Phl 8207. Seminar: Psychopharmacology. (1 cr. Prereq–#)
For graduate students and postdoctoral interns interested in studies and research associated with psychotropic drugs and chemicals. Neurochemistry, pharmacology, and behavior as antecedent or consequential variables. Some seminars devoted to biomedical ethics.

Phl 8208. Neuropsychopharmacology. (3 cr; A-F only. Prereq–[5212, 6112, Psy 5021, Psy 5061] or #)
Methodologies to study relationships between drugs and biochemical, behavioral, and neurophysiological consequences. Functional biogenic amine, peptidergic, other pathways. How manipulations alter neuronal function or behavior. Feedback mechanisms, induction, inhibition. Reinforcement of, tolerance to, or dependence on drugs of abuse: stimulants, hallucinogens, depressants, opiates. Student presentations. Offered alternate years.

Phl 8217. Problems in Investigative Pharmacology. (1 cr; S-N only. Prereq–#)
Presentation and discussion of contemporary research problems, investigative approaches, and methodologies in experimental pharmacology. Related to cardiovascular, renal, endocrine, and autonomic pharmacology; neuropharmacology; psychopharmacology; chemistry; toxicology; and molecular pharmacology.

Phl 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

Phl 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

Phl 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]) NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral

Phl 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]: NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Phl 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]: NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

Philosophy (Phil)
Department of Philosophy
College of Liberal Arts

Phil 5201. Symbolic Logic I. (4 cr. 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. Metatheoretical proofs and methods, including proof by mathematical induction and proof of consistency and completeness.

Phil 5202. Symbolic Logic II. (4 cr. 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. (3 cr. Prereq–5201 or #)
Axiomatic and semantic treatment of propositional and predicate modal logics; problems of interpreting modal languages.

Phil 5221. Philosophy of Logic. (3 cr. 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 cr. Prereq–5202 or 5xxx math course)
Major philosophical questions arising in connection with mathematics: What is mathematics about? How do we know the mathematics we do? What is the relation between mathematics and the natural sciences. Selected readings of leading contributors such as Frege, Dedekind, Russell, Hilbert, Brunner, Godel, Quine.

Phil 5325. Biomedical Ethics. (3 cr. Prereq–# for undergraduates)
A survey of major topics and issues in biomedical ethics including patients’ rights and duties, informed consent, confidentiality, ethical issues in medical research, the initiation and termination of medical treatment, euthanasia, abortion, and the allocation of medical resources.

Phil 5415. Philosophy of Law. (3 cr. Prereq–1003 or 1004 or 3302 or social science major or #)
Analytical accounts of law and legal obligation.

Phil 5506. Philosophy of Quantum Mechanics. (3 cr)
Problems of interpretation in ordinary (nonrelativistic) quantum mechanics. Two-slit experiment, Schrodinger cat paradox (measurement problem), Einstein-Podolsky-Rosen paradox. Leading approaches to interpretation (Copenhagen, hidden variables, universal wave function) and their connections with philosophical issues.

Phil 5760. Selected Topics in Philosophy. (3 cr [max 9 cr]. Prereq–3xxx–5xxx course in phil or #)
Philosophical problems of contemporary interest. Topics specified in Class Schedule.

Phil 5993. Directed Studies. (1-3 cr [max 6 cr]. Prereq–#, Δ, ∆)
Guided individual reading or study.

Phil 8010. Workshop in History of Philosophy. (1 cr [max 4 cr]. Prereq–#)
Topics vary by offering.

Phil 8080. Seminar: History of Ancient and Medieval Philosophy. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8081. Seminar: History of Philosophy—Ancient Philosophers. (3 cr. Prereq–#)
Major developments in ancient Greek philosophic thought; methods and role of history of philosophy in discipline of philosophy.

Phil 8085. Seminar: History of Philosophy—Modern Philosophers. (3 cr. Prereq–#)
Major developments in modern philosophic thought; methods and role of history of philosophy in discipline of philosophy.

Phil 8090. Seminar: History of Modern Philosophy. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8100. Workshop in Epistemology and Metaphysics. (1 cr [max 4 cr]. Prereq–# [epistemology or metaphysics course], #)
Topics vary by offering.

Phil 8110. Seminar: Metaphysics. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8130. Seminar: Epistemology. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8200. Workshop in Logic and Philosophy of Mathematics. (1 cr [max 4 cr]. Prereq–# [logic or 4xxx math or #]
Topics vary by offering.

Phil 8210. Seminar: Logical Theory. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8220. Seminar: Philosophy of Mathematics. (3 cr [max 6 cr]. Prereq–#)
Topics such as significance of limiting metatheorems (Goedel, et al.), assessment of major foundational programs (set theoretic, modern Hilbertian, constructivist), modal/structuralist alternatives to standard platonism.

Phil 8300. Workshop in Moral and Political Philosophy. (1 cr [max 4 cr]. Prereq–# [moral or political philosophy], #)
Topics vary by offering.

Phil 8310. Seminar: Moral Philosophy. (3 cr [max 9 cr]. Prereq–#)
Systematic study of concepts and problems relating to ethical discourse.

Phil 8320. Seminar on Medical Ethics. (3 cr [max 6 cr]. Prereq–#)
Patients’ rights/duties, informed consent, confidentiality, ethical issues in medical research, initiation/termination of medical treatment, euthanasia, abortion, maternal/fetal conflicts, allocation of medical resources.

Phil 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

Phil 8410. Seminar: Philosophy of Law. (3 cr [max 6 cr]. Prereq–#)
Primarily for law students and advanced political science, history, or sociology majors or minors.

Phil 8420. Seminar: Political Philosophy. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

Phil 8500. Workshop in Aesthetics. (1 cr [max 4 cr]. Prereq–# [aesthetics course], #)
Topics vary by offering.

Phil 8510. Seminar: Aesthetics Studies. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8550. Seminar: Philosophy of Religion. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.

Phil 8600. Workshop in the Philosophy of Science. (1 cr [max 4 cr]. Prereq–# [phil of sci course], #)
Topics vary by offering.

Phil 8601. Seminar: Scientific Inquiry. (3 cr. Prereq–#)
Philosophical theories of the nature of scientific methods for evaluating scientific hypotheses, role of experimentation in science, and of how hypotheses come to be accepted within a scientific community.

Phil 8602. Seminar: Scientific Representation and Explanation. (3 cr. Prereq–#)
Contemporary issues concerning representation and explanation of scientific facts.

Phil 8605. Seminar: History of the Philosophy of Science. (3 cr. Prereq–#)
Historical development 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 8606. Seminar: Philosophy of Medicine and the Biomedical Sciences. (3 cr. Prereq–#)
Aims and goals of medicine; concepts of health, illness, and disease; nature of reasoning in clinical medicine; theoretical evolution in medicine; and role of values in practice of medicine and healthcare.

Phil 8610. Seminar: Philosophy of the Physical Sciences. (3 cr [max 6 cr]. Prereq–#)
Topics specified in Class Schedule.

Phil 8620. Seminar: Philosophy of the Biological Sciences. (3 cr [max 6 cr]. Prereq–#)
Topics vary by offering.
Courses

Phil 8640. Seminar: Philosophy of the Cognitive Sciences. (3 cr; max 6 cr; Prereq–#) Philosophical framework for analyzing cognitive sciences. Recent developments in metaphysics/ epistemology. Nature of scientific theories, methodologies, and cognitive sciences, relations among cognitive sciences. Relation of cognitive science to epistemology and to various philosophical problems. Topics very by offering.

Phil 8660. Seminar: Social and Cultural Studies of Science. (3 cr [max 6 cr]; Prereq–#) Review of recent work; analysis of theoretical and methodological differences among practitioners; selected responses from historians and philosophers of science.

Phil 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; N GA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Phil 8670. Seminar: Philosophy of Science. (3 cr [max 6 cr]; Prereq–#) Topics vary by offering.

Phil 8777. Thesis Credits: Master’s. (1-18 cr; max 50 cr; N GA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Phil 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; N GA. Prereq–Max 18 cr per semester or summer; 24 cr required)

Phil 8893. Directed Study. (1-3 cr [max 6 cr]; Prereq–#)

Phil 8904. Directed Research. (1-3 cr [max 6 cr]; Prereq–#)

Physical Medicine and Rehabilitation (PMed)
Department of Physical Medicine and Rehabilitation

Medical School

PMed 5121. Issues in Mental Health. (1 cr; S-N only. 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 illness.

PMed 5122. Descriptive Neurology. (1 cr [max 2 cr]; A-F only Prereq–OT or PT or #)
Relates neuroanatomical/neurophysiological principles to neurological conditions commonly seen in occupational/physical therapy practice.

PMed 5135. Advanced Biomechanics I: Kinematics. (2 cr; A-F only Prereq–#)
How to describe/meter movement. Emphasizes three-dimensional techniques. Lecture, laboratory, seminar discussion of basic and applied biomechanics, pathokinesiology, and rehabilitation literature. Classes held with 8135 registrants. Assignments vary for those registered at different levels.

PMed 5161. Theory of Physical Medicine and Rehabilitation Applied to Medical Sciences. (2 cr [max 2 cr]; A-F only 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.

PMed 5182. Functional Neuroanatomy and Neurophysiology. (4 cr; A-F only Prereq–Registered occupational therapy student or #)
Neuroanatomical structures as functional systems, basic neurophysiological concepts. Emphasizes applications for understanding/treating physical dysfunctions.

PMed 5215. Clinical Practice of Physical Therapy I. (1 cr; S-N only. Prereq–Regis PT student)
First of three-course sequence. Emphasizes sensitivity to needs of patients, families, and health-care coworkers. Patient handling techniques, communication skills, awareness of cultural differences, psychological aspect of disability, and use of community resources.

PMed 5216. Clinical Practice of Physical Therapy II. (1 cr; S-N only. Prereq–Registered 2nd yr PT student)
Second of a three-course sequence. Emphasizes sensitivity to needs of patients, families, and health-care coworkers. Patient-handling techniques, communication skills, awareness of cultural differences, psychological aspect of disability, use of community resources.

PMed 5217. Clinical Practice of Physical Therapy III. (1 cr; S-N only. Prereq–Registered 2nd-year PT student)
Third of three-course sequence. Sensitivity to needs of patients, families, and health-care coworkers. Patient handling techniques, communication skills, awareness of cultural differences, psychological aspect of disability, use of community resources. Offered summer session.

PMed 5223. Electrotherapy and Electrophysiological Testing. (2 cr; A-F only. Prereq–Regis PT student)
Theory and technique of movement analysis and treatment using electrotherapeutic and therapeutic devices.


PMed 5255. Clinical Internship I. (3 cr; S-N only. Prereq–Regis PT student)
Five-week, full-time internship. Select and perform physical therapy evaluation techniques, interpret results, define rationale for physical therapy service, develop a care plan, implement treatment program, and communicate patient/client care process as a physical therapy professional.

PMed 5260. Professional Issues in Physical Therapy. (3 cr; A-F only. Prereq–Regis PT student)
Current professional issues, dilemmas, and trends in health care. Evaluation and treatment skills in physical therapy specialty areas.

PMed 5282. Therapeutic Exercise II. (3 cr; A-F only. Prereq–Regis PT student)
Principles of neurophysiology, neurology, motor control, and motor learning as basis for therapeutic intervention in motor dysfunction.

PMed 5283. Musculoskeletal I. (4 cr; A-F only. Prereq–Regis PT student)
First of two-course sequence. Problem-solving approach to evaluating, treating, and preventing selected musculoskeletal conditions across the life span. Chart review, history taking, strength testing, functional testing, gait and posture examination, special orthopedic tests. Therapeutic exercises, orthopedic amputation, joint mobilization, splinting, patient education.

PMed 5284. Musculoskeletal II. (4 cr; A-F only. Prereq–Regis PT student)
Problem-solving approach to evaluating, treating, and preventing selected musculoskeletal conditions across life span. Chart review, history taking, strength testing, functional testing, gait/posture examination, special orthopedic tests. Therapeutic exercises, orthopedic amputation, joint mobilization, splinting, patient education. Second of two-course sequence.

PMed 5287. Neurorehabilitation I. (4 cr; A-F only. Prereq–Regis PT student)
Assessment and rehabilitation of patients with neurological conditions (e.g., cerebral vascular disease, traumatic brain injury, multiple sclerosis, Parkinson’s disease, amyotrophic lateral sclerosis). Utilizing treatment procedures, orthotics, and equipment to improve function and prevent, stabilize, or decrease impairments.

PMed 5288. Neurorehabilitation II. (4 cr; A-F only. Prereq–Regis PT student)

PMed 5293. Research Design in Physical Therapy. (3 cr; A-F only. Prereq–Registered 2nd yr PT student)
Predictive research, elementary statistical concepts, analysis of scientific literature. Tools to design experiments and analyze data acquired from student group projects. Design/statistical formats: risk analysis, multivariate regression analysis, design of reliability studies, traditional group designs. Students give preliminary presentation of analysis to their peers.

PMed 5294. Independent Study in Rehabilitation Science. (1-3 cr [max 3 cr]) Independent exploration into topics related to rehabilitation science.

PMed 5295. Clinical Education. (12 cr; S-N only. Prereq–Registered 3rd yr PT student)
Students must demonstrate proficiency in communication, team participation, and evaluation/treatment; predict outcomes; and manage a variety of patient diagnoses/problems consistently with good/safe judgment.

PMed 5300. Concepts for Occupational Therapy Practice. (4 cr; A-F only. Prereq–Regis OT or #)
Critical thinking, ethics, professional resources/organizations, patient-therapist relationship. Level I fieldwork experience.

PMed 5313. Therapeutic Occupation. (4 cr; A-F only. Prereq–Regis OT student or #)
Occupational therapy philosophy, history, and frames of reference. Activity analysis applied to purposeful, therapeutic activities for individuals and groups.

PMed 5341. Introduction: Evaluation and Intervention I. (4 cr; A-F only. Prereq–5339 or #)
Assessment/concepts/techniques. Application to patient populations with both mental/physical disabilities. Treatment planning/documentation.

PMed 5342. Compensatory Rehabilitation: Evaluation and Intervention II. (4 cr; A-F only. Prereq–5300, 5313 or #)
Assessment of daily living performance areas; adaptation techniques to compensate for performance deficits. Level I fieldwork experience.

PMed 5343. Specialty Topics: Evaluation and Intervention III. (4 cr; A-F only. Prereq–5342 and #)
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.

PMed 5344. Neurorehabilitation: Evaluation and Intervention IV. (5 cr; A-F only. Prereq–5343 or #)
Assessment/intervention related to perception, cognition, reflexes, sensory integration, and motor control. Application to individuals with multiple performance component deficits.

PMed 5360. Dynamics of Group Models. (2 cr; A-F only. Prereq–5313 or #)
Application of group/team dynamics in diverse professional settings.

PMed 5370. Theory of Occupation. (1 cr; A-F only. Prereq–Registered PT student or #)
Occupational therapy frames of reference, role of activity, and historical development of profession.

PMed 5375. Community Resources and Health-Care Issues. (2 cr; A-F only. 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 local, political or legislative level.
PMed 5376. Adult Education and Planning. (1 cr; A-F only. 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 meet therapeutic interventions. Student teaching unit, community based activity.

PMed 5380. Management of Occupational Therapy Services. (3 cr; A-F only. 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.

PMed 5391. Occupation across the Life Span. (3 cr; A-F only. Prereq—5313 or #) The well elderly, school therapy, work-related injuries/industrial rehabilitation. Fieldwork.

PMed 5392. Research in Occupational Therapy. (3 cr; A-F only. Prereq—5313 or #) Analysis of scientific literature, development of research proposals.

PMed 5393. Functional Anatomy and Kinesiology. (4 cr; A-F only. Prereq—Regis OT student or #) Gross human anatomy emphasizing skeletal, muscular, circulatory, and peripheral nervous systems of the extremities and includes cadaver lab sections. Analyzing functional human movement from a biomechanical perspective.

PMed 5394. Orthotics. (3 cr; A-F only. Prereq—5341 or Analysis) Design, construction and design of orthotic devices.

PMed 5395. Independent Study in Occupational Therapy. (1-4 cr [max 16 cr]. Prereq—Regis OT student or #) Supervised practical experience in classroom/laboratory teaching.

PMed 8188. Teaching Practicum. (1-5 cr; A-F only. Prereq—#) Supervised practical experience in classroom/laboratory teaching.

PMed 8192. Research Design in Physical Therapy. (3 cr; A-F only. Prereq—Grad PT major or #) Critical appraisal of current medical literature. Fundamentals of research design, data analysis, and medical writing.

PMed 8193. Research Problems in Physical Therapy. (1-4 cr [max 4 cr]; A-F only. Prereq—Grad PT major or #) Designing a research project to answer scientific question in physical therapy, collecting data, analyzing data, interpreting results, and defending the work to an examining committee.


PMed 8300. Research Seminar in Occupational Therapy. (1 cr; S-N only. Prereq—5392 or #) Critical review of research literature in occupational therapy. Issues related to ethical/successful conduct/publication of research. Designing a research project to answer scientific questions, methods to answer them. Speaking/writing persuasively on scientific topics.

PMed 8310. Research Problems in Occupational Therapy. (3-6 cr [max 6 cr]; S-N only. Prereq—5392, Plan B OT student or #) Individual, concentrated study of a problem in occupational therapy. Completion of Plan B project.

PMed 8320. Fieldwork Education in Occupational Therapy I, II. (6 cr; S-N only. Prereq—5343, 5344, 5380 or #) Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory and skills.

PMed 8321. Fieldwork Education in Occupational Therapy II. (1 cr; N only. Prereq—5343, 5344, 5380 or #) Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory and skills.

PMed 8322. Fieldwork Education in Occupational Therapy III: Optional. (1-6 cr; S-N only. Prereq—5343, 5344 or #) Optional fieldwork experience involving supervised practice in clinic or community agency with specialty focus. Sample topics: hand therapy, school therapy, clinical research. Students apply critical thinking through supervised application of theory and skills.

PMed 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

PT 8132. Research Seminar in Physical Therapy II. (1 cr; A-F only. Prereq—5313, Grad PT major) Scientific thinking in physical therapy. Preparation to execute research project or literature review. Analysis of current literature. Basic features of research design. Elements of evaluating treatment efficacy. Students interact with their research adviser and with research faculty in various specialties.

PT 8193. Research Problems in Physical Therapy. (1-7 cr [max 7 cr]; A-F only. Prereq—Grad PT major) Process of developing/completing a scholarly research project or literature review related to rehabilitation science. Type of research experience is determined by adviser.

PT 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

Physics (Phys)

School of Physics and Astronomy

Institute of Technology


Phys 5011. Classical Physics I. (4 cr. Prereq—4001 or equiv or #) Classical mechanics: Lagrangian/Hamiltonian mechanics, orbital dynamics, rigid body motion, special relativity.


Phys 5042. Analytical and Numerical Methods of Physics II. (4 cr. Prereq—5041 or #) Survey of mathematical techniques, both analytic and numerical, needed for physics. Application to physical problems.


Phys 5201. Thermal and Statistical Physics. (3 cr.; A-F only; S-N only. Prereq–Grad or equiv; primarily for grad students) Principles of thermodynamics and statistical mechanics. Selected applications such as kinetic theory, transport theory, and phase transitions.


Phys 5402. Radiological Physics. (4 cr. Prereq–1302 or 1402) Signal analysis, medical imaging, medical x-rays, tomography, radiation therapy, nuclear medicine, MRI, and similar topics.

Phys 5701. Solid-State Physics for Engineers and Scientists. (4 cr. Prereq–Grad or advanced undergrad in physics or engineering or the sciences) Crystal structure and binding; diffraction; phonons; thermal and dielectric properties of insulators; free electron model; band structure; semiconductors.

Phys 5702. Solid State Physics for Engineers and Scientists. (4 cr. Prereq–5701 or 4) Diamagnetism and paramagnetism; ferromagnetism and antiferromagnetism; optical phenomena; lasers; superconductivity; surface properties; ferroelectricity.

Phys 5950. Colloquium Seminar. (1 cr. Prereq–Grad or advanced undergrad in physics, A) Introduction to the research activities of the School of Physics and Astronomy.

Phys 5993. Directed Studies. (1-5 cr [max 15 cr]. Prereq–Grad or upper div phys major) Independent, directed study in physics in areas arranged by the student and a faculty member.

Phys 5994. Directed Research. (1-5 cr [max 15 cr]. Prereq–Grad) Problems, experimental or theoretical, of special interest to students. Written reports.

Phys 8001. Advanced Quantum Mechanics. (3 cr. Prereq–5002 or #) Topics in non-relativistic quantum mechanics; second quantization. Introduction to Diagrammatic and Green’s function techniques and to relativistic wave equations. Application of relativistic perturbation theory to particle interactions with electromagnetic field. Invariant interactions of elementary particles.


Phys 8012. Quantum Field Theory II. (3 cr. Prereq–8011 or #) Aspects of general theory of quantized fields, including space-time and discrete transformation properties, the CPT theorem, and the spin-statistics connection. Introduction to functional and path-integral methods. Renormalization group and asymptotic freedom. Semi-classical methods and instantons in gauge theories.

Phys 8013. Special Topics in Quantum Field Theory. (3 cr. Prereq–8012 or #) Includes non-perturbative methods in quantum field theory, supersymmetry, two-dimensional quantum field theories and their applications, lattice simulations of quantum fields, topological quantum field theories, quantum field theory methods applied to condensed matter physics, and string theory.

Phys 8100. Seminar: Problems of Teaching and Higher Education. (1 cr [max 3 cr]. Prereq–#) Lectures and informal discussions of courses and curricula, techniques, and materials important in undergraduate physics instruction; relation to general problems of higher education.


Phys 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent) Prerequisites.

Phys 8401. Atomic and Molecular Structure. (3 cr. Prereq–5002 or #) Understanding behavior of atoms and molecules in terms of basic interactions between electrons and nuclei and electromagnetic radiation. Applications made to condensed-matter physics, astrophysics, biophysics, and physical chemistry.

Phys 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent) Prerequisites.

Phys 8500. Plan B Project. (4 cr. Prereq–#; may be taken once to satisfy Plan B master’s project requirement; no cr toward PhD) Project topic arranged between student and instructor. Written report required.


Phys 8600. Seminar: Space Physics. (1 cr [max 6 cr]; S-N only, Prereq–#) Current topics in space physics and plasma physics.


Phys 8611. Cosmic Ray and Space Physics. (3 cr. Prereq–5012 or #) Properties of energetic particles in the heliosphere and in astrophysical environments; solar physics, including radiation and magnetic effects; solar wind and magnetohydrodynamics; physics of radiation belts.

Phys 8650. Advanced Topics in Space and Plasma Physics. (3 cr. Prereq–8602 or 8611 or #) Topics in plasma waves and instabilities, solar physics, cosmic ray physics, atmospheric physics or planetary physics.

Phys 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]. NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral) Prerequisites.

Phys 8700. Seminar: Condensed Matter Physics. (1 cr [max 6 cr]; S-N only, Prereq–#) Current research.


Phys 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]. NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only]) Prerequisites.

Phys 8800. Seminar: Nuclear Physics. (1 cr [max 6 cr]; S-N only, Prereq–#) Current research topics.

Phys 8801. Nuclear Physics I. (3 cr. Prereq–5001 or #) Properties of nuclei based on hadronic and quark-gluon degrees of freedom. Relativistic field theory at finite temperature and density applied to many-body problems, especially nuclear matter and quark-gluon plasma. Applications to lepton and hadron scattering, nucleus-nucleus collisions, astrophysics and cosmology.

Phys 8802. Nuclear Physics II. (3 cr. Prereq–8801 or #) Properties of nuclei based on hadronic and quark-gluon degrees of freedom. Relativistic field theory at finite temperatures and density applied to many-body problems, especially nuclear matter and quark-gluon plasma. Applications to lepton and hadron scattering, nucleus-nucleus collisions, astrophysics and cosmology.

Phys 8850. Advanced Topics in Nuclear Physics. (3 cr [max 9 cr]. Prereq–8802 or #) Research topics.

Phys 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]. NGA. Prereq–Max 18 cr per semester or summer; 24 cr required) Prerequisites.


Phsl 5511. Advanced Neuromuscular Junction Physiology. (2 cr; Prereq–#) Fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

Phsl 5520. Advanced Pulmonary Mechanics: Physiology and Pathophysiology. (2 cr; Prereq–#) Fundamental concepts and advanced topics related to mechanical aspects of pulmonary function (e.g., elastic recoil, airway resistance). Lectures, laboratory, demonstrations, Intense, one week course.


Phsl 5701. Physiology Laboratory. (1-2 cr [max 2 cr]; A-F only. Prereq–#) Experiments in physiology. Emphasizes qualitative aspects, including analysis of organ systems.

Phsl 8294. Research in Physiology. (1-18 cr [max 20 cr]. Prereq–Grad student) Independent research project in physiology, supervised by faculty member.

Phsl 5094. Research in Physiology. (1-18 cr [max 20 cr]. Prereq–#) Independent lab research project in physiology, supervised by physiology faculty.

Phsl 5095. Problems in Physiology. (1-5 cr [max 20 cr]. Prereq–#) Individual study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.


Phsl 5201. Computational Neuroscience I: Membranes and Channels. (3 cr; 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, voltage and ligand gated ion channels, ion transport theories, and impulse initiation and propagation.

Phsl 5202. Computational Neuroscience II: Neural Systems and Information Processing. (3 cr; Prereq–Understanding of UNIX, Phsl/Nsc 5201 or equiv.) Quantitative examination of information processing by networks based on experimental data and theoretical models. Neural codes, neural network models and information processing, neural control systems, computational maps.

Phsl 5444. Muscle. (3 cr; SBIOS 5444, MDBC 5444, WPB 5444. Prereq–3061 or 3071 or 5061 or BioC 3021 or BioC 4331 or #) Muscle membranes: structures, mechanisms, and physiological roles of channels/pumps. Muscle contraction: force generation by actin/myosin.

Phsl 5510. Advanced Cardiac Physiology and Anatomy. (2-3 cr; Prereq–#) Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

Phsl 5511. Advanced Neuromuscular Junction Physiology. (2-3 cr; Prereq–#) Fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

Phsl 5520. Advanced Pulmonary Mechanics: Physiology and Pathophysiology. (2-3 cr; Prereq–#) Fundamental concepts and advanced topics related to mechanical aspects of pulmonary function (e.g., elastic recoil, airway resistance). Lectures, laboratory, demonstrations, Intense, one week course.


Phsl 5701. Physiology Laboratory. (1-2 cr [max 2 cr]; A-F only. Prereq–#) Experiments in physiology. Emphasizes qualitative aspects, including analysis of organ systems.

Phsl 8294. Research in Physiology. (1-18 cr [max 20 cr]. Prereq–Grad student) Independent research project in physiology, supervised by faculty member.

Phsl 5094. Research in Physiology. (1-18 cr [max 20 cr]. Prereq–#) Independent lab research project in physiology, supervised by physiology faculty.

Phsl 5095. Problems in Physiology. (1-5 cr [max 20 cr]. Prereq–#) Individual study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.


Phsl 5201. Computational Neuroscience I: Membranes and Channels. (3 cr; 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, voltage and ligand gated ion channels, ion transport theories, and impulse initiation and propagation.

Phsl 5202. Computational Neuroscience II: Neural Systems and Information Processing. (3 cr; Prereq–Understanding of UNIX, Phsl/Nsc 5201 or equiv.) Quantitative examination of information processing by networks based on experimental data and theoretical models. Neural codes, neural network models and information processing, neural control systems, computational maps.

Phsl 5444. Muscle. (3 cr; SBIOS 5444, MDBC 5444, WPB 5444. Prereq–3061 or 3071 or 5061 or BioC 3021 or BioC 4331 or #) Muscle membranes: structures, mechanisms, and physiological roles of channels/pumps. Muscle contraction: force generation by actin/myosin.

Phsl 5510. Advanced Cardiac Physiology and Anatomy. (2-3 cr; Prereq–#) Fundamental concepts, advanced topics related to clinical/biomedical cardiac physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

Phsl 5511. Advanced Neuromuscular Junction Physiology. (2-3 cr; Prereq–#) Fundamental concepts and advanced topics related to clinical/biomedical aspects of neuromuscular junction physiology. Lectures, laboratories, workshops, anatomical dissections. Intense, one week course.

Phsl 5520. Advanced Pulmonary Mechanics: Physiology and Pathophysiology. (2-3 cr; Prereq–#) Fundamental concepts and advanced topics related to mechanical aspects of pulmonary function (e.g., elastic recoil, airway resistance). Lectures, laboratory, demonstrations, Intense, one week course.


Phsl 5701. Physiology Laboratory. (1-2 cr [max 2 cr]; A-F only. Prereq–#) Experiments in physiology. Emphasizes qualitative aspects, including analysis of organ systems.

Phsl 8294. Research in Physiology. (1-18 cr [max 20 cr]. Prereq–Grad student) Independent research project in physiology, supervised by faculty member.

Phsl 5094. Research in Physiology. (1-18 cr [max 20 cr]. Prereq–#) Independent lab research project in physiology, supervised by physiology faculty.

Phsl 5095. Problems in Physiology. (1-5 cr [max 20 cr]. Prereq–#) Individual study in physiology. Students address selected problem through library or lab research, supervised by physiology faculty.
Courses

**Plant Pathology (PlPa)**

Department of Plant Pathology  
College of Agricultural, Food and Environmental Sciences

*PlPa 5003. Diseases of Forest and Shade Trees.* (3 cr) 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.* (2-4 cr) See Class Schedule or department for current offerings.

*PlPa 5102. Epidemiology and Genetics of Host-Parasite Interactions.* (3 cr; A-F only. Prereq.–5201 or equiv.) Concepts/methodology in study of plant disease epidemics, host plant resistance, and host-parasite genetics. Disease assessment, epidemic progress models, environmental influences, crop loss assessment, disease forecasting, ecology of host-parasite. Environmentally sound management strategies. Use of resistance for disease control.

*PlPa 5201. Biology of Plant Diseases.* (4 cr. Prereq–Biol 1009 or equiv) Principles and concepts of plant disease caused by selected viruses, bacteria, fungi, nematodes, and environmental factors. Pathogen biology, interaction of pathogens and the environment; epidemiology and control measures appropriate to plant disease.

*PlPa 5202. Field Plant Pathology.* (2 cr. Prereq.–8) 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. Biology and Ecology of Fungi.* (3 cr. Prereq–Biol 1009 or equiv) Major groups of fungi; their roles in ecosystems and human society, environmental and nutritional needs, and modes of dissemination and survival. Representa-tive species of fungi observed and manipulated.


*PlPa 5300. Current Topics in Molecular Plant Pathology.* (1 cr; max 2 cr; A-F only. Prereq.–BIOC 4125, course in [plant pathology or microbiology], course in genetics, [lab in molecular biology, biotechnology or equivalent] or #) Interactive class. Students read, discuss, and critique publications in molecular plant pathology. Each week, students focus on one article and examine it from different dimensions (underlying principles, experimental strategies, data analysis, impact on the broader discourse).

*PlPa 5301. Plant Genomics.* (3 cr. Prereq–Intro course in genetics or #) Introduction to genomics. Emphasizes plants and relevant model organisms. DNA marker/sequencing technology, comparative genomics, whole genome sequencing, DNA chips/microarrays, EST libraries and SAGE analysis, gene-knockout systems, genome databases, sequence comparison/clustering algorithms, visualization tools.

*PlPa 5302. Genomics of Plant-Associated Microbes.* (3 cr; A-F only. Prereq.–BIOC 4125, course in [plant pathology or microbiology], course in genetics, [lab in molecular biology, biotechnology or equivalent]) or #) Genomics research for plant-associated microbes. Journal articles, discussions, case studies. Identification/characterization of genes in plant-microbe interactions. Analysis of plant pathogens, research methodologies. Linkage/gene/physical mapping, candidate genes, sequencing, gene silencing, knock-out, ESTs, microarrays, bioinformatics. Online training modules, field trips, guest lectures, individual/group projects.

*PlPa 5999. Special Workshop in Plant Pathology.* (1-4 cr) Workshops on a variety of topics in plant pathology offered at locations other than the Twin Cities campus. See Class Schedule or department for current offerings.

*PlPa 8005. Supervised Classroom or Extension Teaching Experience.* (2 cr; S-N only. Prereq.–8) Teaching experience in one of the following departments: Biosystems and Agricultural Engineering; Agronomy and Plant Genetics; Horticultural Science; Soil, Water, and Climate; or Plant Pathology. Discussions about effective teaching to strengthen skills and develop a personal teaching philosophy.

*PlPa 8090. Advanced Procedures and Research in Plant Pathology.* (1-8 cr) Special assignments in lab and field problems in pathological research.

*PlPa 8101. Causal Organisms of Plant Disease.* (4 cr. Prereq.–5201 or equiv) Laboratory-based intensive examination of bacteria, viruses, and nematodes as causal agents of plant disease.

*PlPa 8102. Epidemiology and Genetics of Host-Parasite Interactions.* (3 cr; A-F only. Prereq.–5201, GCD 3022) Disease assessment, analysis in time/space, models for epidemic progress, environmental influences, crop loss assessment, disease forecasting, ecology of host-parasite interactions. Mendelian, populational, and molecular genetic aspects of host-parasite interactions. Modes of variability in pathogen populations, strategies for disease resistance.


*PlPa 8200. Seminar.* (1-2 cr; A-F only) Critical review and presentation of current problems and progress in plant pathology.


*PlPa 8333. FTE: Master’s.* (1 cr; NGA. Prereq–Master’s study, advisor and DGS consent)

*PlPa 8444. FTE: Doctoral.* (1 cr; NGA. Prereq–Doctoral student, advisor and DGS consent)

*PlPa 8500. Perspectives in Plant Pathology.* (2 cr [max 4 cr]; S-N only. Prereq.–8) Integrative overview of the field. For Ph.D. students nearing end of formal classroom experience.

*PlPa 8666. Doctoral Pre-Thesis Credits.* (1-18 cr [max 60 cr]; NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

*PlPa 8777. Thesis Credits: Master’s.* (1-18 cr [max 50 cr]; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

*PlPa 8888. Thesis Credits: Doctoral.* (1-24 cr [max 100 cr]; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

**Polish (Plsh)**

Institute of Linguistics, ESL, and Slavic Languages and Literatures  
College of Liberal Arts

*Plsh 5900. Topics.* (1-4 cr) Topics specified in Class Schedule.

*Plsh 5993. Directed Readings.* (1-3 cr) Guided individual reading or study in Polish language, literature, and culture.

**Political Science (Pol)**

Department of Political Science  
College of Liberal Arts

*Pol 5210. Topics in Political Theory.* (3 cr [max 9 cr]; A-F only. §3210. Prereq.– §3210, I, grad)


*Pol 5252. Renaissance, Reformation, and Revolution: Early Modern Political Thought.* (4 cr §3252) Thinkers, themes, and courses from the Renaissance to the French Revolution. Renaissance Humanists; Machiavelli; More; Reformation; Luther; Calvin; Natural Law; Grotius; Divine Right; Common Law; Bacon, English Revolutionaries, Hobbes; Locke; Astell; Enlightenment; Rousseau; French Revolutionaries; Hume; Burke; Wollstonecraft.

*Pol 5253. Modernity and its Discontents: Late Modern Political Thought.* (4 cr §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 cr. §4275. Prereq.–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.* (3-4 cr [max 8 cr]; §4280. Prereq.–Grad student) Topics in historical, analytical, or normative political theory. Topics vary, see Class Schedule.
Pol 5303. American Democracy in Crisis. (3-4 cr. §4303. Prereq–[1002 or equiv], [non-pol sci grad major or #])

Pol 5304. Presidential Leadership and American Democracy. (3 cr. §4306. Prereq–[1001 or equiv], [non-pol sci grad major or #])

Pol 5306. Comparing American Political Systems. (3-4 cr. §4308. Prereq–[1001 or equiv], [non-pol sci grad major or #])

Pol 5308. Congressional Politics and Institutions. (3-4 cr. §4308. Prereq–[1001 or equiv], [non-pol sci grad major or #])

Pol 5310. Topics in American Politics. (3 cr. §4310. Prereq–1001 or equiv or grad student or #)

Pol 5315W. State Governments: Laboratories of Democracy. (4 cr. §4315W. Prereq–[1001 or equiv], [non-pol sci grad major or #])

Pol 5322. Rethinking the Welfare State. (3-4 cr. §4322. Prereq–Grad student)

Pol 5327. Politics of American Cities and Suburbs. (3 cr. §4327. Prereq–[1001 or 1002], [non-pol sci grad major or equiv or #])

Pol 5331. Thinking Strategically in Domestic Politics. (3-4 cr. §4331. Prereq–Grad student)

Pol 5410. Topics in Comparative Politics. (3 cr. §4410. Prereq–Grad student)

Pol 5441. Environmental Policy. (3 cr. §4441. Prereq–Non-pol sci grad student or #)

Pol 5461W. European Government and Politics. (4 cr. §4461W. Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5467. Politics and Market in Contemporary Japan. (3-4 cr. §4467, §4AS 4667. Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5471. After Communism: Russia and the Commonwealth of Independent States. (3-4 cr. §4471. Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5473. Chinese Politics. (3 cr. §4473, §EAS 4473. Prereq–Grad student)

Pol 5474. Latin American Politics. (3 cr. §4474, §LAS 4474. Prereq–Grad student)

Pol 5475. Peace and Security in Africa. (3 cr. §4475. Prereq–Grad student)

Pol 5476. Contemporary Politics in Africa and the Colonial Legacy. (4 cr. §4476, Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5477. Scholars and the Media. (3 cr. §4477. Prereq–1001 or equiv or non-pol sci grad student or #)

Pol 5478. Contemporary Politics in Africa and the Colonial Legacy. (4 cr. §4478. Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5479. Latin American Politics. (3 cr. §4479, §LAS 4479. Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5480. Chinese Politics. (3 cr. §4480. Prereq–Grad student)

Pol 5481. Governments and Markets. (3 cr. §4481. Prereq–1054 or 3051 or non-pol sci grad student or #)

Pol 5482. Grassroots Politics. (3-4 cr. §4482. Prereq–Grad student)

Pol 5485. Human Rights and Democracy in the World. (3 cr. §4485. Prereq–At least one 1xxx or 3xxx course in pol sci, non-pol sci major or #)

Pol 5486. Problem Solving and Social Movements. (4 cr. §4486. Prereq–Non-pol sci grad student)

Pol 5501. Supreme Court and Constitutional Interpretation. (3 cr. §4501. Prereq–1001 or 1002 or equiv or non-pol sci grad student or #)

Pol 5502. Politics of Regulatory Process. (3 cr. §4523. Prereq–[1001 or 1002 or equiv or #], [4309 or 4501 or sr or non-pol sci grad student])

Pol 5525. Federal Indian Policy. (3 cr. §A-F only. §4525, §A/HN 4525. Prereq–Grad student)

Pol 5561. Comparative Legal Systems. (3 cr. §4561. Prereq–ir or sr or non-pol sci grad student)

Pol 5573. American Political Parties. (3-4 cr. §4573. Prereq–[1001 or equiv], grad student or #)

Pol 5574. American Government and Politics. (3-4 cr. §4574. Prereq–[1001 or equiv], grad student or #)

Pol 5575. American Constitutional Interpretation. (3-4 cr. §4575. Prereq–[1001 or equiv], grad student or #)

Pol 5576. American Political Culture and Values. (3-4 cr. §4576. Prereq–1001 or equiv or non-pol sci grad student or #)

Pol 5577. Public Opinion and Voting Behavior. (3 cr. §4577. Prereq–[1001 or equiv], grad student or #)

Pol 5578. American Political Parties. (3-4 cr. §4578. Prereq–1001 or equiv or non-pol sci grad student or #)

Pol 5579. Latin American Politics. (3 cr. §4579, §LAS 4579. Prereq–1001 or 3051 or non-pol sci grad student or #)

Pol 5580. Civil Society and Democracy. (3 cr. §4580. Prereq–Grad student)

Pol 5586. Foreign Policy. (3 cr. §4586. Prereq–Grad student)

Pol 5587. Global Environmental Politics. (3 cr. §4587. Prereq–Grad student)

Pol 5588. International Law. (3 cr. §4588. Prereq–Grad student)

Pol 5589. International Law. (3 cr. §4589. Prereq–Grad student)

Pol 5590. International Law. (3 cr. §4590. Prereq–Grad student)

Pol 5601. Comparative Legal Systems. (3 cr. §4561. Prereq–ir or sr or non-pol sci grad student)

Pol 5602. Comparative Legal Systems. (3 cr. §4562. Prereq–Grad student)

Pol 5603. International Law. (3 cr. §4563. Prereq–Grad student)

For definitions of course numbers, abbreviations, and symbols, see page 153.
Courses

Pol 5883. Global Governance. (3 cr. #4883. Prereq–3835 or non-pol sci grad or #)
Rise/role of inter-governmental organizations such as United Nations, non-governmental organizations. Peacekeeping, trade, development, human rights, security, politics in more self-determination, refugees, health, environment. Seminar discussions, class simulations.

Pol 5885. International Conflict and Security. (3-4 cr. #5885. Prereq–Grad student)
Applications of game theory to international politics. Conflict/cooperation, global environmental commons, deterrence/reputation.

Pol 5889. Governments and Global Trade and Money. (3-4 cr. Prereq–3835 or non-pol sci grad or #)
Study the politics of international trade and monetary affairs including north-south and east-west relations.

Pol 5970. Individual Reading and Research. (1-4 cr [max 1 cr]; A-F only. Prereq–A, -L)
Guided individual reading or study.

Pol 8101. Introduction to Political Science. (3 cr; A-F only. Prereq–Grad pol sci major or #)
History, scope, and methods of political science as a discipline; current subfields; major research programs (including statism, pluralism, institutionalism, realism, behaviorism, rational choice, and critical theory); problems of theory, interpretation, concept-formation, comparison, measurement and experimentation; design of research.

Pol 8104. Professional Development I. (1 cr [max 2 cr]; S-N only. Prereq–Pol student, ABD status)
Research ethics. Completion of dissertation prospecti or early dissertation chapters.

Pol 8105. Professional Development II. (1 cr [max 2 cr]; S-N only. Prereq–Pol student, ABD status)
Research ethics. Skills for teaching undergraduate courses in political science. Completion of dissertation prospecti or early chapters.

Pol 8122. Positive Theory. (3 cr. Prereq–Grad pol sci major or #)
Survey of positive political theory and rational-choice models, information and transaction costs, institutions; models of elections, voting, coalitions.

Pol 8123. Introduction to Quantitative Political Research. (3 cr; A-F only. Prereq–Pol sci grad student or #)
Principles of regression analysis, use of regression models in political science.

Pol 8124. Game Theory. (3 cr. Prereq–[8122, pol sci grad student] or #)
Application of noncooperative game theory in political science. Equilibrium concepts, bargaining, repeated games, games of incomplete information, signaling games, reputation, learning in games.

Pol 8125. Dynamic Analysis. (3 cr. Prereq–Pol sci grad student or #)
Time series method, its application in political science.

Pol 8126. Qualitative Methods. (3 cr. Prereq–Grad pol sci major or #)
Broad introduction to qualitative methods in social science. Practical, hands-on training through fieldwork projects devised and carried out during the semester. Interviewing, participant observation, narrative interpretation, ethical problems, and issues of gender and race in fieldwork.

Pol 8131. Advanced Methods and Models. (3 cr. Prereq–Grad pol sci major, 6 or 81xx seminars or #)
Intersection of statistical methodology and deductive modeling; issues in emerging inductive and deductive research. Sample topics: parties and elections, probabilistic voting, strategic modeling of international relations.

Pol 8160. Topics in Models and Methods. (3 cr [max 12 cr. Prereq–Grad pol sci major or #]
Seminars on selected topics.

Pol 8201. Understanding Political Theory. (3 cr. Prereq–Grad pol sci major or #)
Key concepts and major approaches.

Pol 8215. Philosophy of Political Inquiry. (3 cr. Prereq–Grad pol sci major or #)
Major schools in philosophy of science as applied to political inquiry; pragmatism, positivism, hermeneutics, critical rationalism, critical theory, realism. Themes of political inquiry: explanation, interpretation, theory, criticism. Political issues raised by philosophy of science: liberalism, democracy, control, multiculturalism.

Pol 8225. American Political Thought. (3 cr. Prereq–Grad pol sci major or #)
Colonial era to present: Puritans, American Revolution, Constitution, rise of individualism, pro- and anti-slavery arguments, civil war and reconstruction, industrialism, westward expansion, Native Americans, immigration, populism, socialism, social Darwinism, growth of corporations and unions; Great Depression; growth of American power at home and abroad.

Pol 8235. Democratic Theory. (3 cr. Prereq–Grad pol sci major or #)
Competing models of democracy: classical, republican, liberal, radical, Marxist, neo-Marxist, pragmatist, populist, pluralist, postmodern, participatory. Domestic and international struggles over meaning of “democracy”; social science models of and findings on democracy.

Pol 8251. Ancient and Medieval Political Thought. (3 cr. Prereq–Grad pol sci major or #)

Pol 8252. Early Modern Political Thought. (3 cr. Prereq–Grad pol sci major or #)
Theorists and texts from Renaissance to French Revolution. Selectively includes Machiavelli, More, Calvin, Luther, Grotius, Bodin, Hobbes, Winstanley, Harrington, Locke, Montesquieu, Rousseau, Hume, Smith, Burke, and Wollstonecraft; key debates over liberty, law, power, and knowledge.

Pol 8253. Late Modern Political Thought. (3 cr. Prereq–Grad pol sci major or #)
Theoretical responses to and rival interpretations of Western economy, society, politics, and democratic culture in the modern age; theories of history; class struggle; the end of metaphysics and the death of God; technology and bureaucracy; psychology of culture, in Hegel, Marx, Toqueville, Mill, Nietzsche, Weber, Freud.

Pol 8260. Topics in Political Theory. (3 cr [max 6 cr]. Prereq–Grad pol sci major or #)
Readings and research in special topics or problems.

Pol 8275. Contemporary Political Thought. (3 cr. Prereq–Grad pol sci major or #)
From approximately World War II to the present. Survey of range of texts or intensive focus on such authors as Adorno, Arendt, Derrida, Foucault, Habermas, Kierkegaard, Rawls, Said. Sample topics: feminism, postmodernism, communitarianism, Frankfurt School, postcolonialism.

Pol 8301. American Politics. (3 cr. Prereq–Grad pol sci major or #)
Seminar on main themes of theory and research in American politics, institutions, law, and policy. Major works on individual, mass, elite, and institutional behavior and their relationship to each other. Foundation for advanced seminars in American politics.

Pol 8302. Public Opinion and Political Participation. (3 cr. Prereq–Grad pol sci major or #)
Major theoretical perspectives and research on political participation, voting behavior, and public opinion. Voter turnout, importance of party identification, effects of campaigns, long-term change in public opinion, and designing and conducting research.

Pol 8303. Political Parties. (3 cr. Prereq–Grad pol sci major or #)
Party systems and subsystems; party organizational characteristics, goals, and incentives; distribution of power and authority within the party; chief party functions; party as an organizer of governmental power; determinants of party structure and role.

Pol 8305. Interest Groups and Social Movements. (3 cr. Prereq–Grad pol sci major or #)
Theoretical/empirical work on role of interest groups and social/political movements in American politics and policy-making processes. Theories of interest group and social/political movement formation, maintenance, and decline. How interest groups and social/political movements attempt to influence public policy. Impact/effectiveness of organized groups as agents of democratic representation, particularly for marginalized groups.

Pol 8307. Proseminar in Political Science I. (1 cr; S-N only. Prereq–Grad pol sci major or pol psych minor or #)
Readings, discussion, and guest speakers. Topics vary by semester.

Pol 8308. Proseminar in Political Science II. (1 cr; S-N only. Prereq–Grad pol sci major or pol psych minor or #)
Readings, discussion, and guest speakers. Topics vary by semester.

Pol 8311. Political Psychology and Socialization. (3 cr; A-F only. Prereq–Grad pol sci major or pol psych minor or #)
Introduction to political psychology. Personality and politics; political cognition, emotion, and political behavior; political expertise; media and politics; aggression, authoritarianism, and political behavior; altruism and politics.

Pol 8312. Legislative Process. (3 cr. Prereq–Grad pol sci major or #)
Introduction to study of legislative politics; theories of legislative institutions and individual behavior; congressional elections; congressional committees, parties, and leaders.

Pol 8313. Executive Process. (3 cr. Prereq–Grad pol sci major or #)
Tension between leadership and democracy in context of American presidency in terms of President’s relationship with federal bureaucracy, Congress, and making of diplomatic and military policy.

Pol 8314. Judicial Process. (3 cr. Prereq–Grad pol sci major or #)
Judicial systems and roles; selection of judges; organizing and supporting litigation; influences on judicial decisions; impact of judicial decisions; courts and other institutions of government.

Pol 8320. Social Psychology of Prejudice and Intergroup Relations. (3 cr; A-F only)
Approaches, findings, and controversies in research on social psychology of prejudice, racial attitudes, and intergroup relations. Focuses on approaches based in social psychology and on related work from political science and sociology.

Pol 8321. Urban Politics. (3 cr; A-F only. Prereq–Grad pol sci major or #)
Selection of local leadership; relationship of political system to governmental forms and social institutions; role and impact of political institutions; policymaking at local level; studies in policy problems; the emerging metropolis.

Pol 8325. State Politics and Intergovernmental Relations. (3 cr. Prereq–Grad pol sci major or #)
Theoretical approaches to comparative study of state politics; study of political culture and behavior, governmental institutions, and public policy at state level; federalism.

Pol 8331. Constitutional Law. (3 cr. Prereq–Grad pol sci major or #)
Overview of substantive and theoretical debates in American constitutional law; role of law and constitutional interpretation in shaping American political institutions and American politics.
Prereq–Pol-sci graduate student or #)

Prereq–Grad pol sci major or #)

A-F only. Prereq–Grad pol sci major or #)

Pol 8335. Public Policy.

(3 cr. Prereq–Grad pol sci major or #)

Rival theoretical explanations for cause and nature of welfare state development in context of four American social policies: social security, welfare, education, and healthcare.

Pol 8360. Topics in American Politics.

(1-3 cr [max 3 cr]. Prereq–Pol-sci graduate student or #)

Readings/research in special topics or problems.

Pol 8401. International Relations.

(3 cr. Prereq–Pol-sci graduate student or #)

Basic theories/approaches to study of international politics. Surveys representative work/central issues of scholarship.


(3 cr. Prereq–Grad pol sci major or #)

Introduction to contending theories of international conflict and national security.


(3 cr. Prereq–Grad pol sci major or #)

Origins, roles, and effectiveness of international norms and institutions; theoretical explanations and debates. Institution of sovereignty; rational choice versus constructivist perspectives; role of international law, international organizations, and non-governmental organizations; and international society and transnational cultural norms.

Pol 8404. International Hierarchy.

(3 cr. Prereq–Grad pol sci major or #)

Asymmetric structures and processes of international relations; systemic conditions and implications of informal empires and structures of hegemony; cultural productions of difference and inequality.

Pol 8405. International Political Economy.

(3 cr; A-F only. Prereq–Grad pol sci major or #)

Theoretical and policy issues in international economic relations. Different approaches for understanding outcomes in international economy. Trade, finance, nuclear weapons, moral implications of technology, case study on war (Gulf War).

Pol 8407. Morality in World Politics.

(3 cr. Prereq–Grad pol sci major or #)

Approaches to normative theorizing and empirical research on moral norms in world politics. Theoretical topics: realism, communitarianism, consequentialism, constructivism, postmodernism, cultural relativism. Substantive issue areas: famine and foreign aid, just war theory, nuclear weapons, moral implications of technology, case study on war (Gulf War).

Pol 8408. International Relations of the Environment.

(3 cr. Prereq–Grad pol sci major or #)

Theory and practice of international environmental policies. Emergence of environment as major issue of international relations. Diversities of agendas and politics. Imperatives, templates, resistance in global efforts to forge an applied politics of environmental sustainability. Selected cases.

Pol 8411. Political Psychology and Foreign Policy.

(3 cr. Prereq–Grad pol sci major or #)

Foreign policy theories about decision makers and audiences. Impact of human nature, formal institutions, cultural and cross-cultural settings, and kinds of issues on foreign policy choice, control, and justification.

Pol 8412. American Foreign Policy.

(3 cr. Prereq–8410 or #)


Pol 8444. FTE:Doctoral.

(1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

Readings and research in advanced topics or problems. Recent topics: global environmental issues, morality in world politics, and norms and institutions in world politics.

Pol 8601. Introduction to Comparative Politics.

(3 cr. Prereq–Grad pol sci major)

Main theoretical approaches and issues: comparative method, the state and class; political culture; development, democratization, rational choice, social movements.

Pol 8603. European Government and Politics.

(3 cr; A-F only. Prereq–Grad pol sci major or #)

Main theories and approaches used to interpret European politics. Many of these theories have broad relevance for comparative politics, for example, theories about the state, cleavages and coalitional bases, parties and social movements, and constitutional structures and institutions have broad relevance for the field of comparative politics.


(3 cr; A-F only. Prereq–Grad pol sci major or #)

Theoretical and methodological approaches to study of African politics, focusing on pre-colonial and colonial legacies for post-colonial reality. Local politics, social construction of identities, political economy of peasantry and working class, political development and decay, social movements, and prospects for democracy.


(3 cr; A-F only. Prereq–Grad pol sci major or #)

Framework for understanding politics of change underway in the former Soviet Union. Roots of current transformation, including causes and legacy of the Russian revolution and creation of the Soviet Union. Issues in current transformation, including nationalism, economic reform, and democratization. Prior knowledge of basic Soviet politics is assumed.

Pol 8611. Chinese Political.

(3 cr. Prereq–Grad pol sci major or #)


Pol 8615. The Political Economy of Contemporary Japan.

(3 cr. Prereq–Grad pol sci major or #)

Major political and economic issues confronting the Japanese system; situation of Japanese case within comparative politics literature concerning role of the state in formulating economic and social policy making. Review of literature. Deregulation in key industries, welfare reform, tax reforms.

Pol 8619. Latin American Politics.

(3 cr. Prereq–Grad pol sci major or #)

Major bodies of thought on development, democracy and democratization, social movements, civil society, the state, and transnational linkages.

Pol 8633. Comparative Sociopolitical Change.

(3 cr. Prereq–Grad pol sci major or #)

Critical evaluation of literature and theoretical perspectives; comparative examination of social and political change and interrelationship between both processes; structure/agency nexus.

Pol 8657. Comparative Political Economy.

(3 cr. Prereq–Grad pol sci major or #)

Connections between democracy and markets, emphasizing experiences of countries in North America and Europe.

Pol 8641. Comparative Mass Political Behavior.

(3 cr; A-F only. Prereq–Grad pol sci major or #)

Examined from a cross-national perspective. Development of political participation, mobilization and its effects, development of political cleavages and political parties as vehicles of conflict, modes of political behavior under varied systems of representation and varied party systems.

Pol 8643. Comparative Political Institutions.

(3 cr; A-F only. Prereq–Pol sci grad student or #)

Structure/operation of various political institutions in different settings. Theoretical approaches, comparative frameworks. Introduction to literature on political institutions. Preparation for comparative research on political institutions.

Pol 8660. Topics in Comparative Politics.

(1-3 cr [max 6 cr]. Prereq–Grad pol sci major or #)

Readings in advanced topics or problems; supervised research and research training.

Pol 8866. Doctoral Pre-Thesis Credits.

(1-18 cr [max 60 cr]; NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Pol 8877. Thesis Credits: Master’s.

(1-18 cr [max 50 cr]; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Pol 8888. Thesis Credits: Doctoral.

(1-24 cr [max 100 cr]; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

Pol 8990. Directed Readings and Research in Political Science.

(1-7 cr [max 7 cr]. Prereq–16 cr 8xxx pol sci courses, #, Δ)

Portuguese (Port)

Department of Spanish and Portuguese Studies
College of Liberal Arts

Port 5520. Portuguese Literary and Cultural Studies.

(3 cr [max 9 cr]. Prereq–#)

Study of origins and development of modern Portuguese nation (late 15th 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 cr [max 9 cr]. Prereq–#)

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 cr [max 9 cr]. Prereq–#)

Origins/development of Lusophone Africa (Angola, Mozambique, Cape-Verde, Guinea-Bissau, São Tomé, Príncipe) using literature, cultural/critical 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.

(3 cr [max 9 cr]. Prereq–#)

Cultural manifestations in Portuguese-speaking world (Portugal, Brazil, Lusophone Africa): literature, history, film, intellectual thought, critical theory, popular culture. Topics include: Portuguese colonialism; postcolonial nation in Lusophone world; Lusophone women writers; Luso-Brazilian (post)modernity.
Courses

Psy 5012. Learning and Cognition in Animals. (4 cr. Prereq–3011 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 5014. Psychology of Human Learning and Memory. (3 cr. Prereq–3001 or 3051, except honors, grad students) Survey of basic methods and findings of research on human learning, memory, and cognition. Emphasis on major factors influencing human encoding or acquisition of information and skill, retention, and retrieval. Theoretical perspectives on underlying processes of encoding, retention, and retrieval.

Psy 5015. Cognition, Computation, and Brain. (3 cr. Prereq–3051 except honors, grad students) Human cognitive abilities (perception, memory, attention) from different perspectives (e.g., cognitive psychological approach, cognitive neuroscience approach).

Psy 5031W. Perception. (3 cr. 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 5034. Psychobiology of Vision. (3 cr. Prereq–3031 or #) Analysis of the properties and biological bases of visual perception for humans and animals. Emphasis on color vision, visual sensitivity and adaptation, nerve cells and circuits in the eye, structure and function of the visual brain.

Psy 5036W. Computational Vision. (3 cr. Prereq–[3001 or 3051], Math 1272 or #) Applications of psychology, neuroscience, computer science to design principles underlying visual perception, visual cognition, action. Compares biological/physical processing of images with respect to image formation, perceptual organization, object perception, recognition, navigation, motor control.

Psy 5037. Psychology of Hearing. (3 cr. Prereq–3031 or #) Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical, and other applications.

Psy 5038W. Introduction to Neural Networks. (3 cr. Prereq–[3061 or NSC 3102], Math 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 cr. Prereq–3005W or honors or grad student or #) Theories/experimental evidence in past/present conceptions of psychology of language.

Psy 5061. Neurobiology of Behavior. (3 cr. Prereq–3005W or Biol 1009 or #) Physiological/neuroanatomical mechanisms underlying behavior of animals, including humans. Neural basis of learning/memory, sleep, wakefulness, and attention processes. Effects of drugs on behavior.


Psy 5064. Brain and Emotion. (3 cr. A-F only. Prereq–3061 or 5061 or #) Introduction to affective neuroscience. Focuses on how brain promotes emotional behavior in animals/humans. Biological theories of emotion reviewed in historical, current theoretical contexts. Research related to specific “basic” emotions, including brain substrates for fear, sadness, pleasure, attachment. Implications for understanding emotional development, vulnerability to psychiatric disorders.

Psy 5101. Personality Psychology. (3 cr. §3101. Prereq–3005W, [honors or grad student]) Theories and major issues/findings on personality functioning, personality structure, and personality assessment. Historically important and currently influential perspectives.

Psy 5135. Psychology of Individual Differences. (3 cr. §3135. Prereq–[3005W or equiv], 5862) or #) Differential methods in study of human behavior. Overview of nature of psychological traits. Influence of age, sex, heredity, and environment in individual/group differences in ability, personality, interests, and social attitudes.

Psy 5137. Introduction to Behavioral Genetics. (3 cr. Prereq–3005W or equiv or #) Genetic methods for studying human/animal behavior. Emphasizes nature/orIGIN of individual differences in behavior. TWIN and adoption methods. Cyto genetics, molecular genetics, linkage/association studies.

Psy 5138. Psychology of Aging. (3 cr. Prereq–[3005W or equiv]) Theories/findings concerning age-related changes in mental health, personality, cognitive functioning, productivity are reviewed/interpreted within context of multiple biological, social, and psychological changes that accompany age.

Psy 5202. Attitudes and Social Behavior. (3 cr. Prereq–3021 or #) Theory/research in social psychology, other fields in psychology of attitudes, beliefs, values. These fields’ relationship to social behavior. Principles/theories of persuasion.

Psy 5204. Psychology of Interpersonal Relationships. (3 cr. Prereq–3021 or honors or grad student or #) Introduction to interpersonal relationship theory/ research findings. Emphasizes conceptual/methodological issues.

Psy 5205. Applied Social Psychology. (3 cr. Prereq–3021 or grad student or #) Applications of social psychology research/theory to domains such as physical/mental health, education, the media, desegregation, the legal system, energy conservation, public policy.

Psy 5206. Social Psychology and Health Behavior. (3 cr. A-F only. Prereq–3021 or 3201 or honors or grad student or #) Conceptual/methodological strategies for scientific study of individuals and their social worlds. Applications of theory/research to issues of self, identity, and social interaction.


Psy 5304H. Abnormal Psychology. (3 cr. Prereq–Honors or grad student or #) Comprehensive review of psychopathological disorders. Etiology, diagnostic criteria, clinical research findings.

Psy 5406. Clinical Psychophysiology. (3 cr. Prereq–3005 or equiv, 3061 or 5061, 3054 or #) How psychophysiological methods such as autonomic and central nervous system recording are used in the study of major psychopathological disorders.

Psy 5701. Organizational Staffing and Decision Making. (3 cr. Prereq–[3005W or 4801 or equiv], 3711 or #) Application of psychological research/theory to issues in personnel recruitment/selection and to measurement of job performance. Applying principles of individual differences, psychological measurement to decision making in organizations (recruitment, selection, performance appraisal).

Psy 5702. Psychological Foundations of Individual Behavior in Organizations. (3 cr. Prereq–[3005W or 4801 or equiv], 3711 or #) Theory/research on human behavior/performance in organizations. Organizational socialization processes across career span, leadership styles/processes, work team structures/characteristics. Problem-solving, decision-making processes. Group dynamics, inter-group relations.

Psy 5705. Psychology of Work Motivation. (3 cr. Prereq–4801 or equiv, 3711 or #) Motivation issues related to the behavior and performance of individuals in organizational settings. Contemporary work motivation theories and practices that relate person factors, and environmental factors to skill acquisition, job performance, organizational citizenship behavior, and job satisfaction.
Psy 5707. Personnel Psychology. (4 cr; §5701, §5703. Prereq–[E000W or equiv or §371] or #) Application of psychological research/theory to organizational staffing, evaluation, and training. Principles of individual differences and psychological measurement applied to decision making, staffing, and instruction in organizations. Job analysis, recruitment, screening, selection, performance appraisals, criterion measurement, organizational training, learning, aptitude/trait interactions.

Psy 5708. Organizational Psychology. (4 cr; §5702, §5705. Prereq–[E000W or equiv], §371] or #) Psychological causes of behavior in work organizations. Consequences for individual fulfillment and organizational effectiveness. Individual differences, social perception, motivation, stress, job design, leadership, job satisfaction, teamwork, organizational culture.

Psy 5862. Psychological Measurement: Theory and Methods. (3 cr; Prereq–4801 or equiv) Types of measurements (tests, scales, inventories) and their construction. Theory/measurement of reliability/validity.


Psy 5960. Topics in Psychology. (1-4 cr; max 8 cr. Prereq–1001, [jr or sr or grad student]) Special course or seminar. Topics listed in psychology office.

Psy 8004. Philosophical Psychology. (2 cr; S-N only. Prereq–Logic or phil course, psych or phil PhD student or #) Selected philosophical and methodological problems.

Psy 8010. Advanced Topics in Learning. (2 cr; S-N only. Prereq–5012 or #) Contemporary topics in learning and behavior theory.

Psy 8020. Seminar in Conditioning and Learning. (2 cr; S-N only. Prereq–5012 or grad psych major or #) Review and discussion of ongoing research and prospects on future research.


Psy 8036. Topics in Computational Vision. (3 cr (max 12 cr. Prereq–5013 or 5016 or equiv or #) Recent research in visual psychophysics, visual neuroscience, and computer vision.


Psy 8055. Seminar: Cognitive Neuroscience. (1-4 cr. Prereq–5015 or #) Recent advances in analysis of neural bases of cognitive functions.

Psy 8056. Seminar: Psychology of Language. (3 cr; A-F only. Prereq–Grad psych major or #) Selected topics in psycholinguistics.

Psy 8060. Seminar: Neural Substrates of Mental Processes. (3 cr (max 12 cr. Prereq–5012 or 5061 or 5062 or 5064 or NSCI-5661 or 8010 or CPsy-8301 or NSCI-8401 or #) Neurobiological substrates of psychological processes such as memory, attention, and emotion. Neurobiological substrates of mental dysfunction.

Psy 8070. Seminar: Psychopharmacology. (1-3 cr (max 12 cr. Prereq–#)) Basic issues, contemporary research. Lectures, student presentations.

Psy 8107. Personality, Culture, and Society. (3 cr; A-F only. Prereq–[5101, 5604] or equiv or #) Methodological issues and status of current research in intersection of personality, social, and cultural psychology.

Psy 8108. Theories of Personality and Intervention. (3 cr) Historical perspective on relationship between theories of personality and formulations of etiology/course of types of psychopathology. Treatment techniques ensuing from different theoretical perspectives. Psychoanalytic thought, works of Carl Rogers, existentialism, Gestalt therapists.


Psy 8112. Psychopathology II. (3 cr; A-F only. Prereq–[8111] or #) Descriptive psychopathology. Theory/research. Evaluation of current experimentation in various behavior disorders.

Psy 8201. Social Cognition. (3 cr; A-F only. Prereq–Psych PhD candidate) Theory and research in stereotypes, social inference, and person memory.

Psy 8202. Close Relationships. (3 cr; A-F only. Prereq–5204 or #) Recent theory and research.

Psy 8203. Impression Management. (3 cr. Prereq–Grad psych major; 8208 recommended) Classic and contemporary theory and research concerning interpersonal strategies of impression development and interplay between private and public self.

Psy 8204. Social Psychology of Prejudice and Intergroup Relations. (3 cr) Approaches, findings, and controversies in research on social psychology of prejudice, racial attitudes, and intergroup relations. Focuses on approaches based in social psychology and on related work from political science and sociology.

Psy 8205. Proseminal: Research in Social Psychology. (2 cr (max 8 cr; A-F only. Prereq–Psych PhD student) Contemporary theoretical positions and related research.

Psy 8206. Proseminal: Research in Social Psychology. (2 cr (max 6 cr; A-F only. Prereq–Psych PhD student, 8205) Contemporary theoretical positions and related research.

Psy 8208. Social Psychology: The Self. (3 cr; A-F only. Prereq–Psych background especially in personality and soc psych) Social psychological theory and research concerning the self and social behavior.


Psy 8211. Proseminal in Political Psychology I. (1 cr; S-N only. Prereq–Grad pol psych minor) Readings, discussion, and guest speakers. Topics vary each semester.

Psy 8212. Proseminal in Political Psychology II. (1 cr; S-N only. Prereq–Grad pol psych minor) Readings, discussion, and guest speakers. Topics vary each semester.

Psy 8333. FTE: Master’s. (1 cr; NGA, Prereq–Master’s student, adviser and DGS consent)

Psy 8410. Perspectives in Learning, Perception, and Cognition. (1 cr; max 12 cr. Prereq–#) Lectures and discussions in cognitive sciences by local and visiting faculty.

Psy 8444. FTE: Doctoral. (1 cr; NGA, Prereq–Doctoral student, adviser and DGS consent)

Psy 8501. Counseling Psychology: History and Theories. (3 cr; Prereq–Counseling psych grad student or #) Introduction to history of counseling psychology and to primary theoretical orientations used by counseling psychologists. For each theory: basic principles, application to counseling practice, and research support.


Psy 8503. Interviewing and Intervention. (3 cr. Prereq–8501, 8502 or #) Skills-based course: conceptualization of counseling process, stages of counseling, development of counseling skills, and strategies for behavior change.

Psy 8510. Counseling Psychology Beginning Practicum: General. (1-6 cr; S-N only. Prereq–Counseling psych grad student, 8501, 8502, 8503 or equiv, #) Beginning applied experiences in counseling psychology settings.

Psy 8511. Counseling Psychology Beginning Practicum: General. (3 cr; max 18 cr; S-N only. Prereq–Counseling psych grad student, 8501, 8502, 8503 or equiv, #) Beginning applied experiences in counseling psychology settings.

Psy 8512. Counseling Psychology Beginning Practicum: General. (1-6 cr; max 18 cr; S-N only. Prereq–Counseling psych grad student, 8501, 8502, 8503 or equiv, #) Beginning applied experiences in counseling psychology settings.

Psy 8514. University Counseling Practicum I. (4-6 cr; S-N only. Prereq–Counseling psych grad student, 8501, 8502, 8503 or equiv, #) Integrates science with supervised practice in University Counseling and Consulting Services (UCCS) involving career, academic, and personal counseling clientele.

Psy 8515. University Counseling Practicum II. (4-6 cr; S-N only. Prereq–Counseling psych grad student, 8501, 8502, 8503 or equiv, #) Integrates science with supervised practice in University Counseling and Consulting Services (UCCS) involving career, academic, and personal counseling clientele.

Psy 8541. Seminar: Multicultural Issues in Counseling Psychology. (3 cr; A-F only. Prereq–Counseling psych grad student or #) Theory, research, and practice of multiculturally competent counseling in diverse settings/communities. Emphasizes self-awareness, knowledge, and skills. Discussion, lecture, readings, lab, guest lectures.

Psy 8542. Ethics in Psychology. (3 cr; S-N only. Prereq–Counseling or clinical psych grad student or #) Ethical principles and codes of conduct for psychologists. Ethical dilemmas faced by researchers, practitioners, and teachers.

Psy 8544. Vocational and Occupational Health Psychology Research. (3 cr; A-F only. Prereq–[8501, 8502, 8503] or equiv, counseling psych grad student, #) Research problems specific to special populations, vocational research, assessment/testing, findings in these areas useful to counseling psychology practice.

For definitions of course numbers, abbreviations, and symbols, see page 153.
Courses

Psy 8545. Counseling Psychology Process and Outcome Research. (3 cr. F only. Prereq.—Psy 8501, 8502, 8503 or equiv.) Counseling process research. Methodological issues in the study of counseling process and outcomes. Research design, statistical methods, and data analysis.


Psy 8554. Career and Occupational Health Psychology Assessment. (3 cr. F only. Prereq.—Counseling psych grad student.) History of vocational interest inventories/measures related to career development, and of assessments used in occupational health psychology. Scale construction methodology. Research applications. Interpretation/uses of instruments.

Psy 8560. Counseling Psychology Advanced Practicum I: General. (1-6 cr. S-N only. Prereq.—Psy 8501, 8502, 8503 or equiv.) Counseling psychology practicum. Field experience in professional work in clinical settings. May include guest speakers, readings, and student presentations.

Psy 8561. Counseling Psychology Advanced Practicum II: General. (1-6 cr. S-N only. Prereq.—Counseling psych grad student, Psy 8501-8502, 8503 or equiv, 8510-8511 or 8514-8515 or equiv.) Applied practice experience in counseling psychology settings and seminars. May include guest speakers, readings, and student presentations on topics relevant to clients and settings of practice experiences.

Psy 8562. Counseling Psychology Advanced Practicum III: General. (1-6 cr. S-N only. Prereq.—Psy 8501-8502, 8503 or equiv, 8510-8511 or 8514-8515 or equiv.) Applied practice experience in counseling psychology settings and seminars. May include guest speakers, readings, and student presentations on topics relevant to clients and settings of practice experiences.

Psy 8565. Counseling Psychology Advanced Practicum IV: Vocational Assessment Clinic. (1-6 cr. S-N only. Prereq.—Psy 8501, 8502, 8503 or equiv, 8514, 8515 or equiv.) Counseling psychology practicum. Field experience in vocational assessment clinic of Department of Psychology. Career/vocational testing, assessment, decision making.

Psy 8566. Counseling Psychology Advanced Practicum V: Vocational Assessment Clinic. (1-6 cr. S-N only. Prereq.—Psy 8501, 8502, 8503 or equiv, 8514, 8515 or equiv,) Counseling psychology practicum. Field experience in vocational assessment clinic of Department of Psychology. Career/vocational testing, assessment, decision making.

Psy 8570. Counseling Psychology Internship I. (1-12 cr. [max 36 cr.] S-N only. Prereq.—Counseling psych PhD candidate.) First part of counseling psychology internship.

Psy 8571. Counseling Psychology Internship II. (1-12 cr. [max 36 cr.] S-N only. Prereq.—Counseling psych PhD candidate.) Second part of counseling psychology internship.

Psy 8572. Counseling Psychology Internship III. (1-12 cr. [max 36 cr.] S-N only. Prereq.—Counseling psych PhD candidate.) Third part of counseling psychology internship.


Psy 8620. Clinical Psychology Practicum. (1-6 cr. [max 36 cr.] S-N only. Prereq.—Psy 8612, clinical psych grad student) Field experience in professional work in clinical settings.


Psy 8622. Treatment I. (3 cr. A-F only. Prereq,—Psy 8621, clinical psych grad student) Theories of intervention, applications of clinical methods.


Psy 8666. Doctoral Pre-Thesis Credits. (1-18 cr. [max 60 cr.] NGA. Prereq.—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral) Application of research and theory in psychological measurement and individual differences to problems in job analysis, personnel selection and classification, and individual training.

Psy 8701. Seminar in Industrial and Organizational Psychology I. (3 cr. A-F only. Prereq.—Psy 8701) Application of research and theory in psychological measurement and individual differences to problems in job analysis, personnel selection and classification, and individual training.

Psy 8702. Seminar in Industrial and Organizational Psychology II. (3 cr. A-F only. Prereq.—Psy 8701) Determinants of behavior, performance, job satisfaction that can be influenced after an individual enters an organization. Application of research/theory in motivation, social psychology, human factors to enhancement of job performance/satisfaction.

Psy 8703. Seminar in Industrial and Organizational Psychology III. (3 cr. A-F only. Prereq.—Psy 8701) Topics related to industrial and organizational psychology. Research and theory in psychological measurement and individual differences to problems in job analysis, personnel selection and classification, and individual training.

Psy 8777. Thesis Credits: Master’s. (1-18 cr. [max 50 cr.] NGA. Prereq.—Max 18 cr per semester or summer; total required [Plan A only])


Psy 8882. Seminar: Psychometric Methods. (1 cr. Prereq.—Psy 5862, 5865, 8605) Reviews and research on current topics in psychometric measurement, statistics.


Psy 8886. Hierarchical Models. (3 cr. Prereq.—Psy 8884) Methods for repeated measures and longitudinal data. Linear mixed-effects model. Treatment of missing data and unbalanced designs. Extensions to conditionally linear/nonlinear models. Exercises with software such as HLM and SAS PROC MIXED.

Psy 8888. Thesis Credits: Doctoral. (1-24 cr. [max 100 cr.]) NGA. Prereq.—Max 18 cr per semester or summer; 24 cr required

Psy 9335. Readings in Behavioral Genetics and Individual Differences Psychology. (1 cr. [max 10 cr.]) NGA. Prereq.—Psy 5135, 5137 or #) Advanced topics vary with each offering. Sample topics: gene identification in complex human traits, behavioral genetics of alcoholism, twin-family methodology.


Psy 9893. Directed Studies: Special Areas of Psychology and Related Sciences. (1-6 cr. [max 36 cr.]) Prereq.—Special area of psychology or a related science.

Psy 9895. Research Problems. (1-6 cr [max 36 cr]) Research problems.

Public Affairs (PA)

Humbert H. Humphrey Institute of Public Affairs

PA 5001. Intellectual Foundations of Public Action. (1.5 cr. A-F only. Prereq.—Major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hllth or #) Evolution of intellectual approaches that underlie public planning, management, and policy analysis as strategies for public action. How public decision making is shaped by knowledge and values; role of rationality. Conceptual approaches to public action along descriptive/normative lines and structure/process lines.

PA 5002. Introduction to Policy Analysis. (1.5 cr. A-F only. Prereq.—Major in publ aff or publ policy or sci, tech, and environ pol or urban and regional planning or publ hllth 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 and Management. (1.5 cr. A-F only. Prereq.—Major in publ aff or publ policy or sci, tech, and environ pol or urban and regional planning or publ hllth or #) Basic financial and accounting concepts and tools used in public and nonprofit organizations. Fund accounting, balance sheet and income statement analysis, cash flow analysis, and public sector and
nonprofit sector budgeting processes. Lectures and discussions, as well as cases and examples from nonprofit and public sector organizations.

PA 5004. Introduction to Planning. (3 cr; A-F only. Prereq–Major in [publ aff or publ policy or [sci, tech, and environ policy] or [urban and regional planning] or publ hhh] 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. Public Management and Leadership. (3 cr; A-F only. Prereq–Major in [publ aff or publ policy or sci, tech, and environ policy or urban/ regional planning or publ hhh] or #) Challenges facing higher-level managers in public/nonprofit organizations in a mixed economy and democratic republic. Distinctive features of public/ nonprofit management, skills necessary for effective management, manager’s role as creator of public value. Lectures, case discussions.

PA 5012. The Politics of Public Affairs. (3 cr; A-F only. Prereq–Major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Stages of policy making from agenda setting to implementation. Role and behavior of political institutions (courts, legislatures, executives, and bureaucracies) and citizens, social movements, and interest groups. Concepts of political philosophy. Theories of the state. Team taught interdisciplinary course with small discussion sections.

PA 5013. Law and Urban Land Use. (1.5 cr; A-F only. Prereq–Major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Role of law in regulating and shaping urban development, land use, environmental quality, and local and regional governmental services. Interface between public and private sector.

PA 5021. Economics for Policy Analysis and Planning I. (2-3 cr; A-F only. Prereq–Major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Introduction to a selection of tools useful for public policy: intermediate microeconomics, rudiments of macroeconomics, and central concepts of international trade.

PA 5022. Economics for Policy Analysis and Planning II. (2-3 cr; A-F only. Prereq–5021 or equiv, major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Application of economic reasoning to a variety of public policy issues that may vary by section. Includes cost-benefit analysis, nonmarket valuation, and tax analysis.

PA 5031. Empirical Analysis I. (2-3 cr; A-F only. Prereq–5021 or equiv, major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh 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, and multiple regression analysis. 

PA 5032. Intermediate Regression Analysis. (1-1.5 cr; A-F only. Prereq–5031 or equiv, major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Bivariate and multivariate models of regression analysis and assumptions behind them. Problems using these models when such assumptions are not met.

PA 5033. Multivariate Techniques. (1-1.5 cr; A-F only. Prereq–5031 or equiv, major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Examines public affairs topics using maximum likelihood estimation approaches.

PA 5034. Community Analysis and Planning Techniques. (2 cr. Prereq–5031 or equiv, major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Data analysis techniques for practitioners in fields of planning, development, and policy analysis who work at community and regional levels. Population analysis and forecasting techniques relevant for small geographic areas. Techniques for regional and local economic analysis, such as shift-share analysis, economic base, and location quotient analysis.

PA 5035. Survey Research and Data Collection. (1.5 cr. A-F only. Prereq–5031 or equiv, major in publ aff or publ policy or sci, tech, and environ policy or urban and regional planning or publ hhh or #) Introduction to survey research methods emphasizing applications to policy and applied research. Research design choices (e.g., descriptive, experimental, case studies), sampling, variable specification and measurement, conducting interviews, mailed questionnaires, qualitative techniques.

PA 5101. Management and Governance of Nonprofit Organizations. (3 cr. Prereq–Grad or #) Draws on theories, concepts, and real world examples to explore critical managerial challenges. Governance, management, strategic management practices, effect of different funding environments, management of multiple constituencies. Different types of nonprofits using economic/behavioral approaches.

PA 5102. Organization Design and Change. (1.5 cr. Prereq–Grad or #) Basic concepts related to organizational design decisions. Managerial challenges associated with organizational change in context of public sector agencies and nonprofit organizations. Major forces for change, kinds of change, management of change. Case-based analysis/discussion.


PA 5132. Mediation Training. (3 cr. 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 5142. Public Issues Facilitation Strategies. (1 cr. Prereq–Grad student or #) Course equips facilitators with processes that encourage civic participation and effective, timely decision-making. Students identify and examine facilitation components and link them to public issues, examine one approach or theory of facilitation and apply it to a case study, and share experiences and cases with other learners.

PA 5143. Teaching Leadership for the Common Good. (1 cr. Prereq–Grad student or #, basic ability to use the Internet and Web browsers) Introduces learners to main concepts in “Leadership for the Common Good” framework, offers a number of tools and exercises for applying these concepts, and prepares learners to teach others about leadership for the common good.

PA 5190. Topics in Public and Nonprofit Leadership and Management. (1-3 cr [max 9 cr]. Prereq–Grad student or #) Selected topics.


PA 5203W. Geographical Perspectives on Planning. (4 cr. §Geog 5605, §Geog 5605. Prereq–Grad student or #) Includes additional weekly seminar-style meeting and bibliography project on topic selected in consultation with instructor.

PA 5211. Introduction to Land Use Planning. (3 cr. Prereq–[[Course in spatial analysis or work experience demonstrating knowledge of field], grad student or #) Physical/spatial basis for community/regional development. Role of public sector in guiding private development processes. Issues in design of settlements. Applied case studies examine public regulatory frameworks.

PA 5221. Private Sector Development. (3 cr. Prereq—Grad student or #) Roles of various participants in land development. Investment objectives, effects of regulation. Overview of development process from private/public perspective.


PA 5251. Strategic Planning and Management. (1.5 cr. Prereq—Grad student or #) Theory/practice of strategic planning/management for governments, public agencies, and nonprofit organizations. How to promote strategic thinking/acting by policy-making bodies and management teams. Determining what an organization should do, how it should do it, and why. Lectures, case discussions.

PA 5252. Strategy and Tactics in Project Planning and Management. (1.5 cr. Prereq—Grad student or #) Planning, analysis, evaluation, and implementation of short-term plans. Technical analyses, interactional elements of completing projects within budget/time constraints. Strategic/tactical choices in planning. Case examples.

PA 5253. Participatory Management and Public Involvement Strategies. (3 cr. Prereq—Grad student or #) Survey of strategies, techniques, and tools for involving groups members, teams, organizations, and stakeholders (including public at large) in problem definition, policy/plan formulation, decision making, and implementation. Emphasizes public/nonprofit organizations, citizen involvement.

PA 5261. Housing Policy. (3 cr. Prereq—Grad student or #) Institutional/environmental setting for housing policy in the United States. Competing views of solving housing problems through public intervention in the market. Federal/local public sector responses to housing problems.

PA 5290. Topics in Planning. (1-3 cr [max 9 cr]. Prereq—Grad student or #) Selected topics.


PA 5311. Program Evaluation. (3 cr. Prereq—Grad student or #) Program evaluation/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. (1-4 cr [max 9 cr]. Prereq—Grad student or #) Topics in advanced policy analysis methods.

PA 5401. Poverty, Inequality, and Public Policy. (3 cr. Prereq—Grad student or #) Nature/extent of poverty/inequality in the United States, causes/consequences, impact of government programs/policies. Extent/causes of poverty/inequality in other developed/developing countries.

PA 5411. Child Welfare Policy. (3 cr. Prereq—Grad student or #) Intersection of conceptual orientations of developmental psychology with policies that affect children/families. Demographic, historical, social trends that underlie assumptions driving policies directed at women/children. Projections of future policies.

PA 5412. Aging and Disability Policy. (3 cr. Prereq—Grad student 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 5421. Racial Inequality and Public Policy. (3 cr. Prereq—Grad student or #) Historical roots of racial inequality in American society. Contemporary economic consequences. Public policy responses to racial inequality. Emphasizes thinking/analysis that is critical of strategies offered for reducing racism and racial economic inequality.

PA 5431. Public Policies on Work and Pay. (3 cr. 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 Legislatures. (3 cr. Prereq—Grad student or #) How Minnesota legislature decides K-12 issues. Implications for higher education. How to increase one’s influence in process. Discussions with persons who influence statewide educational policy. Presentations, field trip to state legislature.

PA 5442. Policy Design for Education and Human Development. (3 cr. Prereq—Grad student or #) Designing effective educational policies. Using interdisciplinary approaches to identify/understand core variables (economic, psychological, etc.). Work on policy design.

PA 5451. Immigrant Health Issues. (3-4 cr. 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 5490. Topics in Social Policy. (1-4 cr [max 9 cr]. Prereq—Grad student or #) Selected topics.


PA 5521. Development Planning and Policy Analysis. (4 cr. Prereq—[5031 or equiv], [5051 or equiv], grad student or #) Techniques/assumptions of development planning and policy analysis at national, regional, and project levels. Direct/indirect effects of external shocks and government interventions on national/regional economies. Macroeconomic modeling, input-output analysis, social accounting matrices/multipliers, project appraisal/evaluation techniques.

PA 5522. Economic Development Policies in Latin America. (3 cr. Prereq—[5021 or equiv], [5022 or equiv], grad student or #) Evolution of economic development policies from import-substituting industrialization policies of 1950s/1960s through beginning of reform in 1970s, economic crisis of 1980s, transformation into 1990s. Emphasizes privatization, economic integration, exchange rate/trade, and domestic/adjustment policies.

PA 5531. Strategies for Sustainable Development: Theory and Practice. (3 cr. Prereq—[Microecon course, grad student or #) Economic, environmental, and social aspects of sustainable development. Strategies, methods of implementation, and applications of sustainable development in different economic systems of industrialized/developing countries. Special attention to countries in transition.

PA 5590. Topics in Economic and Community Development. (1-3 cr [max 9 cr]. Prereq—Grad student or #) Selected topics.


PA 5611. Feminist Economics. (1.5 cr. Prereq—[5021, grad student or #) Feminist philosophy, methodology, and economic practice. Feminist perspectives on development and the global economy, work/family. Heterodox traditions in economics.

PA 5690. Topics in Women and Public Policy. (1-3 cr [max 9 cr]. Prereq—Grad student or #) Selected topics.


PA 5711. Science and Technology Policy. (3 cr. Prereq—Grad student or #) Effect of science/technology on global economy, politics, environment, security. Role of national science/technology policies in development, diffusion, and adoption of technologies nationally/ internationally. Issues related to technology policy, technological development, impact of technology, international cooperation.

PA 5721. Energy and Environmental Policy. (3 cr. Prereq—Grad student or #) Impact of energy production/consumption choices on environmental quality, sustainable development, and other economic/social goals. Emphasizes public policy choices for energy/environment, linkages between them.

PA 5790. Topics in Science, Technology, and Environmental Policy. (1-3 cr [max 9 cr]; Prereg–Grad student or #) Selected topics.


PA 5812. Open Economy Models: An Assessment. (3 cr; Prereg–Intermediate macroeconomics, trade theory, grad student or #) Open economics, implications for policy making/implementation. Issues at level of international/domestic economy.

PA 5880. Topics in Foreign Policy and International Affairs. (1-5 cr [max 9 cr]; Prereg–Grad student or #) Selected topics.

PA 5900. Computer Applications in Public Affairs (Summer). (0.5 cr [max 6 cr]; S-N only. Prereg–#) Introduction to basic computer systems/applications in public affairs practice (e.g., MS Windows, MS Word). Offered summer.

PA 5901. Computer Applications in Public Affairs. (0.5-3 cr [max 6 cr]; S-N only. Prereg–#) Introduction to computer systems/applications in public affairs practice.

PA 5902. Computer Applications in Public Affairs. (0.5-3 cr [max 6 cr]; S-N only) Introduction to computer systems/applications in public affairs practice.

PA 5903. Introduction to Computers and Applications at the Humphrey Institute. (2 cr; S-N only. Prereg–International HHH fellow) Computer/applications. Basic skills. Software such as MS Word, Excel, PowerPoint, Access. Using Internet, e-mail, search engines (for research), HTML (through Web page creation software).

PA 5931. Role of the Media in Public Affairs. (3 cr; Prereg–Grad student or #) Historical/contemporary role of news media in defining/shaping public opinion/policy, primarily in the United States. Emphasizes critical research, professional skills in three forms of journalism: hard news coverage, investigative reporting, documentaries. Field experience, practice in governmental public relations.

PA 5941. Leadership for the Common Good. (4 cr; Prereg–#) Personal, team, organizational, visionary, political, and ethical aspects of leadership. Emphasizes building/experiencing a learning community.

PA 5951. Global Commons Seminar. (3 cr [max 6 cr]; S-N only. Prereg–International Hubert H. Humphrey Fellows) Meets specific needs of International Humphrey Fellows. Topics vary each year depending on the interests and needs of the fellows.

PA 5990. Topics: Public Affairs—General Topics. (0.5-3 cr [max 9 cr]; Prereg–Grad student or #) General topics in public policy.

PA 8001. Synthesis Seminar. (4 cr; A-F only. Prereg–Grad PA major or #) Development of interdisciplinary understanding of one or more policy areas through explorations of theory, readings, cases, and model-building exercises. This understanding is then used to articulate possible policy or system improvements, along with leadership implications for formulating and implementing them.

PA 8002. Synthesis Workshop. (4 cr; A-F only. Prereg--[001, grad PA major or #) Development of public policy to advance public interest, common good. Recommendations flow from interdisciplinary understanding of stakeholders, analysis, modeling/analysis. Political feasibility, marketing, entrepreneurship, advocacy.

PA 8081. Capstone Workshop. (3 cr; A-F only. Prereg–Grad major in [public policy or urban and regional planning] or [science, technology, and environment policy], completion of core courses or #) Project external client on issue agreed upon by student, client, and instructor. Students apply interdisciplinary methods, approaches, and perspectives studied in core courses to the issue. Written report includes analysis of issue and policy recommendations. Oral presentation of major findings. Concentration/topic vary term-to-term.

PA 8105. Human Resources and Organizational Performance. (2 cr; Prereg–5032, 5022 or equiv) Impact of human resource policies and practices on organizational productivity and effectiveness. Role of government, unions, and private sector institutions on organizational effectiveness.

PA 8183. Managing Collaborations. (3 cr; A-F only) Management challenges of operating within multiparty (combination of nonprofit, for-profit, and public enterprises) collaborations formed to deal with a social problem. Combines approaches to conceptual and materials with application in community. Student teams work for half a semester with local collaborations on management problems.

PA 8186. Public Services Redesign. (3 cr; A-F only) Theory, strategy, politics, and some practical mechanics required to adapt public service system given constraints on resources and continuing pressure for effectiveness and equity. In-class and out-of-class interviews with persons involved in redesign. Student papers on current redesign issues.

PA 8190. Advanced Topics in Public and Nonprofit Leadership and Management. (1-3 cr [max 6 cr]) Selected topics.

PA 8201. Environment and Infrastructure Planning. (4 cr; A-F only. Prereg–[Urban and regional planning] grad student or #) Relationship between infrastructure, human settlement design. Natural resource systems as foundation of infrastructure provision. Environmental basis of, and political/legal/institutional frameworks for, land-use planning. Parallel computer lab, practicum assignment.

PA 8202. Networks and Places: Transportation, Land Use, and Design. (4 cr; A-F only. §8212. Prereg–Urban and regional planning) grad student or #) Relationship between land use and transportation. Developing synthetic design skills for linking land use transportation in urban/regional settlements. Development of public policies. Parallel computer lab, practicum assignment.

PA 8203. Neighborhood Revitalization Strategies and Theories. (4 cr; A-F only. Prereg–[Urban and regional planning] grad student or #) Policy making/policies of planning in housing, community development, social policy. Connecting policy to local/regional policies. Role of institutional decision-making structures on policy outcomes. Importance of citizens, social movements, interest groups in policy development.

PA 8204. Regional, Economic, and Workforce Development Planning. (4 cr; A-F only. Prereg–5021 or 5202, §5034) Provides a rigorous foundation in the evolution and current state of regional development planning in the United States and abroad; theories of regional and local economic development, linked to various techniques of analysis and implementation; and in workforce development planning at the regional and local level.

PA 8212. Networks and Places: Transportation, Land Use, and Design. (3 cr; A-F only. §8202. Prereg–Transportation Certificate student or #) Relationship between land use and transportation. Developing synthetic design skills for linking land use transportation in urban/regional settlements. Economic, political, legal, institutional frameworks for planning.

PA 8286. International Development and Urban Planning. (3 cr; A-F only) Urbanization process and planning responses in cities of developing world. Urban sustainability, migration, housing, transportation, employment, and urban service delivery. Phenomena such as squatter settlements and informal economy that normally proceed unplanned and without formal government control.

PA 8290. Advanced Topics in Planning. (1-3 cr [max 6 cr]) Selected topics.


PA 8312. Analysis of Discrimination. (3 cr) Introduces students of political science and other applied social sciences to tools for measuring and detecting discrimination in market and nonmarket contexts. Application of modern tools of labor economics and race relations research to specific problems of market and nonmarket discrimination.

PA 8333. FTE: Master’s. (1-cr; NGA. Prereg–Master’s student, adviser and DGS consent)

PA 8386. Research Methods in Social and Labor Policy. (3 cr; A-F only. Prereg–5053 or 5033, 5022 or equiv) Use of social science research methods in analyzing and developing public policies.

PA 8390. Advanced Topics in Advanced Policy Analysis Methods. (1-3 cr [max 6 cr]) Selected topics.

PA 8486. Work and Family in the United States and the Third World. (3 cr; A-F only) Topics based on students’ interests. Topics may relate to formal and informal labor force, work, household work, child care, child labor, youth employment, education, training, or their interrelationships. Data collection and measurement issues; economic and demographic theories of work and education decisions in context of the family.

PA 8490. Advanced Topics in Social Policy. (1-3 cr [max 6 cr]) Selected topics.

PA 8583. Capstone Workshop on Economic and Community Development. (3 cr; A-F only) Comprehensive overview of state, local, community-based economic development strategies. Processes involved in producing broadly conceived economic development strategy. Institutional structures/processes to deal with economic change, new political realities.

PA 8590. Advanced Topics in Economic and Community Development. (1-3 cr [max 6 cr]) Selected topics.

PA 8686. Feminist Organizations. (3 cr; A-F only) Uses social movement literature and histories of U.S. second-wave feminism to elaborate core processes of feminist organizations. Recurring issues and conflicts within organizations and movements examined through comparative studies of feminism in Latin America, Eastern Europe, Britain, and Italy. Methods and sources for studying feminism.

For definitions of course numbers, abbreviations, and symbols, see page 153.

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PA 8690. Advanced Topics in Women and Public Policy. (1-3 cr [max 6 cr]) Selected topics.
PA 8777. Thesis Credits: Masters. (1-18 cr [max 50 cr]; NGA, Preq-Req-Max 18 cr per semester or summer; 10 cr total required [Plan A only])
PA 8790. Advanced Topics in Science, Technology, and Environmental Policy. (1-3 cr [max 6 cr]) Selected topics.
PA 8811. Strategic Issues in International Economic Policy. (3 cr) Comparisons/contrasts experiences of industrial/developing countries in trade, investment, exchange rates, and immigration.
PA 8821. National Security Policy. (3 cr) Politics and economics of national security policy, Defense policy, military strategy, and weapons procurement. While emphasis is on the United States, other countries also discussed.
PA 8890. Advanced Topics in Foreign Policy and International Affairs. (1-3 cr [max 6 cr]) Selected topics.
PA 8991. Independent Study. (1-3 cr [max 6 cr]. Prereq–#)

Public Health (PubH)

School of Public Health

PubH 5005. Topics: Community Health Education. (1-4 cr [max 20 cr]. Preq-Req–#) Topics of interest in community health education.
PubH 5010. Public Health Interventions for AIDS. (3 cr. Preq-Req-Grad student or professional school student or #) Survey of public health approaches to AIDS epidemic. Epidemiological/clinical features of HIV infection. Impact of AIDS on certain communities/populations. Behavior change principles as they apply to AIDS interventions.
PubH 5017. Culture and Health Behavior. (2 cr. Preq-Req-Grad or professional school student or #) Heightens cultural sensitivity regarding public health practice and individual health behaviors. Cultural diversity and its impact on health behaviors; ethnic (universal) and emic (culture-specific) approaches.
PubH 5020. Fundamentals of Social and Behavioral Science. (3 cr. Preq-Req–PubH public health or #) Four major approaches to public health problems: psychosocial, economic, community, policy. Lectures provide overview of theory/application. Small groups provide opportunity to practice skills.
PubH 5030. Prevention of High-Risk Behavior Among Adolescents. (2 cr. A-F only; Preq–[Grad-level behavioral sci course [5200 preferred], [CHE or MCH or PubH Nutr or EPI MPH or Epi grad] or #; 2-yr master's student recommended]) Definitions/etiology of high-risk behaviors among adolescents. Intervention programs. Review of current literature. Students design prevention program overview based on theory/etiological data using health education/behavior change methods.
PubH 5035. Applied Research Methods. (3 cr. Preq–[5414 or 5450 or equiv.], [5034 or 5806 or equiv.] [che or pub hth nutr major or #]; 5420 recommended) Complements master’s project work using forms, questionnaires, interviews. Literature searching, questionnaire development, scale construction, item analysis, data coding, entry/analysis, report writing. Use of computer software package to develop questionnaire and analyze data.
PubH 5049. Legislative Advocacy Skills for Public Health. (3 cr; A-F only, Preq-5078, #) State legislation as arena for public health practice. Skills necessary to operate in that arena. Analyzing emergence, development, and resolution of legislative issues of public health importance.
PubH 5050. Community Health Theory and Practice I. (3 cr. Preq-Req–Che major or #) Socioenvironmental factors influencing health-related behavior. Role of government, social structures in encouraging healthy, unhealthy behavior. Role of interventions affecting social environment; barriers to effective interventions. Individual behavior change models, targeting psychosocial approaches; application of theories in practice.
PubH 5051. Community Health Theory and Practice II. (3 cr. Preq-Req–Che major or #) Conceptualizing, planning, and implementing community health education, public health programs and interventions. Examines health education/promotion organizations; how organizational factors shape health education practice. Focuses on planning health education/promotion efforts. Students gain experience in developing a hypothetical community health intervention.
PubH 5055. Social Inequalities in Health. (2 cr. Preq-Req–Hth sci professional school student or hth sci or soc work or pub affairs grad student or #) Extent/causes of social inequalities in health. Degree to which understanding of these inequalities is hampered by methodological limitations in health research. Focuses on individual, community, and policy approaches to reducing social inequalities in health.
PubH 5074. Mass Communication and Public Health. (2 cr. Preq-Req–PubH MPH or grad student or Jour grad student or #; background or coursework in [social or behavioral] science recommended) Role, functions, effects of mass media on public health. Planned/unplanned effects. Review of literature on how theories, models, assumptions of mass communication research relate to public’s health.
PubH 5078. Public Health Policy as a Prevention Strategy. (2 cr. Preq-Req–CHE or MCH or PubH Nutr or EPI MPH or EPI grad student or #) Philosophical, ethical, economic, political, efficacy rationale for policy approach to prevention. Historical/current application of prevention policy to public health problems.
PubH 5094. Master’s Project: Community Health Education. (1-6 cr [max 6 cr]. Preq-Req–CHE major, #) Directed research towards completion of master’s project in community health education.
PubH 5096. Field Experience: Community Health Education. (1-6 cr [max 6 cr]; S–N only. Preq-Req–CHE major, #) Supervised community health education field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems.
PubH 5100. Topics: Environmental and Occupational Health. (1-4 cr [max 20 cr]. Preq-Req–#) New course offerings or topics of interest in environmental and occupational health.
PubH 5101. Master’s Project: Environmental Health. (1-3 cr [max 5 cr]; S–N only. Preq-Req–EH major, #) Directed research towards completion of the Master’s Project in Environmental Health.
PubH 5102. Field Experience: Environmental Health. (1-5 cr [max 5 cr]; S–N only. Preq-Req–EH major, #) Supervised environmental health field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems.
PubH 5103. Exposure to Environmental Hazards. (2 cr; A-F only, Preq–EH major or #) Concepts, assessment, and control of exposure to biological, physical, and chemical hazards in the environment. Environmental health as an essential component of public health.
PubH 5104. Environmental Health Effects: Introduction to Toxicology. (2 cr; A-F only) Identifying mechanisms/effects on human health of environmental agents. Chemical, biological, physical, and psychological agents.
PubH 5105. Environmental and Occupational Health Policy. (3 cr; A-F only, Preq–EH major or #) Students develop an understanding of environmental and occupational health policies, laws, key concepts and principles, proposals and regulatory reform, approaches to policy analysis, and overall phases and issues in the policy-making process.
PubH 5111. Preventing Pollution: Innovative Approaches to Environmental Management. (3 cr. Preq–PubH hist or grad or honors undergrad student or #) Interdisciplinary approach to pollution problems, including sustainability, pollution prevention, risk assessment, regulatory reform, and strategic environmental management.
PubH 5112. Risk Analysis: Application to Risk-Based Decision Making. (3 cr. Preq–PubH hist or grad student or #) Introduction to risk in context of regulatory decision making.
PubH 5113. Public Policy and Risk: Strategies for Effective Decisions and Discourse. (3 cr. Prereq–Pubhlth or grad student or #) Introduction to policy making in public health, environment characterized by substantial risk/uncertainty of decision making under risk/uncertainty. Cognitive psychology of how people react to risk. Methods of risk communication.

PubH 5114. Foundation of Environmental and Worker Protection Law. (1 cr. Prereq–PubH 5110) Traditional/constitutional law-making authority of courts, legislatures, and administrative agencies.


PubH 5116. Environmental Law. (1 cr. §5110. Prereq–5114) Several difficult legal questions that arise when pollution protection law conflicts with policy encouraging the use of natural resources. Conflict that arises when government restricts the use of property without compensating its owner. Increasing awareness of government agencies to audit businesses to assure compliance.

PubH 5120. Injury Prevention in the Workplace, Community, and Home. (2 cr) Injury epidemiology: analyses of major injury problems affecting the public in the workplace, community, and home using epidemiological model and conceptual framework; emphasis on strategies/ program development for prevention and control.

PubH 5121. Topics: Injury Prevention in the Workplace, Community, and Home. (1-2 cr) §5120 or 5194, §5320, #) Selected projects.


PubH 5123. Violence Prevention and Control: Theory, Research, and Application. (2 cr) Analysis/critique of major theories and of epidemiological research pertinent to violence, including characteristics of violence and relevant risk factors, reporting/treatment protocols, and current potential intervention efforts and prevention initiatives. Emphasizes interdisciplinary contributions to violence prevention/control.


PubH 5131. Working in Global Health. (1-2 cr) §5120 or 5194, §5320, #) Introduction to key issues in global health: global burden of disease; cultural issues and health; nutrition; infectious diseases; environmental problems; women and children. Background for health professionals and for working overseas. Instructors have all had experience working in foreign countries.


PubH 5160. Physiological Disposition of Xenobiotics. (3 cr. Prereq–PubH 5110) Course each in biochem, mole biology, org chem or #) Pharmacokinetics/toxicokinetics and xenobiotic metabolism. Mechanisms by which phase I and phase II enzymes bioactivate and detoxify xenobiotics. Implications of these biochemical reactions for human health.

PubH 5161. Regulatory Toxicology. (2 cr. Prereq–Some background in [toxicology or pharmacology or related field] is recommended) In-depth introduction to regulatory laws (and associated regulations) of U.S. federal regulatory agencies, such as CPSC, EPA, FDA, OSHA, and DOT; that require/ use toxicological data/information in their mission of protecting human/environmental health.


PubH 5172. Industrial Hygiene Applications. (2 cr. Prereq–PubH 5114 or #) Recognition, evaluation, and control of occupational health/safety hazards. Practice application to specific industrial hygiene problems related to gases/vapors, aerosols, and physical agents.


PubH 5174. Control of Exposure to Physical and Chemical Hazards. (2 cr. Prereq–PubH 5114 or #) Hazard evaluation/monitoring, control of physical agents in working/living environments, ionizing/non-ionizing radiations (e.g., lasers/ultraviolet, visible, and infrared light), noise/vibration, heat/cold stress. Dose, response, and engineering interventions.

PubH 5175. Industrial Hygiene Measurements Laboratory. (2 cr. Prereq–PubH 5171 or #) Principles/measurement of process control of exhaust ventilation in workplaces and other indoor air spaces and in air cleaning. Control of emissions to ambient environment.


PubH 5180. Environmental Microbiology. (3 cr. Prereq–Biological course in microbiology or #) Sources, monitoring, and control of microorganisms in the environment that are significant to human health.


PubH 5190. Environmental Chemistry. (3 cr. Prereq–PubH 5116 or #) Overview air, water, and soil chemistry; pertinent environmental problems; human and ecological multimedia exposures to chemicals in the environment.

PubH 5193. Directed Study: Environmental and Occupational Health. (1-4 cr [max 20 cr]; S-N only. Prereq–#) Directed study in a topic agreed upon by student and faculty member.

PubH 5197. Air Pollution. (3 cr. Prereq–PubH 5116 or #) Overview of many facets of air pollution. Primary/secondary sources. Transport mechanisms, including meteorological effects; atmospheric transformations of pollutants, and deposition processes involved in removal of pollutants. Human/ecosystem health effects, nuisance effects. Regulations/standards in place and under review that affect air pollution management.

PubH 5200. Environmental Health. (2 cr) Principles of environmental health relating to macro- and micro-environments and to products consumed or used by people.


PubH 5281. Immigrant Health Issues. (3-4 cr) Prereq–PubH 5110 or grad student or #) How to access demographic background information on U.S. immigrants. Characteristics and health needs of immigrants. Designing culturally competent health programs. How to advocate for changes to promote immigrant health. Community visits required.

PubH 5290. Topics: Public Health Practice. (1-4 cr [max 20 cr]) New course offerings or topics of interest in public health practice.

PubH 5294. Master's Project: Public Health Practice. (1-3 cr [max 3 cr]; S-N only. Prereq–[PHP or PHPH] major, #) Directed field research. One course each in gen chem, org chem or #) Directed field experience or clinical rotation/practicum in selected community or public health agencies/institutions. Integration of knowledge/skills in population science for public health.

PubH 5299. Public Health Practice: Introductory Seminar for Health and Human Resources Professionals. (1 cr [max 3 cr]; S-N only. Prereq–Baccalaureate degree identified from a health professional program or grad student in [dentistry or medicine or nursing or pharmacy or public health or veterinary medicine]) Science/art of public health. Emphasizes interdisciplinary linkages to practice communities. National/local priorities as outlined in “Healthy People 2010” serve as framework for presentations on current issues/trends by public health leaders.


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PubH 5320. Fundamentals of Epidemiology. (3 cr. Prereq—Epidemiology MPH or Epi PhD or Biostatistics major or #) Basic concepts and knowledge of epidemiology, a methodology used to study the etiology, distribution, and control of diseases in human populations.

PubH 5330. Epidemiology I. (4 cr. max 4 cr. Prereq—Epidemiology MPH or Epi PhD or Doctoral level Epidemiology student or Biostatistics major or #) Compendium of epidemiologic principles applicable to infectious/noninfectious disease. Introduction to measures of disease frequency. Study designs (randomized trials, cohort, case-control, cross-sectional, and ecological studies). Issues of bias, confounding, and causal inference. Data analysis using tabular methods.


PubH 5334. Human Behavior II. (2 cr. A-F only. Prereq—(5333, Epi grad student in behavioral track) or #) Critical evaluation of major behavioral public health intervention research. Experience in research designs/methods in health behavior intervention.


PubH 5336. Advanced Seminar in Infectious Disease Epidemiology. (1 cr. max 2 cr S-N only. Prereq—5330, 5335, #) How infectious disease epidemiologic principles are applied in the “real world” to contemporary or controversial issues, including development of prevention and control strategies.

PubH 5337. Analysis of Infectious Disease Data. (2 cr. A-F only. Prereq—5330, 5430, 5335, [EPI MPH or EPI] grad student, #) Methods to analyze/model infectious disease data. Emphasizes critical understanding of methods, statistical analysis specific to infectious disease areas. Infection models, surveillance/epidemic modeling, transmission models, pathogenesis models.


PubH 5345. Epi Methods: Data Collection. (2 cr. Prereq—[5330, 5450, [EPI MPH or clin research student] or #) Methods/techniques for collecting/managing epidemiologic research data. Practical aspects of sampling, response rates/bias, forms design, selecting/training interviewers. Data preparation, entry, cleaning, management. Ethical issues in research.

PubH 5348. Writing Research Grants. (2 cr. S-N only. Prereq—[5330, 5450, [Epi PhD or clinical research MS student] or #) Focuses on NIH-type grants. Mechanisms of grant development/writing, principles of informed consent, budget development, grant-review process, identifying funding sources.

PubH 5351. Molecular Epidemiology. (2 cr. A-F only. Prereq—PubH 5330, at least one college-level general biology course, [Epi MPH or Epi grad student] or #) Introduction to molecular epidemiology. Sample collection, processing, methodology. Biomarkers used in cancer, cardiovascular disease, and infectious epidemiologic studies.


PubH 5363. Design and Analysis of Group-Randomized Trials in Epidemiology. (3 cr. Prereq—5340, 5452, [EPI MPH or EPI] grad student, #) Community, school-based, and work-site trials. Trials involving randomization of other identifiable groups to study conditions. Experimental/quasi-experimental designs and threats to their validity.

PubH 5365. Epidemiology of Aging. (2 cr. Prereq—Grad or professional school student, 5330 or equiv or #) Major concepts and issues. Emphasizes methodological issues unique to studies of older populations with measurement of epidemiologic characteristics especially important. Scope of epidemiologic studies of older populations; most prevalent health conditions.

PubH 5370. Alcohol and Other Drugs: Epidemiology, Prevention, and Control. (3 cr. Prereq—Eh or epi grad major or pub hth or biol or dent or nurs grad or med or school of pharm student or #) Population patterns regarding who uses which drugs, why they use them, and health consequences of alcohol and other drug use. Does not focus on treatments, care, rehab, or exploration of personal attitudes, practices regarding alcohol or other drug use.

PubH 5379. Epidemiology Master’s Project Seminar. (1 cr; S-N only. Prereq—#) Seminar for epidemiology MPH master’s project presentations. Students present their projects and give/receive feedback.


PubH 5386. Public Health Aspects of Cardiovascular Disease. (2 cr. Prereq—[5330, 5450, [EPI MPH or Epi PhD student] or #) Detailed perspective on well-established risk factors for cardiovascular disease (CVD), prevention of CVD, and national recommendations for treatment/prevention. Introduces major risk factors and current controversies in CVD.

PubH 5387. Cancer Epidemiology. (2 cr. Prereq—5330, 5430, hth sc grad and professional school student or #) Epidemiologic aspects of cancer, including theories of carcinogenesis, incidence, site-specific risk factors, and issues of cancer control and prevention.

PubH 5389. Nutritional Epidemiology. (2 cr. Prereq—[5330, [Epi MPH or Epi PhD or public hth nutrition MPH student] or #) Nutrition/disease relationships through application of epidemiologic methods. Characterization of various exposures to food/nutrient intakes, biological basis for nutrition/disease relationships. Studies of specific chronic diseases and nutritional intake. Design/interpretation of studies using nutritional measures.

PubH 5396. Field Experience: Epidemiology. (1-4 cr. max 4 cr S-N only. Prereq—[5330 or Epi PhD or grad student] or #) Supervised epidemiologic field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems.

PubH 5399. Topics: Epidemiology. (1-4 cr [max 20 cr. Prereq—#) New course offerings or topics of interest.


PubH 5452. Biostatistics II. (4 cr. Prereq—[5450, competence in SAS through 5420] or equiv or grade of at least B in [5414, 5415]) Two-way ANOVA, interactions, repeated measures, general linear models. Logistic regression for cohort and case-control studies. Loglinear models, contingency tables, Poisson regression, survival data, Kaplan-Meier methods, proportional hazards models.

PubH 5456. Biostatistics Consulting Seminar. (2 cr. S-N only. Prereq—5465, biostatistics major or #) Professional roles/responsibilities of practicing biostatistician as consultant/collaborator in health science research. Discussion, written assignments, student presentations, meeting notes, interviews, guests.

PubH 5460. Introduction to Biostatistical Thinking. (1 cr; S-N only. Prereq—Biostatistics major or #) Aspects of Biostatistics as described at U of M and as described in research literature.

PubH 5462. Clinical Trials: Design, Implementation, and Analysis. (3 cr. Prereq—5452 or 5466 or #) Introduction to and methodology of randomized clinical trials: design issues, sample size, operational details, interim monitoring, data analysis issues, and overview.


Courses

PubH 5467. Analysis of Categorical Data. (3 cr. Prereq--Stat 322 or 5102.) Contingency tables, odds ratio, relative risk, chi-square tests, log-linear models, logistic regression, conditional logistic regression, Poisson regression, matching, and use of statistical techniques known collectively as latent variable models. Exploratory/confirmatory factor analysis, path analysis, structural equation modeling, latent trait models, latent class models. SAS/AMOS software are used.

PubH 5470. Topics: Biostatistics. (1-4 cr [max 20 cr]). Prereq--#)
Topics of interest in biostatistics.

PubH 5482. Latent Variable Models. (3 cr. Prereq--[5414, 5451] or [5450, 5452] or #) Introduction to use of statistical techniques known collectively as latent variable models. Exploratory/confirmatory factor analysis, path analysis, structural equation modeling, latent trait models, latent class models. SAS/AMOS software are used.

PubH 5483. Statistical Methods for Correlated Data. (3 cr. Prereq--[5420 or equiv], [5452 or 5466 or Stat 5303 or equiv], familiarity with matrix notation) or #) Correlated data arising from data collected over time or space, group randomizations, cluster sampling, nested designs, or random effects assumptions. Modeling, analysis, and interpretation appropriate for such data, for normally or non-normally (e.g., Poisson, gamma) distributed outcomes. Computing using SAS software.

PubH 5494. Master's Project: Biostatistics. (1-3 cr [max 3 cr]; S-N only. Prereq--[Bio MPH or grad student]) Directed research toward completion of Master's or Plan B project in biostatistics.


PubH 5502. Clinical Research Literature Review Seminar. (1 cr. Prereq--Clinical research grad student or #) Students review clinical research literature, critique: hypotheses/goals, methodology of population selection, study design, subject measurement.

PubH 5503. Clinical Research Project Seminar. (2 cr. Prereq--[5502, clinical research grad student, master's project/thesis paper [underway or near completion]] or #) Students to present their master's project/thesis, receive feedback.

PubH 5510. Topics: Clinical Research. (1-4 cr [max 20 cr]). Prereq--#)
Topics of interest in clinical research.

PubH 5550. Clinical Research: Introductory Seminar for Health Professionals. (2 cr. Prereq--[Bachelors degree or public health degree from program or grad student in: dentistry or medicine or nursing or pharmacy or public health or veterinary medicine]]; not for clinical research MS students] Design/implementation of clinical research protocols. IRB, FDA, and other regulations. Practical tools for survey management.


PubH 5593. Directed Study: Clinical Research. (1-4 cr [max 4 cr]. Prereq--CR grad student, #) Directed research or field practice in clinical research.

PubH 5605. Reproductive and Perinatal Health. (2 cr. A-F only. Prereq--Pub hhh or grad student or #) Issues, programs, services, and policies. Social, cultural, psychological, physiologic, environmental, economic, and political factors that affect reproductive health, pregnancy, and childbearing.

PubH 5606. Health of Children. (2 cr. Prereq--Pub hhh or grad student or #) Overview of public health issues related to children in the United States. Focus on identifying and planning effective public health strategies, policies, and programs to improve the health of infants and children.


PubH 5610. Principles of Maternal and Child Health. (2 cr. Prereq--Pub hhh or grad student or #) For MCH students and others interested in learning about the needs of children and families. Examines MCH activities in the context of “Healthy People 2000,” including the history and organization of programs, policies, and advocacy activities.

PubH 5613. Chronic Illness and Disability in Childhood: Principles, Programs, and Policies. (2 cr. Prereq--Pub hhh or grad student or #) Principles, programs, and practices for identifying and meeting the needs of children and adolescents with chronic health conditions and of their families. Skills emphasized: needs assessment, program development/evaluation, family empowerment, interdisciplinary team building, integrated/coordinated service delivery, advocacy.

PubH 5627. Sexuality Education: Criteria, Curricula, and Controversy. (1 cr. Prereq--Prefer public health student or grad student or professional in public health or in social work or grad student in education, 5 seats reserved for UC students) Issues/controversies affecting K-12 sexuality education. Current research/guidelines for effective, responsible education and curricula selection. Various curricula being used in the United States. Challenges in teaching sensitive issues inherent in sexuality education.

PubH 5628. Seminar: Race, Class, and Family Formation. (1 cr; S-N only. Prereq--Pub hhh or grad student or #) Impact of race/class on family formation, family dynamics, and family resiliency/maintenance. Explores whether traditional approaches in family intervention are effective among individuals who are not engaged in traditional social institutions.

PubH 5634. Advocating for Change for Children. (2 cr. Prereq--Pub hhh or grad student or #) Strategies for changing systems, building skills in public policy research, information/perception management, coalition building, personal persuasion, advocacy.


PubH 5654. Adolescent Sexual Identity: Teen Risk and Professional Responsibility. (1 cr. Prereq--Professional in pub hhh or medicine or ed or soc work or counselor/mental health professional) Issues that gay, lesbian, and bisexual adolescents and their families face in coming to terms with sexual orientation. Helpful ways to work with this hidden population and their families. One-day workshop.

PubH 5655. Sexual Orientation Issues for Adolescents. (2 cr. Prereq--Baccalaureate degree or employment in ed or hhh or soc service field) Adolescent sexual orientation from perspective of individual identity; impact of the community and response of the community toward gay, lesbian, bisexual, and transgender youth; and interventions/roles of professionals in the school and community.


PubH 5673. Grant Writing for Public Health. (1 cr. Prereq--MCH or CHE or PubH Nutr or EPI MPH or #) Hands-on workshop. Focuses on children, youth, and families. Identifying successful elements of a grant application. Grant review process. Critiquing a grant. Writing an application.

PubH 5675. Women’s Health. (2 cr. Prereq--Public health [MPH or MS or PhD] student or health sciences grad student or #) Programs, services, and policies that affect women’s health in the United States. Methodological issues in research. Emphasizes social, economic, environmental, behavioral, and political factors. Measurement/interpretation of factors, how they translate into interventions, programs, and policies.


PubH 5694. Master’s Project: Maternal and Child Health. (2-4 cr [max 4 cr]; S-N only. Prereq--MCH major, #) Directed research toward completion of the master’s project in maternal and child health.

PubH 5696. Field Experience: Maternal and Child Health. (2-4 cr [max 4 cr]; S-N only. Prereq--MCH major, #) Supervised maternal/child health field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems.

PubH 5700. Foundations of Public Health Administration. (3 cr. Prereq--[Grad-level epidemiology course, [public health or grad student]]) Organization of public health, predominately in the United States. Role of public health administration. Problem-solving skills necessary for effective administration.

PubH 5705. Community Health Assessment. (3 cr. Prereq--[Grad-level epidemiology course, [public health or grad student]]) or # Two of the three core functions of public health: health assessment, assurance. Lectures, discussion, group activities, oral presentations.

PubH 5708. Analysis of Administrative Data. (3 cr. Prereq--Pub hhh or grad student or #) How to use data for various research designs. Origin, quality, strengths, limitations of data. Files based on Medicare/Medicaid data are used for hands-on learning. Emphasizes broad concepts/skills.

PubH 5711. Public Health Law. (2 cr. Prereq--Grad student or professional school student or #) Basic concepts of law, legislative process, and legal bases for existence/administration of public health programs. Legal aspects of current public health issues/controversies, regulatory role of government in health services system.

PubH 5717. Decision-Making Under Uncertainty. (2 cr. Prereq--Pub hhh or grad student or #) Introduction to theory/applications of decision analysis. Focuses on normative (as opposed to descriptive) modeling of decision-making under uncertainty.

PubH 5721. Managing Collaborative Networks. (2 cr. Prereq--Grad student or professional school student or #) How to manage inter-organizational networks to coordinate provider organizations for associations and rural health networks.

For definitions of course numbers, abbreviations, and symbols, see page 153.
Courses


PubH 5727. Health Leadership and Effecting Change. (2 cr. Prereq–Grad student or professional school or #) Applications of a broad theoretical base in planned change to solve managerial/organizational problems in students’ future roles as leaders in health professions.

PubH 5740. Organizational Behavior. (2 cr. Prereq–Grad or professional school student or #) Human behavior in organizations. Motivation, leadership, influence of organizational structure, informal group behavior, interpersonal relations, supervision. Emphasizes preventing/solving problems among individuals/groups in organizations.


PubH 5751. Principles of Management in Health Services Organizations. (2 cr. Prereq–Grad or professional school student) Role of health-care services administrators, principles of management, administrative process. Lectures, case studies.

PubH 5752. Public Health Management. (3 cr. Prereq–Grad or professional school student or #) Managing projects/organizations in public health. Skills/knowledge necessary to determine mission of an organization, structure it to support individuals in their work, and motivate/manage to achieve goals.

PubH 5760. Healthcare Financial Management: Public Sector Emphasis. (2 cr. Prereq–Grad or professional school student or #) Theory of managerial/financial accounting and of healthcare finance as they relate to program development for non-profit organizations. Emphasizes methods whereby programmatic goals/objectives can be integrated into financial planning, budget preparation, and budget control. Examining an overall program through financial analytical techniques.


PubH 5780. Topics: Public Health Administration. (1-4 cr [max 20 cr], Prereq–#) Topics of interest in public health administration.

PubH 5791. Independent Study: Public Health Administration. (2 cr [max 4 cr], Prereq–PHA major, #) Independent study supervised by a public health administration faculty member.

PubH 5794. Master’s Project: Public Health Administration. (3 cr; S-N only, Prereq–PHA major, #) Students work with their advisor to complete one of three types of master’s projects: research project, critical literature review, or applied field project.

PubH 5796. Field Experience: Public Health Administration. (3 cr; S-N only, Prereq–PHA major, #) Supervised public health administration field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems.


PubH 5806. Principles of Public Health Research. (2 cr. Prereq–PubH fifth or grad or professional school student or #) Evaluation of public health research literature and planning for independent research projects. Formulation of research question, research design, sampling techniques, use of research concepts, data analysis. Data collection techniques, including questionnaires, interviews, and data analysis.


PubH 5832. Economics of the Health Care System. (3 cr; A-F only, Prereq–Microecon theory course or #) Economic analysis of U.S. health-care sector. Emphasizes problems of pricing, production, and distribution. Health-care services as factor contributing to nation’s health.

PubH 5835. Health Services Policy. (2 cr. Prereq–PHA major or [HSRPA or MHA or PA] grad student or #) Social, political, and economic context within which U.S. health-care system developed. Influence of these contextual elements on health-care system. Models of regulation/evaluating/organizing delivery of health services.

PubH 5852. Program Evaluation in Health and Mental Health Settings. (3 cr, Prereq–#) Overview of evaluation, models of evaluation, objectives of an evaluative study, sampling of subjects, methods of data collection, methodological designs, interpretation of data, preparation of final report, and ethical and political considerations.

PubH 5861. Health Insurance. (2 cr; A-F only, Prereq–Microecon theory course or #) Financing personal health care: theory of insurance, health insurance markets, cost sharing, HMOs, PPOs, public and catastrophic health insurance, and the uninsured. Emphasis on public policy.


PubH 5864. Conducting Health Outcomes Research. (3 cr. Prereq–Intro crse in [epidemiology or health services research methods] or #) Major concepts/principles in conducting health outcomes research that evaluates medical care. Developing study design and research questions. Frequently used study designs. Evaluating health outcomes. Analytical approaches.

PubH 5881. Topics: Health Services Research and Policy. (1-4 cr [max 20 cr], Prereq–#) Topics of interest in health services research/policy.


PubH 5902. Maternal and Infant Nutrition. (2 cr. Prereq–3xxx nutr course or equiv or #) Nutritional needs of childbearing women and of infants. How to meet these needs through programs/services.

PubH 5905. Human Nutrition and Health. (2 cr. Prereq– Jr or Sr or grad or professional school student) Broad range of nutrition topics of contemporary interest. Concepts and evidence-based science of human nutrition in relation to personal and community nutrition problems and concerns. Applied, introductory graduate-level course with labs.

PubH 5907. Assessment of Dietary Intake. (1 cr. Prereq–PubH lith nutr major or #) Methods for assessing dietary intake of populations and individuals; appropriate uses of dietary assessment methods in public health, clinical, and research settings; evaluation and interpretation of dietary data.

PubH 5908. Anthropometric Assessment of Nutritional Status. (1 cr. Prereq–5412 or 5414 or equiv grad or professional school student) Anthropometry as used to assess nutritional status; training and experience in taking basic measurements; practical experience in anthropometry; conceptual rationales and interpretation of anthropometric data.

PubH 5909. Topics: Public Health Nutrition. (1-4 cr [max 20 cr], Prereq–#) Topics of interest in public health nutrition.

PubH 5910. Critical Review of Research in Public Health Nutrition. (1 cr. Prereq–Pub hith nutr or mch major, grad-level course each in research, biostat, epi or #) Applying principles of nutrition, biostatistics, and bioinformatics to evaluate scientific research on topics of significance in public health nutrition. Interactive seminar format with lecture, discussion, and student presentations.

PubH 5911. Biochemical Assessment. (1 cr. Prereq–Grad or professional school student, 5450 or 5414 or equiv or #) Use of biochemical measurements for evaluation of nutritional status. Biochemical measurement methods, data analysis, and application of reference data; protein, vitamin, and mineral status.

PubH 5914. Community Nutrition Intervention. (3 cr. Prereq–Grad or professional school student or #) Nutrition intervention strategies used in health programs. Selecting appropriate strategies, applying them to specific target audiences, and evaluating their usefulness in relation to program objectives.

PubH 5932. Nutrition: Adults and the Elderly. (2 cr; A-F only, Prereq–Grad or professional school student or #) Current literature and research on nutrition needs and factors affecting nutritional status of adults and the elderly.

PubH 5933. Nutrition: Health/Disease Relationships. (2 cr. Prereq–5330, FScN 5622 or MdBc 5201 or equiv or #) Issues in nutrition and public health; biological and epidemiologic bases for public health dietary recommendations. Relation of nutrition to heart disease, cancer, hypertension, obesity, and other conditions.
PubH 5935. Child and Adolescent Nutrition. (2 cr. Prereq—PubH Nutr major or #) Current issues and literature. Major nutrition issues of youth; biological, cultural, and psycho-social factors influencing food behaviors; and strategies for improving nutritional health.

PubH 5991. Independent Study: Public Health Nutrition. (1-6 cr [max 4 cr]; Prereq—PubH Nutr MPH student or Nutr grad student) Independent study supervised by a public health nutrition faculty member.


PubH 5996. Field Experience: Public Health Nutrition. (1-6 cr [max 6 cr]; S-N only. Prereq—PubH Nutr major) Supervised public health nutrition field study in health or public health setting under academic/professional supervision. Emphasizes application of acquired knowledge/skills to relevant issues/problems.

PubH 8100. Topics: Environmental and Occupational Health. (1-4 cr [max 20 cr]; Prereq—#) New course offerings or topics of interest in environmental/occupational health.

PubH 8101. Directed Research: Environmental and Occupational Health. (1-6 cr [max 6 cr]; Prereq—EH major or MPH grad student) Research, with direction from faculty member, in environmental/occupational stressors on human health.

PubH 8120. Occupational Injury Epidemiology and Control Program (OIECP) Research Seminar. (1 cr max 12 cr; Prereq—EH grad major, OIECP specialty or equiv, 5120, 5320, 5450 or #) Facilitates student research efforts in occupational injury epidemiology and control through roundtable discussions and interdisciplinary involvement.


PubH 8141. Doctoral Seminar in Observational Inference. (2 cr. Prereq—max 20 cr; S-N only. Prereq—8140, doctoral student in public health, #, 5330, 5340, 8140 recommended) Fundamental concepts of epidemiologic inference, including methods for designing, analyzing, and interpreting epidemiologic studies.

PubH 8160. Advanced Toxicology. (2 cr. Prereq—5160, 1 course in biochm, one course in molecular biol or #) Cellular/molecular mechanisms by which xenobiotics cause toxicity. Investigative approaches to current research problems in toxicology/carcinogenesis. Apoptosis, cell cycle regulation, genetic toxicity, molecular mechanisms of chemical carcinogenesis, genetic basis for susceptibility to environmental toxicants.

PubH 8161. Current Literature in Toxicology. (1 cr [max 3 cr]; S-N only. Prereq—5104) Modern methods in toxicology, critical thinking skills. Topics vary each semester. Students read/discuss toxicological literature.

PubH 8162. Chemical Carcinogenesis and Chemoprevention. (3 cr; A-F only. Prereq—[BioC 3001, BioC 3021, BioC 4331] or equiv, [Chem 2302 or equiv]) Fundamental background in chemical carcinogenesis, carcinogen activation/detoxification, carcinogen-DNA adduct formation, cellular oncogenesis, cancer chemoprevention, nutrition/cancer. Topics integrated/interrelated.

PubH 8170. Advanced Industrial Hygiene. (Applications. (2 cr; A-F only. Prereq—5170, eh grad major) Recognition, evaluation, and control of occupational health/safety hazards. Application of concepts to specific industrial hygiene problems related to gases/vapors, aerosols, and physical agents.

PubH 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent) Prereq—Epi grad major or #)

PubH 8350. Advanced Epidemiologic Theory. (2 cr; S-N only. Prereq—Epi PhD major or #) Integrates concepts from PubH 5330, 5340—Epidemiology I, II. Criteria for study of current theoretical paradigms of epidemiology, philosophy of causal inference in epidemiology, and estimation of causal parameters.

PubH 8377. Seminar: Chronic Disease and Behavioral Epidemiology. (1 cr [max 2 cr]; S-N only. Prereq—Epi grad major or #) Readings, presentations, classroom discussions, and exercises provide experience in epidemiologic research methods in chronic diseases and behaviorally based diseases other than infections and cardiovascular diseases and cancer.

PubH 8378. Advanced Seminar in Epidemiology. (1-3 cr [max 12 cr; S-N only. Prereq—Epi grad major or #) Discussion of one or more major research areas of current interest.

PubH 8379. Seminar in Epidemiology. (2 cr; S-N only. Prereq—Epi grad major or MPH grad student) Discussion of selected current problems.

PubH 8388. Topics: Epidemiology. (1-4 cr [max 20 cr]; Prereq—#) New course offerings or topics of interest in epidemiology.

PubH 8389. Seminar: Topics in Epidemiology. (3 cr. Prereq—Epi grad major or MPH grad major or #) Current theoretical measurement/research issues. Topics drawn from infectious/chronic disease epidemiology, epidemiologic methodology, and biostatistical applications.

PubH 8390. Teaching Practicum in Epidemiology. (2 cr; S-N only. Prereq—Epi grad major or #) Instruction and hands-on experience in teaching methods at the graduate level.

PubH 8391. Independent Study: Epidemiology. (1-4 cr [max 4 cr]; Prereq—[Epi grad major or student], #) Independent study supervised by epidemiology faculty member.

PubH 8392. Readings in Epidemiology. (1-4 cr [max 4 cr; Prereq—Epi MPH or grad student]) Current readings in epidemiology.

PubH 8420. Survival Analysis. (3 cr. Prereq—[5466 or equiv], 5467, Stat 5102) Statistical methodologies in analysis of survival data, including Kaplan-Meier estimator, Cox’s proportional hazards multiple regression model, time-dependent covariates, analysis of residuals, and multiple failure outcomes. Typical biomedical applications, including clinical trials and person-years data.

PubH 8422. Modern Nonparametrics. (2 cr. Prereq—[5466–5468], Stat 5102, MPH grad student or #) Classical nonparametric inference, exact tests and confidence intervals, robust estimates, the jackknife, bootstrap and cross-validation, nonparametric smoothing and classification trees. Variety of models and applications; formal development sufficient for understanding statistical structures and properties. Substantial computing.

PubH 8429. Probability Models for Biostatistics. (3 cr. Prereq—8420, 8421, Stat 5102, advanced biostats or stats major or #) Three basic models used for stochastic processes in the biomedical sciences: point processes (with emphasis on Poisson processes), Markov processes (with emphasis on Markov chains), and Brownian motion. Probability structure and statistical inference studied for each process.

PubH 8430. Sequential Analysis. (2 cr. Prereq—Epi grad major or #) Probability theory underlying sequential analysis, including stopping times, Brownian motion, comparison of frequentist and Bayesian approaches. Biomedical applications, including monitoring clinical trials, laboratory quality control, sequential design and allocation, inference following sequential design.

PubH 8431. Bayesian Decision Theory and Data Analysis. (3 cr. Prereq—[5421 or experience with FORTRAN or with [C, S]+], Stat 5101, Stat 5102, Stat 8311, grad student in biostatistics or statistics or #) Theory/application of Bayesian methods. Bayesian methods compared with traditional, frequentist methods.

PubH 8433. Advanced Longitudinal Data Analysis. (3 cr. Prereq—Stat 5101, Stat 8311, experience with [SAS or S+, advanced [biostat or stat] student or #) Methods of inference for outcome variables measured repeatedly in time or space. Linear/nonlinear models with either normal or non-normal error structures. Random effects. Transitional/marginal models with biomedical applications.

PubH 8434. Advanced Survival Analysis. (2 cr. Prereq—8420, 8429, Stat 5102, advanced biostats or stats major or #) Martingale methods and counting process theory as applied to survival data, including martingale foundations, statistical tests for comparing survival among groups, Cox proportional hazards model, diagnostics and analysis of residuals, multivariate survival data, and extensions to event history analysis.

PubH 8436. Spatial Biostatistics. (3 cr. Prereq—Stat 5101, Stat 5102, some experience with S-plus; [5470 or 8431], Stat 8311 are recommended) Spatial data, spatial statistical models, and spatial inference on unknown parameters or unobserved spatial data. Introduces the nature of spatial data and the special analysis tools that help to analyze such data. Follows a blend of theory and applications.

PubH 8444. FTE: Doctoral. (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)

PubH 8470. Topics: Biostatistics. (1-4 cr [max 20 cr]; Prereq—#) New course offerings or topics of interest in biostatistics.

PubH 8494. Directed Research: Biostatistics. (1-4 cr [max 4 cr]; S-N only. Prereq—#) Research, with direction from a faculty member, in biostatistics.

PubH 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

PubH 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

PubH 8800. Topics of Interest in Health Services Research and Policy. (1-4 cr [max 20 cr]; Prereq—HSRP&A major or MPH or grad student or #) First-time offering. Course title, content, instructor and credit load vary.

PubH 8801. Health Services Policy Analysis: Theory. (3 cr; A-F only. Prereq—[Hsic 5051, grad major or #) Integrated overview of U.S. health-services policy; theoretical and empirical literature related to this field. Analysis of alternative policy-making models and political and philosophical underpinnings of those models.

PubH 8802. Health Services Policy Analysis: Applications. (2 cr; A-F only. Prereq—Hsic grad major or #) Emphasizes relationships between health services research and policy, and uses case studies to examine how research influences policy and vice versa.
Courses

PubH 8803. Long-Term Care: Principles, Programs, and Policies (2 cr; Prereq–Grad-level health-care policy course or #)
Long-term care policy for functionally impaired persons, particularly the elderly. Team taught from health care and social services perspective; grounded in research literature on evidence of program effects. Innovative programs addressing current fragmentation of services.

PubH 8805. Sociology of Health and Illness. (3 cr; A-F only. Prereq–HSRP&A grad major or #)
Affect of social structure on health outcomes/behaviors. Current/historical events/issues from perspective of sociological/social psychological theories. Students apply theories to a topic they identify.

PubH 8806. Sociology of Health Occupations and Organizations. (3 cr; Prereq–HSRP&A grad major or #)
Sociological theories of occupations/organizations as applied to health care. Functional, conflict, evolutionary theories applied to health care reorganization such as managed care, technology on organization of work/occupations. Emphasizes application of theories to develop hypotheses.

PubH 8810. Research Studies in Health Care. (3 cr; max 6 cr; A-F only. Prereq–Grad student or professional school student or #)
Introduction to philosophy of science, conceptual modeling, experimental design, survey/sample design, and issues relevant to health services research.

PubH 8811. Research Studies in Healthcare. (3 cr; A-F only. Prereq–B810 or #)
Research methods commonly used in analysis of health services research and health policy problems.

PubH 8813. Measurement of Health-Related Social Factors. (3 cr; A-F only. Prereq–Intro stat course, understanding of simple correlations or #)
How social factors such as innovativeness, compliance, religiosity, and stress are measured and tested for reliability and validity. Relationships between theory, concepts, variables, data.

PubH 8820. Health Economics I. (3 cr; A-F only. Prereq–One course each in intermediate microeconomics, calculus, intro to linear algebra)
Application of microeconomic theory to healthcare decisions of consumers and producers under different assumptions about market structure and behavior.

PubH 8821. Health Economics II. (3 cr; A-F only. Prereq–B820 or #)
Examines application of microeconomic theory to health services research through selected reading from unpublished and published health economics literature.

PubH 8830. Research Project in Health Care. (1 cr; A-F only. Prereq–HSRP&A grad major or #)
Development and articulation of a research proposal.

PubH 8831. Research Project in Health Care. (1 cr; A-F only. Prereq–B830 or #)
Development and articulation of a research proposal.

PubH 8836. Integration of Public Health Research Methods in Health Services Research and Policy. (2 cr; Prereq–Public Health Research Methods or #)
Integration of concepts/designs of public health research methods, how they can be integrated into health services research and policy analysis. Explores opportunities in clinical settings that illustrate need for integration.

PubH 8888. Thesis Credits: Doctoral. (1-24 cr; max 100 cr; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

PubH 8893. Directed Study: Health Services Research, Policy, and Administration. (1-3 cr; max 3 cr. Prereq–HSRP&A grad student or #)

PubH 8894. Directed Research: Health Services Research, Policy, and Administration. (1-8 cr; max 8 cr. Prereq–HSRP&A grad student, #)

Radiology (Rad)
Department of Radiology
Medical School
Rad 8100. Gastrointestinal Roentgenology. (1-15 cr)
Rad 8101. Urologic Roentgenology. (1-15 cr)
Rad 8102. Neurological Roentgenology. (1-15 cr)
Rad 8103. Cardiovascular Roentgenology. (1-15 cr)
Rad 8104. Pediatric Roentgenology. (1-15 cr)
Rad 8105. Pulmonary Roentgenology. (1-15 cr)
Rad 8150. Research: Roentgenology. (1-15 cr)
Rad 8200. Nuclear Medicine. (1-15 cr)
Rad 8210. Fundamentals of Nuclear Medicine. (1 cr. Prereq–1st yr-resident)
Rad 8250. Research: Nuclear Medicine. (1-15 cr)
Rad 8450. Research: Radiation Biology. (1-15 cr)
Rad 8550. Research: Radiological Physics. (1-15 cr)

Recreation, Park, and Leisure Studies (Rec)
School of Kinesiology
College of Education and Human Development
Rec 5101. Foundations of Recreation. (3 cr; A-F only. Prereq–Grad or grad student or #)
Investigation of the rational, sociological, psychological, and philosophical foundations of the recreational use of leisure in contemporary society. Includes a survey of leisure services.

Rec 5111. Sports Facilities. (3 cr; A-F only. Prereq–Kin 5111. Prereq–Kin or rec major or #)
Steps in planning and building facilities for athletics, physical education, and sport for college, professional, and public use.

Rec 5115. Event Management in Sport. (3 cr; A-F only. Prereq–Grad student or #)
Techniques/principles of planning, funding, and managing sport events. Collegiate championships, non-profit events/benefits, professional events.

Rec 5161. Recreation Land Policy. (3 cr; A-F only. Prereq–5150 or S 5151 or #)
Historical development of recreational land policy in the United States and related contemporary issues in policy, management, interpretation, and research.

Rec 5191. Commercial Recreation and Tourism. (3 cr; A-F only. Prereq–5351 or #)
Scope and development of profit-oriented recreation agencies, including an emphasis on the tourism industry.

Rec 5211. Introduction to Therapeutic Recreation. (3 cr; A-F only. Prereq–1501 or S 5101, rec major or #)
Purposeful intervention; roles of specialist/recreation therapists in meeting cognitive, physical, emotional, social needs of people with disabling conditions through recreation services; roles of specialist/recreation therapists changing societal attitudes toward illness and disability and the self-concepts of individuals with impairments.

Rec 5215. Assess and Monitor Patient/Client Functioning in Recreation Therapy. (3 cr. Prereq–TR major or academic health professional or #; majors A-F only)
Selecting appropriate techniques/tools, analysis of individual p/c supports/deficits. Monitoring/recording progress in RT and in collaborative services: standard notes; team meetings; on-line reporting for quality assurance, referral, augmentation/termination of services.

Rec 5221W. Comprehensive Therapeutic Recreation Services Development and Management. (4 cr. Prereq–5211 or #; rec major)
Guided development of written plans including development of protocols and critical pathways, innovative programs/activities, individual treatment plans and standards for appropriate placement of individuals in group intervention, and management of patient/client service delivery, record keeping, and administrative responsibilities.

Rec 5231. Therapeutic Recreation and Diagnostic Groups. (3 cr; A-F only. Prereq–5211 or #)
Definitions, philosophies, methodologies regarding therapeutic recreation services for persons in diagnostic groups of cognitive, physical, sensory, communication, and developmental disabilities. Lectures, group discussion. Presentations by parents, professionals, and self-advocates. Clinical or community practicum assignment.

Rec 5241. Functional Intervention: Recreation Therapy in Geriatric Care. (3 cr; A-F only. Prereq–3541 or 5111 or #)
Role of leisure in maintenance of mental, physical, social-emotional health/functioning. Issues relative to prevention of impairment/disability. Rehabilitation, support of vital life involvement, effect on design/delivery of recreation services.

Rec 5271. Community Leisure Services for Persons With Disabilities. (3 cr; A-F only. Prereq–1501, rec major, or #)
Exploration and application of concepts and techniques of normalization and least restrictive environment strategies to leisure service delivery in inclusive community settings for a range of individuals with disabilities.

Rec 5288. Grant Writing in Human Services. (3 cr; A-F only)
Identify, develop, and procure financial assistance for programs in human services, including education, recreation, and social programs. Skills and strategies for preparing and evaluating competitive proposals for grant support through federal agencies and private foundations or corporations.

Rec 5301. Wilderness and Adventure Education. (4 cr; A-F only)
Rationale for, methods in applying wilderness/adventure education programs in recreation, corporate, human service settings. Emphasizes adventure/wilderness program management.

Rec 5311. Programming Outdoor and Environmental Education. (3 cr; A-F only. Prereq–Kin 5101 or #)
Methods, materials, and settings for developing and conducting environmental and outdoor education programs.

Rec 5371. Sport and Society. (3 cr; A-F only. Prereq–3126, grad student) or #
Sport, sporting processes, social influences, systems, and structures that have led to and exist within/among societies, nations, and cultures. Issues concerning social differentiation. Social concerns such as violence and honesty.

Rec 5421. Sport Finance. (3 cr; A-F only. Prereq–Grad student, #)
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 cr; A-F only. Prereq–Rec or Kin student or #)
Theories/techniques in administering/managing sport enterprises. Organizational theory/policy. Practical examples of sport management skills/strategies.

Rec 5511. Women in Sport and Leisure. (3 cr; A-F only. Prereq–Kin 5511)
Critically examines women’s involvement in/sport and leisure enterprises. Managing sport and leisure programs.

Rec 5631. Programming and Promotion in Sport. (3 cr; A-F only. Prereq—Grad student) Introduction to marketing concepts as they apply to sport industry. Consumer behavior, market research, marketing mix, corporate sponsorship, licensing concepts. Discussion, practical application.

Rec 5801. Legal Aspects of Sport and Recreation. (4 cr; A-F only. §Kin 5801. 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. (1-12 cr [max 12 cr]) 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 cr; A-F only. §Kin 5981. Prereq—MEd or grad student or #) Defines/reviews various types of research in exercise and sport science, physical education, and recreation studies. Qualitative research, field studies, and introspective research strategies as alternatives to traditional scientific paradigm.

Rec 5992. Readings: Recreation. (1-3 cr [max 9 cr]. Prereq—#) Independent study under tutorial guidance by a faculty member in leisure studies. Intended as an opportunity to conduct in-depth study and reading on particular topics that are not covered in regular coursework.

Rec 5995. Problems in Recreation, Park, and Leisure Studies. (1-12 cr [max 30 cr]. Prereq—MEd or grad student or #) Independent study of leisure service programs, systems, policies, or facilities; focus on conduct of recreation programs. Intended for scholarly projects (e.g., library or field research) or demonstration projects in the field of leisure studies and services. Not intended for additional fieldwork, practicum, or programming experience.

Rec 8310. Seminar: Leisure Services. (3 cr; A-F only. Prereq—Rec MEd or grad student or #) Critical study and special problems in recreation, park, and leisure services and in therapeutic recreation.

Rec 8320. Seminar: Theoretical Perspectives in Leisure Behavior. (3 cr; A-F only. Prereq—RelA 5101 or #) Major theoretical paradigms and empirical findings, where appropriate, from leisure studies in particular and social sciences in general.

Rec 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

Rec 8390. Seminar: Administrative Problems in Leisure Services and Therapeutic Recreation. (3 cr; A-F only. Prereq—MEd or grad student or #) Administrative and management issues and problems in leisure services and therapeutic recreation.

Rec 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]. NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Rec 8890. Graduate Research Seminar in Recreation, Park, and Leisure Studies. (1-3 cr; 3-N only. Prereq—5981, Epsy 5261 or #) Analyzing, designing, and reporting on research problems in leisure studies.

Courses

RelA 5304. Development of Israeliite Religion II. (3 cr)
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.

RelA 5513. Scripture and Interpretation. (3 cr; A-F only. Prereq—5511)
Idea of divine revelation, its impact upon religion/ literature. How history of Bible’s creation, transmission, and interpretation helps us think critically about role of idea of revelation in history of religious traditions. What is revelation? How does belief that a text is revealed affect the way it is read within the community for which it constitutes revelation?

RelA 5993. Directed Studies. (2-4 cr [max 10 cr])
Guided individual reading or study.

RelA 8190. Comparative Seminar in Religions in Antiquity. (3 cr [max 6 cr]; A-F only. Prereq—Grad student in relevant field; reading knowledge of Greek or Latin or Coptic or Arabic recommended)
Topics vary, see Class Schedule. Major cultural movement as it developed over several centuries. Draws on evidence in literature, archival records, inscriptions, documentary papyri, and archaeological remains. Artistic media such as wall painting, architectural sculpture, funerary sculpture, or manuscript illumination.

Religious Studies (RelS)
Department of Classical and Near Eastern Studies

College of Liberal Arts

RelS 5111. Problems in Historiography and Representation of the Holocaust. (3 cr; Prereq—JWst 3521/RelS 3521 [formerly 3541] History of the Holocaust or #)
An advanced course focusing on issues connected with the Holocaust. Inclusiveness of other groups, Holocaust versus “Shoah,” historiographical conflicts about perpetrators, an examination of the problems of representation in literature and art, problems of narrative theology after Auschwitz.

RelS 5251. Archaeology of Herodian Israel. (3 cr; A-F only. Prereq—One course in [archaeology or ancient history] or grad student)
Archaeological sites in Israel dating to era of Herod the Great (37-4 BC). Palaces, religious edifices, and remains from Jewish/ gentile settlements throughout the kingdom. Course readings consist of contemporary literary sources and excavation reports.

RelS 5993. Directed Studies. (1-4 cr [max 24 cr])
Directed studies in religion. Credits may vary from term to term to a limit of nine.

Rhetoric (Rhet)
Department of Rhetoric

College of Agricultural, Food, and Environmental Sciences

Rhet 5111. Message Design: Theory and Practice I. (3 cr; A-F only. Prereq—Grad student or #)
Audience analysis, media selection, message design through various theoretical perspectives, including cognitive/schema, social construction, feminist, intercultural theories. Usability testing, contextual inquiry as means to study effectiveness of messages.

Rhet 5112. Message Design: Theory and Practice II. (3 cr; A-F only. Prereq—5111)
Political, economic, social, and technical aspects of media selection and message design. Media analyses, scripts, budgets, treatments, project-design plans, interactive screens. On-line design project.

Rhet 5196. Internship in Scientific and Technical Communication. (3 cr [max 6 cr]; S-N only. Prereq—STC/RSTC 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.

Rhet 5258. Information-Gathering Techniques in Scientific and Technical Communication. (3 cr; A-F only)
Informational, employment-cycle, and problem-solving interviews. Emphasizes guides, schedules, questioning techniques, and communication theories. Descriptive statistics used to analyze data for various projects.

Rhet 5270. Special Topics. (1-3 cr [max 3 cr]; A-F only. Prereq—[JWst or STC/RSTC] major or grad student), #)
Topics specified in Class Schedule.

Rhet 5291. Independent Study. (1-3 cr [max 3 cr]; Prereq—#, A)
Supervised reading/research on advanced projects not covered in regularly scheduled offerings.

Rhet 5511. Research in Scientific and Technical Communication. (3 cr; A-F only)
Experimental/survey research techniques for quantitative/qualitative methodologies in scientific/technical communication. Face-to-face, phone, focus group interviewing. Questionnaire development, contextual inquiry. Using rating, ranking, q-sort methods. Ethics, experimental bias, inferential statistical analysis.

Rhet 5531. Scientific and Technical Communication Course Development and Pedagogy I. (3 cr; A-F only. Prereq—Grad)
Pedagogical philosophy/methodology in beginning writing, speaking, and technical communication class. Introduction to theories underlying teaching/learning with technology.

Rhet 5532. Scientific and Technical Communication Course Development and Pedagogy II. (3 cr; A-F only. Prereq—5531 or #)
Pedagogical philosophy/methodology in advanced writing, technical communication, distance education courses. Introduction to theories of teaching in scientific/technical communicating/teaching with multimedia.

Rhet 5533. Scientific and Technical Communication Course Development: Teaching Seminar. (3 cr; A-F only. Prereq—5531 or 5532)
Mentor with faculty, usually concurrently with student’s first teaching assignment. Students shares observations, solves teaching problems in seminar setting. Issues facing new teachers, developing a philosophy of teaching. Focuses on evaluating work in classroom.

Rhet 5534. Designing Technical Training for Intercultural Audiences. (3 cr; A-F only)
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.

Rhet 5562. Theory and Practice in International Communication. (3 cr; A-F only. Prereq—3562 or equiv)
Theories and practice in international and intercultural scientific, technical, and business communication. Examine cultural differences by studying cultural metaphors and research studies, by interviewing people from other cultures including international business managers, and through case studies.

Rhet 5664. Science Writing for Popular Audiences. (3 cr; A-F only. Prereq—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.”

Rhet 5775. Major Figures in Rhetorical Tradition: Classical Period. (3 cr; A-F only)
Classical theories of rhetoric. Epistemological status of rhetoric. Ethical implications of persuasion. Emphasizes “Aristotle’s Rhetoric” as founding document. Other figures (e.g., Plato, Isocrates, Cicero, Quintilian).

Rhet 5776. Major Figures in Rhetorical Tradition: Modern Era. (3 cr; A-F only)

Rhet 8011. Research Methods in Rhetoric and Scientific and Technical Communication. (3 cr; A-F only. Prereq—STC/RSTC grad or #)
Quantitative/qualitative research methods. Theoretical perspectives that demonstrate/test analytical approaches to scientific/technological rhetoric.

Rhet 8012. Applied Research Methods in Scientific and Technical Communication. (3 cr; A-F only. Prereq—STC/RSTC grad student or #)
Methodological choices, arguments, and uses of data in case studies. Students design/conduct a pilot study and review/apply research methods, survey research, ethnographies, rhetorical/lexical analysis, archival research, genre analysis, observational research, interviews, and descriptive statistics. Review responsibilities of conducting research.

Rhet 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

Rhet 8444. FTE: Doctoral. (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)

Rhet 8505. Design Project. (5 cr; A-F only. Prereq—STC/RSTC grad student or #)
Extended problem-solving situation in business, government, or industry. Student acts as consultant to explore problem, identify possible solutions, introduce solution, apply it.

Rhet 8510. Topics in Rhetorical Theory, History, and Criticism. (3 cr [max 12 cr]; A-F only. Prereq—5775 or equiv)
Rhetorical theory in context of culture influenced by science/technology. Topics vary. See Class Schedule.

Rhet 8520. Topics in Science and Rhetoric. (3 cr [max 12 cr]; A-F only)
Doctoral seminar concerning relationship between rhetoric and science. Topics vary. See Class Schedule.

Rhet 8530. Topics in Feminist Theory in Science, Technology, and Communication. (3 cr [max 12 cr]; A-F only)
Doctoral seminar on interaction of gender with science/technology. Topics vary. See Class Schedule.

Rhet 8540. Topics in Scientific and Technical Communication Pedagogy. (3 cr [max 12 cr]; A-F only)
Doctoral seminar on theories of pedagogy/research studies that inform technical/scientific classroom/ workplace. Topics vary. See Class Schedule.

Rhet 8550. Topics in Technology and Culture. (3 cr [max 12 cr]; A-F only)
Doctoral seminar on computer-mediated communication, democracy/technology, controversies over digital communication, privacy/ethical issues. Topics vary. See Class Schedule.

Rhet 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Rhet 8775. Classical Rhetorical Theory. (3 cr [max 12 cr]; A-F only)
Aristotle’s “Rhetoric” in context of its times and of Aristotle’s other works, especially “The Ethics” and “The Politics.”

Rhet 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])
Russian Area Studies

(SAS)

Introduction to Literary Analysis

(SAS) 104. Introduction to Literary Analysis. (3 cr. Prereq–1002 or equiv) Reading and analysis of poetry and prose selections to understand rudiments of studying Russian literature. Readings are in Russian.

(SAS) 105. Russian Poetry and Prose. (3 cr. Prereq–3002 or equiv) Appreciation of literary values through stylistic analysis and literary interpretation; analysis of humanistic elements. Readings in Russian.

(SAS) 106. Modern Russian Literature in Translation. (3 cr) Literary, cultural, and political significance of modern Russian literary works.

(SAS) 406. Tolstoy in Translation. (3 cr. §3404) Novels, stories, and philosophical writings of Leo Tolstoy.

(SAS) 407. Stories and Plays of Anton Chekhov in Translation. (3 cr. §3407) Study of literary devices and themes in selected stories and major plays using the intrinsic approach.

(SAS) 409. 19th-Century Russian Novel. (3 cr. §3409) The Russian realistic novel from origin to decline; social, political, and intellectual circumstances that led to its emergence as the dominant genre of the “age of realism” in Russia.

(SAS) 411. Dostoevsky in Translation. (3 cr §3411) Novels, stories, and other writings of Fyodor Dostoevsky.

(SAS) 421. Literature: Middle Ages to Dostoevsky in Translation. (3 cr. §3421) Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.

(SAS) 422. Literature: Tolstoy to the Present in Translation. (3 cr. §3422) Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

(SAS) 501. Methods of Translating Fiction from Russian to English. (3 cr. §3601. Prereq–3102 or equiv) Learning to appreciate a variety of literary styles through the experience of translation.

(SAS) 590. Topics in Russian Language, Literature, and Culture. (1-4 cr. Prereq–1102 for language topics) Variable topics in Russian language, literature, and culture.

(SAS) 593. Directed Studies. (1-4 cr. max 16 cr.) Prereq–8, 2, 4. Guided individual study.

Scandinavian (Scan)

Department of German, Scandinavian, and Dutch

College of Liberal Arts

Scan 5022. Scandinavian Romanticism. (3 cr) Study of Scandinavian literature (poetry, drama, and prose), 1800–1870. Texts in the original languages.

Scan 5051. Scandinavian Mythology. (3 cr) Study of Scandinavian mythology based on primary sources represented by Saso Grammaticus, Snorri Sturluson’s Edda and Ynglinga Saga, and the Poetic Edda. Myths are analyzed using contemporary critical approaches. All readings in translation.

Scan 5052. The Icelandic Saga. (3 cr) Study of the sagas written in 15th-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 5202. Scandinavian Romanticism. (3 cr) Study of Scandinavian literature (poetry, drama, and prose), 1800–1870. Texts in the original languages.

Scan 5613. Contemporary Scandinavian Literature. (3 cr) 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 cr) Close reading of Ibsen’s “modern tragedies” from A Doll’s House (1879) to When We Dead Awaken (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 5616. Strindberg and the Drama in Revolt and Change. (3 cr) Strindberg as the master of naturalistic drama and the precursor of modernity in European and American theater. Close reading of plays with emphasis on dramatic structure and staging conventions in the context of modern theater. All readings in English for nonmajors.
Courses

Scientific Computation (SciC)

Institute of Technology
SciC 8001. Parallel High-Performance Computing. (3 cr; Prereq–Undergrad degree in field using sci comp or #) Interdisciplinary overview of computer science aspects of scientific computation, both hardware and techniques. Parallel computing, architectures, programming, and algorithms; restructuring compilers and data structures.

SciC 8011. Scientific Visualization. (3 cr; Prereq–Undergrad degree in field using sci comp or #) Basic issues in scientific visualization, visualization software, graphics, representation of scientific data, modeling, hardware for visualization, user interface techniques, output, commonly used algorithms and techniques for visualization, animation, information visualization, higher dimensional data, case studies, and examples of successful visualizations.


SciC 8041. Computational Aspects of Finite Element Methods. (3 cr; Prereq–Undergrad degree in field using sci comp or IT grad student or #) Fundamental concepts and techniques of finite element analysis. Variational equations and Galerkin’s method; weak formulations for problems with nonsymmetric differential operators, Petrov–Galerkin methods; examples from solid and fluid mechanics; properties of standard finite element families, implementation.

SciC 8051. Problems in Scientific Computation. (1-3 cr [max 9 cr]; Prereq–Undergrad degree in field using sci comp or #) Selected topics in interdisciplinary aspects of scientific computing.

SciC 8190. Supercomputer Research Seminar. (1 cr [max 3 cr]; Prereq–Undergrad degree in field using sci comp or IT grad student or #) Series of seminars by distinguished lecturers.

SciC 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser approval, DGS approval)

SciC 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser approval, DGS approval)

SciC 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq–Doctoral student who has not passed prelim oral)

SciC 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

SciC 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

Social, Administrative, and Clinical Pharmacy (SACP)

College of Pharmacy

SACP 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser approval, DGS approval)

SACP 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser approval, DGS approval)

SACP 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq–Doctoral student who has not passed prelim oral)

SACP 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq–Plan A)

SACP 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NGA)

Social and Administrative Pharmacy (SAPh)

Department of Pharmacy Practice

College of Pharmacy


SAPh 8100. Seminar. (1 cr [max 8 cr]; Prereq–Grad SAPh major or #) Contemporary issues and research problems in sociobehavioral pharmacy, pharmacoeconomics and policy, and clinical research.

SAPh 8173. Principles and Methods of Implementing Research. (3 cr; Prereq–Two grad stat courses) Integrates scientific, statistical, and practical aspects of research. Interrelationships among design, sample selections, subject access, human subjects requirements, instrument selection and evaluation, data management, analyses plans, grant writing, and research career issues. Field experiences.

SAPh 8200. Research Problems. (1-8 cr [max 16 cr]). Prereq–Grad SAPh major or #) Individually designed research experience directed at contemporary problems related to drug use process.

SAPh 8235. Pharmaceutical Economics and Policy. (3 cr; A-F only; Prereq–Grad SAPh major or #) Economic analysis of pharmaceutical sector of health care systems. Problems of pricing production and distribution of pharmaceuticals. Domestic or international policy issues relevant to price and access of pharmaceuticals.

SAPh 8255. Pharmaceutical Marketing. (3 cr; A-F only; Prereq–Grad SAPC major or #) Historical development of distributive systems, marketing channels, institutions, policies, and practices as they relate to pharmaceutical industry. Contemporary issues/theory related to pharmaceutical marketing. Pharmaceutical proportion, especially directed to consumer advertising.

SAPh 8270. Clinical Conferences. (2 cr; Prereq–Grad SAPh major or #)

SAPh 8420. Social and Behavioral Aspects of Pharmacy Practice. (3 cr; A-F only; Prereq–Grad SAPh major or #) Historical development of the profession, its growth and development, emphasizing forces of education, professionalization, attitude modification, and changes occurring as a product of legal and organizational forces in society.

SAPh 8500. Pharmacy and Its Environment. (3 cr; A-F only; Prereq–Grad SAPh major or #) Cultural foundations of pharmacy. Development of present state of pharmacy practice. Role of pharmacist as health practitioner in relation to other health practitioners. Identification of factors (health policy, regulation, economics, research and development, promotion) that affect individual responses to drug therapy.

SAPh 8700. Hospital Pharmacy Administration. (3 cr; A-F only; Prereq–Grad SAPh major or #) History, classification, organization, and functions of hospital departments in relation to the pharmacy service.

SAPh 8702. Hospital Pharmacy Survey. (1 cr [max 3 cr]; Prereq–Grad SAPh major or #) Readings for self-directed students to explore contemporary issues in hospital pharmacy practices.

SAPh 8810. Social Psychology of Health Care. (2 cr; Prereq–Grad SAPh major or #) Behavioral and social aspects of recovery responses to drugs and other therapies, patients’ compliance with prescribed therapies, relationships between healthcare professional and patient.

SAPh 8840. Social Measurement. (3 cr; A-F only; Prereq–Intro stat course, understanding of simple correlations or #) How social factors such as innovativeness, compliance, religiosity, and stress are measured and tested for reliability and validity. Relationships between theory, concepts, variables, data.

Social Work (SW)

School of Social Work

College of Human Ecology

SW 5051. Human Behavior and the Social Environment. (2-3 cr; A-F only; 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 5052. Ecologies of Child Development Within Communities of Color. (3 cr; Prereq–Grad or #) Examine social, affective, and cognitive development of children of color via a life course, ecological systems framework. Family, school, peers, and community are studied as ecological contexts which influence developmental trajectories for these children and youth. Attention is given to poverty, racism, and oppression.

SW 5101. Historical Origins and Contemporary Policies and Programs in Social Welfare. (3-4 cr; A-F only; Prereq–Grad or 8 cr of 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 cr) Study of feminist issues and conflicts within organizations and movements; methods and sources for studying feminism.

SW 5107. Child Development and Social Policy. (3 cr. Prereq—Grad or adult special or #) Examine the intersection of conceptual orientations of developmental psychology with policies that affect children and families. Demographic, historic, and social trends underlying the assumptions that drive policies directed at women and children; projections of future policies.

SW 5309. Case Management with Special Populations. (3 cr. Prereq—Grad or adult special 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 cr. Prereq—Grad or adult special or #) The practice components of social work with older adults including assessment, intervention, and case management. Taught from the perspective of bio-psychosocial strengths and challenges and within the context of current social policy and delivery systems.

SW 5314. Social Work in the Schools. (2 cr. Prereq—Grad or adult special or #) Application of social work methods in a school setting. Emphasis on assessment, diagnosis, consultation, advocacy, interdisciplinary teamwork building, and crisis intervention.

SW 5315. Social Work Practice in Hospitals and Health Care Settings. (2 cr. Prereq—Grad or adult special or #) Prepares students for social work practice in a hospital or health care setting. Focus on integration of conceptual and practice subject matter that covers differential assessment, clinical intervention models, impact of acute and chronic illness, special populations, managed care, legal and ethical issues, interdisciplinary team work, and transition planning in health care.

SW 5316. Brief Treatment and the Task-Centered Approach. (2 cr. §5803. Prereq—Grad or adult special or #) The advent and current prominence of brief treatment models in work with individuals, families, and groups including their theoretical and empirical bases. Practice with diverse populations in a context of managed care. Emphasis on the task-centered approach including skill training and supervised practice.

SW 5317. Social Work With Vulnerable Clients. (2 cr. Prereq—Grad or adult special 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 5318. Family Centered Home Based Services. (2 cr. §6314. Prereq—Grad or adult special or #) Ecological, multisystems approach focusing on the family system. Triadic theory, meta-neutrality, strengths-based treatment 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 cr) 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 5481. Child Abuse Prevention I: Research and Theory. (3 cr. Prereq—Bachelor's degree or #) Foundation of research/theory for level I child abuse prevention studies certification.

SW 5482. Child Abuse Prevention II: Program Development, Evaluation, and Advocacy. (3 cr. 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 cr. 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 5519. Mediation and Conflict Resolution. (3 cr. §58519) Develop mediator skills for making informed decisions regarding the appropriateness of mediation for conflicts that social workers encounter. Practitioners such as divorce, neighborhood disputes, conflicts between parents and adolescents, conflicts between spouses, and conflicts between crime victims and offenders.

SW 5525. Global Perspectives on Social Welfare, Peace, and Justice. (3 cr. Prereq—2001 or #) Role of international social welfare in meeting basic human needs and promoting human rights, social justice, and peace. Theories, models, and social policies in different economic and political systems with emphasis on Third World nations.

SW 5705. Violence in Families. (3 cr. Prereq—§5707. Prereq—Grad student or adult special or #) Prevention/intervention with perpetrators, survivors, and social institutions. Perpetration, effects on victims, social responses to family violence. Child abuse/neglect. Abuse of women/vulnerable adults. Roles of gender, race, culture, age, physical ability, and sexual orientation.


SW 5707. Interventions with Battered Women and Their Families. (2 cr. Prereq—Grad student or adult special or #) Current theories, research, and evaluation of interventions with battered women and their families. Focus on practice, e.g., direct work with social institutions, victim-survivors, and assailants and their families.

SW 5708. Substance Abuse and Social Work. (3 cr. Prereq—Grad or adult special or #) Assessment and intervention in situations involving substance abuse with special emphasis on cross cultural practice. Relationships of substance abuse to areas such as child welfare, mental illness, and violence within families are examined.

SW 5709. Applied Psychopharmacology for Human Service Professionals. (2 cr; A-F only. Prereq—Cannot be taken for cr by MSW students) Mentally ill, chemically abusive, or dependent clients. Intervention, advocacy, education, and support for clients and those who are part of his/her environment. Social, environmental, and multicultural factors. Meets partial state requirements for becoming licensed as an alcohol/drug counselor.


SW 5820. Field Practicum II. (1-6 cr. S-N only. Prereq—§8010) Integrates classroom learning within a concentration with the direct experience of an internship. Students expand competency in cross-cultural practice.


SW 8041. Specialized Field Placement. (3-4 cr. S-N only. Prereq—§8030. MSW adv-standing) Internship within an agency or a specific population. Applied practical experience in specialized concentration area of practice.

SW 8051. Psychopatology and Social Work Practice. (3 cr. Prereq—All foundation courses for full program or advanced standing or #) Psychopathology from ecosystemic perspective. Biopsychosocial influences on incidence, course, treatment of common mental disorders diagnosed from infancy through adulthood. Differential effects on populations at risk. Diagnostic skills, alternative intervention strategies, social work roles.

SW 8101. Social Policy and Delivery Systems for Child Welfare and Family Services. (3 cr. Prereq—§8211, advanced standing) Federal, state, and local policies related to contemporary child welfare system and system of social services to families. Current debates about policies, financing, and structure and organization of service delivery; process of influencing policy changes in children and family services.
Courses

SW 8103. Health and Mental Health Policy. (3 cr. Prereq—advanced standing or #) Factors affecting health and mental health status of variety of populations. Policies on organizational, local, state, and federal levels affecting health status; financing and delivery of health and mental health services. Ethical issues embedded in policies, issues in need of policy development.

SW 8105. Economic Security of Disadvantaged Populations. (3 cr. Prereq—[8211, advanced standing] or #) Impact of social policy and macro economic trends on economic security of disadvantaged populations. Focuses on antipoverty/welfare programs in the United States, although international perspective is used as well.

SW 8150. Special Topics in Social Policy. (1-9 cr [max 9 cr]; Prereq—#)  

SW 8201. Social Work Methods: Practice With Individuals and Systems. (3 cr; A-F only Prereq—MSW student) Introduction to theories, knowledge, values, skills in initial social work practice. Practice phases-assessment, goal setting, contracting, intervention, treatment. Developing relationships, interviewing skills in practice with diverse populations. Ecological problem-solving framework from empowerment orientation.

SW 8202. Social Work Methods: Practice With Families and Groups. (3 cr; A-F only Prereq—[8201 or #) Intervention theories, roles, methods, evaluation in practice with families/groups. Continues ecological problem-solving framework from empowerment orientation.


SW 8303. Advanced Mental Health Practice With Adults. (3 cr. Prereq—[8501 or 8505 or 8501 or #] or all foundation courses for full program or advanced standing or #) Theory/practice of cognitive-behavioral and psychodynamic social work treatment in community/clinical settings. Criteria for differential applications, including brief treatment and crisis-oriented approaches. Cultural/social aspects of mental health, issues important to populations at risk.

SW 8304. Advanced Practice With Children and Adolescents. (3 cr. Prereq—All foundation courses for full program or advanced standing or #) Practice with children, adolescents, and their families. Ecosystemic model that undergirds assessment/intervention. Mastery of developmental tasks and enhanced social functioning as protective mechanisms. Biopsychosocial focus. Integrates familial/community contributions, especially in face of loss or disruption.

SW 8313. Professional Practice in Interdisciplinary Teams and Collaboratives. (3 cr. Prereq—Foundation curriculum, [advanced standing or grad student in health and human service or in educational professional program] or #) Principles of interdisciplinary/interorganizational collaboration in human services, health, and educational settings. Team building, decision-making models, engaging value differences, managing conflict on team, role/status disparities, relational communications. Emerging approaches to interorganizational collaboration.

SW 8314. Social Work Interventions With Families. (3 cr. 55318. Prereq—Adv standing or 8202 or #) Interventions based on systems perspective of family as center of focus, in environmental context. Policy/practice principles of working with families in their home, community environment.

SW 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, advisor and DGS consent)  

SW 8331. Life-Cycle Therapy. (2 cr. Prereq—Advanced standing or 8202 or #) Strength-based approach to client treatment grounded in Erik H. Erikson’s theory of the life cycle. Model explicitly considers differences in environments, supports and in “healthy” outcomes, based on culture, race, gender, sexual orientation, spiritual belief, and age. Focus on maximizing health and remediating disorder, practice.

SW 8444. FTE: Doctoral. (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)  

SW 8460. Special Topics: Practice With Individuals, Families, and Groups. (1-3 cr or 9 cr; Prereq—8201 or #) Advanced practice courses.

SW 8501. Planning, Marketing, and Program Development. (3 cr. Prereq—[Foundation curriculum, advanced standing] or #) Principles, applied practice of management concepts in human service settings. Management theories, organizational planning, program development, marketing/communication. Management practice that is client/community-focused, results-oriented, and seeks to achieve positive social change.


SW 8505. Advanced Community Organization and Advocacy. (3 cr. Prereq—[Foundation curriculum, advanced standing] or #) Methods for stimulating/supporting joint action for constructive change to fulfill community needs. Principles of working with local organizations. Social action to accomplish specific changes.

SW 8507. Community Practice Seminar. (1 cr. Prereq—[Foundation curriculum, advanced standing] or #) Links content from human services management and from community organization and advocacy. Integrating framework that draws upon knowledge/skills used in agency/organizational management and in community organization/change.

SW 8519. Mediation and Conflict Resolution for Social Workers. (3 cr. Prereq—MSW student or grad conflict mgmt minor or #) Advanced mediator skills for social workers; appropriateness of mediation for conflicts that frequently confront social work practitioners, such as divorce, neighborhood disputes, and conflicts between parents and adolescents, between spouses, and between crime victims and offenders.

SW 8525. Global Perspectives on Social Welfare, Peace, and Justice. (3 cr. Prereq—[8211, advanced standing] or #) Role of international social welfare in meeting basic human needs and promoting human rights, social justice, and peace. Theories, models, and strategies of social welfare in different economic/political systems. Emphasizes Third World nations. Skills for social workers and other professionals in the helping professions.

SW 8601. Social Work Research Methods. (3 cr; A-F only. Prereq—MSW student or #) Introduction to quantitative and qualitative social work research skills fundamental to development and critical use of information relevant to social work practice decision-making and evaluation at case, program, policy levels. Social research ethics, development of research questions, sampling, measurement, research design, data collection and analysis.

SW 8602. Direct Practice Evaluation. (2 cr. Prereq—8601 or equiv or #) Students design evaluations that incorporate current evaluation methods and principles derived from research theory, practice wisdom, their own experience. Evaluation methods include single-system designs, client-focused evaluations, practitioner-focused evaluations, and use of event analyses, standardized instruments, self-constructed instruments.

SW 8603. Program Evaluation. (2 cr. Prereq—8601 or equiv or #) Conceptual, methodological, political, psychological, and administrative factors related to conduct and consequences of social work program evaluation. Social programs as cause and effect; models, types, and strategies of evaluation; appraisal of selected research literature.

SW 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq—Max 18 cr per semester or summer, doctoral student who has not passed prelim oral)

SW 8693. Directed Study. (1-6 cr [max 6 cr]. Prereq—#)  

SW 8694. Directed Research. (1-6 cr [max 6 cr]. Prereq—#) Individual or small group research inquiry translating introductory course content into research design and study. Projects may be carried out alone, in collaboration with field learning experiences or other coursework.

SW 8702. Advanced Social Work Practice With Diverse Populations. (2 cr. Prereq—All foundation courses for full program or advanced standing or #) Models of ethnic-sensitive social work practice applied in human service management or direct practice settings. Critical examination of human needs and organizational responses to racially and culturally competent practice with populations at risk.

SW 8801. Social Work Ethics and Legal Issues. (3 cr. §5318. Prereq—Foundation courses or adv standing or #) Develops knowledge base and skills required to identify and understand legal and ethical issues, resolve ethical dilemmas, and make ethical decisions within social work. Values base, ethical standards, ethical decision-making models, and laws and legal procedures related to social work. Legal aspects of child welfare practice.

SW 8803. Social Work Supervision, Consultation, and Leadership. (3 cr. Prereq—Foundation courses or adv standing or #) Principles, practices, and models of supervision in human service systems: administrative, educational, and supportive functions. Organizational leadership and mediation skills. Contextual factors that influence supervisory role and function. Principles and methods of teamwork, staff development, and consultation.

SW 8851. History of Social Work and Historical Research Methods. (3 cr. Prereq—[Required research courses for soc work PhD student; equiv research methods courses for other graduate students] Methods of historical research in, and survey of, history and evolution of social welfare and social work, using primary and secondary source materials.

SW 8855. Social Policy Formulation and Analysis. (3 cr. Prereq—So wk PhD student or #) Application of theoretical perspectives, conceptual frameworks, and research methodologies to analysis of social issues and analysis and formulation of social welfare policy.
Soc 8021. Sociology of Higher Education: Theory and Practice. (3 cr) Prereq—Grad soc major or #)
Social/political context of teaching. Ethical issues, multiculturalism, academic freedom. Teaching skills (e.g., lecturing, leading discussions). Active learning. Evaluating effectiveness of teaching. Opportunity to develop a syllabus or teaching plan.

Soc 8090. Topics in Sociology. (1-4 cr. Prereq—#) Topics specified in Class Schedule.

Soc 8091. Independent Study. (1-5 cr. Prereq—#) Independent study of an established 8xxx course.

Soc 8093. Directed Study. (1-4 cr. Prereq—#) May be used to fulfill sociology graduate requirement for advanced methodological training.

Soc 8101. Sociology of Law. (3 cr) Sociological analysis of law and society. In-depth review of research on why people obey the law, of social forces involved in creation of law (both civil and criminal), procedures of enforcement, and impact of law on social change.

Soc 8111. Criminology. (3 cr) Overview of theoretical developments and empirical research. Underlying assumptions, empirical generalizations, and current controversies in criminological research.

Soc 8114. Law, Society, and the Mental Health System. (3 cr. AF only. Prereq—Grad student, 4148 or #) Intensive survey of legal psychopathology. Reference to criminal behavior, criminal justice system.

Soc 8190. Topics in Law, Crime, and Deviance. (3 cr; max 12 cr) Prereq—Grad student in sociology or #) Advanced topics in law, crime, and deviance. Social underpinnings of legal/illegal behavior and of legal systems.

Soc 8201. Social Stratification and Mobility. (3 cr. Prereq—# or equiv or #) Form and content of hierarchical arrangements. Relationship of hierarchy to social order and individual behavior. Structures of social stratification. Status attainment. Mobility. Inequality and economic development. Social stratification, and technological change. Economic status in relation to social status, including race, gender.

Soc 8211. Race Relations Theory. (3 cr) Major theoretical debates. Classic and contemporary theoretical approaches to studying U.S. race relations; contemporary and historical experiences of specific racial and ethnic groups.

Soc 8221. Sociology of Gender. (3 cr) Organization, culture, and dynamics of gender relations and gendered social structures. Sample topics: gender, race, and class inequalities in the workplace; women’s movement; social welfare and politics of gender inequality; theoretical and methodological debates in gender studies; sexuality; science; sociology of emotions.

Soc 8290. Topics in Social Stratification. (3 cr) Comparative perspectives on racial inequality; race, class, and gender; quantitative research on gender stratification; stratification in post-communist societies; institutional change and stratification systems; industrialization and stratification. Topics specified in Class Schedule.

Soc 8311. Political Sociology. (3 cr) Social dimensions of political behavior and social origins of different forms of the state. How various theoretical traditions—Marxist, Weberian, and feminist—address key issues in political sociology, including citizenship, revolution, state formation, origins of democracy, welfare state, and fascism.

Soc 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

Soc 8390. Topics in Political Sociology. (3 cr) Topics with common focus on social underpinnings of political behavior and political change. Sample topics: democracy and development, international legal and political systems, power and protest in advanced capitalist states, xenophobia and international migration, and civil society and democracy. Topics specified in Class Schedule.


Soc 8421. Work and Occupations. (3 cr) Sociological analysis of work, occupations, and labor markets, including contemporary theory and research. Course emphasis varies with instructor.

Soc 8444. FTE: Doctoral. (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)

Soc 8490. Advanced Topics in Social Organization. (3 cr. Prereq—#) Content varies with instructor. Sample topics: gender and organizations, interorganizational relations, comparative study of organizations, nonprofit organizations, consumer behavior, industry and technology, social networks, conflict, coercion, and social exchange. Topics specified in Class Schedule.

Soc 8501. Sociology of the Family. (3 cr) Theoretical and empirical works from contemporary family sociology. Content varies with instructor. Sample topics: definitions of the family, family roles, family interactions, marriage and divorce, child-bearing, parenthood, and cultural variations in families.

Soc 8540. Topics in Family Sociology. (3 cr) Families and mental health; families, work, and the labor market; historical/comparative research on the family. Topics specified in Class Schedule.

Soc 8551. Social Structure and the Life Course. (3 cr. Prereq—Soc grad major or #) Central concepts/premises of life course analysis as applied to institutional (comparative); intrasocietal (socioeconomic status, race, gender); and historical variability. Institutional patterning of life course (family, education, work, polity), deviance and criminal careers. changes in the self. methodological strategies.

Soc 8590. Topics in Life Course Sociology. (3 cr) Sociology of aging, sociology of youth, and mental health and adjustment in early life course. Topics specified in Class Schedule.

Soc 8666. Doctoral Pre-Thesis Credits. (1-18 cr. max 60 cr; NGA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Soc 8701. Sociological Theory. (4 cr; AF only. Prereq—Grad soc major or #) Traditions of social theory basic to sociological knowledge, their reflection and expansion in contemporary theory, their applications in selected areas of empirical research. Sample topics: social inequality, social organization and politics, family organization and social reproduction, social order and change, sociology of knowledge and religion.

Soc 8711. Theories of Social Organization. (3 cr) Key frameworks and theories, structure and process, micro and macro levels of analysis. Empirical literature on major substantive issues related to work, gender, and race; politics and social movements; and post-industrialization and technological change. World systems theory.

Soc 8721. Theories of Social Psychology. (3 cr) Pertinent contemporary theories of sociological social psychology, including structural (social structure and personality) perspectives, social relationships and small group processes (exchange, equity, expectation states theories), and symbolic interactionism. Classical writings, theoretical statements, and empirical studies.
Courses

Soc 8725. Sociological Theory Construction. (3 cr; Prereq—A) Structure of social scientific theories, basic tools for developing/critiquing them. Types of theoretical statements, concept formation, operationalization, testability. Contrasts/methods of different theoretical perspectives.

Soc 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])


Soc 8801. Sociological Research Methods. (4 cr; A-F only. Prereq—Grad soc major or #) Multiple objectives of social research and how they inform research design. Conceptualization and measurement of complex concepts. Broad issues in research design and quantitative and qualitative approaches to data collection and management.

Soc 8811. Advanced Social Statistics. (4 cr; A-F only. Prereq—5811 or grad soc major or #) Statistical methods for analyzing social data. Sample topics: advanced multiple regression, logistic regression, limited dependent variable analysis, analysis of variance and covariance, log-linear models, structural equations, and event history analysis. Applications to datasets using computers.

Soc 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NGA. Prereq—Max 18 cr per semester or summer; 24 cr required)

Soc 8890. Advanced Topics in Research Methods. (3-4 cr; A-F only. Prereq—Grad soc major. E8801, E8811 or #) Advanced quantitative methods (e.g., multilevel models) and historical/comparative, field, and survey research. Topics specified in Class Schedule.

Software Engineering (SEng)

Department of Computer Science

Institute of Technology

SEng 5115. Graphical User Interface Design, Evaluation, and Implementation. (3 cr; A-F only. Prereq—SEng major) Design and evaluation of interactive application interfaces, user- and task-centered approaches to design, guidelines for graphical design, interface evaluation techniques, current interface trends, including web interfaces and information visualization. Group projects that include designing, prototyping, and implementing an application interface.

SEng 5116. Graphical User Interface Toolkits. (2-3 cr; A-F only. Prereq—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. Network Programming: Distributed Objects. (3 cr; A-F only. Prereq—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. (3 cr [max 6 cr]; A-F only. Prereq—SEng grad student) Topics specified in Class Schedule.

SEng 5511. Artificial Intelligence. (3 cr; A-F only. Prereq—Grad SEng major) Introduces ideas and theories of AI. Problem solving, search, inference techniques. Logic and theorem proving. Knowledge representation, rules, frames, semantic networks, and planning. Introduces Lisp programming language.

SEng 5551. Introduction to Intelligent Robotic Systems. (3 cr; A-F only. 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 5707. The Principles of Database Systems. (3 cr; A-F only. Prereq—Grad SEng major) Fundamental concepts; conceptual data organization; data models; data manipulation languages; database design; security and integrity; performance evaluation; query optimization; distributed database systems.

SEng 5708. Object- Oriented Databases. (2-3 cr; A-F only. Prereq—Grad SEng major) Applications and implementations of object-oriented relational, object-relational, and object-oriented data models; object identifier, types and constructors; versions and schema evolution; query language (recursion, path expressions, etc.), object databases, buffer management and other implementation issues; triggers, rules, complex objects, and case studies.


SEng 5802. Software Engineering II: Advanced Software Engineering. (3 cr; A-F only. Prereq—Grad SEng major) Topics in software engineering and in object-oriented software development. Software design/implementa- tion using UML, object-oriented techniques, object-oriented languages such as Java. Lectures, project.


SEng 5841. Formal Modeling and Analysis in Software Engineering. (2 cr; A-F only. Prereq—Grad SEng major) Formal specification of software artifacts; applicability of formal specifications; introduction to methods such as Z, SCR, and Satecharts. Formal analysis techniques; basic theorem proving; reachability analysis techniques; model checking; introduction to tools such as PVS, Statemathe, SPIN, and SMV.

SEng 5851. Software Project Management. (3 cr; A-F only. Prereq—Grad SEng major) Concepts used to manage software projects. Project management cycle: initiation, planning/control, status reporting, review, post-project analysis. Leadership and motivation strategies. Lecture, discussion, individual/team presentations/projects.

SEng 5852. Quality Assurance and Process Improvement. (3 cr; A-F only. 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 5899. Software Engineering Seminar. (1-3 cr [max 12 cr]; A-F only. Prereq—Grad SEng major) Software engineering trends. Talks by invited speakers, selected readings.

Seng 5900. Directed Study. (0.5-3 cr; A-F only) Directed study/research in software engineering. Topics/scope decided in collaboration with instructor.

Seng 8333. FTE Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

Seng 8494. Capstone Project (Plan B Project). (3 cr; S-N only. Prereq—SEng major) Students work in teams on software project using tools, techniques, and skills acquired during previous coursework. Each team works with a client to establish requirements, agree upon design, and achieve a successful acceptance test of resulting software system.

Soil Science (Soil)

Department of Soil, Water, and Climate

College of Agricultural, Food, and Environmental Sciences

Soc 5111. Practicum Internship in Precision Agriculture. (2-5 cr; S-N only. Prereq—#) Practical experience in precision agriculture in agri- industry/business. Content and extent of work at the internship site is jointly decided by the instructor, host business representative, and student’s principal adviser.

Soc 5125. Soil Science for Teachers. (3 cr) Basic physical, chemical, and biological properties of soil. Soil genesis classification and principles of soil fertility. WWW used for lab. Soil survey information used to make a land-use plan. Similar to 2125 with less emphasis on chemistry.

Soc 5211. Environmental Biophysics and Ecology. (2 cr; A-F only. Prereq—[Biol 1009 or equiv], Math 1271, Phys 1101,[upper div or grad student] or #) Basic concepts of environmental variables such as temperature, humidity, wind, and radiation. Mechanics of heat/ mass transfer between a living organism and its surrounding environment. Set of practical examples to integrate concepts and transport processes.


Soc 5232. Vadose Zone Hydrology. (3 cr. 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.


Courses

Soil 5402. The Atmospheric Boundary Layer. (3 cr. Prereq.—Math 1271, Phys 1201, Stat 3011) Calculus-based introduction to the atmospheric boundary layer (ABL), the interface between the earth’s surface and the atmosphere. Topics include ABL development, turbulence, surface energy balance, ABL clouds, air quality, microclimate, and observational and modeling methods.

Soil 5421. Introduction to Atmospheric Science. (3 cr [max 3 cr]. Prereq.—Math 1271, Phys 1201, Stat 3011) Calculus-based, introductory description of the atmosphere including atmospheric dynamics, radiation, thermodynamics, chemical composition, and cloud processes. Discusses applications to climate, meteorology, the hydrologic cycle, air quality, and biogeochemical cycles.

Soil 5515. Soil Genesis and Landscape Relations. (3 cr; A-F only. Prereq.—2125 or #) Basic soil morphology and soil profile descriptions; pedogenic processes and models of soil development; soil geochemistry; hydrology; and hillslope processes; digital spatial analysis; soil classification; soil surveys and land use; soil geography.


Soil 5888. Thesis Credits: Doctoral. (1-24 cr; A-F only. Prereq.—Grad major in soil sci or related field, #) Directed research on special topics of interest in soil science or climatology supervised by individual or small groups of faculty.

Soil 8128. Seminar in Soils. (1 cr [max 2 cr]; S-N only) Students present an open seminar on an advanced topic and attend seminars presented by other graduate students.

Soil 8195. Research Problems in Soils. (1-5 cr [max 10 cr]; Prereq.—Grad major in soil sci or related field, #) Directed research on special topics of interest in soil science or climatology supervised by individual or small groups of faculty.


Soil 8333. FTE: Master’s. (1 cr; NGa. Prereq.—Master’s student, adviser and DGS consent)

Soil 8444. FTE: Doctoral. (1 cr; NGa. Prereq.—Doctoral student, adviser and DGS consent)

Soil 8510. Advanced Topics in Pedology. (2-4 cr [max 12 cr]; A-F only. Prereq.—5515) Sample topics: soil-landscape relations, soil genesis, landscape evolution, land use and management, precision agriculture, digital terrain modeling, forest soils.

South Asian Languages and Cultures (SALC)

SALC 5101. Hindi. (3 cr) Development of Hindiusmn focusing on sectarian trends, modern religious practices, myths and rituals, pilgrimage patterns and religious festivals, and the interrelationship between Indian social structure and Hinduism.

SALC 5111. Introduction to Indian Philosophy. (3 cr. Prereq.—Doctoral major in philosophy; graduate and PhD students allowed) Major concepts; principal schools of Indian philosophy; traditional and contemporary views.

SALC 5142. Hinduism. (3 cr) Development of Hinduism focusing on sectarian trends, modern religious practices, myths and rituals, pilgrimage patterns and religious festivals, and the interrelationship between Indian social structure and Hinduism.

SALC 5413. Buddhism. (3 cr) Historical account of Buddhist religion in terms of its rise, development, various schools, and common philosophical concept. Indian Buddhism compared with Hinduism; Buddhism’s demise and revival on the Indian subcontinent.

SALC 5413. Comparative Religions of South Asia. (3 cr) Compares and contrasts basic philosophical concepts, literatures, ideologies, and ritualistic practices of Hinduism, Buddhism, and Jainism with those of Islam and Sikhism.

SALC 5456. The Cinema of India. (3 cr) Survey of cinema of South Asia; aesthetic, social, economic, and political perspectives.

SALC 5500. Problems in Indian Philosophy. (3 cr. Prereq.—3411 or 3412 or 3413 or 5411 or 5412 or 5413) An introduction to Indian philosophy emphasizing analyses of mind and knowledge.

SALC 5521. Gandhi and Non-Violent Revolution. (3 cr) Character of Gandhi; his influence over contemporaries, and his hold on the world today.

SALC 5556. Women in India: Role and Repression. (3 cr) Representation of Indian women studied through literature of contemporary Indian women and against background of traditional Indian values and roles.

SALC 5710. Seminar in South Asian Languages. (4-5 cr) Selected topics on South Asian languages; no knowledge of South Asian languages required.

SALC 5720. Seminar in South Asian Literature. (4-5 cr) Selected topics on South Asian literature.

SALC 5730. Seminar in South Asian Culture. (4-5 cr) Selected topics on South Asian cultures.

SALC 5833. India’s Gods and Goddesses. (3 cr) Historical history examined by following development of the deities Krishna, Shiva, and Kali.

For definitions of course numbers, abbreviations, and symbols, see page 153.
Courses

Spanish (Span)

Department of Spanish and Portuguese Studies
College of Liberal Arts

Span 5106. The Literature of the Reconquest and Feudal Spain. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) 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 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) 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 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) Analysis of Cervantes’ Don Quixote in its sociohistorical context; focus on the novel’s reception from the romantic period to postmodern times.

Span 5109. The Crisis of the Old Regime: Spanish Literature of the Enlightenment and Romanticism. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) 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 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) Theory and representative examples of the realist/ naturalist novel (Galdós, Pardo Bazán) in the context of its antecedents (“romanticismo”), opposite(s) (the idealist/sentimental novel), and turn-of-the-century innovations of modernism and the “generation of 1898.”

Span 5111. Contemporary Spanish Literature Since 1915. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) Major literary works and movements in Spain from 1915 to 2000. Neomodernism; surrealism; social realism; literatures of dictatorship and exile; postmodernism. Poetry, novel, drama, essays, film, video/TV; problems of literary history.

Span 5221. Spanish Drama in Performance: 17th-Century Comedia. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) Critique of artistic and literary production in Hispanic cultures from mid-19th century to present. Modernity and modernization in Hispanic world. “Generation of 1898”; Castilian, Catalan, and Latin American practices along interdisciplinary and comparative lines.


Span 5526. Creole Consciousness and Mercantilist Culture. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish) Discourse production in Spanish America between 1492 and 1700. Conquest and colonial writing and counterwriting; historical origin and evolution and the impact of cultural, political, and socioeconomic factors.

Spans 5527. National Literary Consciousness and Free Trade. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish) Literary movements as part of the process of forming nation-states in Spanish America.

Span 5528. Popular Literary Consciousness: 1900-1950. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) Spanish-American literature between the eve and aftermath of the two world wars. Impact of modernization, industrialization, and nationalistic and populist thought on emergence of distinctive writing, thematic trends, and literary genre conventions.

Span 5529. National Affirmation and Transnationalization. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) Literary trends of the contemporary period (1950 to present) as a reaction to internal social demands for development of independent national cultures in response to international cultural pressures.

Span 5531. Hispanic Literature of the United States. (3 cr. Prereq—Three 3 xxx or 5 xxx literature courses in Spanish or Portuguese) 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.

SALC 8333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

SALC 8444. FTE: Doctoral. (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)

SALC 8666. Doctoral Pre-Thesis Credits. (1-18 cr; max 60 cr; NGA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

SALC 8710. Seminar: South Asian Languages, Literatures, and Cultures. (1-5 cr; Prereq—a topic specified in Class Schedule)

SALC 8720. Seminar: Interdisciplinary Study of South Asian Topics. (1-5 cr; Prereq—)

SALC 8777. Thesis Credits: Master’s. (1-18 cr; max 50 cr; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required (Plan A only))

SALC 8790. Research. (1-5 cr; Prereq—)

SALC 8888. Thesis Credits: Doctoral. (1-24 cr; max 100 cr; NGA. Prereq—Max 18 cr per semester or summer; 24 cr required)
Span 5731. Spanish Dialectology: Regional and Social Dialects of Modern Spain. (3 cr. Prereq.–Three 3xxx or 5xxx linguistics courses in Spanish or #) Major dialect areas of Spain, with distinguishing phonological, morphological, lexical, and syntactic variations of each. Impact of recent cultural, political, and socioeconomic transformations on language.

Span 5732. Spanish Dialectology: Regional and Social Dialects of Modern Spanish America. (3 cr. Prereq.–Three 3xxx or 5xxx linguistics courses in Spanish or #) Major dialect areas of Spanish America, with distinguishing phonological, morphological, lexical, and syntactic variations of each. Their historical origin and evolution and the impact of cultural, political, and socioeconomic transformations on the language.

Span 5910. Topics in Spanish Peninsular Literature. (3 cr [max 9 cr]. Prereq.–Three 3xxx or 5xxx literature courses in Spanish or Portuguese) Problems in Spanish cultural history and their applicability to studies of artistic movements, ideological trends, formal methods, or literary genres. Topics specified in Class Schedule.

Span 5920. Topics in Spanish-American Literature. (3 cr [max 9 cr]. Prereq.–Three 3xxx or 5xxx courses in Span literature and culture) 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 cr [max 9 cr]. Prereq.–#) Problems in Iberian/Lusophone linguistics; a variety of approaches and methods.

Span 5970. Directed Readings. (1-4 cr [max 9 cr]. Prereq.–MA or PhD candidate, & A, ∆) 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 cr. Prereq.–Three 3xxx or 5xxx linguistics courses in Spanish or #) Sociolinguistic analysis of issues such as language maintenance/shift in U.S. Latino communities, code switching, attitudes of Spanish speakers toward varieties of Spanish and English, language change in bilingual communities, and language policy issues.

Span 5990. Directed Research. (1-4 cr [max 9 cr]. Prereq.–9, A, ∆)

Span 5991. The Acquisition of Spanish as a First and Second Language. (3 cr. Prereq.–Three 3xxx or 5xxx linguistics courses in Spanish or #) Analysis of issues such as the acquisition of Spanish and English by bilingual children; Spanish in immersion settings; developmental sequences in Spanish; classroom language learners’ attitudes, beliefs, and motivation; development of pragmatic competence.

Span 8100. Research in Sociolinguistic Approaches to Spanish Literature. (3 cr [max 9 cr]. Prereq.–5xxx courses in Span literature and culture) Sociolinguistic functions of Spanish literary works and major theories concerning literary production of texts. Testing modern theories in terms of representative fictional discourses from specific historical periods.

Span 8200. Spanish Literary Texts: Theories of Formal Structures. (3 cr [max 9 cr]. Prereq.–5xxx courses in Spanish literature and culture) Advanced research in methods of literary analysis of discourse. Emphasizes theoretical and practical frameworks within which representative texts are analyzed and interpreted from differing perspectives.


Span 8223. The Poetry of the Spanish Golden Age. (3 cr. Prereq.–5xxx courses in Spanish literature and culture) New Spanish poetic forms, from Garcilaso de León, mystics, and San Juan to Baroque trends by Góngora, Lope, and Quevedo. Classic traditions and modern adaptations, ideological trends found in lyric genres—eclogue, lira, mystics, satire, conceptismo, culteranismo, and somet.


Span 8300. The Construction of Spanish Literary History. (3 cr [max 9 cr]. Prereq.–Two 5xxx courses in Spanish literature and culture) Origins and development of Hispanic literary canon; sociocultural theories of Spanish literary histories as academic and historiographic discipines. Critiques of modern literary theories through analysis of literary works by major writers.

Span 8312. Two Spanish Masterpieces: Libro de Buen Amor and La Celestina. (3 cr. Prereq.–5106, 5107 or 5xxx course in Portuguese) Cultural reappraisal of the late Middle Ages by reference to two Spanish masterpieces: the Archpriest’s Book of True Love and Rojas’ La Celestina (1499–1502). Emphasizes historical function of varied genres, motifs, and sources adapted by the authors.

Span 8333. FTE: Masters’. (1 cr; NGA. Prereq.–Master’s student, adviser and DGS consent)

Span 8444. FTE: Doctoral. (1 cr; NGA. Prereq.–Doctoral student, adviser and DGS consent)

Span 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq.–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Span 8710. Seminar in Spanish and Portuguese Phonology. (3 cr [max 9 cr]. Prereq.–5711, Ling 5302 or #) Critical examination of readings and research on specific topic.

Span 8730. Seminar in Spanish and Portuguese Syntax. (3 cr [max 9 cr]. Prereq.–5714 or #) Critical examination of readings and research on specific topic.

Span 8750. Seminar in Spanish and Portuguese Pragmatics. (3 cr [max 9 cr]. Prereq.–5716 or #) Critical examination of readings and research in specific topic.

Span 8777. Thesis Credits: Masters’. (1-18 cr [max 50 cr]; NGA. Prereq.–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Span 8780. Seminar in Hispanic Sociolinguistics. (3 cr [max 9 cr]. Prereq.–5731 or 5732 or 5985 or #) Current issues.

Span 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NGA. Prereq.–Max 18 cr per semester or summer; 24 cr required)

Span 8900. Spanish Seminar. (3 cr [max 9 cr]. Prereq.–Span 5xxx series required for MA or #) Projects relying heavily on advanced research in Spanish problems. Investigation of assigned fields, analysis of problems, appraisal of principles. Limited to small group of students. For list of sample seminars, consult department and director of graduate studies.

Span 8940. Advanced Research in Spanish-American Literatry Historiography. (3 cr [max 9 cr]) Sources and procedures that have given rise to institutionalizations of Spanish-American literary history. Evaluation and review of epistemological principles and assumptions in theory of literary criticism and histories of literature.

Span 8960. Workshop: Research in Hispanic Cultural Issues. (3 cr [max 9 cr]; A-F only, Prereq.–Reading knowledge of Spanish and Portuguese) Individualized support and advice in framing, theorizing, problematizing, and interpreting areas of cultural research. Taught in Spanish, Portuguese, and English.

Span 8990. Advanced Comparative Research of Caribbean Genres. (3 cr [max 9 cr]. Prereq.–5525 or #) Second language acquisition and adaptation in the Caribbean literature studied against the background of sociohistorical vicissitudes of the process leading to the formation and consolidation of the national states.

Spanish-Portuguese (SpPt)

Department of Spanish and Portuguese Studies
College of Liberal Arts

SPPT 5930. Selected Topics in Hispanic Cultural Discourse. (3 cr [max 9 cr]; A-F only. Prereq.–Reading knowledge of Spanish and/or Portuguese) Critical exchanges in Spanish- and Portuguese-speaking areas. Historical intersections and divergences. Taught in Spanish and/or Portuguese; English when cross-listed. Topics specified in the Class Schedule.

SPPT 5999. The Teaching of College-Level Spanish: Theory and Practice. (3 cr. Prereq.–Grad or #) Theoretical grounding in the general principles of second language acquisition and of Culture with their practical applications to the teaching of first- and second-year Spanish at the college-level.

SPPT 8400. Topics in Modern Hispanic and Lusophone Culture. (3 cr [max 9 cr]. Prereq.–Three 5xxx Spanish or Port courses) Advanced research in methods of analysis of culture. Emphasizes theoretical and practical frameworks within which representative cultural products and events are analyzed and interpreted from differing perspectives.

SPPT 8920. Cross-Cultural Issues in Hispanic and Lusophone Brazilian Cultural Discourses. (3 cr [max 9 cr]) Comparative study of literary and cultural production in historical periods when economic, social, political, and ideological bonds among Hispanic and Lusophone countries were intensified. Topics specified in Class Schedule.

Statistics (Stat)

School of Statistics
College of Liberal Arts

Stat 5021. Statistical Analysis. (4 cr & 5301. Prereq.–College algebra or #; Stat course recommended) Intensive introduction to statistical methods for graduate students needing statistics as a research technique.

Stat 5031. Statistical Methods for Quality Improvement. (4 cr. Prereq.–3502 or 3022 or 4102 or 5021 or 5102 or 8102, Math 1272) Random variability/sampling. Controlling statistical process. Shewhart/accumulative charting. Analyzing plant data, trend surface, and variance/design of experiments.
Courses

Stat 5041. Bayesian Decision Making. (3 cr. Prereq–5101 or 5021 or #)


Stat 5102. Theory of Statistics II. (4 cr. §5410. Prereq–5101 or Math 5651)


Stat 5201. Sampling Methodology in Finite Populations. (3 cr. Prereq–3011 or 3021 or 5021 or #)


Stat 5302. Applied Regression Analysis. (4 cr. Prereq–3022 or 4102 or 5021 or 5102 or #)


Stat 5401. Applied Multivariate Methods. (3 cr. Prereq–5302 or 8102 or #)


Stat 5421. Analysis of Categorical Data. (3 cr. Prereq–5302 or 8102 or #)


Stat 5601. Nonparametric Methods. (3 cr. Prereq–3022 or 4102 or 5021 or 5102 or #)

- Order statistics. Classical rank-based procedures (e.g., Wilcoxon, Kruskal-Wallis). Goodness of fit. Topics may include smoothing, bootstrap, and generalized linear models.

Stat 5931. Topics in Statistics. (3 cr)

- Topics vary according to student needs and available staff.

Stat 5932. Topics in Statistics. (3 cr)

- Topics vary according to students’ needs and available staff.

Stat 5993. Tutorial. (1-6 cr; max 12 cr. Prereq–#)

- Directed study in areas not covered by regular offerings.

Stat 8061. Applied Statistical Methods I. (4 cr; A-F only. Prereq–Grad stat major or #)

- The regression problem; linear regression with one or more predictors; classical regression; model building; model assessment and diagnostics; outliers; generalized linear models; logistic, Poisson, and nonlinear regression.

Stat 8062. Applied Statistical Methods II. (4 cr; A-F only. Prereq–8061, grad stat major or #)

- Categorical data analysis: loglinear models, logit models, multinomial response models, exact and asymptotic inference, conditional independence; models of association. Experimental design: randomization, ANOVA, contrasts and multiple testing, factorials, blocking, covariates, split plots, random effects, fractional factorials, response surfaces.

Stat 8101. Theory of Statistics I. (3 cr. Prereq–Grad stat major or #)

- Probability, transformations, expectation, univariate and multivariate distributions, central limit theorem, sampling and sampling distributions, sufficiency, likelihood.

Stat 8102. Theory of Statistics II. (3 cr. Prereq–8101, grad stat major or #)

- Point and interval estimation, maximum likelihood, delta method, hypothesis testing, decision theory, analysis of variance, regression.

Stat 8111. Mathematical Statistics I. (3 cr. Prereq–§5102 or 8102 or #. Prereq–Math 5615, Math 5616 or real analysis, matrix algebra)

- Probability theory, basic inequalities, characteristic functions, and exchangeability. Multivariate normal distribution. Decision theory, admissibility, and Bayes rules.

Stat 8112. Mathematical Statistics II. (3 cr. Prereq–8111)


Stat 8121. Theory of Inference. (3 cr. Prereq–8112, Math 8657 or #)

- Topics may vary according to instructor and student interests. Sample topics: conditional distributions and sufficiency, estimation theory, comparison of statistical inference theories; Neyman-Pearson hypothesis-testing theory and its extensions, confidence regions, invariance, and nonparametric, sequential, likelihood, and Bayes inference.

Stat 8131. Predictive Inference. (3 cr. Prereq–8112 or equiv)

- Traditional frequentist and nontraditional predictive approaches. Bayesian predictive methods and the purpose for which data are used. Theoretical apparatus discussed using a variety of common statistical paradigms. Model selection, comparisons and allocation, perturbation analysis and control.

Stat 8141. Probability Assessment. (3 cr. Prereq–5102)

- Probability as a language of uncertainty for quantifying and communicating expert opinion and for use as Bayesian prior distributions. Methods for elicitation and construction of subjective probabilities. De Finetti coherence, predictive elicitation, fitting subjective-probability models, computer-aided elicitation, and use of experts.

Stat 8151. Statistical Decision Theory. (3 cr; S-N only. Prereq–8112, Math 8856)

- Comparison of inferential methods in statistics (including risk comparison, minimaxity, and admissibility) using Wald’s formulation of decision. Formal and proper Bayes rules compared with frequentist inferences. Topics may vary depending on instructor.

Stat 8171. Sequential Analysis. (3 cr. Prereq–8112)

- Wald’s sequential probability ratio test and modifications. Sequential decision theory. Martingales. Sequential estimation, design, and hypothesis testing. Recent developments.

Stat 8201. Topics in Sampling. (3 cr; S-N only. Prereq–8102 or #)

- Sampling theory; stratified sampling, ratio estimators, cluster sampling, double sampling, superpopulation theory, Bayesian methods; multiple imputation, nonresponse.

Stat 8311. Linear Models. (4 cr. Prereq–Linear algebra, 5102 or 8062 or #)

- General linear model theory from a coordinate-free geometric approach. Distribution theory, ANOVA tables, testing, confidence statements, mixed models, covariance structures, variance components estimation.

Stat 8312. Linear and Nonlinear Regression. (3 cr. Prereq–8311)

- Nonlinear regression: asymptotic theory, Bates-Watts curvature, super leverage, parameter plots, projected residuals, transform-both-sides methodology, Wald versus likelihood inference. Topics in linear and generalized linear models as they relate to nonlinearity issues, including diagnostics, semi-parametric models, and model assessment.

Stat 8313. Topics in Experimental Design. (3 cr. Prereq–8311)

- Optimal, Bayes, and nonlinear designs; algorithms for computing designs; sample size; recent developments.


Stat 8333. FTE Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

Stat 8401. Topics in Multivariate Methods. (3 cr. Prereq–8311)


Stat 8411. Multivariate Analysis. (3 cr. Prereq–8152)

- Multivariate normal distribution. Inference on the mean, covariance, and correlation and regression coefficients; related sampling distributions such as Hotelling’s T-squared and Wishart distributions. Multivariate analysis of variance. Principal components and canonical correlation. Discriminant analysis.

Stat 8421. Theory of Categorical Data Analysis. (3 cr. Prereq–8062 or #)


Stat 8444. FTE Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

Stat 8501. Introduction to Stochastic Processes With Applications. (3 cr. Prereq–§5101 or 8101)

- Markov chains in discrete and continuous time, renewal processes, Poisson process, Brownian motion, and other stochastic models encountered in applications.

Stat 8511. Time Series Analysis. (3 cr. Prereq–§5102 or 8111 or #)


Stat 8666. Doctoral Pre-Thesis Credits. (1-18 cr; max 60 cr. NGA. Prereq–Max 1 cr per semester or summer; doctoral student who has not passed prelim oral)
Studies of Science and Technology (SST)

Institute of Technology

SST 8080. Colloquium. (1.5 cr; max 3 cr; S-N only. Prereq–Grad SST major) Series of weekly lectures by nationally and internationally known scholars with diverse disciplinary and methodological backgrounds speaking on a variety of issues.

SST 8100. Seminar: Models, Theories, and Reality. (3 cr; Prereq–HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or #) Students participate in ongoing research on the role of models and theories in science, and prepare and present research papers.

SST 8200. Seminar: The Physical Sciences. (3 cr; Prereq–HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or #) Students participate in ongoing research in history, philosophy, and social study of physical sciences and prepare and present research papers.

SST 8300. Seminar: The Biological and Biomedical Sciences. (3 cr; Prereq–HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or #) Students participate in ongoing research in history, philosophy, and social study of biological and biomedical sciences, and prepare and present research papers.

SST 8400. Seminar: Science, Technology, and Society. (3 cr; Prereq–HSci 8111 or [Phil 8601 or Phil 8602 or Phil 8605] or #) Students participate in ongoing research on interactions involving science, technology, and society from perspectives of history, philosophy, and social study of science, and prepare and present research papers.

SST 8420. Social and Cultural Studies of Science. (3 cr. Prereq–#) Recent work; theoretical and methodological differences among practitioners; selected readings from historians and philosophers of science.

Surg 8202. Surgical Research. (3 cr; A-F only. Prereq–Grad surg major) Graduate students undertake original investigation of problems in either experimental or clinical surgery.

Surg 8203. Surgery Complications and Research Conference. (1 cr; A-F only. Prereq–Grad surg major) Evaluation of surgical patients, including postoperative course. Discussion and critical evaluation of current research problems.

Surg 8207. Transplantation Conference. (1 cr; A-F only. Prereq–Grad surg major) Interdepartmental discussion and evaluation of current clinical and research problems.

Surg 8293. Applied Statistics. (1 cr; S-N only. Prereq–Grad student in [surg or experimental surg or health sciences] or #) Interactive computer course. Concepts of applied statistics. Examples, problem sets based on surgical research. How to independently set up appropriate experiments and perform basic descriptive/inferential analysis.

Surg 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

Surg 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

Surg 8666. Doctoral Pre-Thesis Credits. (1-18 cr; max 60 cr; NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

Surg 8777. Thesis Credits: Master’s. (1-18 cr; max 50 cr; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Surg 8888. Thesis Credits: Doctoral. (1-24 cr; max 100 cr; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

Sustainable Agricultural Systems (SAgr)

Department of Agronomy and Plant Genetics

College of Agricultural, Food and Environmental Sciences

SAgr 8010. Colloquium in Sustainable Agriculture. (2 cr; A-F only. Prereq–Coursework in biological or social sciences that provides intro to ag practices or issues) Forum for University faculty and students, and representatives of the farming community, including farmers, grassroots organizations, agricultural businesses, and representatives of state agencies, to engage in discussions on topics related to sustainability of food production.

SAgr 8020. Field Experience in Sustainable Agriculture. (1-4 cr; S-N only. Prereq–Coursework in biological or social sciences that provides intro to ag practices or issues) 3- to 14-week internship with growers or organizations working with sustainable agriculture issues. Students analyze issues in final written project, oral seminar.

Teaching English as a Second Language (TESL)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

TESL 5401. Language Analysis for Teachers of English as a Second Language, (4 cr; Prereq–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. Phonetics, phonology, morphology, and some aspects of the syntax of the English language. Part of a two-course sequence.
Courses

TESL 5402. Language Analysis for Teachers of English as a Second Language. (4 cr. Prereq—5401, Ling 5003). 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.

TESL 5610. Proseminar in Second Language Acquisition and Learning. (3 cr [max 16 cr]. Prereq—Ling 5505 or #). Key issues in second language acquisition/learning research. Focuses on learning a second or foreign language in the classroom.

TESL 5721. Methods in Teaching English as a Second Language. (3 cr. Prereq—Ling 3001 or 5001 or 1). Introduction to methods for teaching English as a second language to adults.

TESL 5722. Practicum in Teaching English as a Second Language. (4 cr [max 8 cr]; S-N only. Prereq—[5501 or 5502 or 5504] or [5401 or 5402] or ESL major or ESL minor or #). Observation of, and practice in, teaching English as a second language to adults at college or university level.


TESL 5724. Introduction to Language Assessment. (3 cr; A-F only). How to engage in meaningful, appropriate, and fair second-language assessment practices; interpret test results; and construct new forms of assessment.

TESL 5900. Topics in Second Language Learning and Teaching. (1-4 cr [max 16 cr]). Topics vary. See Class Schedule.

TESL 5910. Seminar in Teaching English as a Second Language. (3 cr. Prereq—9 cr [max 9 cr]). Topics related to English as a second language and applied linguistics. Topics specified in Class Schedule.

TESL 5993. Directed Studies. (1-4 cr [max 9 cr]. Prereq—#, #, #). Directed study for teaching English as a second language.

TESL 6333. FTE: Master’s. (1 cr; NGA. Prereq—Master’s student, adviser and DGS consent)

TESL 8751. English for Specific Purposes. (3 cr. Prereq—5721, 5401, 5402 or #). Critical review of literature: registers of English used in fields such as engineering, nursing, and business. Students gather data and write reports.

TESL 8777. Thesis Credits: Master’s. (1-18 cr; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Theatre Arts (Th)

Department of Theatre Arts and Dance
College of Liberal Arts

Th 5100. Theatre Practicum. (1-4 cr [max 20 cr]. Prereq—A [4 cr of 3100 for undergrads]). Individual creative projects in production of approved plays as an actor, director, dramaturg, or playwright. (See 5501 for design practicums.)

Th 5117. Performance and Social Change. (3 cr; A-F only. Prereq—3 or # 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 5172. History of the Theatre II. (3 cr). Theatre as a mirror of society. Aesthetics, philosophy, and practices of theatre arts. Mid-18th century to the present.

Th 5181. Blacks in American Theatre. (3 cr). Historical survey of significant events in the development of American Black theatrical tradition; essays, plays, playwrights, and theatres from early colonial references to Black Arts Movement.

Th 5182. Contemporary Black Theatre: 1960-Present. (3 cr). Essays, plays, playwrights, and theatres that have contributed to contemporary Black theatre. From the beginning of the Black Arts Movement to the present.

Th 5500. Theatre Design Practicum. (1-3 cr [max 20 cr]. Prereq—5515, 5721, ESL major or ESL minor or #). Individual projects in production of approved plays as a designer of scenery/properties, costumes, lighting, or sound. (See 5100 for other creative practicums.)

Th 5510. Drawing, Rendering, and Painting for the Theatre Designer I. (3 cr. Prereq—3515 or grad or #). Development of skills necessary for presentation of theatre scene/costume designs. Materials, layout, and techniques in scene painting. Basic drawing/graphic skills.

Th 5515. Design Composition and Collaboration. (3 cr. Prereq—Grad or 3515, 3711; #). Classical composition of art and its application to stage design and directing through the collaborative process.

Th 5520. Scene Design. (3 cr [max 9 cr]. Prereq—3515 or grad or #). Conceiving/communicating design ideas in both two-dimensional sketches and three-dimensional models for theatre and allied venues. Drafting.

Th 5530. Costume Design. (3 cr [max 9 cr]. Prereq—3515 or grad or #). Theory and process of costume design for theatrical productions (e.g., dance, opera, film) through hypothetical productions.

Th 5540. Lighting Design for the Theatre. (3 cr. Prereq—3515 or grad or #). Design aesthetics and exploration of design for various stage forms and venues. Development of the lighting plot and paperwork; use of the computer in lighting design.

Th 5545. Stage Lighting Technology. (3 cr. Prereq—3515 or grad or #). The lighting technician’s skills and crafts: equipment, techniques, control operation, wiring, and maintenance.

Th 5551. Editing and Post Production for Video and Film. (3 cr. Prereq—#). Students manipulate software and other technologies used in post production. Editing, audio, image manipulation.

Th 5553. Video Production Design and Aesthetics. (3 cr. Prereq—5553 or #). Use of technologies in video/film in making a statement or communicating an idea/emotion. Creativity, sensitivity to an audience. Students explore different creative uses of technologies/medium.

Th 5554. Multimedia Production for Live Performance. (3 cr. 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 cr. Prereq—4555 or #). Mixing/recording techniques specific to music and dramatic dialogue. Students explore recording different styles of music. Hands-on experience in recording bands and doing final mixes to a demo CD. Field trips to professional studios and club/concert recordings.

Th 5558. Audio Systems Analysis and Installation. (3 cr. Prereq—4555 or #). Analyzing, designing, developing specifications, and installing sound systems. Students work from client program lists, with given resources and given spaces, to arrive at best possible audio system. Hands-on experience.

Th 5559. Sound Design for Performance. (3 cr. Prereq—5555 or #). Audio technology and psychology and their impact on an audience in a performance situation. Communication, design process, psychoacoustics, and script analysis.


Th 5580. Costume Technology. (1-3 cr [max 15 cr]. Prereq—3515 or grad or #). Management, structures, upholstery, mask-making, furniture construction, stage mechanics, soft properties, faux finishes. Topics specified in Class Schedule.

Th 5590. Theatre Technology Practicum. (1-3 cr [max 15 cr]. Prereq—3515 or grad or #). Individual creative project in technology/craft area of theatre. Practical work in costume, lighting, makeup, props, scenery, sound, or theatre management.


Th 5713. Theory and Practice of Performance. (3 cr; A-F only. Prereq—[3171, 3172, 4177 or 4178, 5711] or grad student). Traditions of thinking about theatre, from ancient Greece to present, in practical applications. Focuses on epistemological significance of performance in current critical practices of postmodernism, psychoanalysis, and phenomenology.

Th 5714. The Drama of Myth. (3 cr. Prereq—[3122, 3171, 3172] or #). Role of myth in performance. Students choose a myth and study its iconography, tracing its journey in painting, sculpture, music, and other texts that accumulated around it throughout history. Course culminates in creation of a non-traditional performance score that embodies/reveals energies of contemporary culture within ancient metaphor of a chosen myth.

Th 5715. Actor-Director Collaboration. (3 cr. Prereq—Grad or 3322, 3711). Applying advanced acting and directing technique to an artistic, collaborative process that promotes flexibility and creativity. Actors and directors are exposed to a challenging range of roles, styles, and scenes.

### Courses

#### Toxicology (Txcl)

**College of Veterinary Medicine**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Txcl 5000.</td>
<td>Directed Research in Toxicology. (1-4 cr) [max 16 cr]; A-F only. Prereq—#</td>
<td></td>
<td>Special project that addresses specific issue in toxicology. Under guidance of faculty member.</td>
</tr>
<tr>
<td>Txcl 5011.</td>
<td>Principles of Toxicology. (2 cr; A-F only) Prereq—Grad txcl major or #</td>
<td></td>
<td>Introduction to fundamentals of poisoning in individuals and the environment, assessment of potential health hazards, and application of toxicology in various professional careers.</td>
</tr>
<tr>
<td>Txcl 5195.</td>
<td>Veterinary Toxicology. (3 cr; A-F only) Prereq—Grad student or #</td>
<td></td>
<td>Toxicology of minerals, pesticides, venom, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.</td>
</tr>
<tr>
<td>Txcl 5545.</td>
<td>Introduction to Regulatory Medicine. (2-4 cr; A-F only. Prereq—Grad student or #)</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Txcl 8012.</td>
<td>Advanced Toxicology I. (3 cr; A-F only) Prereq—(Duluth: 5011, Chem 4341 or #); [TC: 5011 or BioC 4331, PubH 5104 or #])</td>
<td></td>
<td>Kinetic and dynamic determinants of target organ toxicity; pathological alterations in structure/function relationships for major target organ systems; mechanisms of mutagenesis, carcinogenesis, and teratogenesis.</td>
</tr>
<tr>
<td>Txcl 8013.</td>
<td>Advanced Toxicology II. (3 cr; A-F only) Prereq—(Duluth: 8012, Chem 4342, Phsl 5061 or #); [TC: 8012, BioC 4332, Phsl 5062 or Phsl 6101 or #])</td>
<td></td>
<td>Toxicology of minerals, pesticides, venom, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.</td>
</tr>
</tbody>
</table>

#### Translation and Interpreting (TrIn)

**Institute of Linguistics, ESL, and Slavic Languages and Literatures**

**College of Liberal Arts**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>TrIn 5900.</td>
<td>Topics in Translation and Interpreting. (1-4 cr; max 6 cr) Prereq—#</td>
<td></td>
<td>Topics specified in Class Schedule.</td>
</tr>
<tr>
<td>TrIn 5993.</td>
<td>Directed Study. (1-3 cr; Prereq—#; A-F)</td>
<td></td>
<td>Directed study in translation and interpretation.</td>
</tr>
</tbody>
</table>
Courses

Urban Studies (UrbS)
Department of Geography
College of Liberal Arts
UrbS U101. The City and the Metropolis: an Exploration. (2 cr; Prereq–Grad student or [Adv UrbS undergrad, #])
The City and the Metropolis as places that result from important acts of human creativity. Interdisciplinary/ exploratory perspectives. Building/developing (North American) cities, construction of “urban culture.”

Veterinary Diagnostic Medicine (VDM)
Department of Veterinary Diagnostic Medicine
College of Veterinary Medicine
VDM 5000. Comparative Pathology Conference. (1-3 cr [max 99 cr]; A-F only. Prereq–#)
Discussions/demonstrations of contemporary aspects of diseases of animals. Emphasizes disease diagnosis, clinical outcomes, pathogenesis, and molecular mechanisms.

VDM 5100. Clinical Pathology Conference. (1 cr; S-N only. Prereq–[VMed resident or grad student, #])
Topics involving cytology, hematology, clinical chemistry, and hemostasis. May be addressed from clinical path perspective.
VDM 5322. Hematology, Cytology, and Microbiology. (2-4 cr [max 40 cr]; S-N only. Prereq–Grad student or #)
Hematology/cytology lab emphasizes microscopic aspects in dog, cat, cow, horse, sheep, goat, pig, and llama; case oriented approach to pathophysiologic aspects of disease. Diagnostic/clinical microbiology lab uses clinical diagnostic materials: students cultivate specimens, identify bacteria and fungi, and determine susceptibility; student presentations discuss cases and outline therapy/control.
VDM 5533. Hematology and Cytology. (2 cr [max 98 cr]; S-N only. Prereq–Grad student or #)
Microscopic aspects of hematology/cytology in dog, cat, cow, horse, sheep, goat, pig, and llama. Case oriented approach is used to develop pathophysiologic aspects of disease. One week rotation.

Veterinary Medicine, Graduate (VMed)
College of Veterinary Medicine
VMed 5080. Problems in Veterinary Epidemiology and Public Health. (1-3 cr; A-F only. Prereq–#)
Individual study on problem of interest to epidemiology or public health student.

VMed 5090. Seminar: Veterinary Epidemiology. (1 cr [max 3 cr; S-N only. 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.

VMed 5093. Directed Studies in Population Medicine. (1-4 cr [max 8 cr]; A-F only. Prereq–Grad student or #)
Directed studies arranged between student and instructor.

VMed 5165. Monitoring and Surveillance of Disease and Production. (2 cr; A-F only. Prereq–#)
Seminars and discussion on techniques used to monitor animal disease and production.

VMed 5193. Dairy Decision Making in a Financial Context. (2 cr; A-F only. Prereq–#)
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. (1-3 cr [max 6 cr])
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. (1-3 cr [max 6 cr]; A-F only. Prereq–VMed 5210 recommended)
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 5232. Comparative Clinical Veterinary Dermatologic Pathology. (1 cr; A-F only. Prereq–Grad student, #)
Microscopic pathology of basic dermatologic reactions and of variable disease states.

VMed 5274. Diseases of the Urinary System. (1 cr; A-F only. Prereq–#)
Expands on disorders of small animal urinary system. Introduction to core and to additional disorders.

VMed 5291. Independent Study in Veterinary Medicine. (2 cr. Prereq–DVM, #)
Arranged independent study in a clinical area of veterinary medicine.

VMed 5293. Directed Studies in Comparative Medicine and Pathology. (1-4 cr [max 8 cr]; A-F only. Prereq–Grad student, #)
Directed studies arranged between student and instructor.

VMed 5295. Problems in Large Animal Clinical Medicine/Surgery and Theriogenology. (1 cr [max 3 cr; A-F only. 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 5493. Directed Studies in Infectious Disease. (1-4 cr [max 8 cr]; A-F only. Prereq–Grad student, #)
Directed studies arranged between student and instructor.

VMed 5596. Swine Diseases and Diagnostics. (2-3 cr)
Review of recent advances in swine diseases; farm visits for on-farm disease diagnostics and control programs.

VMed 5610. Companion Animal Oncology. (2 cr; S-N only. Prereq–DVM, #)
Principles of veterinary oncology. Biologic behaviors, treatments, and prognosis of neoplastic disorders.

VMed 5691. Independent Research in Veterinary Anesthesiology. (1-6 cr; A-F only. Prereq-[Biology major or prevet or vet grad student, #])
Independent research supervised by faculty member.

VMed 5693. Directed Studies in Surgery/Radiology/Anesthesiology. (1-4 cr [max 8 cr; A-F only. Prereq–Grad student, #])
Directed studies arranged between student and instructor.

VMed 5720. Small Animal Orthopedic Radiology. (2 cr. Prereq–#)
Roentgen signs of common bone diseases of small animals.

VMed 5722. Large Animal Orthopedic Radiology. (1-2 cr; Prereq–#)
Roentgen signs of common bone diseases of large animals. Emphasizes the horse.

VMed 5893. Directed Studies in Theriogenology. (1-4 cr [max 8 cr]; A-F only. Prereq–Grad student, #)
Directed studies arranged between student and instructor.

VMed 8090. Epidemiology of Zoonoses and Diseases Common to Animals and Humans. (1-3 cr; A-F only. Prereq–Epidemiology and infectious disease course or #)
Major human zoonotic diseases, methods of transmission, diagnosis, control, and prevention.

VMed 8134. Ethical Conduct of Animal Research. (2 cr; A-F only. Prereq–Grad or professional school) student of #)
Ethical considerations in use of animal subjects in agricultural, veterinary, and biomedical research. Federal, state, and University guidelines relating to proper conduct for acquisition/use of animals for laboratory, observational, epidemiological, and clinical research. Regulatory requirements. Bases for proper conduct. Societal impact on scientific investigations utilizing animal subjects.

VMed 8195. Pre-Harvest Food Safety and Public Health Aspects of Food Animal Production. (1-3 cr. Prereq–#)
Includes presentations and discussions on on-farm HACCP principles and prudent use of antibiotics.

VMed 8201. Advanced Small Animal Veterinary Medicine. (1-5 cr; A-F only. Prereq–#)
Discussions of diseases of organs or systems in animals, including degenerative, psychological, anomalous, metabolic, nutritional, neoplastic, immune, inflammatory, toxic, and traumatic disorders.

VMed 8202. Internal Medicine in Small Companion Animals. (1-3 cr; A-F only. Prereq–#)
Lectures, assigned readings, and discussions on internal medical problems of dogs and cats.

VMed 8203. Advanced Diagnosis and Therapeutics of Animal Disease. (1-2 cr; A-F only. Prereq–#)
Detailed examination, treatment, and discussions of naturally occurring disease in patients admitted to Veterinary Teaching Hospital.

VMed 8210. Seminar: Veterinary Medicine. (1 cr. Prereq–#)
Participation and presentations of regularly scheduled seminars about internal medicine.

VMed 8220. Advanced Nephrology/Urology Clinics. (1-3 cr. Prereq–#)
Clinical investigation of naturally occurring urinary diseases in patients admitted to Veterinary Teaching Hospital.

VMed 8230. Medical Conference. (1-3 cr. Prereq–#)
Participation in weekly conference about internal medical disorders.

VMed 8250. Problems in Acid-base, Electrolyte, and Fluid Metabolism. (2-4 cr; A-F only)
Clinical problems and physiology of acid-base, electrolyte, and fluid disorders of dogs and cats.

VMed 8293. Advanced Studies in Nephrology and Urology. (1-3 cr; A-F only.
Studies of urinary tract disease with goal of generating new knowledge.

VMed 8294. Research Studies in Nephrology and Urology. (1-3 cr. Prereq–#)
Individual research on selected problems

VMed 8296. Advanced Large Animal Veterinary Medicine. (1-3 cr [max 6 cr]; A-F only. Prereq–#)
Includes presentations and discussions on on-farm HACCP principles and prudent use of antibiotics.

VMed 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

VMed 8360. Evidence-based Medicine. (2 cr; A-F only)
Use of medicine literature in clinical problem solving.

VMed 8393. Medical Conference. (1-3 cr [max 6 cr]; A-F only. Prereq–#)
Medical, surgical, or obstetrical cases supported by anatomic, bacteriologic, pathologic, physiologic, pharmacologic, and radiologic evaluations whenever applicable.
VMed 8394. Research in Veterinary Medicine. (1-3 cr. Prereq–A) Research problems relating to any aspect of internal medicine or to the various systems in animals.

VMed 8396. Diagnostic and Therapeutic Techniques of Animal Diseases. (1-3 cr [max 6 cr]; Prereq–CAPS 7801, DVM, grad vet med major; #) Detailed examination, discussions, and treatments of cases of animal diseases in a clinical setting.

VMed 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)


VMed 8494. Research in Infectious Diseases. (1-3 cr) Directed research.

VMed 8495. Problems in Infectious Diseases. (1-3 cr) In-depth discussion on specific problems for various infectious diseases of farm animals.

VMed 8520. Advanced Immunology. (2 cr) Lectures and case presentations.

VMed 8530. Advanced Swine Diseases. (2 cr) Lectures and discussion on advances.

VMed 8592. Infectious Disease Journals: Critical Thinking. (1 cr) Reading and critical discussion of journal articles.

VMed 8593. Advanced Veterinary Virology and Serology. (1-3 cr) Discussion and laboratory practice.

VMed 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

VMed 8681. Advanced Small Animal Surgery. (1-2 cr; A-F only) Advanced techniques and procedures.

VMed 8682. Advanced Large Animal Surgery. (1-3 cr [max 6 cr]; A-F only. Prereq–DVM or equiv degree; #) Surgery of various systems in large animals, with preparatory and postoperative evaluation and management.


VMed 8686. Thoracic and Cardiovascular Surgery. (2-4 cr; A-F only) Advanced thoracic and cardiovascular diseases of small animals amenable to surgical treatment.

VMed 8687. Plastic and Reconstructive Surgery. (2-3 cr; A-F only) Advanced techniques in conditions of small animals.


VMed 8696. Research in Critical Care/Emergency Medicine. (1-3 cr; A-F only. Prereq–DVM or equiv degree; <) Special problems course. Controlled study; prospective and retrospective models of evaluation are defined, critiqued, and used for experimental design and data collection to validate research methods.

VMed 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

VMed 8780. Advanced Avian Critical Care: Principles and Procedures. (2 cr; A-F only. Prereq–Course each in vet pathology, physiology, pharmacology, anatomy, small animal anesthesiology and critical care) Procedures and protocols for managing avian medical emergencies such as starvation, toxicities, respiratory failure, and massive trauma.

VMed 8781. Seminar: Advanced Veterinary Anesthesiology. (1-3 cr; A-F only. Prereq–[[CVM 6321, CVM 6322] or equiv], grad student) Active interaction around topics of advanced anesthesiology in veterinary species.

VMed 8782. Advanced Veterinary Abdominal Imaging. (1-3 cr) Applications and discussion of basic principles through emerging techniques.

VMed 8783. Advanced Veterinary Thoracic Imaging. (1-3 cr) Application and discussion of basic principles through emerging techniques.

VMed 8784. Veterinary Therapeutic Radiology. (2-3 cr) In-depth discussion of principles, practice, techniques, and complications.

VMed 8785. Veterinary Nuclear Medicine. (1-3 cr [max 6 cr]) In-depth discussion of principles, practice, techniques, and complications.


VMed 8789. Research in Avian Clinical Problems and Procedures. (1-3 cr; A-F only. Prereq–5330, 8780, 8796, DVM) Students conduct medical and surgical procedures involved in management of avian trauma and critical care patients.

VMed 8791. Research in Veterinary Anesthesia. (1-3 cr; A-F only. Prereq–8781 or equiv; SACS 5380 or equiv) Research methodology; controlled prospective and retrospective research studies. Collection and analysis of scientific data.

VMed 8792. Seminar: Veterinary Radiology. (1 cr [max 6 cr]) Current topics in veterinary imaging, veterinary radiation therapy, or specific applications.

VMed 8793. Seminar: Veterinary Anesthesiology. (1-2 cr; A-F only. Prereq–CVM 6321, CVM 6322 or equiv, DVM degree) Discussion and presentations; for veterinary anesthesiology and surgery residents and graduate students.

VMed 8794. Research in Veterinary Radiology. (1-3 cr) Research into an application, development of an application, or prospective/retrospective study of any aspect of veterinary imaging or veterinary radiotherapy.

VMed 8795. Problems: Veterinary Radiology. (1-3 cr [max 6 cr]) Discussion of problems associated with veterinary imaging or radiation therapy.


VMed 8882. Theriogenology Journals: Critical Evaluation. (1 cr [max 1 cr]) Reading and presentation of selected research journal articles; critical evaluation of experimental design, methods, and results.

VMed 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

VMed 8891. Seminar: Theriogenology. (1 cr)


Vet Pathobiology (VPB)

Department of Veterinary Pathobiology
College of Veterinary Medicine

VPB 5601. Veterinary Parasitology. (4 cr)

VPB 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

VPB 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

VPB 8501. Advanced Veterinary Basic Pathology. (2-3 cr; Prereq–A) Basic mechanisms and concepts relating to reaction of tissue to injury. Gross and microscopic interpretation of retrogressive cellular changes, cellular infiltrations, inflammation, and neoplasia. Students complete a special project selected in conjunction with instructor.

VPB 8502. Advanced Systemic Pathology. (3-4 cr) Prereq–5501 or 8501, # Reaction of specific systems to injury emphasizing basic response capabilities of tissue or organ, with materials illustrating gross and microscopic changes. Students complete a special project selected in conjunction with instructor.

VPB 8504. Advanced Veterinary Histopathology. (1 cr) Prereq–5502, 5503, # Discussion and study of selected case materials from veterinary anatomic, diagnostic, and surgical pathology programs.

VPB 8531. Hospital Pathology. (1-2 cr. Prereq–5501, 5502, 5503, #) Necropsy and surgical pathology techniques, examination of tissue for diagnosis, and preparation of reports and records.

VPB 8540. Problems: Veterinary Pathology. (2-6 cr [max 12 cr]; Prereq–A) Independent study.

VPB 8550. Problems: Veterinary Clinical Pathology. (2-6 cr [max 12 cr]; Prereq–A) Independent study.

VPB 8666. Doctoral Pre-Thesis Credits. (1-18 cr; NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

VPB 8700. Seminar: Veterinary Pathobiology. (1 cr [max 5 cr]; Prereq–A)

VPB 8724. Advanced Veterinary Diagnostic Microbiology. (3 cr. Prereq–#) Lectures and laboratory in techniques of diagnostic mycology, bacteriology, virology, and serology.

VPB 8777. Thesis Credits: Master’s. (1-18 cr; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

VPB 8888. Thesis Credits: Doctoral. (1-24 cr; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

For definitions of course numbers, abbreviations, and symbols, see page 153.
Water Resources Science (WRS)

College of Natural Resources

WRS 5001. Introduction to Field Research in Water Resources. (2 cr. Prereq–Grad WRS major or #) Introduction to field research techniques and opportunities during two-week summer excursion to regional sites. Data acquisition in large/small lakes, streams, and wetlands for biota and chemical/physical water quality; surface and groundwater hydrologic measurements and sampling.

WRS 5101. Water Resources: Individuals and Institutions. (3 cr. 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.

WRS 5241. Ecological Risk Assessment. (3 cr. 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.

WRS 8050. Special Topics in Water Resources Science. (1-3 cr [max 6 cr]; A-F only. Prereq–#)

WRS 8060. Directed Studies in Water Resources Science. (1-3 cr [max 6 cr]; A-F only. Prereq–#)

WRS 8095. Plan B Project. (3 cr; S-N only. Prereq–#) Satisfies Plan B project requirement. May appear on master’s program, but does not count toward credit minimum in major. Project topic arranged between student and adviser. Written report required.

WRS 8100. Interdisciplinary Seminar in Water Resources. (1-3 cr [max 3 cr])

WRS 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

WRS 8444. FTE: Doctoral. (1 cr; NGA. Prereq–Doctoral student, adviser and DGS consent)

WRS 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NGA. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

WRS 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]; NGA. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

WRS 8855. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NGA. Prereq–Max 18 cr per semester or summer; 24 cr required)

Women's Studies (WoSt)

Department of Women's Studies

College of Liberal Arts

WoSt 5101. Feminist Approaches to Ethnography. (3 cr) 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.

WoSt 5102. Feminist Approaches to History. (3 cr. 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.

WoSt 5103. Feminist Pedagogies. (3 cr. 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.

WoSt 5105W. Gendered Rhetoric of Science and Technology. (3 cr. Prereq–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.

WoSt 5106. The Cultural Construction of Sex, Gender, and Sexuality. (3 cr. Prereq–Feminist studies grad or 12 cr WoSt or #) Investigation of Euro-American concepts of sex, gender, sexuality in representative texts and images from the 17th century to the present. Critical and source materials from literary and cultural studies, history, biology, anthropology, psychology, and sociology.

WoSt 5107. Gender, Culture, and Science. (3 cr) Critical study of some of the major papers concerning the relations of gender and scientific inquiry produced in the past 20 years.

WoSt 5190. Topics: Methods of Inquiry. (3 cr) Topics specified in Class Schedule.

WoSt 5201. Global Processes and the Politics of Sexuality. (3 cr. 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/art, role of sexuality in relation to agency/ subjectivity.

WoSt 5202. Feminist Therapies. (3 cr) Feminist and multicultural perspectives regarding therapy and other helping forms for women, including philosophy of feminist therapy; feminist ethics in therapy; gender, sexual identity, race and class in therapy, and related topics.

WoSt 5203. Women and Madness in History and Literature. (3 cr. §3206. Prereq–2 or 4 cr WoSt or #) The representation of madness and how it intersects with gender as well as class, race, sexual orientation, and nationality.

WoSt 5290. Topics: Biology, Psychology, and Social Perspectives. (3 cr) Topics specified in Class Schedule.

WoSt 5300. Communication and Gender. (3 cr; A-F only. 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.

WoSt 5390. Topics: Literature, Film, and Other Arts. (3 cr) Topics specified in Class Schedule.

WoSt 5403. Chicana/Latina Feminisms. (3 cr. Prereq–8 cr WoSt and/or Chic and/or AmIn or #) The historical and social development of Chicana and Latina feminisms in general and their various specific types.

WoSt 5404. Working Class Women’s Cultures. (3 cr. 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.

WoSt 5405. Chicanas: Women and Work. (3 cr. 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.

WoSt 5490. Topics: Comparative and Global Studies. (3 cr [max 12 cr]) Topics specified in Class Schedule.

WoSt 5501. Women and the Law. (3 cr. Prereq–9 cr [WoSt or pre-law grad] or #) Legal system as it relates to women: historical legal approach to issues related to constitutional rights of women.

WoSt 5505. Women and Indigenous Land Struggles. (3 cr. Prereq–WoSt and/or Chic and/or AmIn or #) Representative land struggles by indigenous women from a critical race and gender perspective.

WoSt 5590. Topics: Civic and Community Studies. (3 cr [max 12 cr]) Topics specified in Class Schedule.

WoSt 5993. Directed Study. (1-12 cr [max 12 cr]. Prereq–#)

WoSt 5994. Directed Instruction. (1-12 cr [max 36 cr]. Prereq–#)

WoSt 5995. Directed Research. (1-8 cr [max 36 cr]. Prereq–#)

WoSt 8101. Intellectual History of Feminism. (3 cr) Major trends in feminist intellectual history from 14th century to the present, especially in the United States and Europe.

WoSt 8102. Advanced Studies in Sexuality. (3 cr) Contemporary theoretical scholarship and research on selected issues related to sexuality, gender, and the body.

WoSt 8103. Feminist Theories of Knowledge. (3 cr) Interdisciplinary seminar; feminist approaches to knowledge and to criticism of paradigms of knowledge operative in the disciplines. Feminists’ use of concepts of subjectivity, objectivity, and intersubjectivity; feminist empiricism, standpoint theory, and contextualism, and postmodern and postcolonial theorizing.


WoSt 8109. Feminist Theories and Methods II. (3 cr. Prereq–8108, feminist studies PhD or grad minor student) Two-semester interdisciplinary seminar. First term: current debates in gender theory; intersections of gender theory with critical race theory, post-colonial theory, sexuality theory, and social class analysis. Second term: inter- and multi-disciplinary feminist research frameworks and methodologies from humanities and social sciences.

WoSt 8190. Topics: Feminist Theory. (1-3 cr [max 12 cr])

WoSt 8201. Feminist Theory and Methods in the Social Sciences. (3 cr) Seminar on recent theories, including feminist theories of positivist, interpretivist, critical theoretical, and postmodernist models of social science knowledge. Methodologies congenial to feminist practices of inquiry, including use of narrative in theory, feminist ethnography, discourse analysis, and comparative methods in history.

WoSt 8202. Sociology of Gender. (3 cr) Organization, culture, dynamics of gender relations and gendered social structures. Gender, race, and class inequalities in the workplace; the women’s movement; social welfare and politics of gender inequality; gender and science; theoretical debates in gender theory and methods; sexuality; cultural studies of gender; sociology of emotions.

WoSt 8290. Topics: Social Sciences and Public Policy. (1-3 cr)

WoSt 8301. Feminist Literary Criticism. (3 cr) Recent developments and major issues in feminist studies of literature. Introduction to array of scholars and scholarship in field of feminist literary theory and criticism, emphasizing broad range of feminist textual analysis taking place in various University departments.

WoSt 8333. FTE: Master’s. (1 cr; NGA. Prereq–Master’s student, adviser and DGS consent)

WoSt 8390. Topics: Literary Studies. (1-3 cr)
WoSt 8401. Gender, Space, and Resistance. (3 cr) Identifying politics, social movements, and development politics; complex interrelationships among gender, space, and resistance. Social nature of place and space; sociopolitical and economic processes by which gendered, raced, and classed differences are constituted, reinforced, and resisted in and through space, place, and social networks.

WoSt 8444. FTE: Doctoral. (1 cr; NSA. Prereq—Doctoral student, adviser and DGS consent)

WoSt 8490. Topics: Comparative and Global Studies. (1-3 cr)

WoSt 8590. Topics: Historical Studies. (1-3 cr)

WoSt 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]; NSA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

WoSt 8888. Thesis Credits: Doctoral. (1-24 cr [max 100 cr]; NSA. Prereq—Max 18 cr per semester or summer; 24 cr required)

WoSt 8993. Directed Study. (1-6 cr [max 9 cr])

WoSt 8994. Directed Instruction. (1-8 cr [max 36 cr])

WoSt 8995. Directed Research. (1-6 cr [max 36 cr])

WoSt 8996. Women's Studies/CAPS Colloquium. (1 cr [max 4 cr]; S-N only)

Feminist studies Ph.D. students must register for 1 credit per semester. Credit available also to other graduate students.

WoSt 8997. Feminist Research and Writing. (3 cr. Prereq—8109, passed written prelims in degree granting program)

Develops interdisciplinary feminist components of Ph.D. thesis or other major piece of writing. Facilitates research/writing.

Wood and Paper Science (WPS)

Department of Wood and Paper Science

College of Natural Resources

WPS 5042. Business Markets in the Forest Products Industry. (2 cr; max 3 cr; A-F only)

How forest products companies sell to other businesses, how this differs from traditional consumer process. Emphasizes business marketing communications, sales force management, organizational buying, partnering, e-commerce, globalization of business markets. Case studies, discussion, daily readings from course text, academic industry publications.

WPS 8300. Research Problems. (1-10 cr [max 10 cr]; Prereq—A only)

Independent research under faculty guidance.

WPS 8303. Advanced Topics in Panel Products Technology. (2 cr; Prereq—4307)

Particle/fiber processing, additives, press cycle, design of panels for specific end uses.

WPS 8304. Advanced Topics in Wood Drying. (2 cr; Prereq—4304)


WPS 8306. Graduate Seminar. (1 cr [max 3 cr])

Communication of scientific knowledge related to wood and paper science through the media of poster sessions, oral presentations, and the Internet.

WPS 8307. Advances and Methods in Forest Products Pathology and Preservation. (2 cr; Prereq—4303)

Principles of wood protection, methods of evaluating preservatives. Emphasizes international developments.

WPS 8311. Mechanics of Wood and Wood Composites. (2 cr; Prereq—A only)

Advanced topics on behavior of wood composites.

Work, Community, and Family Education (WCFE)

Department of Work, Community, and Family Education

College of Education and Human Development

WCFE 5002. Thinking, Learning, and Teaching in Work, Community, and Family. (3 cr; A-F only)

Nature of thinking/learning in everyday life contexts of family, work, community. Theory/practice relevant to stimulating/supporting thinking/learning in/for these contexts.

WCFE 5011W. Technology and Public Ethics. (3 cr; A-F only)


WCFE 5021. Learning Through Service. (3 cr)

Service as both a philosophy and method of learning. Content covers both the theory and the practice of service in school-based and community-based organizations.

WCFE 5031. Information Resources in Education. (3 cr; S-N only)

Sources of knowledge and search strategies for accessing library, electronic, institutional, and informal resources of interest to educators.

WCFE 5101. Introduction to Leadership and Administration of WCFE. (3 cr)

Basic concepts of finance, public relations, communications, legal aspects, leadership, personnel policies and management, program planning and development, evaluation, and interinstitutional collaboration of work, community, and family education programs in school-based settings.

WCFE 5102. Leadership in WCFE. (2 cr)

An introduction to the concepts of leadership, leadership roles and responsibilities, and application to work, community, and family education settings.

WCFE 5121. Principles of Supervisory Management. (3 cr)

Introduction to the principles of supervision in education, business, industry, government, and service organizations.

WCFE 5125. Critical Pedagogy. (3 cr; S-N only)

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.

WCFE 5131. Planning WCFE. (3 cr)

Examination of educational planning and evaluation of work, community, and family education in formal and nonformal settings.

WCFE 5141. Evaluation of WCFE. (3 cr)

Designing and conducting project, program, and systems evaluations in work, community, and family education contexts and settings.

WCFE 5201. Family and Work Relationships. (3 cr; A-F only)

Examination of the interactions of work and family to prepare professionals to improve work and family relationships.

WCFE 5301. Philosophy and Practice of Career and Technical Education Advanced. (2 cr; A-F only)


WCFE 5331. Coordination Techniques for Work and Community Education. (3 cr)

Purposes of cooperative work and community education; responsibilities of instructor coordinator; guidance, selection, placement, supervision and evaluation of students; articulation of related instruction; training sponsor identification, orientation, development, and evaluation; management of the program.

WCFE 5341. Global Program Delivery Techniques and Technology. (2 cr; A-F only)

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.

WCFE 5351. Methods for Change in Developing Countries. (3 cr; A-F only)

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.

WCFE 5400. Special Topics in Youth Development Leadership. (1-4 cr [max 4 cr])

An examination of important social and political topics of current interest to youth development practitioners with an emphasis on leadership implications for practice in youth agencies, congregations, schools, and other community settings. Content varies by offering.

WCFE 5411. The Everyday Lives of Youth. (3 cr; A-F only)

Lived realities of body, time, space, other, and self from an existential and phenomenological perspective.

WCFE 5412. Experiential Learning: Theory and Practice. (3 cr; A-F only)

Examines the theory and practices of learning by doing. Emphasis on the educator's personal engagement in the actual process to understand the technical, motivational, and evaluative aspects of experiential learning.

WCFE 5413. Organizational Approaches to Youth Development. (3 cr; A-F only. Prereq—YDL ME student or #)

Language, historical influences, and educational philosophies fundamental to youth development work in organizations serving youth.

WCFE 5414. Issues in Youth Development Leadership. (3 cr; A-F only)

An examination of issues that drive the professional practice of community-based youth work. Participants engage experts from the family, community, schools, and workplace to develop a deeper understanding of how public issues and policy affect the everyday lives of youth.

WCFE 5451. Seminar: Youth Development Leadership. (1-4 cr [max 4 cr]; S-N only. Prereq—YDL student or #)

Applies principles of healthy youth development, nonformal learning venues, and experiential education to practice/policies of community-based youth work. Individual/group projects focus on applied research, community-based teaching/learning, and foundations of ethical practice. Four-course sequence.

WCFE 5496. Leadership Field Experience: Youth Development. (4 cr; S-N only)

Leadership in support of healthy youth development. Work in agency dedicated to community-based youth programming, education, public policy; advocacy for children, youth, families.

WCFE 5511. Education for Work. (3 cr)

Examination of contextual bases underlying education for work; implications for practice.

WCFE 5521. School-to-Work Policies. (3 cr)

Examination of the premises and purposes, federal and state policies, educational reform, and issues and concepts relating to school-to-work education.
Courses

WCFE 5522. School-to-Work Practices. (3 cr)
Examination of learning in context; curricular integration; educational system articulation; educational partnerships; best practices in school-based, work-based, service-based learning, and connecting accountability with community support; and leadership relating to school-to-work education.

WCFE 5601. Student and Trainee Assessment: Advanced. (2 cr; A-F only)
Developing learning progress reporting systems and tests of knowledge, affect, and processes for programs focused on improving skills associated with business/industry. Evaluating instructional effectiveness. Applying tests and other evaluation instruments to assess/report learning in business/industry and the technical education fields. Students develop each type of test and an overall evaluation plan for a course.

WCFE 5629. Course Development for Business and Industry: Advanced. (2 cr; A-F only)
Designing instructional programs/courses that help learners develop desired competencies. Designing instruction for performance-based training and vocational/technical education. Developing course syllables that clearly express instructional objectives. Developing academic/community-based elements that complement course goals. Reflect on and compare performance-based instruction with other curriculum models for the field.

WCFE 5661. Instructional Methods for Business and Industry Education: Advanced. (2 cr; BIE 5561; HRD 5561)
Theory/practice in instructional methods for career/technical education (CTE) instructors and human resource 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.

WCFE 5696. Teaching Internship: Introduction. (1 cr; S-N only, Prereq—Admission to an init lic program)
Initial experiences in the teaching profession provided through observations of school organization and administration, seminars, relationship building with cooperating teachers, and a reflection on personal involvement as a beginning student teacher.

WCFE 5697. Teaching Internship: School and Classroom Settings. (2 cr; Prereq—5696 for init lic program)
Part-time supervised teaching experience in a school. Seminars on managing student’s learning in the context of work, community, and family education programs in contemporary schools and on becoming a reflective educator.

WCFE 5698. Teaching Internship. (3-8 cr; max 8 cr, Prereq—Admission to an init lic program)
Teaching experience in a school system that provides programs for grades 5-12.

WCFE 5699. Teaching Internship: Extended Practice. (1 cr; Prereq—5698)
Extended student teaching experience in a school system that provides programs for grades 5-12.

WCFE 5771. Teaching Entrepreneurship: Small Business Management. (3 cr)
Methods, organization, curriculum development and modification, and implementation of educational programs for entrepreneurs.

WCFE 5801. Educating Special Populations in Work, Community, and Family Settings. (3 cr)
Identifying and accommodating educational traits of students with disabilities and disadvantaged conditions in work, community, and family settings.

WCFE 5802. Interagency Collaboration for Special Populations in Work, Community, and Family Settings. (2 cr)
Interagency planning issues and practices relating to special education, work, community, business, and human service organization personnel, as well as family members and advocates.

WCFE 5803. Developmental Writing and the College Student: Theory and Practice. (3 cr; Prereq—Bachelor’s degree)

WCFE 5804. Research in Postsecondary Developmental Education. (3 cr; Prereq—Bachelor’s degree, courses in [intro psychology, basic statistics])
Strategies for conducting three types of research that are central to developmental education: placement test validation, program evaluation, and classroom research. Students read examples and learn what constitutes best practices in each type.

Examination of the nature of diverse populations and their unique learning and training needs, exemplary programs, and collaborative efforts among persons representing work, community, and family settings.

WCFE 5822. Diversity and Organizational Transformation in Work, Community, and Family Education. (2 cr)
Developing models for understanding the impact of diversity on individual, organizational, and community outcomes; discussing organizational change in relation to diversity.

WCFE 5823. Program Planning and Improvement for Special Populations in Work, Community, and Family Education. (2 cr)
Concepts, issues, and practices related to the design, implementation, and evaluation of efforts focused on developing new programs or modifying existing programs for individuals with special learning needs in work, community, and family settings.

WCFE 5901. Using Research in Work, Community, and Family Education. (3 cr)
Introduction to the role of work, community, and family education research in professional practice, significant problems of practice for research, alternative modes of research, and synthesis and application of the results of research.

WCFE 5990. Special Topics in Work, Community, and Family Education. (1-4 cr; max 4 cr)
Topics vary.

WCFE 5993. Directed Study in WCFE. (1-4 cr; max 4 cr, Prereq—A)
Self-directed study, with faculty advice, in areas not covered by regular courses.

WCFE 8100. Work, Community, and Family Education Colloquium. (1-3 cr; max 3 cr)
Selected topics of significance to work, community, and family education professionals. Topics based on interest and demand.

WCFE 8141. History and Philosophy of Work, Community, and Family Education. (3 cr)
Historical influences and philosophical views regarding ideas, research, practice, and continuing issues in work, community, and family education.

WCFE 8142. Work, Community, and Family Education Comparative Systems. (3 cr; Prereq—8141)
Comparison of work, community, and family education systems within the United States and between the United States and other countries.

WCFE 8444. FTE: Doctoral. (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)

WCFE 8666. Doctoral Pre-Thesis Credits. (1-18 cr; max 60 cr; NGA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

WCFE 8888. Thesis Credits: Doctoral. (1-24 cr; max 100 cr; NGA. Prereq—Max 18 cr per semester or summer; 24 cr required)

WCFE 8896. Internship. (1-10 cr; max 10 cr; S-N only)
Prereq—A
Students apply for placement in professional practice; individual arrangements describe specific responsibilities during internship. Ed.D. program requirement.

WCFE 8911. Foundations of Inquiry. (2 cr; A-F only)

WCFE 8912. Quantitative Research. (3 cr; Prereq—8911)
Assumptions, procedures for, and considerations in planning/conducting quantitative research in work, community, and family education.

WCFE 8913. Interpretive Research. (3 cr; A-F only;
Prereq—8911)
Hermeneutic, ethnomet hodological, and phenomenological research methodologies. Consideration of ethics, evaluation, and usefulness of interpretive research. Practice in conducting interpretive research in work, community, and family education.

WCFE 8914. Critical Science Research. (3 cr; A-F only; Prereq—8911)
Origins, influences, characteristics, and central concepts; distinction between critical science and other action research; requisite skills and knowledge for conducting critical science research and using that knowledge in a project.

WCFE 8915. Ethics and Responsible Research. (1 cr; A-F only)
Introduction to ethical and legal issues involved in practicing responsible educational research. Key issues, formal and informal codes of conduct, and ethical reasoning skills.

WCFE 8990. Research Seminar. (1 cr; max 6 cr; S-N only; Prereq—8911, 8912 or 8931 or 8914) or A)
Developing, reporting, and evaluating research. Participants make and react to presentations. (Two credits counted in doctoral program.)

Youth Development and Research (YoSt)

School of Social Work
College of Human Ecology

YoSt 5031. Youth in the World. (3 cr; Prereq—Upper div ADPy course)
Encourages critical thinking about how youth as ideal and as lived reality are understood in scholarship, public discourse, and professional practice. Larger framework includes building a basis for understanding youth and working with or on behalf of youth.

YoSt 5032. Child and Adolescent Psychology for Practitioners. (3 cr; Prereq—Courses in ed psych or child or adolescent psych)
Application of theory and research about children and adolescents including how findings can be used and how theories facilitate understanding of behavior.

YoSt 5101. Youth Work Practice I: Internship. (3 cr; Prereq—5101, 5032 or equiv, §5111, #)
First course of a sequential internship that includes 15 hours per week working with youth in a community youth-serving organization. Develop and enhance competence and identity as a youth worker, and reflect on and integrate knowledge about youth with on-going experience in youth work.

YoSt 5102. Youth Work Practice II: Internship. (3 cr; Prereq—5101, §5112, #)
Second course of a sequential internship that includes 15 hours per week of work with youth in a community youth-serving organization. Develop and enhance competence and identity as a youth worker, and reflect on and integrate knowledge about youth with ongoing experience in youth work.
YoSt 5111. Youth Work Methods I: Seminar. (1 cr. Prereq—3101, 5032 or equiv, ¶5101, #) Weekly discussion seminar taken concurrently with 5101 to integrate theory and praxis with youth work experience. Written and experiential assignments to increase knowledge, competency, and skills related to working with youth.

YoSt 5112. Youth Work Methods II: Seminar. (1 cr. Prereq—5111, ¶5102, #) Weekly discussion seminar taken concurrently with 5102 to integrate theory and praxis with youth work experience. Written and experiential assignments to increase knowledge, competency, and skills related to working with youth.

YoSt 5234. Youth Agencies, Organizations, and Youth Service System. (2 cr. Prereq—Two social sci courses, work exper in a youth agency or org) Overview of major forms of youth agencies and organizations, sources of agency legitimacy, ideologies and values, and goals. Relations between and among agencies and organizations. Roles of adults and youth; professionals and nonprofessionals; paid staff and volunteers; youth participation; legal and ethical issues. Examples of existing and ideal agencies.

YoSt 5235. Community Building for Healthy Youth Development. (2 cr. Prereq—Two social sci courses, exper working with youth or #) Community is a major context of adolescence and youth life, and community-building is a major strategy for healthy development. Explore recent foundation and government reports that address issues and practical problems of community-building.

YoSt 5240. Special Topics in Youth Studies. (2-8 cr [max 10 cr] 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 5241. Experiential Learning. (2 cr. Prereq—Two social sci courses, exper working with youth or #) Cover rationale for and purposes of experiential learning in schools and youth-serving agencies, development and implementation of experiential programs for adolescents, and evaluation of experiential-learning programs. Each student will develop a plan for an experiential program for teenagers.

YoSt 5291. Independent Study in Youth Studies. (1-8 cr [max 8 cr], Prereq—¶) Independent reading and/or research under faculty supervision.

YoSt 5301. Communicating with Adolescents About Sexuality. (2 cr. Prereq—Upper div AdPy course, exper working with youth or #) Sexual development and experiences emphasizing how adults can be comfortable in communicating more effectively with young people. Sexual patterns, variations, roles, power, exploration, and sex education.

YoSt 5313. Direct Work with Adolescents. (2 cr. Prereq—Two social sci courses, exper working with youth or #) Designed to give an understanding of direct work with troubled and at-risk adolescents in a wide range of settings where youth workers or social workers are typically involved. Emphasis on young people in groups in the “lifespace” in everyday life, rather than in one-to-one office-based interactions.

YoSt 5321. Work with Youth—Individual. (2 cr. Prereq—5032 or equiv or #) Examination of basic assumptions underlying individual work with youth. Attention to special issues and concerns of adolescents and of persons who work with them, especially those who work with youth in one-to-one interactions.

YoSt 5322. Work with Youth—Families. (2 cr. Prereq—5321 or upper div AdPy course, family theory course or #) Theories and techniques of working with youth and their families. Emphasis on practical methods of structural change, developing effective communication, decision-making and problem-solving systems, winning the family’s cooperation; the role of the professional to influence healthy family development.

YoSt 5323. Work with Youth—Groups. (2 cr. Prereq—5321 or upper div AdPy course or #) Increase knowledge and understanding of adolescent group needs and associations; increase knowledge of group process; and enhance skill in working with groups of adolescents in the community, in group living situations, and in group therapy.


YoSt 5402. Youth Policy: Enhancing Healthy Development in Everyday Life. (3 cr. Prereq—Two social sci courses, exper working with youth or #) Youth policy is typically grounded to problems and risks and is specific to human services domains such as education, health, juvenile justice, employment, and the like. Create youth policy directed at enhancing healthy development through community building, program development, and other strategies.