555 Wetland Soils (3.0 cr.; A-F or Audit; 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 in wetland delineations. Peatlands, Wetland benefits, preservation, regulation, mitigation. Field trips, lab, field hydric soil delineation project.

SOIL 5611 Soil Biology and Fertility (3.0 cr.; Student Option; prereq 2125, Biol 1009 or equiv, Chem 1021 or equiv, sr or grad, BioC 3xxx, MicB 3xxx recommended)


Spanish (SPAN)

College of Liberal Arts

SPAN 144 Intermediate Medical Spanish (0.0 cr.; S-N or Audit; 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 (0.0 cr.; S-N or Audit)

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 (0.0 cr.; S-N or Audit; 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 Intermed Med Span 0144, a course designed to help care professionals communicate with patients who speak Spanish.

SPAN 1001 Beginning Spanish (5.0 cr.; Student Option; 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 (5.0 cr.; Student Option; prereq 1001 completed at UMNTC, %)

Listening, speaking, reading, writing. Emphasizes development of communicative competence. Cultural readings.

SPAN 1003 Intermediate Spanish (5.0 cr.; Student Option; prereq [1002 or 1022] or EPT placement)


SPAN 1004 Intermediate Spanish (5.0 cr.; Student Option; prereq 1003 or EPT placement)


SPAN 1014 Business Spanish (5.0 cr.; Student Option; prereq 1003)

Vocabulary, report writing skills. Proper format for business communications. Conversational fluency on trade-related topics.

SPAN 1022 Alternate Second-Semester Spanish (5.0 cr.; Student Option; prereq Placement above 1001)

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 1044 Intermediate Medical Spanish (5.0 cr.; Student Option; prereq 1003 or equiv)

Language needed by health-care workers who interact with Spanish-speaking patients. Basic medical vocabulary, questions/answers.
in common medical situations. Vocabulary/ phrases to conduct patient interviews and physical exams. Readings on Latin American view of health and health care.

**SPAN 1902 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr with no more than 30 cr)**
Topics specified in Class Schedule.

**SPAN 1904 Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr with no more than 30 cr)**
Topics specified in Class Schedule.

**SPAN 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr with no more than 29 cr)**
Topics specified in Class Schedule.

**SPAN 1907W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr with no more than 29 cr)**
Topics specified in Class Schedule.

**SPAN 1910W Freshman Seminar (3.0 cr.; Student Option; prereq Fr)**
Topics specified in Class Schedule.

**SPAN 3011 Spanish Communication Skills (4.0 cr.; Student Option; prereq [1004 or 1014 or 1044], LPE pass)**

**SPAN 3015 Spanish Composition and Communication (4.0 cr.; Student Option; prereq 1004 or 1014 or 1044, LPE pass)**
Comprehending written/spoken texts. Speaking, reading, writing beyond intermediate level.

**SPAN 3015H Spanish Composition and Communication (4.0 cr.; A-F or Audit; prereq [1004 or 1014 or 1044], LPE pass) Honors student**
Comprehension of written/spoken text. Speaking/reading/ writing.

**SPAN 3023 Advanced Business Spanish (4.0 cr.; Student Option; prereq 3015)**
Major issues of culture in relation to business in context of Spanish-speaking world. Important historical-social factors that contribute to understanding of economy/business relationships with industrialized nations.

**SPAN 3044 Advanced Medical Spanish (4.0 cr.; Student Option; prereq [1004 or 1014 or 1044] equiv, Span LPE or #)**

**SPAN 3104W Introduction to the Study of Hispanic Literatures (3.0 cr.; A-F Grade Basis; prereq 3015, Spanish major or minor)**
Structures, meaning, and social/historical function of diverse literary texts.

**SPAN 3105W Introduction to the Study of Hispanic Cultures (3.0 cr.; Student Option; prereq 3015, Spanish major or minor)**
Cultural issues pertaining to Spain or Spanish America.

**SPAN 3107W Introduction to the Study of Hispanic Linguistics (3.0 cr.; Student Option; prereq 3015, Spanish major or minor)**

**SPAN 3211 Discourses of Imperial Spain, 1492-1800 (3.0 cr.; Student Option; prereq 3015, [3104W or TLDO 3104 or VENZ 3104 or #])**
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 (3.0 cr.; Student Option; prereq 3015, [3104W or TLDO 3104 or VENZ 3104 or #])**
Wide variety of texts. Questions of gender, class, subjectivity, representation, art, and politics.

**SPAN 3221 Latin American Colonial Discourses: Empire and Early Modernity (3.0 cr.; Student Option; prereq 3015, [3104W or TLDO 3104 or VENZ 3104 or #])**
Conquest, colonization, and forms of resistance in Latin America.

**SPAN 3222 Discourses of Modern and Contemporary Latin America (3.0 cr.; Student Option; prereq 3015, [3104W or TLDO 3104 or VENZ 3104 or #])**
Late modern and contemporary discourses in literature, popular culture, mass media, and film.

**SPAN 3401 Latino Immigration and Community Service (3.0 cr.; A-F Grade Basis; prereq 3015)**

**SPAN 3404 Medical Spanish and Community Health Service (3.0 cr.; Student Option; prereq 3015 with grade of at least B- or [1044, 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 (3.0 cr.; Student Option; prereq 3015, [3105W or TLDO 3105 or VENZ 3105 or #])**
Historical/cultural events leading to nation building in early modern Spain and Spanish speaking America.

**SPAN 3502 Modern Spain (3.0 cr.; Student Option; prereq 3015, [3105W or TLDO 3105 or VENZ 3105 or #])**
Spanish culture, from beginning of 19th century to present. Cultural change and its conflicts as represented in Spanish art, literature, film, and diverse political developments.

**SPAN 3503 Pre-modern Spanish Culture and Literature (3.0 cr.; Student Option; prereq 3105W)**
Notions of nation, empire, and race precipitated by presence of Muslims, Jews, and Christians in Iberia in 12th/13th centuries. Toledo as center of translation, technology, innovation, design, and philosophical inquiry for all of Europe. How Iberian literary works differed from those produced in the rest of Western Europe. Readings from Saint Isidore, Ibn Hazm, Averroes (Ibn Rusht), and Maimonides.

**SPAN 3510 Issues in Hispanic Cultures (3.0 cr.; A-F or Audit; prereq 3015, [3105W or TLDO 3105 or VENZ 3105 or #])**
Analysis of practices that have shaped cultural identity of Spanish or Portuguese-speaking areas. Topics vary.

**SPAN 3512 Modern Latin America (3.0 cr.; A-F or Audit; prereq 3015, [3105W or TLDO 3105 or VENZ 3152 or #])**
Impact of various forms of modernization on cultural production in Latin American racial, ethnic, class relations, institutional, and ideological structures.

**SPAN 3603 Jews and Muslims in Medieval Iberia (3.0 cr.; Student Option)**

**SPAN 3606 Human Rights Issues in the Americas (3.0 cr.; Student Option)**

**SPAN 3612 Don Quijote and the Novel (3.0 cr.; Student Option)**
How Cervantes' text enters in dialogue with prevalent novelistic and social discourses of Spain's Renaissance and Baroque periods (sixteenth/seventeenth century). How novel has managed to interest succeeding generations of readers. Taught in English.

**SPAN 3653 Contemporary Latin and Latin American Drama Written in English (3.0 cr.; Student Option; 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 (1.0-5.0 cr.; Student Option; prereq Two yrs college-level Spanish, %)**
Study of advanced Spanish language in a Spanish-speaking country.

**SPAN 3701 Structure of Spanish: Phonology and Phonetics (3.0 cr.; Student Option; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])**
SPAN 3702 Structure of Spanish: Morphology and Syntax (3.0 cr.; Student Option; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])
Using linguistic concepts such as morpheme, flexional affix, noun phrase, subject, subordination, and coordination to identify different morphological/syntactic components of Spanish.

SPAN 3703 Origins and History of Spanish and Portuguese (3.0 cr.; Student Option; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])
Development of Spanish from its Latin roots. Phonetic, morphological, syntactic, and sociolinguistic aspects of language variations over time.

SPAN 3704 Sociolinguistics of the Spanish-Speaking World (3.0 cr.; Student Option; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])
Spanish dialects. Spanish in contact with other languages. Bilingualism, language attitudes. Pragmatic analysis of Spanish. Impact of recent cultural, political, and socioeconomic transformations on language.

SPAN 3705 Semantics and Pragmatics of Spanish (3.0 cr.; Student Option; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])
Introduction to systematic analysis of meaning. Focuses on importance that cultural/linguistic contexts have for interpretation of meaning.

SPAN 3706 Spanish Applied Linguistics (3.0 cr.; Student Option; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])
Introduction to second language acquisition processes as they relate to fundamental analysis of linguistic concepts of Spanish. Features that present difficulties for English speakers. Sociolinguistic aspects of language learning. Application to Spanish language teaching.

SPAN 3707 Linguistic Accuracy Through Translation (3.0 cr.; A-F Grade Basis; prereq 3015, [3104W or 3105W or 3107W or TLDO 3104 or TLDO 3105 or TLDO 3107 or VENZ 3104 or VENZ 3107 or VENZ 3512 or #])
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 (3.0 cr.; A-F Grade Basis; prereq 3015, [3107W or TLDO 3107 or VENZ 3107 or #])
Topics specified in Class Schedule.

SPAN 3800 Film Studies in Spanish (3.0 cr.; A-F Grade Basis; prereq 3015, [3104W or 3105W or TLDO 3104 or TLDO 3105 or VENZ 3104 or VENZ 3512 or #])
Films from Spain or Spanish-speaking world in their historical, (geo)political, and socioeconomic contexts. Films analyzed under interdisciplinary frameworks, noting aspects related to cinematography/rhetoric.

SPAN 3910 Topics in Spanish Peninsular Literature (3.0 cr.; A-F or Audit; prereq 3015, [3104W or TLDO 3104 or VENZ 3104 or #])
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 (3.0 cr.; A-F Grade Basis; prereq 3015, [3104W or TLDO 3104 or VENZ 3104 or #])
Focuses on a central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in Class Schedule.

SPAN 3970 Directed Studies (1.0-4.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; prereq 31 cr of 3xx, #)
Completion of a research paper on cultural, literary, or artistic issue in Spanish or Portuguese speaking worlds or on topic related to Hispanic linguistics. In-depth research/consultation with instructor.

SPAN 4001 Beginning Spanish (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1001. See 1001 for course description.

SPAN 4002 Beginning Spanish (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1002. See 1002 for course description.

SPAN 4003 Intermediate Spanish (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1003. See 1003 for course description.

SPAN 4004 Intermediate Spanish (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1004. See 1004 for course description.

SPAN 4022 Alternate Second-Semester Spanish (2.0 cr.; Student Option; prereq Grad student)
Meets concurrently with 1002. See 1002 for course description.

SPAN 5106 Medieval Iberian Literatures and Cultures (3.0 cr.; Student Option; prereq Grad student or #)
The major literary genres developed in Spain from the Reconquest to 1502, with reference to the crucial transformations of the Middle Ages, including primitive lyric, epic, clerical narrative, storytelling, debates, collections, chronicles, “exempla,” and the Celestina (1499-1502).

SPAN 5107 The Literature of the Spanish Empire and its Decline (3.0 cr.; Student Option; prereq Grad student or #)
Major Renaissance and Baroque works of the Spanish Golden Age (16th- and 17th-century poetry, nonfiction 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 (3.0 cr.; Student Option; prereq Grad student or #)
Analysis of Cervantes’ [Don Quixote] in its sociohistorical context; focus on the novel’s reception from the romantic period to postmodern times.

SPAN 5109 The Crisis of the Old Regime: Spanish Literature of the Enlightenment and Romanticism (3.0 cr.; Student Option; prereq Grad student or #)
Major literary works and intellectual movements and conflicts represented in written culture, of the 18th and early 19th centuries (1680-1845), examined as expressions of the long crisis of Spain’s Old Regime and the rise of bourgeois liberalism.

SPAN 5110 Discursive Formations at the Threshold of 20th-Century Spain (3.0 cr.; Student Option; prereq Grad student 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 (3.0 cr.; Student Option; prereq Grad student or #)

SPAN 5221 Spanish Drama of the 17th-Century (3.0 cr.; Student Option; prereq Grad student or #)
Polemics surrounding public theater in 1600s. Analyses of texts in light of current approaches to comedy and related theatrical genres (e.g., autosacramentales).

SPAN 5316 Spanish Picaresque Narratives (3.0 cr.; Student Option; prereq Grad student or #)

SPAN 5525 Caribbean Literature: An Integral Approach (3.0 cr.; Student Option; prereq Grad student or #)
Literature of Spanish-speaking Caribbean. Emphasizes historical legacy of slavery, African culture, and independence struggles.

SPAN 5526 Colonial Discourse in Spanish American Writing (3.0 cr.; Student Option; prereq Grad student or #)
Discourse production in Spanish America between 1492 and 1700. Conquest and colonial writing/counterwriting. Historical origin, evolution, and impact of cultural, political, and socioeconomic factors.

SPAN 5527 Nineteenth Century Latin America: Enlightened Thought, Nation Building, Literacy, Cultural Discourse (3.0 cr.; Student Option; prereq Grad student or #)

SPAN 5528 Latin American Cultural Integration in the Neocolonial Order (3.0 cr.; Student Option; prereq Grad student or #)
Modernismo, historical vanguard, impact of populist politics in patterns of culture/literature. 1900-50.
SPAN 5529 The Impact of Globalization in Latin American Discourses (3.0 cr.; Student Option; prereq Grad student or #) Second half of 20th century: critical culture. Neo-indigenism, the new novel, poetry/antipoetry, theater/drama. Pragmatic search for a past and identity. Globalization, its impact in literature.

SPAN 5531 Hispanic Literature of the United States (3.0 cr.; Student Option; prereq Grad student 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 5701 History of Ibero-Romance (3.0 cr.; Student Option; prereq Grad student or #) Origins and developments of Ibero-Romance languages; evolution of Spanish, Portuguese, and Catalan.

SPAN 5711 The Structure of Modern Spanish: Phonology (3.0 cr.; Student Option; prereq Grad student or #) Formulating and evaluating a phonological description of Spanish. Approaches to problems in Spanish phonology within metrical, autosegmental, and lexical phonological theories.

SPAN 5713 The Structure of Modern Spanish: Syntax (3.0 cr.; Student Option; prereq Grad student or #) Study and analysis of the principal constructions found in the syntax of Spanish.

SPAN 5714 Theoretical Foundations of Spanish Syntax (3.0 cr.; Student Option; prereq Grad student or #) Linguistic types/processes that appear across languages. Grammatical relations, word order, transitivity, subordination, information structure, grammaticalization. How these are present in syntax of Spanish.

SPAN 5717 Spanish Sociolinguistics (3.0 cr.; Student Option; prereq Grad student 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 (3.0 cr.; Student Option; prereq Grad student or #) Analysis of different types/results of Spanish language contact globally, taking into account varying social conditions under which contact occurs.

SPAN 5721 Spanish Laboratory Phonology (3.0 cr.; A-F or Audit; prereq Grad student or #) Core laboratory on Spanish laboratory phonology. Phonology from a laboratory perspective. Students evaluate laboratory research methodologies, perform basic acoustic analyses, and design laboratory phonology studies.

SPAN 5910 Topics in Spanish Peninsular Studies (3.0 cr.; Student Option; prereq Grad student or #) Crucial moment or characters, works, or events marking beginning of new phase in literary/cultural landscape.

SPAN 5920 Topics in Spanish-American Studies (3.0 cr.; Student Option; prereq Grad student or #) Spanish-American literature analyzed according to important groups, movements, trends, methods, and genres. Specific approaches depend on topic and instructor. Topics specified in Class Schedule.

SPAN 5930 Topics in Ibero-Romance Linguistics (3.0 cr.; Student Option; prereq Grad student or #) Problems in Hispanic linguistics; a variety of approaches and methods.

SPAN 5970 Directed Readings (1.0-4.0 cr.; Student Option; prereq Grad student or #) Students must submit reading plans for particular topics, figures, periods, or issues. Readings in Spanish and/or Spanish-American subjects.

SPAN 5985 Sociolinguistic Perspectives on Spanish in the United States (3.0 cr.; Student Option; prereq Grad student 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 5990 Directed Research (1.0-4.0 cr.; Student Option; prereq Grad student or #) Directed research.

SPAN 5991 The Acquisition of Spanish as a First and Second Language (3.0 cr.; Student Option; prereq Grad student 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) College of Liberal Arts

SPPT 3256 Latin American Cultural Discourse (3.0 cr.; Student Option; prereq SPAN 3015) Cultural assumptions in current modes of interpreting Latin American reality. Representative texts are analyzed.

SPPT 5930 Selected Topics in Hispanic and Lusophone Cultural Discourse (1.0-3.0 cr.; A-F or Audit; prereq Reading knowledge of Spanish and Portuguese-speaking areas. Historical intersections/divergences. Taught in Spanish or Portuguese, and in English when cross-listed. Topics specified in Class Schedule.

SLHS 1301V Physics & Bio Honors (4.0 cr.; A-F or Audit) Physics/biology of spoken language, from talker’s production of sounds/words, to transmission of sound, to listener’s perception of what was said. Computer analysis/synthesis of speech.

SLHS 1301W The Physics and Biology of Spoken Language (4.0 cr.; Student Option) Physics and biology of spoken language, from the talker’s production of sounds and words, to the transmission of sound, to the listener’s perception of what was said. Computer analysis and synthesis of speech.

SLHS 1302 Rate Your World: Quantifying Judgments of Human Behavior (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) 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 (3.0 cr.; A-F or Audit; prereq freshman) Topics vary. See class schedule.

SLHS 1905 Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr) Freshman seminar.

SLHS 3301 Introduction to Acoustics (3.0 cr.; Student Option) 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
SLHS 3302 Anatomy and Physiology of the Speech and Hearing Mechanisms (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Survey of typical language development, major theoretical perspectives about development, and applications of current theory to analysis of children's language.


SLHS 3305W Speech Science (3.0 cr.; Student Option) Survey of theories, methods, and research in speech science. Speech acoustics, speech perception, speech production.


SLHS 3401 Communication Differences and Disorders (3.0 cr.; Student Option) 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-Language-Hearing Sciences (3.0 cr.; A-F Grade Basis; prereq SLHS major, Jr or Sr, honors) Seminar for completion of undergraduate major project.

SLHS 3402W Major Project in Speech and Hearing Science (3.0 cr.; S-N or Audit; prereq Jr or Sr CDIS or SLHS major) Seminar for completion of undergraduate major project.

SLHS 3555H Honors Thesis (1.0-2.0 cr.; A-F or Audit; prereq See dir of undergrad 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 (1.0-3.0 cr.; Student Option) SLHS 3994 Directed Research (1.0-12.0 cr.; Student Option; prereq Undergrad doing research) tbd

SLHS 4301 Introduction to the Neuroscience of Human Communication (3.0 cr.; Student Option) Basic neuroanatomy and neurophysiology, especially as they relate to normal speech, language, and hearing processes.

SLHS 4402 Assessment and Treatment in Speech-Language Pathology (3.0 cr.; A-F or Audit; prereq [[1401 or 3401], 3302, 3303, 3304, [4301 or 4301]] 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 (3.0 cr.; Student Option) 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 (3.0 cr.; Student Option) Social/environmental variables on young children's propensity for problem behavior. Communication strategies that have been validated as a component in reducing problem behavior.


SLHS 4801 Hearing Measurement and Disorders (3.0 cr.; Student Option; prereq [3302, 3305W] or #) Introduction to theory, administration, and interpretation of behavioral/physiological hearing tests for all age groups. Immittance, pure tone, speech, otoacoustic emissions, evoked potential measures. Hearing-screening protocols.

SLHS 4802 Rehabilitative Audiology (3.0 cr.; Student Option; prereq [3306, 4801] or [CDIs 3305, 4801]) or #) Survey of sensory aids/methods used in rehabilitation across life span after diagnosis of hearing loss. Degree of hearing loss, developmental level, communication modalities, client/family choice, disability, cultural considerations.


SLHS 5401 Counseling and Professional Issues (3.0 cr.; Student Option; prereq [[& 8720 or & 8820], grad student]) Recommended Basic counseling principles and current professional issues in communication disorders. Application of counseling theory to clinical practice. Analysis of regulation, practice, and future direction of communication disorders.

SLHS 5501 Fluency and Phonological Disorders (3.0 cr.; Student Option; prereq Grad student or #) Description, nature, and treatment of fluency disorders in children/adults. Involvement in therapeutic/research activities.

SLHS 5502 Voice and Cleft Palate (3.0 cr.; Student Option; prereq [3305, 4301] or [CDIs 3305, 4301]) or #) Normal/disordered aspects of voice and resonance. Organic/functional voice disorders, laryngeotomy, cleft palate. Nature and clinical management of these disorders.

SLHS 5503 Dysphagia and Motor Speech Disorders (3.0 cr.; Student Option; prereq [3305, 4301] or [CDIs 3305, CDIs 4301]) or #) Nature/management of motor speech disorders in adults/children. Dysarthria, apraxia.

SLHS 5603 Language and Cognitive Disorders in Children (3.0 cr.; Student Option; prereq 3303 or CDIs 3303 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 (3.0 cr.; Student Option; 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 neurolinguistic and second language learning needed for clinical competency in speech-language pathology. Basic/applied issues across a broad range of culturally/linguistically diverse populations.

SLHS 5608 Clinical Issues in Bilingualism and Cultural Diversity (3.0 cr.; A-F Grade Basis; prereq 3303 or equiv or #) Topics in cultural diversity, bilingualism, and second language learning needed for clinical competency in speech-language pathology. Basic/applied issues across a broad range of culturally/linguistically diverse populations.

SLHS 5801 Audiologic Assessment I (3.0 cr.; Student Option; prereq 4801 or CDIs 4801 or# Basic audiometric battery, including pure tones, speech, masking, andimmittance in adults. Industrial audiometry, otoacoustic emissions.

SLHS 5802 Hearing Aids I (3.0 cr.; Student Option; prereq [3305, 4801] or [CDIs 3305, CDIs 4801]) SLHS grad or #) Survey of modern hearing aids including history of development, electroacoustic functions, clinic and laboratory measurement techniques, sound field acoustics, techniques for selection.

SLHS 5803 Hearing Loss in Children: Diagnosis (3.0 cr.; Student Option; prereq [[4801 or CDIs 4801], SLHS grad 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 (3.0 cr.; A-F or Audit; prereq [4802, 5801, 5802]) or CDIS 5802W or Audit; prereq [4802, 5801, 5802] or CDIS 5802 or Audit; prereq [4802, 5801, 5802] or CDIS 5802.
SLHS 5805 Advanced Rehabilitative Audiology (3.0 cr.; A-F Grade Basis; prereq [4802 or CDIS 4802, SLHS grad] or #)

SLHS 5806 Auditory Processing Disorders (2.0 cr.; A-F or Audit; prereq [4802 or CDIS 4802, SLHS grad] or #)
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 5807 Noise and Hearing Conservation (3.0 cr.; A-F or Audit; prereq [8801, 8802] or [CDIS 8801, CDIS 8802])

SLHS 5808 Hearing Disorders (3.0 cr.; A-F or Audit; prereq [8801, 8802] or [CDIS 8801, CDIS 8802], SLHS grad] or #)
Disorders of auditory system, including anatomical, physiological, perceptual, and audiological manifestations of pathologies affecting hearing.

SLHS 5810 Laboratory Module in Audiology (1.0-2.0 cr.; Student Option; prereq [4801 or CDIS 4801, SLHS grad] or #)
Intensive study of clinical methods in audiology. Supplements didactic courses in audiology curriculum. Laboratory study, individually or in small groups.

SLHS 5820 Clinical Research and Practice: Grand Rounds (1.0-6.0 cr.; S-N or Audit; prereq [(4801 or CDIS 4801 or equiv), SLHS grad] or #)
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 5830 Clinical Foundations in Audiology (1.0-8.0 cr.; S-N or Audit; prereq Grad SLHS major)
Clinical foundations in audiology for first year AuD graduate students.

SLHS 5900 Topic in Speech-Language-Hearing Sciences (1.0-4.0 cr.; Student Option; prereq SLHS grad student or #)
Topics listed in Speech-Language-Hearing Sciences office.

SLHS 5993 Directed Study (1.0-12.0 cr.; Student Option; prereq SLHS grad or #)
Directed readings and preparation of reports on selected topics.

Sport Management (SMGT)

SMGT 1701 Introduction to Sport Management (2.0 cr.; A-F or Audit)
Scope/motive of the study of sport from sociological, psychological, historical, economic, and scientific perspective. Issues in sport.

SMGT 1905 Freshman Seminar (1.0-3.0 cr.; Student Option No Audit; prereq Fr)
Interdisciplinary seminar. Topics specified in Class Schedule.

SMGT 3111 Sports Facility and Event Management (3.0 cr.; A-F or Audit; prereq SMGT major or #)
Aspects of managing sport facilities/events. Conceptualization of sports events. Event management planning process, budgeting, site selection, booking, ticketing, sponsorship.

SMGT 3143 Organization and Management of Sport (3.0 cr.; A-F or Audit; prereq SMGT major)
Principles, policies, and procedures in administration/management of sport programs at intercollegiate/intercollegiate levels.

SMGT 3421 Business of Sport (3.0 cr.; A-F or Audit; prereq SMGT or kin or rec major or #)

SMGT 3501 Sport in a Diverse Society (3.0 cr.; A-F Grade Basis; SMGT major)
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 (dis)abilities.

SMGT 3501H Sport in a Diverse Society: Honors (3.0 cr.; A-F Grade Basis; prereq Honors student)
Pervasive and significant relationships between social constructions of sport and physical activity to contemporary social institutions such as politics, religion, economics, education, and mass media. Social issues related to sport. How specific social categories (e.g., age, gender, race, social class) intersect to influence participation/experiences of individuals within sport/physical activity contexts.

SMGT 3601 Ethics and Values in Sport (2.0 cr.; A-F or Audit; prereq SMGT major)
Violence, demonstrative behavior, sportsmanship. Ethical issues in playing of sport and in management/governance of sport industry.

SMGT 3631 Sport Marketing (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; 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 3681 Senior Seminar in Sport Management (3.0 cr.; A-F or Audit; prereq SMGT major, completion of major coursework, #)
Presentations/discussions on sport-related topics of interest.

SMGT 3693 Directed Study in Sport Management (1.0-3.0 cr.; A-F Grade Basis; prereq Undergrad, #)
Students work with faculty and grad students on research, scholarly, or creative activities. Students assist with faculty scholarship or carry out projects under faculty supervision.

SMGT 3796 Practicum: The Sport Experience (2.0-8.0 cr.; S-N Grading Basis; prereq 3881, SMGT major, #)
Practical experience in one or more sport settings.

Statistics (STAT)

College of Liberal Arts

STAT 1001 Introduction to the Ideas of Statistics (4.0 cr.; Student Option; prereq Mathematics requirement for admission to University)
Graphical/numerical presentations of data. Judging the usefulness/reliability of results/inferences from surveys and other studies to interesting populations. Coping with randomness/variation in an uncertain world.

STAT 1905 Freshman Seminar (3.0 cr.; A-F or Audit)
Topics specified in Class Schedule.

STAT 3011 Introduction to Statistical Analysis (4.0 cr.; Student Option)

STAT 3021 Introduction to Probability and Statistics (3.0 cr.; Student Option; prereq Math 1272)
Elementary probability, probability distributions. Sampling, elements of statistical inference. Regression.

STAT 3022 Data Analysis (4.0 cr.; Student Option; 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 5102 Theory of Statistics II (4.0 cr.; Student Option; prereq 4101)

STAT 4893W Senior Project (3.0 cr.; A-F Grade Basis; prereq Senior Stat major (BA or BS))

STAT 4931 Topics in Statistics (3.0 cr.; Student Option)
Topics vary according to student needs and available staff.

STAT 4932 Topics in Statistics (3.0 cr.; Student Option; prereq #)
Topics vary according to student needs and available staff.

STAT 5021 Statistical Analysis (4.0 cr.; Student Option; 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 (4.0 cr.; Student Option; prereq [3021 or 3022 or 4102 or 5021 or 5102 or 8102], Math 1272)

STAT 5041 Bayesian Decision Making (3.0 cr.; Student Option; prereq 4101 or 5021 or 5101 or #)

STAT 5101 Theory of Statistics I (4.0 cr.; Student Option; prereq MATH 2263 or MATH 2374)
Logical development of probability, basic issues in statistics. Probability spaces. Random variables, their distributions and expected values. Law of large numbers, central limit theorem, generating functions, multivariate normal distribution.

STAT 5102 Theory of Statistics II (4.0 cr.; Student Option; prereq 5101 or Math 5651)

STAT 5201 Sampling Methodology in Finite Populations (3.0 cr.; Student Option; prereq 3022 or 4102 or 5021 or 5102 or #)

STAT 5302 Applied Regression Analysis (4.0 cr.; Student Option; prereq 3022 or 4102 or 5021 or 5102 or #)

STAT 5303 Designing Experiments (4.0 cr.; Student Option; prereq 3022 or 4102 or 5021 or 5102 or #)

STAT 5401 Applied Multivariate Methods (3.0 cr.; Student Option; prereq 5302 or 8102 or #)

STAT 5421 Analysis of Categorical Data (3.0 cr.; Student Option; prereq 5302 or #)

STAT 5511 Time Series Analysis (3.0 cr.; Student Option; prereq Theoretical understanding)

STAT 5601 Nonparametric Methods (3.0 cr.; Student Option; 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 5631 Topics in Statistics (3.0 cr.; Student Option)
Topics vary according to student needs and available staff.

STAT 5932 Topics in Statistics (3.0 cr.; Student Option)
Topics vary according to students’ needs and available staff.

SCB 5051 Stem Cell Biology Practical Training Module (1.0 cr.; A-F Grade Basis; prereq Acceptance into stem cell biology master program)

SCB 5054 Stem Cell Institute Research Seminar and Journal Club (2.0 cr.; A-F Grade Basis; prereq Acceptance into stem cell biology master’s prog or PhD minor prog or #) Students attend weekly Stem Cell Institute research seminars and journal clubs, write brief summaries, participate in journal club, and present original research paper.

SCB 5900 Master's Plan B Research Paper and Presentation (2.0 cr.; A-F Grade Basis; prereq Admission to stem cell biology master’s plan B program) Students write research paper based on primary literature on stem cell biology topic of interest, mentored by faculty member.

SCMC 3001W History of Cinema and Media Culture (4.0 cr.; Student Option)
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 (4.0 cr.; A-F Grade Basis; 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 (4.0 cr.; A-F Grade Basis; 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 (1.0-3.0 cr.; Student Option) Guided individual reading or study.

SCMC 4993 Directed Study (1.0-3.0 cr.; Student Option) Guided individual reading or study.

SCMC 5001 Critical Debates in the Study of Cinema and Media Culture (4.0 cr.; Student Option) Basic concepts in historical/international debates over production/reception of media culture. Emphasizes cinema. Advanced
SCMC 5002 Advanced Film Analysis (4.0 cr.; A-F Grade Basis; prereq [1201 or ARTH 1921W or CSCL 1201 or CSCL 1921 or equiv coursework]; SCMC major)
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 (1.0-3.0 cr.; Student Option)
Guided individual reading or study.

Study Abroad in Argentina (ARGN)
Office of the Senior Vice President for System Administration

ARGN 3009 Argentina: Stereotypes and Identity (3.0 cr.; Student Option; prereq 1004)
Intercultural perspectives on Argentina. How others perceive Argentines and how Argentines perceive themselves, through literature, humor, art, music, and history.

Study Abroad in Dublin (DBLN)
Office of the Senior Vice President for System Administration

DBLN 3001 Literature (1.5 cr.; A-F Grade Basis)
Modern Irish writing, 1890–2003, celebrating range/diversity of Irish literature from Yeats to Joyce to present. Intensive reading on founding figures of modern literature, their influence on succeeding generations. Selected novels, short stories, and poetry.

DBLN 3002 Drama (1.5 cr.; A-F Grade Basis)
Literary/cultural framework for studying tradition of Irish drama from 19th century to present. World of Irish plays/playwrights through text/performance. Yeats and the founding of a national theatre. Works of Synge, O’Casey, and Beckett. Contemporary playwrights such as Brian Friel, Tom Murphy, Frank McGuinness, and Marina Carr.

DBLN 3003 History (1.5 cr.; A-F Grade Basis)

DBLN 3004 Gaelic Culture (1.5 cr.; A-F Grade Basis)

DBLN 3005 Visual Culture (1.5 cr.; A-F Grade Basis)
Interdisciplinary look at visual culture in Ireland. Archaeology, art, architecture, film, television, and video with reference to relevant literary, social, and cultural contexts.

DBLN 3006 Critical Issues (1.5 cr.; A-F Grade Basis)
Critical issues facing Ireland, North and South. Relationships with Britain, Europe, the U.S., and developing world. Economics, sociology, politics, religion, culture.

Supply Chain and Operations (SCO)
Curtis L. Carlson School of Management

SCO 2550 Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr.; A-F or Audit; 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.

SCO 2550H Honors: Business Statistics: Data Sources, Presentation, and Analysis (4.0 cr.; A-F or Audit; 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.

SCO 3001 Introduction to Operations Management (3.0 cr.; A-F or Audit)

SCO 3041 Project Management (2.0 cr.; A-F or Audit; 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.

SCO 3045 Sourcing and Supply Management (2.0 cr.; A-F Grade Basis; prereq [3001 or equiv])
Strategic role of purchasing/supply management. Supplier-selection criteria such as quantity, quality, and cost/price considerations. Buyer-supplier relationships.

SCO 3048 Transportation and Logistics Management (2.0 cr.; A-F Grade Basis; prereq 3001)
Linkages between logistics/transportation and marketing, operations, and finance. How different industries integrate logistics, warehousing, transportation, and information systems.

SCO 3051 Service Management (2.0 cr.; A-F Grade Basis; prereq 3001)
Issues unique to managing service processes. Identifying service needs, designing services, and managing services.

SCO 3056 Supply Chain Planning and Control (4.0 cr.; A-F or Audit; prereq 3001 or #)
Decisions/strategies 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.

SCO 3059 Quality Management and Lean Six Sigma (4.0 cr.; A-F or Audit; prereq 3001 or equiv or #)

SCO 3061 Lean Thinking (2.0 cr.; A-F Grade Basis; 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.

SCO 3072 Managing Technologies in the Supply Chain (2.0 cr.; A-F Grade Basis; prereq 3001)
Technologies and technological change within/between firms as opportunities for professional leadership. Selecting technologies, nurturing their adoption, and ensuring their exploitation.

SCO 3850 Topics in Operations and Management Science (2.0-4.0 cr.; A-F Grade Basis; prereq 3001)
Discussion/analysis of current topics/developments in operations/management science.

SCO 4065W Supply Chain and Operations Strategy (4.0 cr.; A-F Grade Basis; prereq 3001, 3056, 3059, 4 [OMS or SCO] 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.

Sustainability Studies (SUST)
College of Food, Agricultural and Natural Resource Sciences

SUST 3003 Sustainable People, Sustainable Planet (3.0 cr.; Student Option; 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.

SUST 3480 Topics in Sustainability (1.0-4.0 cr.; A-F Grade Basis)
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 (3.0 cr.; A-F Grade Basis; prereq [3003 or GLOS 3304, [jr or sr] in sustainability studies minor] or #)
Students synthesize multiple disciplinary perspectives and integrate insights gained from various approaches/methods. Concepts/scholarship related to sustainability. Applying knowledge/experience to real sustainability problems.

SUST 4450 Sustainability Internship (3.0-4.0 cr.; A-F Grade Basis; prereq Familiarity with sustainability concepts through academic work or other experiences)
Eight to ten hour per week internship experience related to a sustainability theme or approach, such as sustainable foods, green building, renewable energy or environmental justice. Intern in a nonprofit, governmental,
educational or business organization, from choices provided or approved by instructor.

**Swedish (SWED)**
College of Liberal Arts

**SWED 1001 Beginning Swedish** (5.0 cr.; Student Option)
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** (5.0 cr.; Student Option; 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** (5.0 cr.; Student Option; 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** (5.0 cr.; Student Option; prereq 1003)
Emphasis on developing intermediate-high proficiency in listening, reading, speaking, and writing. Contextualized work on grammar and vocabulary is supported by work with authentic readings and essay assignments.

**Swahili (SWAH)**
College of Liberal Arts

**SWAH 1221 Beginning Swahili, Semester I** (5.0 cr.; Student Option)
Comprehension, speaking, reading, writing. Continuation of skill development from 1222.

**SWAH 1222 Beginning Swahili II** (5.0 cr.; Student Option; prereq 1221 or equiv)
Readings of contemporary Swahili texts. Review of grammar and complex verb forms. Vocabulary, communication skills.

**SWAH 3226 Intermediate Swahili II** (5.0 cr.; Student Option; prereq 1 yr Swahili or equiv)
Continuation of skill development from 3225.

**SWAH 4225 Intermediate Swahili** (5.0 cr.; Student Option; prereq Grad student)
Continuation of skill development from 4225.

**SWAH 5226 Advanced Swahili II** (3.0 cr.; Student Option; prereq 5225 or equiv)
Continuation of skill development from 5225.

**Theatre Arts (TH)**
College of Liberal Arts

**TH 1101V Honors Section: Introduction to the Theater** (4.0 cr.; A-F Grade Basis; 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 1102 Drama and the Media** (3.0 cr.; Student Option)
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 1301 Acting/Non-Majors** (3.0 cr.; Student Option)
Background/techniques of acting as viewed/practiced in theatre, society, and student's own relationships.

**TH 1321 Beginning Acting: Fundamentals of Performance** (3.0 cr.; Student Option; prereq 1101 or &1101)
Vocabulary/techniques for practical performance studies. Use/training of body/voice. Creative choices and dramatic phrases. Storytelling. Training the will, the instrument, and the imagination.

**TH 1322 Creating the Performance** (3.0 cr.; Student Option; 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** (3.0 cr.; A-F or Audit)
Beginning singing, interpretation, part singing, phonetics, audition techniques. Solo/ensemble presentations at final class performance.

**TH 1362 Dance for Musical Theatre** (2.0 cr.; A-F or Audit)
Movement based lab. Dance skills in musical theatre performance. Focuses on various styles/disciplines of dance throughout its culturally diverse heritage. Character development necessary to execution of various dance styles.

**TH 1381 New Voices** (1.0 cr.; S-N Grading Basis; prereq Fr or transfer) student from BFA actor training or BA or BFA dance or BA theater/other.
Instructors lead students in four Saturday workshop intensives. Student forge interdisciplinary collaborations as they journey through their respective programs.

**TH 1391 BFA Acting I** (3.0 cr.; A-F or Audit; prereq Accepted into BFA acting program)
Acting.

**TH 1392 BFA Voice and Speech I** (2.0 cr.; A-F or Audit; prereq Accepted into BFA acting 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** (2.0 cr.; A-F or Audit; prereq BFA-acting major)
Focuses on building a foundation for further work in program.

**TH 1395 BFA Acting II** (3.0 cr.; A-F or Audit; prereq 1391)
Continuing the process of interpreting dramatic material.

**TH 1396 BFA Voice and Speech II** (2.0 cr.; A-F or Audit; prereq 1392)
Building a foundation for further work in the program. Emphasizes practicing the sounds of good American speech and of the written phonetic alphabet.

**TH 1397 BFA Movement II** (2.0 cr.; A-F or Audit; 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 1501 Introduction to Design and Technology for Live Performance** (3.0 cr.; A-F Grade Basis; prereq 1101 or &1101)
Principles, processes, and possibilities in all areas of stage design and production. Process and relationship between artistic and production staff members. Collaboration, compromise, creation. Student are assigned to a lab in a technical area.

**TH 1904 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

**TH 1905 Freshman Seminar** (3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

**TH 1909W Topics: Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

**TH 1910W Topics: Freshman Seminar** (3.0 cr.; A-F or Audit; prereq freshman)
Topics specified in Class Schedule.

**TH 1911W Freshman Seminar: Theatre, Entertainment With Attitude** (3.0 cr.; A-F or Audit; 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/performing arts professionals.

**TH 1950 Topics in Theater** (1.0-3.0 cr.; Student Option)
Topics specified in Class Schedule.

**TH 2391 BFA Acting III** (3.0 cr.; A-F or Audit; prereq BFA student in theatre arts)
Applying concepts of first year of training to an ensemble performance project. Beginning of Shakespeare foundation unit.

**TH 2392 BFA Voice and Speech III** (2.0 cr.; A-F or Audit; prereq BFA student in theatre arts)
Continuing to build a strong, healthy voice. Mastering written phonetics, sounds of good American speech for stage. Students begin to explore speaking of heightened verse, particularly Shakespearean text.

**TH 2393 BFA Movement III** (2.0 cr.; A-F or Audit; prereq BFA student in theatre arts)
Dependences/refines foundation laid in BFA Movement III.

**TH 2395 BFA Acting IV** (3.0 cr.; A-F or Audit; prereq BFA-Acting sophomore)
Application of process towards performance. Emphasizes Shakespeare.

**TH 2396 BFA Voice and Speech IV** (2.0 cr.; A-F or Audit; 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 2397 BFA Movement IV** (2.0 cr.; A-F or Audit; prereq BFA-acting sophomore)
May include sections such as jazz dance, partner dances, and movement for actors.

**TH 3100 Theatre Practicum** (1.0 cr.; S-N or Audit; 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** (3.0 cr.; Student Option)
Study of traditional play structure, characterization, dialogue, dramatic action, and theme. Final project is a one-act play.

**TH 3120 Theatre: Theory and Practice** (3.0 cr.; Student Option; prereq 1101)
Introduction to diverse ways of thinking about theatre and its representational practices. Students explore traditional/non-traditional modes of performance through readings, discussions, and hands-on performance projects. Seminar-style course.

**TH 3171 History of the Theatre: Ancient Greece Through Neo-Classicism** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; prereq Th major or #)
Theatrical practices, staging conventions, and dramatic structure of plays.

**TH 3314 Text and the Actor** (3.0 cr.; A-F or Audit; prereq 1101, 1321, 1322)
Standard stage speech, international phonetic alphabet transcription, and textual analysis to perform heightened language texts such as Shakespeare/Shavian monologues. Chaucer's Canterbury Tales, and Beowulf. Videos viewed/discussed.

**TH 3316 Voice for the Actor** (3.0 cr.; A-F Grade Basis; prereq 1101, 1321, 1322)

**TH 3321 Stanislavski and Techniques for Characterization** (3.0 cr.; Student Option; prereq 1322, [3314 or & 3314], audition)

**TH 3322 Advanced Techniques for Characterization** (3.0 cr.; Student Option; prereq 3321)

**TH 3330 Physical Approaches to Acting** (3.0 cr.; Student Option; prereq 1322, [3314 or 3314], audition, #)
Dynamic physical approach to acting. Expanding expressiveness/creativity. Strengthening connections between physical/vocal expression. Uniting instinct and intellectual analysis. Techniques as advanced by Delsarte, Meyerhold, Grotowski, Kantor, Suzuki, Barba, etc., and structured improvisation, are incorporated in solo/collaborative performance projects.

**TH 3332 Circus Performance** (1.0 cr.; A-F Grade Basis)

**TH 3361 Introductory Musical Theater** (3.0 cr.; A-F or Audit; prereq BFA-acting)
History of American musical theater. Videos/discussions, basic music theory, voice, dance, acting, audition techniques. Solo/ensemble presentations for public class performance.

**TH 3365 Intermediate Musical Theater** (3.0 cr.; A-F or Audit; prereq 3361 or #)

**TH 3381 Theater Storytelling and Solo Performance** (3.0 cr.; Student Option)
Live storytelling and solo performance as theatrical art form. How to turn personal experiences into stage stories. Guests perform, discuss their work, and critique student work. Students develop short monologues/performance and conclude with original solo theater performance/story.

**TH 3391 BFA Acting V** (3.0 cr.; A-F or Audit)
Experiencing a foreign theater culture/history. Applying process of interpreting dramatic material to plays of that culture.

**TH 3392 BFA Voice and Speech V** (2.0 cr.; A-F or Audit)
Experiencing a foreign theater culture/history. Applying voice training to dramatic material of that culture.

**TH 3393 BFA Movement V** (2.0 cr.; A-F or Audit; prereq BFA student in theatre arts)
Experiencing a foreign theatre culture/history, applying training to dramatic material of that culture.

**TH 3395 BFA Intensive I** (2.0 cr.; A-F or Audit; prereq BFA-acting jr)
Incorporating disciplines of acting/voice/movement.

**TH 3398 BFA Rehearsal & Performance I** (2.0 cr.; A-F or Audit; prereq BFA-acting jr)
Continuing the application of process towards performance.

**TH 3399 BFA Rehearsal and Performance II** (2.0 cr.; A-F or Audit; prereq BFA-acting jr)
Continuing the application of process towards performance.

**TH 3521 Introduction to Scenic Design for Theater and Performance** (3.0 cr.; Student Option; prereq 3571)

**TH 3531 Introduction to Theatrical Costume Design** (3.0 cr.; Student Option; prereq TH 3571)
Costume design process, including, researching, script analysis, the costume designer's role throughout the production process, and design problems.

**TH 3541 Introduction to Stage Lighting** (3.0 cr.; Student Option; prereq 3571)
Composition, color theory, instrumentation, and control (dimming) as they apply to theater, opera, and dance. Collaborative process of the lighting designer through individual and group projects in a lab setting (i.e., a theater.)

**TH 3571 Introduction to Stage Technology** (3.0 cr.; A-F Grade Basis; prereq 1501)

**TH 3716 Stage Management** (4.0 cr.; A-F Grade Basis; prereq 1501 or #)
Production process, pre-production to maintaining/closing. Managing rehearsals, communication, conflict resolution. Individual/group projects: promptbook building, blocking notation, Cue placement/execution, scene breakdowns, creating/maintaining checklist, building a form library.

**TH 3950 Topics in Theatre** (1.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

**TH 3993 Directed Study** (1.0-6.0 cr.; Student Option; prereq 6 Th cr, #, %, @)
Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
Guided individual reading or study.

**TH 4115 Intermediate Playwriting** (3.0 cr.; Student Option; 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, workshop of student plays.

**TH 4177W Survey of Dramatic Literature I: Strategic Interpretation** (3.0 cr.; Student Option; 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** (3.0 cr.; Student Option; 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 4321 Career Preparation for the Actor** (3.0 cr.; Student Option; prereq 3322) Information/techniques necessary for professional acting career.

**TH 4322 Acting for the Camera** (3.0 cr.; Student Option; prereq 3322) Differences between stage acting and acting for camera. Hands-on experience with film equipment. Scenes/monologues rehearsed/performed for camera. Videotape playback for class critique.

**TH 4380 Creative Collaboration** (1.0-3.0 cr.; Student Option; prereq Audition, interview, #) Ensemble creation of a single theatre performance work. Creative/dramaturgical work. Public showing of work, completed or in-progress. Students work collaboratively with faculty or affiliate guest artists.

**TH 4391 BFA Intensive II** (2.0 cr.; A-F or Audit; prereq 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 4393 BFA Rehearsal and Performance III** (2.0 cr.; A-F or Audit; prereq BFA student in theatre arts) Acting, voice, movement. Application of process toward performance.

**TH 4394 BFA Rehearsal and Performance IV** (2.0 cr.; A-F or Audit; prereq BFA student in theatre arts) Acting, voice and movement. Application of process toward performance.

**TH 4395 BFA Intensive III** (2.0 cr.; A-F or Audit; prereq BFA-acting sr) Incorporating the disciplines of acting/voice/movement.

**TH 4398 BFA Rehearsal and Performance V** (2.0 cr.; A-F or Audit; prereq BFA-acting sr) Acting, voice and movement. Continuing the application of process towards performance.

**TH 4399 BFA Rehearsal and Performance VI** (2.0 cr.; A-F or Audit; prereq BFA-acting sr) Acting, voice, and movement. Continuing the application of process towards performance.

**TH 4532 Makeup for the Actor** (2.0 cr.; Student Option) Topics vary. May include functions/aesthetics of stage makeup, application techniques, prosthetics, and facial hair.

**TH 4550 Video Technology** (3.0 cr.; Student Option) 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 4555 Audio Technology** (3.0 cr.; Student Option; prereq 1501 or #) Sound as the science. Technology to create/manipulate sound. Recording techniques. Effects/signal processing. Microphone/mixing techniques.

**TH 4556 Digital Audio and MIDI for Performance** (3.0 cr.; Student Option) Hands-on computer/CPU-generated audio technology. Use of MIDI language protocol for performance in all aspects of the arts.

**TH 4711 Intermediate Stage Direction** (3.0 cr.; Student Option; prereq 1322 or #) Coordinating/guiding collaborative artistic team. Script selection, textual analysis, concept development, space use, composition, movement, dialogue. Final presentation of scene. Intensive research, textual examination, journal.

**TH 4901 Senior Seminar I** (2.0 cr.; S-N or Audit; 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 Performance Studio** (2.0-4.0 cr.; A-F Grade Basis; prereq =4905; honors, theatre arts, %; [cum laude or magna cum laude] 4 cr for summa cum laude) Independent reading/research in preparing honors thesis or selected creative project.

**TH 5000 Theatre Practicum I** (1.0-4.0 cr.; Student Option; 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 (3.0 cr.; A-F or Audit; 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 5178 History and Theory of Performance Conventions** (3.0 cr.; A-F or Audit; prereq [1322, 3171 or 3172]) Grad student) Draws on visual materials, practical exercises, and theories of spatial representation in context of political/social function. Historical/cross-cultural overview of performance conventions and theatrical space from City of Dionysia to site-specific happenings of 20th century.

**TH 5179W Text and Performance** (3.0 cr.; A-F or Audit; prereq [1322, 3171 or 3172]) 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 5520 Scene Design (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 3515 or grad or #)
The lighting technician's skills and crafts: equipment, techniques, control operation, wiring, and maintenance.

TH 5550 Video Project (3.0 cr.; Student Option; 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 5554 Multimedia Production for Live Performance (3.0 cr.; Student Option; prereq 5553 or #)
Use of multimedia production technologies in actual production. Students apply knowledge/skill in conjunction with an artistic team on a production and are an integral part of the development/realization of that production.

TH 5556 Audio Engineering (3.0 cr.; Student Option; 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 5559 Sound Design for Performance (3.0 cr.; Student Option; prereq 4555 or #)
Audio technology/psychology, their impact on a audience in a performance. Communication, design process, psychoacoustics, script analysis.

TH 5560 Drawing, Rendering, and Painting for the Theatre Designer II (3.0 cr.; Student Option; prereq 5510)
Development of skills necessary for presentation of theatre scene/costume designs. Materials, layout, and techniques in scene painting. Rendering and scene painting skills.

TH 5570 Properties/Scenery Technology (1.0-3.0 cr.; Student Option; prereq 3515 or grad or #)
Management, structures, upholstery, mask-making, furniture construction, stage mechanics, soft properties, faux finishes. Topics specified in Class Schedule.

TH 5580 Costume Technology (3.0 cr.; Student Option; prereq 3515 or grad or #)
Fabric enhancement techniques, masks, wig-making, millinery, makeup prosthetics, pattern drafting, and draping. Topics specified in Class Schedule.

TH 5590 Theatre Technology Practicum (1.0-3.0 cr.; Student Option; prereq 3515, #, %; 4 cr max for undergrads)
Individual creative project in technology/craft area of theatre. Practical work in costume, lighting, makeup, props, scenery, sound, or theatre management.

TH 5711 Advanced Stage Direction (3.0 cr.; Student Option; prereq [4711, #] or grad student)

TH 5716 Stage Management for the Theatre (4.0 cr.; Student Option; prereq [1101, 1321, soph] or grad)
Theories, practicalities, and techniques for rehearsal/performance. Organizing/managing various types of performance venues.

TH 5718 Principles of Arts Management (3.0 cr.; Student Option; prereq #)
Nonprofit arts organization structure: concept, mission, organization. Financial, marketing, fund-raising, and grant-writing strategies. Discussion/guest professionals from Twin Cities arts/funding communities.

TH 5760 Advanced Stage Management (2.0-3.0 cr.; Student Option; prereq 5716 or & 5716, #; [4 cr max for undergrads])
Practical experience in stage management for specific productions of the University Theatre with emphasis on rehearsal and performance.

TH 5780 Advanced Topics in Arts Management (2.0-4.0 cr.; Student Option; prereq 5718)
Students apply nonprofit arts management theories/techniques learned in 5718. Marketing/audience development, fundraising and grant writing strategies, and financial management of a nonprofit arts organization.

TH 5950 Topics in Theatre (1.0-4.0 cr.; Student Option)
Topics specified in Class Schedule.

TH 5993 Directed Study (1.0-5.0 cr.; Student Option; prereq 5 Th cr., #, @)
Guided individual reading or study.

TXCL 5195 Veterinary Toxicology (3.0 cr.; A-F or Audit; prereq Grad student or #)
Toxicology of minerals, pesticides, venoms, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.

TXCL 5545 Introduction to Regulatory Medicine (2.0 cr.; A-F or Audit; prereq Grad student or #)
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 900 Special Education for Interpreters (0.0 cr.; S-N Grading Basis)
Terminology, processes, concepts, and legalities involved in interpreting in special education settings.

TRIN 990 Interpreting in Special Education Settings (0.0 cr.; S-N Grading Basis)
Advanced skills to apply special education protocols/concepts to simulated interpreting encounters. Self-assessment, glossary compilation, critical analysis, review of ethical procedures.

TRIN 1201 Health Care Terms and Concepts for Interpreters (3.0 cr.; A-F or Audit)
Technical vocabulary, oral discourse patterns used by health care providers in talking to patients, family members. Language of American health care interview.

TRIN 1301 Legal Terms and Concepts for Interpreters (3.0 cr.; Student Option)

TRIN 3001 Introduction to Translation (3.0 cr.; Student Option; prereq Bilingual proficiency in [English, second language of instruction])

TRIN 3002 Intermediate Translation (3.0 cr.; Student Option; prereq 3001)
Additional instruction and supervised practice in translation.
TRIN 3005 Principles of Translation (3.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq high level of proficiency in spoken English and another language; 3001 recommended) Practical and theoretical introduction to interpreting in health, human service, and legal settings. Emphasizes 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 3102 Consecutive Interpreting (3.0 cr.; Student Option; prereq 3101, high level of proficiency in [spoken English, another language]) Practice/theory at professional level in interpreting in health, human service, legal settings. Emphasizes professional/client dialogues. Consecutive interpreting skills, vocabulary research/storage, intercultural issues. Analyzing interpretive process. Performance assessment through audio/video taping. Subject languages (e.g., Spanish, Russian, Somali) specified for each section.

TRIN 3900 Topics in Translation and Interpreting (3.0 cr.; Student Option) Topics specified in Class Schedule.

TRIN 4201 Interpreting in Health Care Settings (3.0 cr.; A-F or Audit; prereq 1201, 3102) Practice in interpreting simulated clinical encounters and monologues. Fluency/accuracy in consecutive/simultaneous modes. Sight translation, medical vocabulary in two languages, ethical/situational considerations in health care interpreting. Coursework mainly in bilingual sections (English, another language).


TRIN 5900 Topics in Translation and Interpreting (1.0-8.0 cr.; Student Option) Topics specified in Class Schedule.

TRIN 5993 Directed Study (1.0-3.0 cr.; Student Option) Directed study in translation/interpretation.

Turkish (TURK) College of Liberal Arts

TURK 1001 Beginning Turkish I (5.0 cr.; Student Option) Listening, speaking, reading, writing.

TURK 1002 Beginning Turkish II (5.0 cr.; Student Option; prereq 1001) Listening, speaking, reading, and writing.

TURK 3001 Intermediate Turkish I (5.0 cr.; Student Option; prereq 1002 or #) Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 3002 Intermediate Turkish II (5.0 cr.; Student Option; prereq 3001 or #) Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 3900 Topics in Turkish Language, Literature, and Culture (4.0 cr.; Student Option) Topics in Turkish language, literature, and culture.

TURK 4001 Beginning Turkish (3.0 cr.; Student Option; prereq Grad student) Listening, speaking, reading, writing.

TURK 4002 Beginning Turkish (3.0 cr.; Student Option; prereq 4001, grad student) Listening, speaking, reading, writing.

TURK 4003 Intermediate Turkish (3.0 cr.; Student Option; prereq 4002, grad student) Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 4004 Intermediate Turkish (3.0 cr.; Student Option; prereq 4003, grad student) Listening, speaking, reading, and writing skills in modern standard Turkish.

TURK 5900 Topics in Turkish Language, Literature, and Culture (3.0 cr.; Student Option) Topics in Turkish language, literature, and culture.

University College (UC) College of Continuing Education

UC 1000 Exploring Educational Options (1.0 cr.; S-N or Audit; prereq %, #) Clarifying expectations, resources, and challenges for transition into (back to) college. Students assess their interests and learning style as they relate to a college major. Internet as means of gaining options for education. Individualized degrees at the University, how to prepare an application for them. Campbell Skills and Interest Survey, Learning Styles Inventory, written assignments. Materials fee: $25.

UC 1005 Global Perspectives on Higher Education (2.0 cr.; Student Option; prereq International student) Provides international students with the skills to examine, process, and articulate the values, contexts, and goals of the American higher educational system as it compares to their previous experiences.

UC 1485 Creativity: Photography (4.0 cr.; Student Option; 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.

UC 3201 Web Designer Introduction (4.0 cr.; Student Option) Web design process: plan, design, launch, and publish. Design principles, business practices, site analysis. Students use industry standard Web design software, including Adobe Photoshop, Macromedia Dreamweaver, and Flash, to build Web site. HTML, CSS. Lectures, exercises, lab.

UC 3202 Web Designer Introduction II (4.0 cr.; Student Option; prereq 3201 or #) Designing with Adobe Photoshop vector tools, using batch processing, Macromedia Flash as an animation tool. Developing an environment through ActionScripts. DHTML Layers, HTML frames, form processing. Internet service providers, hosting, search engines, Web site marketing.

UC 3950 Special Topics (1.0-4.0 cr.; Student Option) Special topics course.

UC 3993 Internship in Substance Abuse Counseling II (4.0 cr.; S-N or Audit; prereq Adds 4001, Adds 4002, Adds student, #) Students' knowledge, internship site functioning, and counseling skills are advanced through clinical experience/supervision.

UC 4301 Perspectives: Interrelationships of People and Animals in Society Today (2.0 cr.; Student Option) Interrelationships of people and animals from several viewpoints. Social, economic, and health consequences of these relationships, including issues such as pets and people sharing an urban environment, animal rights, and the influence of differences in cultures on animal-human relationships.

UC 4525 Garbage and the Human Environment (3.0 cr.; A-F or Audit) Human development, use of natural resources, waste production, pollution of environment, waste management. Comparative look at issues/problems associated with rapid technological development. Laws to control waste production and manage accumulated waste.

UC 5075 Directed Study (1.0-8.0 cr.; Student Option) Directed study.

UC 5950 Special Topics (1.0-8.0 cr.; Student Option) Special topics.

Urban Studies (URBS) College of Liberal Arts

URBS 1001W Introduction to Urban Studies: The Complexity of Metropolitan Life (3.0 cr.; A-F or Audit) Interdisciplinary course, ranging across spatial, historical, economic, political, and design perspectives, among many others.

URBS 3001W Introduction to Urban Studies: The Complexity of Metropolitan Life (3.0 cr.; A-F or Audit) Interdisciplinary course, ranging across spatial, historical, economic, political, and design perspectives, among many others.

URBS 3201 Urban Studies Colloquium (1.0 cr.; A-F or Audit; prereq %) Urban/metropolitan issues. Topics vary to reflect current concerns. In-depth reading, intensive group discussion.

URBS 3202 Urban Studies Colloquium (1.0 cr.; A-F or Audit) Urban/metropolitan issues. Topics vary to reflect current concerns. In-depth reading, intensive group discussion.
URBS 3301W American Cities As Settings for Cultural Diversity (3.0 cr.; Student Option)
Explores cultural diversity in American cities, considering patterns of and reasons for racial and class segregation and interaction. Its foci are the problems, conflicts, and successes of cultural diversity from a multidisciplinary perspective.

URBS 3500 Urban Studies Workshop (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F or Audit)
Examine 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 (3.0 cr.; A-F Grade Basis)
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 (3.0 cr.; A-F Grade Basis)
Topics specified in Class Schedule.

URBS 3861 Financing Cities (3.0 cr.; A-F Grade Basis)
Readings, lecture, discussion, coursework. 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.

URBS 3871 A Suburban World (3.0 cr.; Student Option)
Suburbs as sites of urgent battles over resources, planning practices, land use, and economic development. How suburban life shapes values, political ideals, and worldviews of its populations.

URBS 3900 Urban Studies Internship Seminar (2.0 cr.; A-F or Audit; prereq Sr, internship placement, %, #)
Weekly seminar integrates internship experience with academic program.

URBS 3955W Senior Paper Seminar (2.0 cr.; A-F or Audit; prereq %)
Methods/resources for research. Substantial writing.

URBS 3993 Urban Studies Directed Study (1.0-3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq Grad student or [adv UrbS undergrad, #])
The City and the Metropolis as places that result from important acts of human creativity.

URBS 5681 Financing Cities (3.0 cr.; A-F Grade Basis)
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.

VCS 4600 Small Animal and Equine Behavior (3.0 cr.; A-F or Audit)
Basics of normal animal behavior, ethology, and welfare in cats, dogs, and horses. Common behavioral problems. Approaches to prevent/treat them, including pre-purchase considerations, management, and housing. Principles of behavior modification.

VCS 4606 Small Animal Management (3.0 cr.; A-F or Audit)
Husbandry, anatomy/physiology, common disease conditions of dogs/cats. Small mammals, reptiles, caged birds. Career opportunities in fields dealing with small animals, regulatory aspects, animal rights, state/federal legislation concerning animal and public health issues. Lectures, demonstrations. Lectures taught by CVM faculty members and outside contractors. Student performance judged by tests and several group projects.

VCS 4992 Directed Readings in Veterinary Clinical Sciences (1.0-6.0 cr.; A-F Grade Basis; prereq [One-page proposal, bibliography of works to be read] submitted to faculty)
Students read seminal works in veterinary medicine and literature pertaining to their area of interest. Final project evaluated by faculty member.

VCS 4993 Directed Study in Veterinary Clinical Sciences (1.0-6.0 cr.; A-F Grade Basis; 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 (1.0-6.0 cr.; A-F Grade Basis; prereq One-page proposal submitted to faculty member)
Students perform research in lab setting.

URDU 5993 Directed Readings (1.0-5.0 cr.; Student Option; prereq #, %, @)
Guided individual readings.

Veterinary & Biomedical Sciences (VBS)
College of Veterinary Medicine

VBS 1001 Introduction to Biotechnology (4.0 cr.; A-F or Audit)


VBS 2032 General Microbiology With Laboratory (5.0 cr.; A-F Grade Basis; prereq One semester each of college chemistry, biology) Bacterial metabolism, growth, genetics, biology of viruses/fungi. Control of microorganisms. Host-microbe interactions, microorganisms/disease, applied microbiology.

VBS 2100 Companion Animal Anatomy (3.0 cr.; A-F Grade Basis; prereq General Biology (e.g., BIOL 1009) is recommended) Develop anatomical knowledge through study/dissection. Compare/contrast animal adaptations.

VMS 5080 Problems in Veterinary Epidemiology and Public Health (1.0-3.0 cr.; A-F or Audit)
Individual study on problem of interest to epidemiology or public health student.

VMS 5082 Diagnostic Epidemiology of Infectious Diseases (2.0 cr.; A-F Grade Basis; prereq Statistics course or #) Theoretical principles, practical applications of diagnostic testing in populations. Examples related to infectious diseases in veterinary/human health. Basis of test performance, limitations, interpretations.

VMS 5090 Seminar: Veterinary Epidemiology (1.0 cr.; S-N or Audit; prereq Veterinary Medicine grad student) Each student leads at least one seminar. Reviews of current research, literature reviews, and technique development. Students and participating faculty participate in presentation, discussion, and administration of the seminars.

VMS 5101 Molecular and Cellular Basis of Nanoparticle Toxicity (3.0 cr.; A-F or Audit) Use of nanotechnology in scientific research. Impact of nanomaterials on biological systems.

VMS 5165 Surveillance of Foodborne Diseases and Food Safety Hazards (2.0 cr.; Student Option; prereq [PUBH 5330, [professional school or grad student]] or #) Principles/methods for surveillance of foodborne diseases. Investigation of outbreaks. Assessment of food safety hazards. Focuses on integration of epidemiologic/lab methods.

VMS 5181 Spatial Analysis in Infectious Disease Epidemiology (4.0 cr.; Student Option No Audit; prereq Intro to epidemiology, statistics, #) Spatial distribution of disease events. Exposures/outcomes. Factors that determine where diseases occur. Analyzing spatial disease data in public health, geography, epidemiology. Focuses on human/animal health related examples.
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VMED 5190 Seminar and Presentation Development (2.0 cr.; S-N Grading Basis; prereq Grad student)
Skills needed to research, organize, develop, and deliver an original scientific presentation or to assist in finding, compiling, and organizing information for presentations, theses, or papers suitable for publication.

VMED 5193 Dairy Decision Making in a Financial Context (2.0 cr.; A-F or Audit; prereq Earned DVM, #)
Economic decision-making principles applied to commercial dairy farms in North America. Economic techniques, decision making under financially constrained conditions. Financial evaluation of a dairy operation. Modules: assignments, written work submitted via the Internet, discussions at online course site.

VMED 5210 Advanced Large Animal Physiology I (1.0-3.0 cr.; Student Option)
Review of large animal physiology at level needed for specialty board certification or beginning research. Students present topics in physiology and supplement reading with clinical case material or journal articles.

VMED 5211 Advanced Large Animal Physiology II (1.0-3.0 cr.; A-F or Audit; prereq #; 5210 recommended)
Large animal physiology for specialty board certification or beginning research. Students present topics in physiology and supplement reading with clinical case material or journal articles.

VMED 5232 Comparative Clinical Veterinary Dermatologic Pathology (1.0 cr.; S-N Grading Basis; prereq DVM degree or foreign equiv)
Microscopic pathology of basic dermatologic reactions and of variable disease states.

VMED 5240 Advanced Small Animal Pathobiology I (1.0 cr.; A-F Grade Basis; prereq CVM grad student, [DVM or foreign equiv] degree)
Biology, physiology, pathophysiology, and medicine. Topics relevant to companion animals. Pathogenesis/treatment of diseases. Developing hypotheses that can be translated into clinical research.

VMED 5241 Advanced Small Animal Pathobiology II (1.0 cr.; A-F Grade Basis; prereq CVM grad student, [DVM or foreign equiv] degree)
Overview of biology, physiology, pathophysiology, and medicine of disciplines. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research.

VMED 5242 Advanced Small Animal Pathobiology III (1.0 cr.; A-F Grade Basis; prereq CVM grad student, [DVM or foreign equiv] degree)
Overview of biology, physiology, pathophysiology, and medicine. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research.

VMED 5243 Advanced Small Animal Pathobiology IV (1.0 cr.; A-F Grade Basis; prereq CVM grad student, [DVM or foreign equiv] degree)
Overview of biology, physiology, pathophysiology, and medicine. Underlying pathogenesis/treatment of diseases of companion animals. Developing hypotheses that could be translated into clinical research.

VMED 5295 Problems in Large Animal Clinical Medicine/Surgery and Theriogenology (1.0 cr.; A-F or Audit; prereq VMED grad student, possess DVM)
Hospital cases using standardized format, audiovisual aids. Review literature pertaining to case. One or two cases presented by enrolled participants per month.

VMED 5310 Topics in Veterinary Clinical Pathology (1.0 cr.; S-N Grading Basis; prereq Grad student in CVM)
Modified rounded formats. Cases from VMC used to explore pathobiology with associated chemistry/hematology data. Attendees/canicians can request lab topics for discussion. Past topics have included lab measurement of chemical analytes, test sensitivity or specificity (e.g., ethylene glycol test, FELV test), lab testing for infectious agents.

VMED 5319 Veterinary Gross Pathology (1.0 cr.; S-N Grading Basis; prereq Grad student in CVM or [VMED, DVM degree or foreign equiv] or #)
Diagnosing gross lesions of tissues. Evaluating images from wide variety of animals submitted to lab. Mock exams. Students prepare two in-depth reviews on topics covered during course.

VMED 5320 Advanced Veterinary Systemic Pathology I (3.0 cr.; A-F Grade Basis; prereq Grad student in VMED or [CMB, DVM degree or foreign equiv] or #)
Students review/summarize topics in systemic pathology using veterinary pathology textbooks and relevant updates from pathology and veterinary medical journals. Diagnostic cases in alimentary, respiratory, urinary, cardiovascular, and hematopoietic system pathology. Students give 10-15 presentations with handouts for other students.

VMED 5330 Veterinary Gross Pathology (1.0 cr.; A-F Grade Basis; prereq Grad student in VMED or [CMB, DVM degree or foreign equiv] or #)
Weekly, one-hour microscopic slide presentations, reviews on wide variety of diseases in domestic/non-domestic animals. Students present microscopic slide cases and prepare discussions about disease entities, differential diagnoses, and ancillary tests.

VMED 5410 Scientific Writing and Speaking (2.0 cr.; A-F Grade Basis; prereq Grad student in health sciences)

VMED 5420 Molecular Epidemiology of Infectious Disease (3.0 cr.; A-F Grade Basis; prereq Basic course in microbiology)

VMED 5430 HIV/AIDS: Pathogenesis, Treatment, and Prevention (1.0 cr.; Student Option; prereq Grad student)
Exposure to pathogenesis, treatment, and prevention of HIV/AIDS from clinical faculty who are dealing with AIDS patients. Developing new questions and design experiments that have greatest chance of translating to clinical setting.

VMED 5440 Microbial Risk Assessment of Foods (3.0 cr.; Student Option No Audit; prereq Intro course in microbiology, [basics algebra, calculus, probability theory, probability distributions] or #)
Risk analysis process as part of science-based decision-making. Conduct microbial risk assessment by different steps of hazard identification, hazard characterization, exposure assessment/risk characterization. Qualitative/quantitative tools.

VMED 5486 Training in Swine Production and Management (4.0 cr.; S-N Grading Basis; prereq VMED grad student or #)
Production module introduces techniques/protocols for swine production system operation. Research module covers applied research trials for viral/bacterial pathogens in pigs.

VMED 5594 Research in Veterinary Medicine (2.0-3.0 cr.; Student Option)
Review of recent advances in swine diseases; farm visits for on-farm disease diagnostics and control programs.

VMED 5610 Companion Animal Oncology (2.0 cr.; S-N or Audit; prereq DVM, #)
Principles of veterinary oncology. Biologic behaviors, treatments, and prognosis of neoplastic disorders.

VMED 5621 Principles of Veterinary Anesthesiology (2.0 cr.; A-F Grade Basis; prereq VMED grad student, DVM degree or foreign equiv, instr consent)
In-depth training in principles of veterinary anesthesiology. Lectures, anesthesia labs, presentations by students.

VMED 5670 Bovine Surgery Practicum (2.0 cr.; S-N Grading Basis; prereq VMED grad student, [DVM or equiv foreign degree] or #)
Intensive training in ruminant surgery. Evaluation of food animal surgery principles, hands-on laboratory components.

VMED 5910 Grant Writing: What Makes a Winning Proposal? (1.0-4.0 cr.; Student Option; prereq, Jr, #)
Components of a strong proposal. Grant submission process. What reviewers look for. How to locate grant announcements that match research interests.

VMED 5920 Food Defense: Prepare, Respond, Recover (3.0 cr.; A-F Grade Basis; prereq Grad or professional student or #)
Basic principles of preparedness/emergency response. Instructor may substitute topics if timelier topic arises.
VMED 5991 Animal Health and Food System Policy and U.S. State government (1.0 cr.; S-N Grading Basis)

VMED 5992 Animal Health and Food System Policy and U.S. National Government (0.0-1.0 cr.; S-N Grading Basis; prereq DVM or equiv degree or current DVM student or #)
Evidence-based policy development. Relevant global animal health and food system issue. Role of scientific evidence in developing/implementing policy. Policy-making process as it pertains to trade, animal health, and food system at national level, as well as role of scientific evidence.

VMED 5993 Animal Health and Food System Policy and Intergovernmental Organizations (1.0 cr.; S-N Grading Basis; prereq DVM or equiv degree or current DVM student or #)
Evidence-based policy development. Relevant global animal health and food system issue. Role of scientific evidence in developing/implementing policy. Policy-making process as it pertains to trade, animal health, and food system across intergovernmental organizations. Role of scientific evidence in intergovernmental organization's policy development.

VMED 5994 Advanced Clinical Epidemiology (1.0 cr.; A-F Grade Basis)
An in-depth focus on infectious disease epidemiology with opportunities to apply epidemiologic principles to control infectious diseases in animal populations.

VMED 5995 Engaging Intergovernmental Organizations (1.0 cr.; S-N Grading Basis) Relevant policy issue/roles of intergovernmental organizations. Discussions/debate about current issue, interact with key officials, perform group task assignments, develop/deliver presentation to relevant leaders.

VMED 5996 Professional Communications: Current Veterinary, Public Health and Food System Issues (1.0 cr.; S-N Grading Basis; prereq Students must have a professional or graduate degree related to human, animal, or ecosystem health or be pursuing a graduate degree (MS/PhD) or professional masters (MPH/MFA) or #)

VMED 5997 Farm to Table Study Program (1.0 cr.; Student Option; prereq #)
Explore food system within specific country while considering aspects of animal welfare/health, food safety, food protection, public health. Site visits along food supply chain. Discussions with government/private sector leaders. Interactive cross-culture group activities.

VMED 5998 Leadership to Address Global Grand Challenges (1.5 cr.; Student Option No Audit; prereq Grad or professional student)

**Veterinary Population Medicine (VPM)**

**College of Veterinary Medicine**

VPM 1550 Introduction to the horse including care, handling, and recognizing behaviors (1.0 cr.; A-F Grade Basis)
Horse breeds, colors, behaviors. Basic care/handling. Online course, but includes three labs working with live horses.

VPM 1905 Freshman Seminar (2.0 cr.; A-F Grade Basis) Freshman seminar.

VPM 2850 Health and Biodiversity (2.0 cr.; A-F Grade Basis)
Basics of biodiversity, human/animal health, and their interdependence. Strategies for sustainable health of all.

VPM 3700 Equine Reproduction and Breeding Management (2.0 cr.; A-F Grade Basis; prereq AnSc 3305 recommended)

VPM 4131 Immunology (3.0 cr.; Student Option)

**Vienna Executive MBA (VMBA)**

**Curtis L. Carlson School of Management**


VMBA 5701 Data Analysis and Decision Making (4.0 cr.; A-F or Audit) Exploratory data analysis, basic inferential procedures, statistical process control, regression analysis, decision models.

VMBA 5702 Financial Management (4.0 cr.; A-F or Audit) Theory/practice of finance from an analytical approach. Students apply concepts of risk, return, valuation to decisions that a corporate financial officer or person engaged in small business must make about sources/uses of funds during changing financial markets.

VMBA 5703 Marketing Management (4.0 cr.; A-F or Audit) Developing/implementing most appropriate combination of variables to carry out a firm's strategy in its target markets. Analytic perspectives, concepts, decision tools of marketing for product offering decisions, distribution channel decisions, pricing decisions, communication program decisions.

VMBA 5704 Managing People and Organizations (4.0 cr.; A-F or Audit) Theories/frameworks for analyzing behavior of individuals, groups, organization itself. Emphasizes making decisions, developing action plans. Concepts/principles associated with function of human resource management (e.g., personnel selection, reward/compensation, collective bargaining).

VMBA 5705 Operations Management (4.0 cr.; A-F or Audit) Operations management function in different types of organizations. Emphasizes productive, innovative, competitive operations. Concepts/principles related to management of quality/innovation within service/manufacturing organizations.


VMBA 5707 Economics in Transition (8.0 cr.; A-F or Audit) Technological, political, and ethical forces that are shaping the competitive environment. Theoretical considerations. Business responses to specific issues. Projects/cases for companies in East Central Europe.

VMBA 5709 Info Tech Mgmt (8.0 cr.; A-F or Audit) Various information technologies, their applications. Competitive advantages associated with information technology, organizational/managerial implications.


VMBA 5712 Strategies for a Global Company: an Integrative Perspective (6.0 cr.; A-F or Audit) Multi-disciplinary perspectives from strategic marketing, corporate strategy, operations management. Involvement of faculty/corporate executives. Site visits to global companies, student projects. Capstone course.

VMBA 5713 Negotiations and Conflict Management (4.0 cr.; A-F Grade Basis) Typical challenges faced when negotiating. Strategies for managing challenges and improving skills as a negotiator and conflict manager.

VMBA 5714 Financial Accounting (4.0 cr.; A-F or Audit)
University of Minnesota Twin Cities Undergraduate Catalog


**Vietnamese (VIET)**

**College of Liberal Arts**

**VIET 1015 Accelerated Beginning Vietnamese**

(5.0 cr.; Student Option; prerequisite Ability in basic spoken Vietnamese)


**VIET 1016 Accelerated Intermediate Vietnamese**

(5.0 cr.; Student Option; prerequisite 1015 or #)


**Warsaw Executive MBA (WMBA)**

Curtis L. Carlson School of Management

**WMBA 5606 Economic Essentials for Business**

(1.5 cr.; A-F or Audit)

Managerial economics, economics of public sector. Tools of economists. The market, the state.

**WMBA 5621 Field Project**

(12.0 cr.; A-F or Audit)

Personal involvement, practical teamwork. Students define problem; gather, analyze, evaluate data; develop managerial recommendations; prepare/present report.

**WMBA 5627 Business Ethics**

(1.5 cr.; A-F or Audit)

Ethical dimension of business decision making in a market economy. Does behaving ethically mean more than behaving legally? Do managers have responsibilities to parties other than stockholders? How can managers balance potentially conflicting obligations? Is there a logical/empirical relationship between ethical behavior and profitability? Ethical dilemmas in a variety of business settings.

**WMBA 5628 Policy Analysis**

(3.0 cr.; A-F Grade Basis)

Students apply several methods of policy analysis in real situations drawn from experience of developed market economies. Students examine case studies on competition policy, trade policy, implementation of cost-benefit analysis, and efficient contract design in business. Analysis in context, strengths/weaknesses of various analytical techniques/approaches. Seminar. Cases form basis for student presentations/discussion.

**WMBA 5629 Management Challenges**

(1.5 cr.; A-F Grade Basis)

Overview of ideas, theories, and concepts of complex/hybrid organizational/management systems. Perspectives on organizations.

**WMBA 5650 Management Challenges and Organizational Behavior**

(3.0 cr.; A-F or Audit)


**WMBA 5651 Human Resources Management**

(3.0 cr.; A-F or Audit)

Human resources issues from managerial perspective. External environment in which firm operates, characteristics of its workforce. The firm's developed culture. Strategy of the organization, technology of production, organization of work. Framework for managing human resources strategically.

**WMBA 5652 Economic Essentials for Business**

(1.5 cr.; A-F or Audit)

Managerial economics, economics of public sector. Some concepts of economics. Tools of an economist, the market, the state.

**WMBA 5653 Managerial Economics**

(3.0 cr.; A-F or Audit)

Tools, economics principles that provide overview of competition/cooperation in different environments. Emphasizes practical implications of principles.

**WMBA 5654 Business Law**

(3.0 cr.; A-F or Audit)


**WMBA 5655 Data Analysis and Reasoning**

(3.0 cr.; A-F or Audit)

Exploratory data analysis, inferential procedures, regression analysis, and time series analysis in a business setting. Overview of graphical/numerical methods for summarizing data. Use of inferential statistics. Focuses on sampling distribution of a statistic.

**WMBA 5656 Financial Accounting**

(3.0 cr.; A-F or Audit)

Introduction to accounting system used by firms to measure/report their economic performance and financial position to external constituents, such as stockholders, creditors, and potential investors. Basic accounting model, its strengths/shortcomings.

**WMBA 5657 Managerial Accounting**

(3.0 cr.; A-F or Audit)


**WMBA 5658 Financial Management**

(4.5 cr.; A-F or Audit)


**WMBA 5659 Strategic Marketing Management**

(4.5 cr.; A-F or Audit)

Marketing concepts/analysis, strategy/planning in different market conditions. Lectures, readings, case discussions, computer simulation.

**WMBA 5660 Operations and Logistics Management**

(4.5 cr.; A-F or Audit)

Operations/business logistics as field of managerial responsibility. Linkages between logistics, operations, and other managerial disciplines, such as marketing and finance.

**WMBA 5661 Managing in an International Environment**

(4.5 cr.; A-F or Audit)

Policies to balance constraints produced by globalization and regional economic integration, in order to reduce transaction costs for business/public.

**WMBA 5662 Macroeconomic Business Environment**

(3.0 cr.; A-F or Audit)

Students apply methods of decision-making, and of business/public policy analysis, in various real situations drawn from experience of developed market economies.

**WMBA 5663 Business Ethics**

(1.5 cr.; A-F or Audit)

Ethical dimension of business decision-making in a market economy. Does behaving ethically mean more than behaving legally? Do managers have responsibilities to parties other than stockholders? How can managers balance potentially conflicting obligations? Is there a logical relationship between ethical behavior and profitability? Ethical dilemmas in various business settings.

**WMBA 5664 Strategic Management**

(4.5 cr.; A-F or Audit)

Integrated top-executive point of view on successful managing of diverse businesses in a challenging game with competitors. Analytical skills, creative synthesis of diverse factors, individual/team work, information search, problems formulation. Decision making under conditions of time pressure, uncertainty, ambiguity, and risk.

**WMBA 5665 Management Information Systems**

(3.0 cr.; A-F or Audit)

Information technology/systems. Data flow diagrams, data modeling, electronic commerce, HTML, Web design, ERP systems, database management systems, business process re-engineering.

**WMBA 5666 Effective Decisions**

(1.5 cr.; A-F or Audit)

Identifying barriers to effective decision making in business. Different forms of decision making. Methods of overcoming barriers and managing practical difficulties.

**WMBA 5667 Concentration**

(1.5 cr.; A-F or Audit)

Students take at least three electives: one of limited choice and two of free choice. List of options changes yearly.

**WMBA 5668 Concentration**

(1.5 cr.; A-F or Audit)

Students take at least three electives: one of limited choice and two of free choice. List of options changes yearly.

**WMBA 5669 Concentration**

(1.5 cr.; A-F or Audit)

Students take at least three electives: one of limited choice and two of free choice. List of options changes yearly.

**WMBA 5670 Field Project**

(12.0 cr.; A-F or Audit)

Students define problem; gather, analyze, and evaluate data; develop managerial
recommendations; and prepare/present a report.

WMBA 5571 Managing Project Operations (1.0-1.5 cr.; A-F or Audit)
Issues/concepts related to managing projects in organizations. Project planning/organization, budgeting/control, project life cycles, organization of workflow, project planning elements. Organizational forms, conflict resolution, leadership/task management in project environment. Project scheduling: WBS, PERT, simulation, resource constrained scheduling.

WMBA 5672 Action-oriented Strategy Mapping (or What to Do When Thinking Matters) (1.5 cr.; A-F Grade Basis)
AOSM technique for linking strategic thinking, acting, and learning. Helping make sense of complex problems and communicating to oneself/others what might be done about them.

WMBA 5673 Strategic Brand Management (1.5 cr.; A-F Grade Basis)
Warshall Executive MBA: Strategic Brand Management

WMBA 5674 Manager's Self Development (1.5 cr.; A-F or Audit)
Concentration course for Warsaw Executive MBA students.

WMBA 5694 International Residency (12.0 cr.; A-F Grade Basis)
Perspective on U.S./international business practices. Global business strategy coursework, corporate site visits.

WMBA 5695 Entering Entrepreneurship from IDEA to IPO (1.5 cr.; A-F Grade Basis)
Enterprise entrepreneurship from IDEA to IPO.

WMBA 5696 Developing a New High-Growth Business (1.5 cr.; A-F Grade Basis)
Entrepreneurship as a business phenomenon, whether as a corporate or independent venture or as an alliance. How to apply knowledge to new-business development process.

WMBA 5697 Corporate Restructuring for Value (1.5 cr.; A-F Grade Basis)
Corporate restructuring for value.

WMBA 5698 Financial Risk Management (1.5 cr.; A-F Grade Basis)
Financial risk management. Ways for a firm to reduce risk.

WMBA 5699 Technology Marketing (1.5 cr.; A-F or Audit)
Marketing/management side of technology. Strategic decision problems in technology marketing/management. How to address these decision problems. Technology trends, drivers shaping the economy.

WMBA 5700 Developing Management Skills (1.5 cr.; A-F Grade Basis)

WMBA 5701 Manager's Development Path (1.5 cr.; A-F Grade Basis)
Warshall Executive MBA elective course.

Water Resources Science (WRS)
College of Food, Agricultural and Natural Resource Sciences

WRS 5101 Water Policy (3.0 cr.; Student Option; prereq Grad student or #)
Socio-cultural, legal, and economic forces that affect use of water resources by individuals/institutions. Historical trends in water policy, resulting water laws in the United States. Institutional structures whereby water resources are managed at federal, state, and local levels.

WRIS 5241 Ecological Risk Assessment (3.0 cr.; Student Option; prereq #)
Evaluating current/potential impact of physical, chemical, and biological agents on ecosystems. Identifying ecological stressors, assessing level of exposure, measuring ecological responses, communicating/managing risks. Class participation, two reaction papers, final exam, small-group project.

Writing Studies (WRIT)
College of Liberal Arts

WRIT 1201 Writing Studio (4.0 cr.; A-F Grade Basis; prereq Placement in WRIT 1201)

WRIT 1301 University Writing (4.0 cr.; A-F Grade Basis; prereq Placement in WRIT 1301)

WRIT 1401 Writing and Academic Inquiry (4.0 cr.; A-F Grade Basis; 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 (3.0 cr.; A-F Grade Basis; prereq Fr)
Topics vary.

WRIT 1908W Topics: Freshman Seminar (3.0 cr.; A-F or Audit; prereq Fr)
Topics specified in Class Schedule.

WRIT 1910W Topics: Freshman Seminar (3.0 cr.; Student Option; prereq Fr)
Topics vary.

WRIT 3001 Professional Practices in Scientific and Technical Communication (3.0 cr.; A-F or Audit)

WRIT 3029W Business and Professional Writing (3.0 cr.; Student Option)
Practice writing for various professional purposes/audiences, using appropriate styles, tones, and organizational elements. Potential genres include proposals, reports, web content, email, executive summaries, job search portfolios. Attention to workplace collaboration and broader issues of professional literacy.

WRIT 3101W Writing Arguments (3.0 cr.; A-F or Audit; prereq Soph or Jr or Sr)

WRIT 3102W Public Writing (3.0 cr.; A-F Grade Basis; prereq Soph or Jr or Sr)
Practice and study of public writing beyond the academy or professions. Examine public documents and apply critical/rhetorical analysis regarding audience, purpose, message, power, and context. Students conduct research/write documents for public audiences on contemporary issues of interest.

WRIT 3152W Writing on Issues of Science and Technology (4.0 cr.; A-F or Audit)
Read books/articles, discuss, and write about major issues in science/technology. Possible topics: DNA and human genome. Animal/human interaction. Global warming; Alternative energies; Animal/human cloning and stem-cell research. Vaccines from Smallpox to AIDS. Why civilizations collapse.

WRIT 3221W Communication Modes and Methods (4.0 cr.; Student Option; prereq Soph or Jr or Sr)
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 (3.0 cr.; A-F or Audit; 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 (3.0 cr.; Student Option; 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 (1.0-3.0 cr.; Student Option)
See Class Schedule.

WRIT 3291 Independent Study (1.0-3.0 cr.; Student Option; prereq #, %)
Supervised reading and research on topics not covered in regularly scheduled offerings. Intended primarily for upper division undergraduate students.

WRIT 3315 Writing on Issues of Land and the Environment (3.0 cr.; A-F or Audit; 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 Present (3.0 cr.; A-F or Audit; prereq Soph or Jr or Sr or #)

Courses listed in this catalog are current as of January 1, 2012. For up-to-date information, visit www.catalogs.umn.edu.
WRIT 3371 Technology, Self, and Society (3.0 cr.; A-F or Audit; prereq Soph or Jr or Sr)
Cultural history of American technology. Social values that technology represents in shifts from handicraft to mass production/consumption and in modern transportation, communication, and bioengineering. Ethical issues in power, work, identity, and our relation to nature.

WRIT 3381W Writing and Modern Cultural Movements (3.0 cr.; A-F; Audit)
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 3441 Editing, Critique, and Style (3.0 cr.; A-F Grade Basis; prereq Soph or Jr or Sr)

WRIT 3470 Special Topics in Communication Skills (2.0 cr.; Student Option)
Topics vary. see current Class Schedule.

WRIT 3533 Roles of the Reader (3.0 cr.; A-F or Audit; 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 (4.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; prereq Soph or Jr or Sr or #)
How persuasive communication is tailored to the Internet; how Internet technologies enable/limit persuasion; how to adapt rhetorical theory to 21st century digital writing; ethical issues, including free speech, copyright, fair use, privacy; rhetorics of social networks.

WRIT 3671 Visual Rhetoric and Document Design (3.0 cr.; A-F or Audit; 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 3672W Project Design and Development (3.0 cr.; A-F or Audit; prereq Jr or Sr)
Students study, plan, research, design, and develop technical communication print documents, including documentation, brochures, and newsletters. Workplace project processes. Develop production-quality documents.

WRIT 3701W Rhetorical Theory for Writing Studies (4.0 cr.; Student Option; prereq Soph or Jr or Sr or #)

WRIT 3751W Seminar: Theory and Practice of Writing Consultancy (4.0 cr.; Student Option; 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 (3.0 cr.; A-F Grade Basis; prereq 3562W, 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 4320 Topics in Travel Writing (3.0 cr.; A-F or Audit; 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 (3.0 cr.; A-F Grade Basis; 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 (3.0 cr.; Student Option; prereq [S&T TC major, [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 4573W Writing Proposals and Grant Management (3.0 cr.; A-F or Audit; prereq [[3562W or 3029W or equiv]. [Jr or Sr or STC major or grad student]] or #) Research funding sources. Interpreting RFP or program announcement. Letters of intent. Grant preparation, following guidelines of RFP or program announcement. Proposals for nonprofits or research/business.

WRIT 4662W Writing With Digital Technologies (4.0 cr.; A-F or Audit; 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 4664W Science Writing for Popular Audiences (3.0 cr.; A-F or Audit; prereq 3562 or #) How science is translated for popular audiences. Rhetorical theory to critique popularized articles. Developing heuristic for writing articles. Controversial issues in moving from science as science to science as popular.

WRIT 4980 Senior Seminar in Writing Studies (3.0 cr.; A-F Grade Basis; 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 4995 Senior Project (1.0 cr.; A-F Grade Basis; prereq [3671 or 3701 or 4501 or 3102W or 3424W or 4662W or 3361 or 3381W or 3577W], Scientific and Technical Communication major) Senior project addressing topic in writing studies related to WRIT course. Taken in conjunction with any one of the following courses: 3671, 3701, 4501, 3102W, 3244W, 4662W, 3361, 3381W, or 3577W.

WRIT 5001 Introduction to Graduate Studies in Scientific and Technical Communication (3.0 cr.; A-F Grade Basis; 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 5051 Graduate Research Writing Practice for Non-native Speakers of English (3.0 cr.; Student Option; prereq Grad student) Graduate-level writing techniques/formats for summaries, critiques, research, and abstracts. Persuasion, documentation, structure, grammar, vocabulary, field-specific requirements. Writing through several drafts, using mentor in specific field of study. Revising/editing to meet graduate standards. Discussions.

WRIT 5052 Graduate Research Presentations and Conference Writing for Non-Native Speakers of English (3.0 cr.; Student Option; 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 5112 Information Design: Theory and Practice (3.0 cr.; A-F or Audit; 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 (3.0-6.0 cr.; S-N or Audit; 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 (3.0 cr.; Student Option; prereq Grad student or #)
Topics specified in Class Schedule.
WRIT 5291 Independent Study, Reading, and Research (1.0-3.0 cr.; Student Option; prereq #, %) Supervised reading/research on advanced projects not covered in regularly scheduled offerings.


WRIT 5531 Introduction to Writing Theory and Pedagogy (3.0 cr.; A-F or Audit; prereq Grad student) Pedagogical philosophy/methodology in composition, primarily first-year writing. Theories underlying teaching/tutoring with technology.

WRIT 5532 Writing Pedagogy Practicum (1.0 cr.; S-N Grading Basis; 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 (3.0 cr.; A-F or Audit) 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 (3.0 cr.; A-F or Audit) Students primarily use electronic editing methods. Editor's responsibilities, relationship to writers, roles within an organization, style guides, ethical choices. Editing in global setting. Editing/style for visual design and online documents.

WRIT 5570 Minnesota Writing Project Directed Studies (1.0-3.0 cr.; A-F or Audit) Guided individual research into current theories/practices of writing and writing pedagogy.

WRIT 5564 Science Writing for Popular Audiences (3.0 cr.; A-F or Audit; 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 5571 Visual Rhetoric (3.0 cr.; A-F Grade Basis; prereq Jr or Sr or grad student) Range/development of visuals, especially those in science/technology. Vocabularly for commenting on, criticizing, and creating visuals.

WRIT 5775 The Rhetorical Tradition: Classical Period (3.0 cr.; A-F Grade Basis) Rhetoric in the Classical world and recurring themes that constitute "the rhetorical tradition." Epistemological/ethical status and sociopolitical importance of ancient rhetorical training and discourse. Works by Isocrates, Plato, Aristotle, Cicero, Quintilian, and others. Prepares students for preliminary examinations/seminars in rhetoric.

WRIT 5776 The Rhetorical Tradition: Modern Era (3.0 cr.; A-F or Audit) Core works in modern/contemporary rhetorical theory. Twentieth-century revivals of and challenges to the Aristotelian rhetorical tradition. Units devoted to Enlightenment rhetoric, in New Rhetorics of R. A. Richards, Kenneth Burke, and Chaim Perelman; feminist rhetorical theory, historiography, and critique; deconstruction/post-structuralism. Prepares students for preliminary examinations/seminars in rhetoric.

Youth Development and Research (YOST) College of Education and Human Development

YOST 1001 Seeing Youth, Thinking Youth: Media, Popular Media, and Scholarship (3.0 cr.; Student Option) 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 2101 Urban Youth and Youth Issues (4.0 cr.; Student Option; prereq 1001 or #) What it is like to be a young person in a city, in the United States and worldwide.

YOST 2241 Experiential Learning (4.0 cr.; Student Option; 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 3001 Introduction to History & Philosophy of Youthwork (4.0 cr.; Student Option; prereq 2xxx or #) Foundations of youthwork. Where contemporary American youthwork stands, particularly in comparison with international perspectives on youth/youthwork.

YOST 3031 International Youthwork (3.0 cr.; A-F Grade Basis; prereq 2xxx 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. Socio-political analysis of globalization, its impact on young people, youthwork, and youth policy worldwide.

YOST 3032 Adolescent and Youth Development for Youthworkers (4.0 cr.; Student Option; prereq 1001 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 Youthwork: Orientations and Approaches (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; 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 3240 Special Topics in Youth Studies (2.0-8.0 cr.; Student Option; 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 (1.0-9.0 cr.; Student Option; prereq #) Independent reading or research under faculty supervision.

YOST 4180H Honors Capstone Project (2.0 cr.; A-F Grade Basis; prereq YoST honors or #) Individualizes the honors experience by connecting aspects of major program with special academic interests.

YOST 4196 Youthwork Internship (4.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 1001 or 2002W or #) How to communicate sensitively/effectively with adolescents and their concerned persons about sexuality in everyday life. Focuses on healthy sexual development (physical, emotional, ethical) and sexual diversities. Adolescent sexual issues; gender, body image, disease, sexual violence, intimacy, sex in cyberspace.

YOST 4314 Theater Activities in Youthwork and Education (2.0 cr.; Student Option; prereq 1001 or 2101) Empowering methods of personal/creative development using experiential learning and theater activities to enhance creativity/imagination. Approaches to working with youth in school and youth agency settings.

Experiential learning, improvisational theater/practice.

YOST 4315 Youthwork in Schools (4.0 cr.; Student Option; 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: "school" and "not school."

YOST 4316 Media and Youth: Learning, Teaching, and Doing (2.0 cr.; Student Option; 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 (3.0 cr.; Student Option; prereq 1001 or 2101 or #, 3101 recommended)
Consequences of organized violence on everyday lives/futures of youth. Violence in conflict/post-conflict societies. Role of youthwork under these circumstances.

YOST 4319 Understanding Youth Subcultures
(3.0 cr.; Student Option; 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
(2.0 cr.; Student Option; 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
(2.0 cr.; Student Option; 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
(2.0 cr.; A-F Grade Basis; prereq [[1001 or 2002], 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 4325 Improving Everyday Youthwork: Practical Program Evaluation
(3.0 cr.; Student Option; prereq [1001 or 2101], 3234 or #)
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
(4.0 cr.; Student Option; partial credit)
Adolescent spirituality, its relation to working with young people. Faith/spirituality as necessary for healthy youth development. Knowledge, attitudes, and skills to recognize spirituality in cultural, social, economic, and political worlds.

YOST 4402 Youth Policy: Enhancing Healthy Development in Everyday Life
(4.0 cr.; Student Option; prereq [1001, 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 4403 Indirect Youthwork: Working on Behalf of Young People
(4.0 cr.; Student Option; prereq [1001 or 2101], 3234 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
(4.0 cr.; Student Option; 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 research/evaluation study.

YOST 4501 International Youthwork
(3.0 cr.; Student Option; prereq 2xxx 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. Socio-political analysis of globalization. Its impact on young people, youthwork, and youth policy worldwide.

YOST 5032 Adolescent and Youth Development for Youthworkers
(4.0 cr.; Student Option; prereq [1001 or 2001 or 2002W or 2101], [any Psych or CPsy course])
Application of theory/research about children/adolescents. How findings/theories facilitate understanding of behavior.

YOST 5234 Youth Agencies, Organizations, and Youth Service System
(3.0 cr.; Student Option; prereq [Two soc/anth courses, work experience in [youth agency or org] or #]
Communities/governmental responses to young people. 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 5240 Special Topics in Youth Studies
(2.0 cr.; Student Option; 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 specific topic and student needs. Topic announced in advance.

YOST 5291 Independent Study in Youth Studies
(1.0-8.0 cr.; Student Option)
Independent reading and/or research under faculty supervision.

YOST 5301 Communicating With Adolescents About Sexuality
(3.0 cr.; Student Option; prereq [Upper div AdPy course, exper working with youth or #)
How to communicate sensitively/effectively with adolescents and their concerned persons about sexuality in everyday life. Healthy sexual development (physical, emotional, ethical), sexual diversities. Gender/body image, disease, sexual violence, intimacy, sex in cyberspace.

YOST 5314 Theatre Activities in Youthwork and Education
(2.0 cr.; Student Option; prereq 1001 or 2101)
Using experiential learning and theater activities to enhance creativity/imagination of youthworkers/educators. Approaches to working with youth in school/agency settings. Application of experiential learning and improvisational theater/praxis.

YOST 5315 Youthwork in Schools
(4.0 cr.; Student Option; 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 “school” and “not school.”

YOST 5316 Media & Youth: Learning, Teaching, and Doing
(2.0 cr.; Student Option; prereq 1001 or 2101 or #)
Youth are targets, producers, and consumers of a variety of media. This course is about understanding and learning to use a variety of these sources with young people to enhance their development and civic engagement.

YOST 5319 Understanding Youth Subcultures
(3.0 cr.; Student Option; 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 5322 Work With Youth: Families
(2.0 cr.; Student Option; prereq 1001 or 2002W or #)

YOST 5323 Work with Youth--Groups
(2.0 cr.; Student Option; 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
(4.0 cr.; A-F or Audit; prereq [2001, one course each in [Anth, Soc, CPsys] 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
(4.0 cr.; Student Option; 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.

YOST 5952 Every Day Lives of Youth
(3.0 cr.; A-F or Audit)
Youth as idea/lived-reality in scholarship, public discourse, and professional practice. Building practice of work with or on behalf of youth.

YOST 5954 Experiential Learning: Pedagogy for Community and Classroom
(3.0 cr.; Student Option)
Relationship between experience and learning in community and school settings. Emphasizes intentional application of experiential learning theory/practice to educational program development.

YOST 5955 Organizational Approaches to Youth Development
(3.0 cr.; A-F or Audit)
Historical contexts, theoretical frameworks, organizational practices, and public policies that shape nonformal educational experiences of youth in community-based or school-linked settings.

YOST 5958 Community: Context for Youth Development
(3.0 cr.; A-F or Audit)
Perspective taken is youth's place in the community and events in the life of the community. Examines youth as idea/lived-reality in scholarship, public discourse, and professional practice.
Issues/policies in family, school, and community that drive the professional practice of community-based youth work. Practical projects explore what it means to be local, to build social capital for youth, and to involve youth in community change.

**YOST 5960 Seminar in Youth Development Leadership** (1.0-4.0 cr.; S-N or Audit; prereq YDL student or #)
Group study of topics/issues. Course proposal, educational program development. Students participate in co-created learning experience with a group of peers. Four-course sequence.

**YOST 5962 Leadership Field Experience: Youth Development** (4.0 cr.; S-N Grading Basis; prereq YDL student)
Demonstration of leadership in practice. Project on youth, experiential pedagogy, and community/program settings. Focuses on public policy, advocacy, evaluation, pedagogical issues, program design, curriculum development, or applied research.

**YOST 5972 Education in the Community** (3.0 cr.; Student Option)
Models of community/education, their intersections. Twentieth century practice of education in the community in the U.S. Examples from other cultures/times.

**YOST 5974 The Democratic Learning Community** (3.0 cr.; Student Option)
Historical/theoretical development of how leading thinkers have conceptualized education centered in the community. Colonial, Native American, transcendentalist, progressive, experiential, critical, and feminist perspectives.