Math 5345. Introduction to Topology. (4 cr. Prereq:—2263 or 2374 or 2573.) (2263 or 2374 or 2263 or 2374 or 2573 or 3283) Recommended Set theory. Euclidean/metric spaces. Basics of general topology, including compactness/connectedness.

Math 5378. Differential Geometry. (4 cr. Prereq:—2263 or 2374 or 2573; [2243 or 2374 or 2574; [2283 or 2383]

Basic geometry of curves in plane and in space, including Frenet formula, theory of surfaces, differential forms, Riemannian geometry.

Math 5385. Introduction to Computational Algebraic Geometry. (4 cr. Prereq:—2263 or 2374 or 2573; [2243 or 2374 or 2574])

Geometry of curves/surfaces defined by polynomial equations. Emphasizes concrete computations with polynomials using computer packages, interpaly between algebra and geometry. Abstract algebra presented as needed.

Math 5467. Introduction to the Mathematics of Wavelets. (4 cr. Prereq:—2243 or 2373 or 2573; [2283 or 2574 or 2283 or 2374])

For definitions of course numbers, abbreviations, and symbols, see page 167.
Courses

Math 8172, Model Theory. (3 cr; A-F only. Prereq—Math grad student or permission of adviser and DGS) Introduction to model theory. Basic concepts, direct limits, ultraproducts.

Math 8173, Model Theory. (3 cr; A-F only. Prereq—8172 or #) Types of elements. Prime models, homogeneity, saturation, categoricity in power. Forking.

Math 8190, Topics in Logic. (1-3 cr [max 12 cr]; A-F only. Prereq—#; offered for one year or one semester as circumstances warrant) Advanced topics in model theory. Proofs of classical theorems.

Math 8201, General Algebra. (3 cr; A-F only. Prereq—4xxx algebra or equiv or #) Groups through Sylow, Jordan-Hölder theorems, structure of finitely generated Abelian groups. Rings and algebras, including Gauss theory of factorization. Modules, including projective and injective modules, chain conditions, Hilbert basis theorem, and structure of modules over principal ideal domains.

Math 8202, General Algebra. (3 cr; A-F only. Prereq—8201 or #) Classical field theory through Galois theory, including solvable equations. Symmetric, Hermitian, orthogonal, and unitary form. Tensor and exterior algebras. Basic Wedderburn theory of rings; basic representation theory of groups.

Math 8207, Theory of Modular Forms and L-Functions. (3 cr; A-F only. Prereq—8202 or #) Zeta and L-functions, prime number theorem, Dirichlet’s theorem on primes in arithmetic progressions, class number formulas; Riemann hypothesis; modular forms and associated L-function; Eisenstein series; Hecke operators, Poincaré series, Euler products; Ramanujan conjectures; Theta series and quadratic forms; waveforms and L-functions.

Math 8208, Theory of Modular Forms and L-Functions. (3 cr; A-F only. Prereq—8207 or #) Applications of Eisenstein series: special values and analytic continuation and functional equations of L-functions. Trace formulas. Applications of representation theory. Computations.

Math 8211, Commutative and Homological Algebra. (3 cr; A-F only. Prereq—8221 or #) Selected topics.

Math 8212, Commutative and Homological Algebra. (3 cr; A-F only. Prereq—8221 or #) Selected topics.

Math 8245, Group Theory. (3 cr; A-F only. Prereq—8202 or #) Permutations, Sylow’s theorems, representations of groups on groups, semi-direct products, solvable and nilpotent groups, generalized Fitting subgroups, p-groups, co-prime action on p-groups.

Math 8246, Group Theory. (3 cr; A-F only. Prereq—8245 or #) Representation and character theory, simple groups, free groups and products, presentations, extensions, Schur multipliers.

Math 8251, Algebraic Number Theory. (3 cr; A-F only. Prereq—8202 or #) Algebraic number fields and algebraic curves. Basic commutative algebra. Completions: p-adic fields, formal power series, Puiseux series. Ramification, discriminant, different. Finiteness of class number and units theorem.


Math 8270, Topics in Algebraic Geometry. (1-3 cr [max 12 cr]; A-F only. Prereq—Math 8201, Math 8202; offered for one year or one semester as circumstances warrant) Topics in algebraic geometry.

Math 8271, Lie Groups and Lie Algebras. (3 cr; A-F only. Prereq—8202 or #) Definitions and basic properties of Lie groups and Lie algebras; classical matrix Lie groups; Lie subgroups and their corresponding Lie subalgebras; covering groups; Maurer-Cartan forms; exponential map; correspondence between Lie algebra and simply connected Lie groups; Baker-Campbell-Hausdorff formula; homogeneous spaces.

Math 8272, Lie Groups and Lie Algebras. (3 cr; A-F only. Prereq—8271 or #) Solvable and nilpotent Lie algebras and Lie groups; Lie’s and Engel’s theorems; semisimple Lie algebras; cohomology of Lie algebras; Whitehead’s lemmas and Levi’s theorem; classification of complex semisimple Lie algebras and compact Lie groups; representation theory.

Math 8280, Topics in Number Theory. (1-3 cr [max 12 cr]; A-F only. Prereq—#; offered for one year or one semester as circumstances warrant) Selected topics.


Math 8303, Algebraic Topology. (3 cr; A-F only. Prereq—8301 or #) Singular homology, cohomology theory with coefficients. Eilenberg-Steenrod axioms. Mayer-Vietoris theorem.

Math 8304, Algebraic Topology. (3 cr; A-F only. Prereq—8304 or #) Basic homotopy theory, cohomology rings with applications. Time permitting: fibre spaces, cohomology operations, extra-ordinary cohomology theories.

Math 8331, FTE: Master’s. (1 cr. Prereq—Master’s student, adviser and DGS consent) A Forschungsstipendium for Forschungsstipendium students.

Math 8360, Topics in Topology. (1-3 cr [max 12 cr]; A-F only. Prereq—# or offered as one yr or one sem as circumstances warrant) Survey of typical problems. Necessary conditions. Selected topics.

Math 8365, Riemannian Geometry. (3 cr; A-F only. Prereq—8301 or basic point-set topology or #) Riemannian metrics, curvature, Gaussian-Bonnet theorem. Mayer’s theorem. Cartesian-Hadamard theorem.

Math 8366, Riemannian Geometry. (3 cr; A-F only. Prereq—8365 or #) Gaussian, Cozadi equations. Tensor calculus, Hodge theory, spinors, global differential geometry, applications.

Math 8370, Topics in Differential Geometry. (1-3 cr [max 12 cr]; A-F only. Prereq—8301 or 8365; offered for one yr or one sem as circumstances warrant) Current research in Differential Geometry.

Math 8380, Topics in Advanced Geometry. (1-3 cr [max 12 cr]; A-F only. Prereq—8301, 8365, #; offered for one year or one semester as circumstances warrant) Advanced topics in geometry.


Math 8386, Calculus of Variations and Minimal Surfaces. (3 cr; A-F only. Prereq—8595 or #) Theory of multiple integrals. Geometrical differential equations, i.e., theory of minimal surfaces and related structures (surfaces of constant or prescribed mean curvature, solutions to variational integrals involving surface curvatures), all extremals for variational problems of current interest as models for interfaces in real materials.

Math 8387, Mathematical Modeling of Industrial Problems. (3 cr; A-F only. Prereq—[Some numerical analysis, some computer experience] or #) Mathematical models from physical, biological, social systems. Emphasizes industrial applications. Modeling of deterministic/probabilistic, discrete/continuous processes; methods for analysis/computation.

Math 8388, Mathematical Modeling of Industrial Problems. (3 cr; A-F only. Prereq—8591 or #) Mathematical models, including finite element methods, finite difference methods, and spectral methods. Grid equations, including finite element methods, finite difference methods, and spectral methods. Grid generation.

Math 8390, Topics in Mathematical Physics. (1-3 cr [max 12 cr]; A-F only. Prereq—8601; offered for one yr or one sem as circumstances warrant) Current research.

Math 8401, Mathematical Modeling and Methods of Applied Mathematics. (3 cr; A-F only. Prereq—4xxx numerical analysis and applied linear algebra or #) Dimension analysis, similarity solutions, linearization, stability theory, well-posedness, and characterization of type. Fourier series and integrals, wavelets, Green’s functions, weak solutions and distributions.

Math 8402, Mathematical Modeling and Methods of Applied Mathematics. (3 cr; A-F only. Prereq—8401 or #) Calculus of variations, integral equations, eigenvalue problems, spectral theory. Perturbation, asymptotic methods. Artificial boundary conditions, conformal mapping, coordinate transformations. Applications to specific modeling problems.


(3 cr. Prereq–5457 recommended for engineering and science grad students) 

Math 4444. FTE: Doctoral. 
(1 cr. Prereq–Doctoral student, advisor and OIR consent) 

(3 cr; A-F only. Prereq–4040 numerical analysis, 4040 partial differential equations or #) 
Numerical methods for parabolic equations (e.g., heat equations). Methods for elasticity, fluid mechanics, electromagnetics. Applications to specific computations.

Math 4450. Topics in Numerical Analysis. 
(1-3 cr; S-N only. Prereq–Two sem crse as circumstances warrant) 
Selected topics.

Math 4470. Topics in Mathematical Theory of Continuum Mechanics. 
(1-3 cr; max 12 cr) (A-F only. Prereq–Grad math major or #; offered as one yr or one sem crse as circumstances warrant) 
Selected topics.

Math 8450. Topics in Numerical Analysis. 
(1-3 cr; max 12 cr; A-F only. Prereq–Grad math major or #; offered as one yr or one sem crse as circumstances warrant) 
Selected topics.

(3 cr; A-F only. Prereq–8445 or #) 
Numerical methods for parabolic equations (e.g., heat equations). Methods for elasticity, fluid mechanics, electromagnetics. Applications to specific computations.

Math 8450. Topics in Numerical Analysis. 
(1-3 cr; max 12 cr; A-F only. Prereq–Grad math major or #; offered as one yr or one sem crse as circumstances warrant) 
Selected topics.

(3 cr; A-F only. Prereq–4040 numerical analysis, 4040 partial differential equations or #) 
Finite element and finite difference methods for elliptic boundary value problems (e.g., Laplace’s equation) and solution of resulting linear systems by direct and iterative methods.

(3 cr; A-F only. Prereq–8445 or #) 
Numerical methods for parabolic equations (e.g., heat equations). Methods for elasticity, fluid mechanics, electromagnetics. Applications to specific computations.

Math 8572. Theory of Evolutionary Equations. 
(3 cr; A-F only. Prereq–8571 or #) 
Dynamics of Navier-Stokes equations, strong/weak solutions, global attractors. Chaotically reacting fluid flows. Dynamics in infinite dimensions, unstable manifolds, center manifolds perturbation theory. 

Math 8578. Topics in Evolutionary Equations. 
(1-3 cr; max 12 cr; A-F only. Prereq–8572 or #; offered for one yr or one semester as circumstances warrant) 

Math 8581. Applications of Linear Operator Theory. 
(3 cr; A-F only. Prereq–4040 applied mathematics or #) 

Math 8582. Applications of Linear Operator Theory. 
(3 cr; A-F only. Prereq–8581 or #) 

(3 cr; A-F only. Prereq–[Some 5xx PDE, 8601] or #) 

(3 cr; A-F only. Prereq–8583 or #) 
Fundamental solutions/distributions, Sobolev spaces, regularity. Advanced elliptic theory (Schauder estimates, Garding’s inequality). Hyperbolic systems.

Math 8590. Topics in Partial Differential Equations. 
(1-3 cr; max 3 cr; A-F only. Prereq–8602; offered for one yr or one sem as circumstances warrant) 

Math 8591. Applications of Linear Operator Theory. 
(3 cr; A-F only. Prereq–8593 or #) 

Math 8601. Real Analysis. 
(3 cr; A-F only. Prereq–5587 or #) 

(3 cr; A-F only. Prereq–8602 or #) 

Math 8640. Topics in Real Analysis. 
(1-3 cr; max 12 cr; A-F only. Prereq–8590 or #; offered for one yr or one sem as circumstances warrant) 

Math 8652. Theory of Evolutionary Equations. 
(3 cr; A-F only. Prereq–8571 or #) 

(3 cr; A-F only. Prereq–8583 or #) 

(3 cr. Prereq–8651 or 8602 or #) 
Review of basic theorems of probability for independent random variables; introductions to Brownian motion process, Poisson process, conditioning, Markov processes, stationary processes, martingales, super- and sub-martingales, Doob-Meyer decomposition.

Math 8655. Stochastic Calculus with Applications. 
(3 cr. Prereq–8654 or 8659 or #) 
Stochastic integration with respect to martingales, Ito’s formula, applications to business models, filtering, and stochastic control theory.

(3 cr. Prereq–8652 or #) 
In-depth coverage of various stochastic processes and related concepts, such as Markov processes and processes, renewal sequences, exchangeable sequences, stationary sequences, Poisson point processes, Levy processes, interacting particle systems, diffusions, and stochastic integrals.

Math 8660. Topics in Probability. 
(1-3 cr; max 12 cr) 
Offered for one year or one semester as circumstances warrant.

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

(3 cr; A-F only) 
Basic enumeration, including sets and multisets, permutation statistics, inclusion-exclusion, integer/set partitions, involutions and Polya theory. Partially ordered sets, including lattices, incidence algebras, and Mobius inversion. Generating functions.

(3 cr; A-F only. Prereq–8668 or #) 
Further topics in enumeration, including symmetric functions, Schensted correspondence, standard tableaux; non-enumerative combinatorics, including graph theory and coloring, matching theory, connectivity, flows in networks, codes, and extremal set theory.

Math 8680. Topics in Combinatorics. 
(1-3 cr; max 12 cr; A-F only. Prereq–Grad math major or #; offered as one yr or one sem crse as circumstances warrant) 
Selected topics.

Math 8701. Complex Analysis. 
(3 cr; A-F only. Prereq–5586 or #) 

Math 8702. Complex Analysis. 
(3 cr; A-F only. Prereq–8701 or #) 

For definitions of course numbers, abbreviations, and symbols, see page 167. 267
Courses

Mth 8777. Thesis Credits: Master’s. (1-16 cr [max 50 cr]. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

Mth 8790. Topics in Complex Analysis. (1-3 cr [max 12 cr]; A-F only. Prereq–8702 or #; offered for one yr or one sem as circumstances warrant) Current research.

Mth 8801. Functional Analysis. (3 cr; A-F only. Prereq–8602 or #) Motivation in terms of specific problems (e.g., Fourier series, eigenfunctions). Theory of compact operators. Basic theory of Banach spaces (Hahn-Banach, open mapping, closed graph theorems). Frechet spaces.

Mth 8802. Functional Analysis. (3 cr; A-F only. Prereq–8801 or #) Spectral theory of operators, theory of distributions (generalized functions), Fourier transformations and applications, Sobolev spaces and pseudo-differential operators, C-star algebras (Gelfand-Naimark theory) and introduction to von Neumann algebras.

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

Mth 8990. Topics in Mathematics. (1-6 cr [max 24 cr]; S-N only. Prereq–#) Individually directed study.

Mth 8991. Independent Study. (1-6 cr [max 24 cr]; S-N only. Prereq–#) Individually directed reading.

Mth 8992. Directed Reading. (1-6 cr [max 24 cr]; S-N only. Prereq–#) Individually directed reading.

Mth 8993. Directed Study. (1-6 cr [max 24 cr]; S-N only. Prereq–#) Individually directed study.

Mathematics Education (MthE)

Department of Curriculum and Instruction

College of Education and Human Development

MthE 5011. Arithmetic Structures in School Mathematics. (3 cr. Prereq–Enrollment in math initial licensure program or tchg exp) Pedagogy, content, and instructional strategies for teaching arithmetic. Content and issues relevant to the K-8 mathematics curriculum. Instructional materials and technology appropriate for elementary or middle school arithmetic. Credit hours and targeted level vary with particular classes.

MthE 5021. Algebraic Structures in School Mathematics. (3 cr. Prereq–Tchg exp or intrm consent) Pedagogy, content, and instructional strategies for teaching arithmetic. Content and issues relevant to the algebra curriculum. Instructional materials and technology appropriate for arithmetic. Each offering of the course will focus on either elementary/middle or middle/secondary grade levels.

MthE 5031. Geometric Structures in School Mathematics. (3 cr. Prereq–Enrollment in math initial licensure program) Pedagogy, content, and instructional strategies for teaching school geometry. Content and issues relevant to the geometry curriculum. Instructional materials and technology appropriate for geometry. Each offering will focus on either elementary/middle or middle/secondary grade levels.

MthE 5100. Topics in Mathematics Education. (1-6 cr [max 12 cr]. Prereq–Ed or grad student) Issues, materials, and instructional techniques focusing on a current single topic of particular relevance to secondary school and college mathematics teachers.

MthE 5101. Teaching Elementary School Mathematics. (3 cr. Prereq–Tchg license or student elem ed MEd or special ed or #) Modern trends, methods, and materials used to convey mathematical ideas.

MthE 5155. Rational Number Concepts and Proportionality. (3 cr. Prereq–Grad student or #) The relationship between the development of rational number concepts and proportional reasoning skills. Examination of how newer school curricula treat these concepts. Applications of materials in the classroom and analysis of results. Reading and responding to current research.


MthE 5170. Historical Topics in the Mathematics Classroom. (1-3 cr [max 3 cr]) Historical underpinnings of school mathematics content and methodology. Cross-cultural contributions in the development of mathematical ideas. Development of lessons, activities, and materials for school use.

MthE 5171. Teaching Problem Solving. (3 cr) Investigation of fundamental concepts and principles of problem solving, reasoning, and proof. Emphasis on activities and applications appropriate for junior and senior high classes. Pedagogical experiences to prepare teachers to teach problem solving, reasoning, and proof in classroom.

MthE 5172. Teaching Probability and Statistics. (3 cr) Investigation of fundamental concepts and principles of probability and statistics. Emphasis on activities and applications appropriate for junior and senior high school classes. Pedagogical experiences to prepare teachers to integrate quantitative literacy accurately and effectively in classrooms.


MthE 5313. Teaching and Learning Mathematics in the Middle School. (3 cr. Prereq–Tchg exp or #) Mathematics learning, instruction methods, mathematical topics, and assessment procedures appropriate for the middle grades. Examination of newer curricular materials and improvement of successful instructional techniques. Discussion of the relationship between the nature of the learner and effective instruction.


MthE 5355. Mathematics for Diverse Learners. (3 cr. Prereq–Teaching license or student in elem ed or special ed or #) Mathematical concepts and methods for exceptional students, both low achieving and gifted. Experimental materials and methods designed for underachieving students.

MthE 5366. Technology-Assisted Mathematics Instruction. (3 cr) Technology—including computers, programmable and graphing calculators, and video—as instructional tools in mathematics; design and evaluation of technology-based mathematics lessons; the effect of technology on the mathematics curriculum; managing the technology-enriched classroom.

MthE 5969. Student Teaching in Mathematics. (1-3 cr [max 8 cr]. Prereq–MEd/intial licensure student or #) Student teaching in secondary school mathematics classes.

MthE 5993. Directed Studies in Mathematics Education. (2 cr [max 3 cr]; S-N only. Prereq–Math ed MEd student, #) Secondary school classroom teaching project to improve specific teaching skills, planned by student, approved/directed by student’s adviser.

MthE 8501. Theory and Classical Research in Mathematics Education. (3 cr. Prereq–Grad math educ major) Critical review of research and relevant theoretical formulations; criteria for appraising research methods; educational implications.


MthE 8591. Secondary Mathematics Education. (1-3 cr [max 3 cr]. Prereq–Math educ PhD student) Problems of mathematics instruction from kindergarten through junior college; opportunity to develop proposals and design models for empirical research.

MthE 8999. Problems: Mathematics Education. (1-6 cr [max 12 cr]. Prereq–MA or PhD educ major with math educ concentration) Students survey most recent literature and design and prepare research reports on special topics.

Mechanical Engineering (ME)

Department of Mechanical Engineering

Institute of Technology

ME 5090. Topics in Mechanical Engineering. (4 cr. Prereq–IT upper div or grad student, submission of permission form, #) Topics vary each semester.

ME 5090. Advanced Engineering Problems. (1-4 cr [max 4 cr]. Prereq–ME upper div, #) Special investigations in various fields of mechanical engineering and related areas including an independent study project.

ME 5101. Vapor Cycle Systems. (4 cr. A-F only. Prereq–IT upper div or grad student) Vapor compression and absorption refrigeration systems; heat pumps; vapor power cycle analysis, regeneration, reheat, compound cycle modifications, combines gas turbine—vapor cycle systems.

ME 5103. Thermal Environmental Engineering. (4 cr. A-F only. Prereq–IT upper div or grad, 3322 or 3323) Thermodynamic properties of moist air; psychrometric charts; HVAC systems; solar energy; human thermal comfort; indoor air quality; heating and cooling loads in buildings.

ME 5105. HVAC System Design. (4 cr. A-F only. Prereq–5103, IT upper div or grad student) Design procedures used for heat exchangers, cooling towers, hydronic systems, and air handling systems. HVAC system design for a commercial building.

ME 5113. Aerosol/Particle Engineering. (4 cr. A-F only. Prereq–IT upper div or grad student) Kinetic theory, definition, theory and measurement of particle properties, elementary particle mechanics, particle statistics; Brownian motion and diffusion, coagulation, evaporation and condensation, sampling and transport.
ME 5115. Air Quality and Air Pollution Control. (4 cr; A-F only. Prereq–IT upper div or grad student)

ME 5116. Cleanroom Technology and Particle Monitoring. (4 cr; A-F only. Prereq–IT upper div or grad student)
Fundamentals of cleanroom technology for microelectronics manufacturing; airborne and liquidborne particulate contaminants; particle monitors; optical particle sensors; laser and light-scattering surface scanner, microscopy; filter performance and testing; cleanroom design and operation; high purity systems; particle detection in processing equipment.

ME 5332. Stress Analysis, Sensing, and Transducers. (4 cr; A-F only. Prereq–IT upper div or grad student)

ME 5247. Stress Analysis, Sensing, and Transducers. (4 cr; A-F only. Prereq–IT upper div or grad student)


ME 5223. Materials in Design. (4 cr, Prereq–IT upper div, 3211)
Fundamental properties of engineering materials. Fabrication techniques and heat treatment. Physical and corrosion properties. Failure mechanism, cost and value analysis as related to material selection and specification.

ME 5228. Introduction to Finite Element Modeling, Analysis, and Design. (4 cr; A-F only. Prereq–IT upper div or grad, 3221, AEM 3031, CSci 1113, MatS 2001)
Finite elements as principal analysis tool in computer-aided design (CAD); theoretical issues and implementation aspects for models and analyzing engineering problems encompassing stress analysis, thermal analysis, and fluid problems for linear situations. One-, two-, and three-dimensional practical engineering applications.

ME 5324. Thermodynamics of Fluid Flow with Applications. (4 cr; A-F only. Prereq–IT upper div or grad student, 3232)

ME 5348. Heat Transfer in Electronic Equipment. (4 cr, Prereq–IT upper div or grad student, 3322)
Technology trends and packaging needs of microelectronic components; thermal characteristics, heat transfer mechanisms, and thermal failure modes of modern electronic and microelectronic equipment; reliability prediction techniques; thermal stress and strain in layered structures and solder joints.

ME 5351. Computational Heat Transfer. (4 cr; A-F only. Prereq–IT upper div or grad student, 3322)
Numerical solution of heat conduction and analogous physical processes. Develop and use a computer program to solve complex problems involving steady and unsteady heat conduction, flow and heat transfer in ducts, flow in porous media, and other special applications.

ME 5361. Biological Transport Processes. (4 cr; A-F only. Prereq–IT upper div or grad student, transport class, 3322 or ChEn 5103)

ME 5446. Introduction to Combustion. (4 cr; A-F only. Prereq–IT upper div or grad student, 3321, 3322)
Thermodynamics, kinetics, energy and mass transport, and pollutants in reacting systems. Reactors, laminar and turbulent flames. Ignition, quenching, and flame stability. Diffusion flames. Combustion in reduced gravity environments; combustion stability; autoignition with emphasis on internal combustion engine performance and emissions.

ME 5461. Internal Combustion Engines. (4 cr; A-F only. Prereq–IT upper div or grad student, C or better in 3322 or 3324)
Basic spark ignition and diesel engine principles, air, fuel-air and actual engine cycles, cycle modeling, combustion and emissions, knock phenomena, air flow and volumetric efficiency, mixture requirements, ignition requirements and performance. Lectures and complementary labs.

ME 8113. Advanced Aerosol/Particle Engineering. (3 cr; max 4 cr; A-F only. Prereq–IT grad student or #) Introduction to kinetic theory, definition, theory, and measurement of particle properties; elementary particle mechanics, particle statistics; Brownian motion and diffusion, coagulation, evaporation and condensation, sampling, and transport.

ME 8221. New Product Design and Business Development I. (4 cr; A-F only. BMEn 8401, Enr 6041, Enr 6018, DMS 6061)
Prereq–IT grad student, some design experience) Students and faculty work with company representatives to develop a product concept, a working physical prototype, and an extensive business plan. Concept design, detail design, manufacturing, marketing, introduction strategy, and profit forecasting. Sponsoring company intends to bring product to market. ME 8222 must be taken in sequence the same year.

ME 8222. New Product Design and Business Development II. (4 cr; A-F only. BMEn 8402. Prereq–8221)
Students and faculty work with company representatives to develop a product concept, a working physical prototype, and an extensive business plan. Concept design, detail design, manufacturing, marketing, introduction strategy, and profit forecasting. Sponsoring company intends to bring product to market. Must be taken in sequence with 8221 the same year.

ME 8228. Finite Elements in Multidisciplinary Flow/Thermal/Strength and Manufacturing Applications. (4 cr; A-F only. Prereq–3222, 5341, AEM 3031, CSci 1113)
ME 8229. Finite Element Methods for Computational Mechanics: Transient/Dynamic Problems. (4 cr; A-F only. Prereq–5252 or equiv, 5341, AEM 3031, CSci 1113) Computational mechanics involving transient or dynamic situations; development and analysis of computational algorithms, stability and accuracy of algorithms, convergence issues; linear/nonlinear situations. Implicit, explicit, mixed, and variable time discretization approaches; modal-based methods for engineering problems.

ME 8243. Topics in Design. (4 cr [max 12 cr]; A-F only. Prereq–5243) Topics vary with each offering.


ME 8287. Topics in Dynamics and Control. (4 cr [max 12 cr]; A-F only. Prereq–5281) Topics vary with each offering.

ME 8333. FTE: Master's. (1 cr. Prereq–Master's student, adviser and DGS consent)


ME 8381. Bioheat and Mass Transfer. (3 cr. Prereq–IT grad student, upper-division transportation/transport course. [physics, biology] recommended) Analytical/numerical tools to analyze heat/mass transfer phenomenon in cryobiological, hyperthermic, other biomedically relevant applications.

ME 8390. Advanced Topics in the Thermal Sciences. (1 cr [max 6 cr]; A-F only) Topics vary according to instructor.

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

ME 8462. Turbomachinery. (3 cr; A-F only. Prereq–IT grad student, 3321, 3322 or equiv or #) Thermodynamic analysis of energy transfer between fluid and rotor; dimensional analysis; principles of axial, mixed, and radial flow pumps, fans, compressors, and turbines; cascade performance; computer flow simulations; applications to propulsion systems and power plants.


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

ME 8772. Advanced Transportation Technologies Seminar. (1 cr; S-N only. §Chem 8700, Phar 6247H. Prereq–5600 or #) Recent developments.

ME 8773. Graduate Seminar. (1 cr. S-N only. Prereq–IT grad student) Recent developments.


ME 8775. Technical Communication. (1 cr; S-N only) One-day workshop on presenting a seminar. Students deliver one-hour seminar on technical topic and attend nine other technical seminars.

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

ME 8794. Mechanical Engineering Research. (1-6 cr. Prereq–#) Directed research.

ME 8800. Modern Developments in Mechanical Engineering. (1 cr [max 2 cr]; S-N only. Prereq–IT grad student) Seminars on topics in engineering science of importance to engineers. Invited scholars deliver five-lecture series on each topic; two to five topics each semester.

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

ME 8951. Plan B. (1 cr; S-N only) Structured environment in which students can complete a M.S. Plan B project.

ME 8953. Plan B. (2 cr; A-F only. Prereq–8951) Structured environment in which students can complete a M.S. Plan B project.

Medicinal Chemistry (MedC)

Department of Medicinal Chemistry

College of Pharmacy

MedC 5185. Principles of Biomolecular Simulation. (3 cr. Prereq–Chem 3502 or #) Molecular simulation for students in medicinal chemistry, pharmaceutics, biochemistry, and chemical physics.

MedC 5202. Research and Development Process of Pharmaceutical Products. (2 cr; S-N only) New drug development process in the U.S. pharmaceutical industry.

MedC 5245. Introduction to Drug Design. (3 cr; A-F only. §Chem 5245, Phar 6245. Prereq–Chem) Concepts that govern design/discovery of drugs. Physical, bioorganic, medicinal chemical principles applied to explain rational design, mechanism of action, drugs.

MedC 5494. Advanced Methods in Quantitative Drug Analysis. (1 cr; A-F only. Prereq–#) Quantitative methods (HPLC, GC, TLC, and immunoassays) for analysis of drugs and metabolites in biological fluids. Advanced techniques such as capillary electrophoresis, supercritical fluid chromatography, GC-MS, LC-MS, and tandem mass spectrometry. Chromatographic theory and statistical approaches to method validation.

MedC 5495. Vistas in Medicinal Chemistry Research. (1 cr; S-N only) Selected topics of contemporary interest in medicinal chemistry.

MedC 5700. General Principles of Medicinal Chemistry. (2 cr; A-F only. Prereq–MedC grad student or #) Fundamental principles of molecular recognition, physicochemical properties of drugs, drug metabolism and disposition, interaction of molecules with DNA/RNA.

MedC 5710. General Principles of Medicinal Chemistry. (2 cr; A-F only. Prereq–MedC grad student or #) Fundamental principles of enzyme inhibitors, combinatorial chemistry and library design, drug receptor interactions and signal transduction mechanisms, and molecular modeling.

MedC 8100. Medicinal Chemistry Seminar. (1 cr [max 6 cr]. Prereq–Grad major or #) Current topics.

MedC 8333. FTE: Master's. (1 cr. Prereq–Master’s student, adviser and DGS consent)

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

MedC 8500. Design of Chemotherapeutic Agents. (2 cr; A-F only. Prereq–5600 or #) Modern aspects of designing chemotherapeutic agents. Strategies for enzyme inhibition and metabolic blocks in development of anticancer, antimicrobial, and antiviral agents.

MedC 8600. Chemical Aspects of Drug Metabolism and Bioactivation. (2 cr; A-F only. Prereq–5600 or #) Chemical and enzymatic mechanisms of biotransformation and bioactivation of drugs and other xenobiotics. Reactivity and fate of bioactivated metabolites.

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

MedC 8700. Advanced Concepts in Drug Design. (2 cr; A-F only. §Chem 8700, Phar 6247H. Prereq–5600 or #) Current approaches to rational design of drugs.
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MedC 8760. Design of Peptidomimetics. (2 cr; A-F only. Prereq—5600 or #) Current approaches to design and synthesis of mimetics of biologically active peptides. Structural and conformational rationale used in peptidomimetic design.

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

MedC 8800. Medicinal Chemistry Laboratory Techniques. (1-2 cr [max 4 cr]; S-N only. Prereq—Grad med chem major or #) Experiential rotations in medicinal chemistry research laboratories.

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

MedC 8900. Research in Medicinal Chemistry. (1-4 cr [max 8 cr]; A-F only. Prereq—Grad med chem major or #) Study and experimental investigation.

Medieval Studies (MeSt)

Center for Medieval Studies

College of Liberal Arts

MeSt 5610. Advanced Topics in Medieval Studies. (3-4 cr [max 15 cr]. Prereq—One yr work in some area of Middle Ages, reading knowledge of appropriate language, #) From late antiquity through end of Middle Ages (circa 300-1500 A.D.). Current topics specified in Class Schedule.

MeSt 5993. Directed Studies in Medieval Studies. (1-3 cr [max 8 cr]. Prereq—One yr work in some area of Middle Ages, reading knowledge of appropriate language, #) Directed study with one of the core faculty of medieval studies program.

MeSt 8010. Medieval Studies Colloquium. (1 cr [max 3 cr]. S-N only. Prereq—#) Lectures by and discussions with faculty and visiting speakers.

MeSt 8110. Seminar in Medieval Studies. (3-4 cr [max 48 cr]; A-F only. Prereq—Appropriate languages, #) Offered when feasible.

Microbial Engineering (MicE)

BioTechnology Institute

College of Biological Sciences

MicE 5309. Biocatalysis and Biodegradation. (3 cr. §BioC 5309. Prereq—chemistry through organic chemistry; knowledge of word processing, e-mail, access to World Wide Web, access to college-level science library recommended) Assessing validity of information on biocatalysis and biodegradation; fundamentals of microbial catabolic metabolism as it pertains to biodegradation of environmental pollutants; biocatalysis for specialty chemical synthesis; display of this information on the World Wide Web.

MicE 5355. Advanced Fermentation and Biocatalysis Laboratory. (3 cr; A-F only. Prereq—[ Biol 3311 or MicE 3301], [grad student in microbial engineering or upper-div major in [microbiology or chem engineering or biochemistry], #) Methods in industrial microbiology, laboratory, and pilot scale fermentation/biocatalysis engineering. Laboratory experiments carried out in fermentation pilot plant. Operation of bench scale and pilot scale bioreactors, designing bioreactors, process optimization, process monitoring/control, scale-up experiments, experimental design, data analysis.

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

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

MicE 8920. Teaching Practicum. (1 cr [max 4 cr]. Prereq—Grad MicE major) Supervised experience in classroom, laboratory, and/or recitation instruction; develops skills in effective use of instructional techniques, materials, tests, and measurements.

MicE 8990. Biotechnology Seminar. (1 cr [max 2 cr]. Prereq—First-yr students enroll S-N, as they do not make a presentation; second-yr students enroll A-F, as they present a seminar) Student presentations of thesis research and presentations by invited speakers.

Microbiology (MicB)

Department of Microbiology

Medical School

MicB 5205. Microbiology and Immunology for Medical Students. (0-7 cr [max 7 cr]) Basic/clinical human immunology, medical microbiology. Molecular/cellular basis of immune responses, tolerance. Immunologic disease, serology, antimicrobial agents, chemotherapy. Basic/molecular bacteriology, parasitology, mycology, virology. Unifying principles governing pathogenesis. Diseases are grouped with organisms important in differential diagnosis.

Microbiology, Immunology, and Cancer Biology (MICa)

Department of Microbiology

Medical School

MICa 5000. Practicum: Teaching. (1 cr [max 4 cr]; A-F only. Prereq—[MIMP or MicCa] grad major or #) Supervised experience in lab instruction. Use of instructional materials, tests/measurement.

MICa 6001. Integrated Topics in Microbiology, Immunology, and Cancer Biology. (3 cr; A-F only. Prereq—MicCa grad student or #) Molecular, structural, and biochemical complexity of microbes. Molecular mechanisms of disease. Cell death/injury. Adaptive immune responses, immunological tolerance.

MICa 8002. Structure, Function, and Genetics of Bacteria and Viruses. (4 cr; A-F only. Prereq—8001 or #) Structure, function, and metabolism of microorganisms; microbial genetics; molecular virology.

MICa 8003. Immunity and Immunopathology. (4 cr. Prereq—8001 or #) Lymphocyte activation, signal transduction in lymphocytes, antigen receptor genes, antigen presentation, lymphoid anatomy, adaptive immune responses to microbes, immunodeficiency, immunopathology, cytokines, transplantation, and autoimmunity.


MICa 8005. Topics in Microbiology, Immunology, and Cancer Biology. (1-4 cr [max 4 cr]. Prereq—8001, two of [8002 or 8003 or 8004]) Colloquium format. Readings/discussion on specialized topic.

MICa 8006. Protein Sequence Analysis. (3 cr. Prereq—Biochem course, knowledge of UNIX operating system recommended) DNA and protein sequence and protein structure databases; protein sequence analysis; methods for display of sequence comparison and prediction results; Genetics Computer Group (GCG) sequence analysis programs; and current literature and research problems.

MICa 8007. Cell Biology and Biochemistry of the Extracellular Matrix. (3 cr; A-F only. §BioC 8007. Prereq—8002 or 8004 or #) Concepts in cell adhesion and tissue composition and importance of cell adhesion in tissue function and disease. Topics range from structure/function/assembly of tissue components to cellular adhesion mechanisms.


MICa 8010. Microbial Pathogenesis. (3 cr; A-F only. Prereq—MicCa grad student or instr) Molecular mechanisms of bacterial/viral pathogenesis. Strategies of disease causation/interaction with host, regulation of virulence factors, mechanism of virulence factor transmission to other microbes.

MICa 8011. Current Topics in Immunology. (3 cr; A-F only. Prereq—MicCa 8003 or #) Colloquium format. In-depth reading, discussion

MICa 8094. Research in Microbiology, Immunology, and Cancer Biology. (1 cr [max 5 cr]; S-N only. Prereq—1st yr MicCa grad student) One-on-one research training from faculty adviser during laboratory rotation.

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

MICa 8371. Mucosal Immunobiology. (3 cr; A-F only. §CMB 8371, Obio 8371. Prereq—8001 or #) Host immune processes at body surfaces. Immune/adaptive immunity at mucosal surfaces, interactions/responses of various mucosal tissues to pathogens, current approaches being used to target protective vaccination to mucosal tissues. Lectures, journal club format.

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

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

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

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

MICa 8910. Seminar: Faculty Research Topics. (1-10 cr [max 10 cr]. S-N only. Prereq—[MIMP or MicCa] grad student or State-of-the-art information presented by scientific experts within/outside the University.

MICa 8920. Seminar: Student Research Topics. (1 cr [max 10 cr]; S-N only. Prereq—[MIMP or MicCa] grad student or #) Current thesis topics and other aspects of microbiology, immunology, and cancer biology.

For definitions of course numbers, abbreviations, and symbols, see page 167.
Courses

Eastern Languages and Cultures (MELC)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

MELC 5311. Medieval Sages. (3 cr. §§CAS 5311, Prereq—Background in Iranian, Central Asian, or Islamic studies recommended) Study and discussion of the intellectual life of the region from the rise of the Ghaznavids (A.D. 1000) to the fall of the Timurids (A.D. 1500). Ibn Sina (Avicenna), al-Biruni, al-Ghazali, Rumi, Sa‘di, and Firdowsi are among the sages whose lives are examined.

MELC 5526, Islam and Communist. (3 cr. §§CAS 3526, CAS 5526, MEL 3526) Development of medieval Islamic culture in Transoxiana; formation of Sufi orders; rise and development of Communist ideology; introduction of socialist principles into Central Asia; clash of Islamic principles with Communist dicta; Pan-Islamism; Pan-Turkism.

MELC 5532, Russia and Central Asia. (3 cr. §§CAS 3532, CAS 5532, MEL 3532) Rise and fall of the Mongol Empire, formation of the Chaghatai Khanate and the Golden Horde. Russian expansion into Central Asia and rivalry with Britain. Russia and the Central Asian republics during and after the Soviet period.

MELC 5561, Persian Fiction in Translation. (3 cr. §§CAS 3601, CAS 5601, MEL 3601) Impact of westernization on Iran, from 1920s to present. Materials produced by Iranian writers, film makers, and intellectuals. Internal/external forces that bind contemporary Iranian society to world civilization. Works of Hedayat (especially Blind Owl), Chubak, Al-i Ahmad, Dastaneshv, and Behrang are analyzed/interpreted.

MELC 5602, Persian Poetry in Translation. (3 cr. §§CAS 3602, CAS 5602, MEL 3602) Major poetic works of Iran dealing with life at the medieval courts, Sufi poetry, and “new” poetry are studied. Rudaki, Sa‘di, Rumi, Hafiz, Yusef, and Farnzhad are among the poets whose works are examined.

MELC 5993, Directed Studies. (1-10 cr [max 10 cr]. Prereq—Grad)•)

MELC 5994, Directed Research. (1-10 cr [max 10 cr]. Prereq—Grad)

Molecular Cellular Developmental Biology and Genetics (MCDG)

College of Biological Sciences

MCDG 8333. FTE: Master’s. (1 cr. Prereq—Master’s student, advisor and GDS consent)

MCDG 8444. FTE: Doctoral. (1 cr. Prereq—Doctoral student, advisor and GDS consent)

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

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

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

MCDG 8900. Student Research Seminar. (1 cr [max 10 cr]; S-N only. Prereq—Grad MCDG major) Presentation and discussion of student thesis research.

MCDG 8910. Journal Presentations. (1 cr [max 2 cr]; S-N only. Prereq—Grad MCDG major) Discussion of original scientific literature; for first-year graduate students.

MCDG 8920. Special Topics. (1-4 cr [max 8 cr]. Prereq—Grad MCDG major or Δ)

MCDG 8950. Teaching Practicum. (1 cr [max 2 cr]; S-N only. Prereq—Grad MCDG major or Δ) Supervised experience in classroom, laboratory, and/or recitation instruction; development of skills in effective use of instructional techniques, materials, tests, and measurements.

MCDG 8993. Directed Studies. (1-15 cr [max 15 cr]. Prereq—MCDG grad student or Δ)

MCDG 8994. Research. (1-5 cr [max 10 cr]; S-N only. Prereq—MCDG grad student or Δ) Independent research determined by student’s interests, in consultation with faculty mentor.

Museum Studies (MST)

Bell Museum of Natural History

MST 5011. Museum History and Philosophy. (3 cr; A-F only. Prereq—Grad) Historical and philosophical roots of museum development in Europe and North America from the Renaissance to modern days and history centers. Emerging philosophical issues faced by museums today.

MST 5012. Museum Practices. (3 cr; A-F only. Prereq—5011 or Δ) Practical aspects of museum work. Standards, practices, responsibilities, and issues, all set in greater museum context. Curatorial and educational duties, collections management, security, funding, boards, public relations, installation, and budgeting.

MST 5020. Internship. (1-4 cr [max 32 cr]; S-N only. Prereq—5011, 5012) Students arrange to perform a professional-level task in a museum of good standing under close supervision of a member of the museum’s professional staff. Instructor must approve a work plan and report.

MST 5893. Directed Study in Museum Studies. (1-16 cr [max 16 cr]; A-F only. Prereq—5012 or 5011, 5012) Students selected by or in consultation with a faculty member, on a topic not covered (or not covered in depth) by another course. Program of study is determined jointly by student and advising faculty member.

Music (Mus)

School of Music

College of Liberal Arts

Mus 5101. Piano Pedagogy I. (2 cr. Prereq—8 cr in MusA 1301 or MusA 1401 or #) Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the elementary, early intermediate, and late intermediate levels.

Mus 5102. Piano Pedagogy II. (2 cr. Prereq—8 cr in MusA 1301 or MusA 1401 or #) Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the elementary, early intermediate, and late intermediate levels.

Mus 5111. Advanced Piano Pedagogy I. (2 cr; A-F only. Prereq—5102 or grad piano major or #) Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the intermediate and early advanced levels.

Mus 5120. Piano Pedagogy Practicum. (1 cr [max 4 cr]; A-F only. Prereq—5101-5112 or 5111-5112 or #) Supervised teaching of a piano pupil or group of pupils for one semester (minimum 12 weeks for one half-hour per week). Supervising instructor will assist with selection of materials, periodic consultation, and observation (live or video taped) of selected lessons.

Mus 5150. Body Awareness in Activity: The Alexander Technique for Musicians. (2 cr [max 4 cr]) Alexander technique with specific applications to music performance. Emphasis on body/mind awareness to promote technical ease and freedom.

Mus 5151. Organ Literature I. (3 cr; A-F only. Prereq—3502, 3603, or grad or #) Organ literature from the 14th century to the mid-18th century. Influence of organ design of various periods and national schools on the literature and its performance.

Mus 5152. Organ Literature II. (3 cr; A-F only. Prereq—3502, 3603, or grad or #) Organ literature of J. S. Bach and of other 19th- and 20th-century composers. Influence of organ design of various periods and national schools on the literature and its performance.

Mus 5160. Instrumental Accompanying Skills and Repertoire. (2 cr [max 4 cr]; A-F only. Prereq—Accomp major) Performance class in accompanying skills particular to orchestral reductions and non-sonata instrumental accompanying. Repertoire to include, but not be limited to, classical and romantic string concerti, and “encore” pieces.

Mus 5170. Vocal Accompanying Skills and Repertoire. (2 cr [max 4 cr]; A-F only. Prereq—French, German and Italian diction, accomp or grad vocal major) Performance class (Lieder, melodie, opera) with emphasis on coaching techniques and performance skills of pianists and singers.

Mus 5181. Advanced Piano Literature I. (2 cr; A-F only. Prereq—Grad piano major or #) Literature for piano from late Baroque period to mid-20th century.

Mus 5182. Advanced Piano Literature II. (2 cr; A-F only. Prereq—Grad piano major or #) Literature for piano from late Baroque period to mid-20th century.

Mus 5230. Chorus. (1 cr [max 8 cr]. Prereq—Choral and/or instrumental music background, audition, #) University Women’s Chorus, Men’s Chorus, Concert Choir and Choral Union. Chors participate in a variety of programs exploring both Western and non-Western repertoire from the Middle Ages through the 20th century. Concerts include touring, and collaborative and community performances.

Mus 5240. Chamber Singers. (1 cr [max 8 cr]. Prereq—Audition, #) Mixed chorus of about 24 voices. Performances each semester of works for small choirs.

Mus 5241. Vocal Literature I. (3 cr; A-F only. Prereq—[12 cr in MusA 1304, grad music student] or Δ) Vocal literature of major/minor composers from 17th century to present. Structure, style, performance practice.

Mus 5242. Vocal Literature II. (3 cr; A-F only. Prereq—[12 cr in MusA 1304, grad music major] or Δ) Vocal literature of major and minor composers from 17th century to present; structure, style, and performance practice.

Mus 5250. Opera Workshop and Ensemble. (1 cr [max 8 cr]; A-F only. Prereq—Audition, #) Preparation and performance of operatic arias, choruses, and scenes. Participation in fully staged or workshop productions of music theatre repertoire.

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Mus 5270. Voice Practicum. (1 cr; max 2 cr). Prereq—Undergrad or vocal major or #. Teaching voice class or individual students with peer and faculty feedback. Assist in class voice instruction or teach two students weekly in conjunction with two one-hour observation labs. May be taken for two semesters.

Mus 5271. Diction for Singers I. (2 cr; A-F only. Prereq—12 cr MusA 1304 or grad music major or #). Principles and techniques of diction in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used.

Mus 5272. Diction for Singers II. (2 cr; A-F Only. Prereq—12 cr MusA 1304 or grad music major or #). Principles and techniques of diction in English, Italian, Spanish, German, and French. International Phonetic Association alphabet used.

Mus 5275. Vocal Pedagogy. (3 cr. Prereq—Sr vocal major or #). Advanced study of mind/body preparations for singing, anatomy, and physiology of the vocal mechanism. Voice use and care, historical and comparative pedagogy, learning theories, models and guidelines for teaching, instructional techniques, and diagnosing and solving vocal problems.

Mus 5277. Vocal Workshop. (1-2 cr [max 8 cr]; A-F only. Prereq—Music major or #). Short-term vocal workshops address specific topics including voice science, pedagogy, and performance of vocal repertoire. One workshop focuses on class voice instruction.

Mus 5279. Group Voice: Performance/Pedagogy. (2-3 cr; A-F only. Prereq—Performance only track: 2 cr per sem; performance/pedagogy track: 3 cr per sem; upper div student or grad student). Foundations/fundamentals of speech/singing. Vocal production, anatomy, physiology, terminology. Application of vocal techniques in learning/performance repertoire. Teaching methods, including voice/motion exercises.


Mus 5340. Jazz Ensemble. (1 cr [max 6 cr]; A-F only. Prereq—Audition, #). A 20-member performing organization covering significant jazz repertory and arrangements written specifically for this medium.

Mus 5341. Jazz Pedagogy. (2 cr; A-F only. Prereq—#). Teaching methods of vocal and instrumental jazz improvisation, basic arranging techniques, and jazz history; bibliographies and materials.


Mus 5410. University Wind Bands. (1 cr [max 14 cr]; A-F only. Prereq—Audition, #). Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate.

Mus 5420. Orchestra. (1 cr [max 8 cr]; A-F only. Prereq—Audition, #). Symphony orchestra performs standard repertory and major works with chorus; concerts and tour appearances. Players from all colleges may participate.

Mus 5421. Suzuki Violin Pedagogy I. (1 cr; A-F only. Prereq—Violin major or #). Philosophy and teaching techniques of Japanese pedagogue Shinichi Suzuki and their applications in Western culture. Discussion, playing experience, and observation of children’s lessons in the MacPhail Center Suzuki Program.

Mus 5422. Suzuki Violin Pedagogy II. (2 cr; A-F only. Prereq—5421 or equivalent). Philosophy and teaching techniques of Japanese pedagogue Shinichi Suzuki and their applications in Western culture. Discussion, playing experience, and observation of children’s lessons in the MacPhail Center Suzuki Program.

Mus 5423. Suzuki Pedagogy Practicum. (1 cr; A-F only. Prereq—[(¶5424 or ¶5425), grad music student] or [or, grad consent]). Supervised teaching of both individual and group lessons. Instructor provides periodic critiques from observation of live or videotaped lessons.

Mus 5424. Advanced Suzuki Violin Pedagogy I. (2 cr; A-F only. Prereq—5422 or #). Intensive examination of Suzuki techniques for intermediate and advanced violin students in Western society. Discussion, playing experience, observation of children’s lessons in the MacPhail Center Suzuki Program, and practical teaching experience.

Mus 5425. Advanced Suzuki Violin Pedagogy II. (2 cr; A-F only. Prereq—5424 or #). Intensive examination of Suzuki techniques for intermediate and advanced violin students in Western society. Discussion, playing experience, observation of children’s lessons in the MacPhail Center Suzuki Program, and practical teaching experience.

Mus 5426. Violin Pedagogy. (2 cr; A-F Only. Prereq—Violin or viola major or #). Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

Mus 5428. Violin Pedagogy II. (2 cr; A-F Only. Prereq—Violin or viola major or #). Private teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

Mus 5430. New Music Ensemble. (1 cr [max 8 cr]; A-F only. Prereq—#). Study/performance of contemporary ensemble (including small chamber orchestra) literature. Historical/analytical analysis of works performed.

Mus 5440. Chamber Ensemble. (1 cr [max 8 cr]; A-F only. Prereq—Audition, #). Performance of chamber music; duos, trios, quartets, quintets, and other ensemble combinations for instruments and/or voices.

Mus 5450. Orchestral Repertoire. (1 cr [max 3 cr]; A-F only. Prereq—#). Investigation of practical and performance problems in standard orchestral repertoire with regard to style and interpretation.

Mus 5460. Ensemble for the Performance of Early Music, c800-1750. (1 cr [max 8 cr]). Performance of medieval, renaissance, and baroque music (sacred and secular) according to traditions established from c900 to 1750. Ensemble consists of a chamber chorus and consorts of period instruments. Repertoire includes Gregorian chant, masses, motets, chansons, madrigals, and choral/instrumental movements from cantatas, oratorios, passions, all in original languages.

Mus 5464. Cello Pedagogy. (2 cr; A-F only). Concentrated study of cello teaching methods. Provides students with the strategies for teaching cello privately, develops analytical skills, and increases knowledge of cello repertoire. For practical application in conjunction with string technique course.

Mus 5466. Guitar Pedagogy. (2 cr; A-F Only. Prereq—Guitar principal or major or #). Historical survey of methods and etudes from late 18th century to present, reflecting variety of content and approach. Works by Aguduo, Sor, Giuliani, Tarrega, Segovia, Carlevaro, Duncan, Iznaola, Dodigson, and Brandle.

Mus 5470. Woodwind Chamber Ensemble. (1 cr [max 8 cr]; A-F only. Prereq—Audition, #). Chamber music performance using homogeneous or mixed combinations of woodwind instruments.

Mus 5471. Woodwind Literature and Pedagogy I. (3 cr; A-F only. Prereq—Music major or #). A study of the major teaching materials for the five woodwind instruments including methods, duets, and solos used primarily for pedagogical reasons.

Mus 5472. Woodwind Literature and Pedagogy II. (3 cr; A-F only. Prereq—Music major or #). A study of chamber music involving one or more woodwind instruments. May include additional instruments such as piano, strings, and/or voice.

Mus 5473. History and Acoustics of Single Reed Instruments. (2 cr; A-F only. Prereq—Music major or #). Study of clarinet and saxophone history and literature, mechanical design and development, acoustics, modern schools of performance, selected teaching and performance techniques.

Mus 5480. University Brass Choir. (1 cr [max 8 cr]). Prereq—Audition, #. The University Brass Choir is an ensemble of 16 brass and percussion players exploring unique literature that spans 400 years. From the rich antiphonal music of Giovanni Gabrieli (1557-1612) to the works of the 20th century. The Brass Choir performs in Twin Cities churches and concert halls.

Mus 5481. Trumpet Pedagogy. (2 cr. Prereq—Sr or grad in music or #). Principles of trumpet pedagogy. Discussion of literature, history, and current teaching aids.

Mus 5485. Transcription for Winds. (2 cr. Prereq—3502 or #). Principles of music manuscript and examination of transcription examples. Transcription projects with score and parts. Smaller projects that involve arrangements and original compositions.

Mus 5490. Percussion Ensemble. (1 cr [max 10 cr]; A-F only). Prereq—#.

Mus 5491. Percussion Literature I. (2 cr; A-F only. Prereq—Jr or Sr or grad or #). Repertoire derived from orchestral and band literature for snare drum, timpani, mallet instruments, and various percussion accessories. Major works of the 20th century written for solo percussion, percussion ensemble, and chamber groups of percussion and non-percussion instruments.

Mus 5492. Percussion Literature II. (2 cr; A-F only. Prereq—Jr or Sr or grad or #). Repertoire derived from orchestral and band literature for snare drum, timpani, mallet instruments, and various percussion accessories. Major works of the 20th century written for solo percussion, percussion ensemble, and chamber groups of percussion and non-percussion instruments.

Mus 5550. Class Composition. (2 cr [max 8 cr]; A-F only. Prereq—3502 or #). Original works in various forms. Development of individual compositional style in a post-tonal idiom. Various forms, performing forces, techniques.

Mus 5561. Orchestration I. (3 cr; A-F only. Prereq—3502). Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries.

Mus 5562. Orchestration II. (3 cr; A-F only. Prereq—5561). Scoring techniques for ensembles in combination and full orchestra; year-long sequence. Score study of representative works from 18th through 20th centuries.

Mus 5571. Schenkerian Analysis for Performers. (3 cr; A-F only. Prereq—5502). Theory/analysis of tonal music using principles developed by Henrich Schenker. Basic concepts/notation, their application to excerpts/short pieces from 18th/19th centuries.
Courses

Mus 5572. Chromaticism in Tonal Music. (3 cr; Prereq--3502) Explores and develops tonal practices through analysis of selected repertoire, completion of written analyses (figured bass, harmonization of melodies, model composition), ear-training, and keyboard exercises.

Mus 5573. Analysis of Late-Romantic Orchestral Literature. (3 cr; A-F only. Prereq--3602 or Theory IV Exam or # 5504 or equiv recommended) Introduction to advanced tonal analysis. Corpus of dramatic orchestral music by Wagner, Strauss, Tchaikovsky, Rimsky-Korsakov, Moussorgsky, and Rachmaninoff as focus for projects and classroom discussions related to chromatic harmony, form, and orchestration.


Mus 5592. Digital Music Synthesis and Processing Techniques. (3 cr; A-F only. Prereq--5591 or #) Study of specific digital topics such as filtering, formant synthesis, reverberation techniques, and additive synthesis. Work with interactive MIDI applications.

Mus 5597. Music and Text. (3 cr; A-F only. Prereq--3502) Designed for music majors only, this course gives an introduction to the analysis of music with texts such as art song and opera.

Mus 5611. Resources for Music Research. (3 cr; A-F only. Prereq--3803) Development of skills in identifying, locating, and evaluating resources for research in music. Computer-searching techniques, acquaintance with basic reference sources in the field, preparation of the music research paper.

Mus 5620. Topics in Opera History. (3 cr; max 6 cr; A-F only. Prereq--Grad--Mus grad major or #) Study of specific operas. Development of opera in context of other artistic, social, cultural, and political events, movements, and changes. Periods/countries vary each semester.

Mus 5644. Music in 20th-Century American Culture. (3 cr; A-F only. Prereq--3603, 5501 or #) Stylistic and cultural bases of cultivated and vernacular traditions and their intersections. Topics include folk and ethnic musics, ragtime, city blues and jazz, rock, musical theater, impact of technology, modernism, nationalism, new accessibility.

Mus 5647. 20th-Century European/american Music. (3 cr; Prereq--3603 or equiv, 5501 or equiv, 12 undergrad cr in music history) Emphasizes major artistic movements, stylistic turning points, social roles of music, interactions between high art, popular, ethnic musics; contributions of men and women as composers and performers.

Mus 5658. History of the Symphony in the 20th Century. (3 cr; A-F only. Prereq--3603, 5501 or #) History of symphony (and related genres) in Europe and America, ca. 1890 to present. Changing aesthetic concerns, structural, harmonic, and timbral innovations. Sociocultural contexts; analysis and criticism.

Mus 5666. Stravinsky. (3 cr; A-F only. Prereq--5502, 12 cr music history) Analysis and criticism of representative works; aesthetic concerns as expressed in writings of Stravinsky and others; influence upon European and American composers; biographical issues and contributions to art music life, particularly the ballet.

Mus 5668. Beethoven’s Symphonies. (3 cr; A-F only. Prereq--3603, #) Analytical overview of selected movements from Beethoven’s 9 symphonies. Principles of sonata analysis (norm and deformation); introduction to wider conceptualization and understanding (generic, expressive, social).

Mus 5804. Folk and Traditional Musics: Selected Cultures of the World. (3 cr; A-F only. Prereq--1801 or 1804 or music grad grad or #) A study of selected music traditions from 5 to 7 world cultures. Genres, social institutions, concepts, styles, instruments, and usages.

Mus 5950. Topics in Music. (1-4 cr; max 15 cr) Each offering focuses on a single topic. Topics specified in Class Schedule.

Mus 5993. Directed Studies. (1-4 cr; max 12 cr. Prereq--#, A, D) Guided individual reading or study.

Mus 8110. Sonata Seminar. (2 cr; max 8 cr; A-F only. Prereq--Announcing emphasis, strings and winds by audition, #) Performance in standard Baroque, Classical, and Romantic sonatas for piano and violin, cello, viola, flute, clarinet, or oboe.

Mus 8112. Instrumental Repertoire: Reduction and Realization. (2 cr; A-F only. Prereq--Grad student in accompanying/conducting) Reducing orchestra scores, representing orchestral reductions at piano, working with conductors. Conductors join course in mid-semester.

Mus 8131. Advanced Keyboard Skills. (2 cr; A-F only. Prereq--Grad student in music or #) Diatonic/chromatic tonal harmony applied to keyboard. Emphasizes harmonization, transposition, and improvisation. Open score and clef reading using alto, tenor, and soprano clefs.

Mus 8133. Seminar in Basso Continuo. (3 cr; A-F only. Prereq--Grad--Student in music or #) Realization of figured basses (bass lines annotated with Arabic numerals indicating harmony) and performance of continuo parts in European concerted music from 17th/18th centuries at keyboard. Emphasizes developing stylistic accompaniment skills at harpsichord/organ.

Mus 8151. Seminar in Organ Repertoire. (3 cr; A-F only. Prereq--Grad--Student in music or #) Repertoire for pipe organ. Readings/presentations on selected areas of repertoire of 15th through 20th centuries. Organ design/construction of various periods/countries. Organ design/construction of various periods/countries. Organ design/construction of various periods/countries.

Mus 8170. Advanced Vocal Accompanying Skills and Repertoire. (2 cr; max 8 cr; A-F only. Prereq--Grad--French, German, Italian diction), accompanying or DMM voice emphasis or MM voice emphasis by audition) Advanced performance (Lieder, melody, opera) emphasizing coaching techniques and performance skills of pianists and singers.

Mus 8171. Song Repertoire and Performance for Pianists and Singers: German Literature (1 cr; A-F only. Prereq--Grad student with major in vocal performance or in accompanying or in piano) Surveys standard German-language songs repertoire: Mozart, Schubert, Schumann, Brahms, Strauss, Wolf.

Mus 8172. Song Repertoire and Performance for Pianists and Singers: French Melodies. (2 cr; A-F only. Prereq--Grad--Student with major in vocal performance or in accompanying or in piano) Surveys standard French melodies: Faure, Chausson, Duparc, Debussy, Ravel, Poulenc, Caplet, Roussel, Satie.

Mus 8173. Song Repertoire and Performance for Pianists and Singers: 20th Century. (2 cr; A-F only. Prereq--Grad--Student with major in vocal performance or in accompanying or in piano) Surveys standard 20th-century songs; non-traditional notation, “avant garde” compositions.

Mus 8174. Song Repertoire and Performance for Pianists and Singers: Italian and English Song. (2 cr; A-F only. Prereq--Grad student with major in vocal performance or in accompanying or in piano) Surveys standard English songs from Elizabethan Age to present, Italian songs, “bel canto” tradition.

Mus 8175. Song Repertoire and Performance for Pianists and Singers: Russian, Spanish, and Other Languages. (2 cr; A-F only. Prereq--Grad student with major in vocal performance or in accompanying or in piano) Surveys standard songs in Russian, Spanish, and other languages: Turina, Obregón, Granados, Nin, Rodrigo, Montsalvatge, Guridi, Tchaikovsky, Rachmaninoff, Prokofiev, Stravinsky, Shostakovich. International Phonetic Alphabet.

Mus 8181. Operatic Accompaniment Skills and Repertoire. (2 cr; A-F only. Prereq--Grad--Student with major in accompanying in or conducting) Development of skills required in operatic accompanying/coaching work. Standard opera arias, ensembles, study, interpretation, pedagogy and performance techniques, working with conductors.

Mus 8237. Score Study: Choral. (3 cr; A-F only. Prereq--#) Analysis of various choral scores ranging from Renaissance through 20th century. Reading of choral and choral/orchestral scores at piano, including scores with C clefs and transposing instrument.

Mus 8255. Choral Literature: Baroque Era to the Present. (3 cr; A-F only. Prereq--#) Survey of sacred and secular choral works.

Mus 8299. Performance in Choral Conducting. (3 cr; A-F only. Prereq--#) Preparation and performance of choral conducting, both with supporting paper.

Mus 8333. FTE: Master’s. (1 cr. Prereq--Master’s student, adviser and DGS consent) Seminar in choral conducting.

Mus 8444. FTE: Doctoral. (1 cr. Prereq--Doctoral student, adviser and DGS consent) Seminar in choral conducting.

Mus 8450. Graduate Seminar in Conducting. (4 cr [max 8 cr; A-F only. Prereq--Grad student in conducting or #) Development of musicianship, conducting, rehearsal, and analytical skills. Repertoire, gesture, score study, interpretation, pedagogy, and performance presentation in wind band, orchestral, and choral conducting. Students meet twice weekly in group seminar, and prepare and participate in weekly conducting labs scheduled with all major University ensembles.


Mus 8471. Wind Ensemble/Band Conducting I. (4 cr; A-F only. Prereq--Wind Conducting emphasis or #) Seminar in wind band repertoire of 18th, 19th, and 20th centuries emphasizing stylistic and period techniques; techniques of score study, analysis, and interpretation. Practical conducting experience.

Mus 8472. Wind Ensemble/Band Conducting II. (4 cr; A-F only. Prereq--Wind Conducting emphasis or #) Seminar in study of music for small wind ensembles and chamber music. Study and rehearse repertoire and strategies. Music since 1960; contemporary notation systems; rehearsal techniques and strategies. Practical conducting experience.

Mus 8473. Performance and Document: Wind Ensemble/ Band Conducting. (4 cr [max 16 cr; A-F only. Prereq--#) Seminar in orchestral conducting techniques, including work with diverse orchestral, operatic, choral, and dance repertoire of differing styles and periods; 17th to present.
Musa 8489. Performance and Document: Orchestral Conducting. (3 cr; A-F only. Prereq—Δ)
Preparation and performing full orchestral conducting program with supporting document.

Musa 8490. Choral Conducting. (4-12 cr [max 12 cr]; A-F only. Prereq—Δ)
Preparation and conducting of choirs and vocalsembles in educational institutions.

Musa 8501. Music Theory Pedagogy. (3 cr; A-F only. Prereq—Grad student in music or #)
Comparison of pedagogical philosophies/methods in music theory. Pedagogical literature, practice teaching, curriculum design.

Musa 8550. Composition. (3 cr [max 12 cr]; A-F only. Prereq—Δ)
Creation of original musical works in various instrumental and vocal forms; advanced development of writing and realization of musical ideas.

Musa 8560. Readings in Music Theory. (3 cr [max 12 cr]; A-F only. Prereq—Δ)
Seminars on major theoretical text or group of interrelated texts. Pre-tonal, tonal, post-tonal, or non-Western focus in individual offerings.

Musa 8565. Text Setting. (3 cr; A-F only. Prereq—Emphasis in composition or choral conducting or voice or accompanying or music education. #)
Techniques for many mediums (from jungle to art song to choral settings) through analysis of repertoire and original compositions. Emphasizes sense and sound aspects of language, nature of specific text, and special considerations in writing creatively for voice.

Musa 8570. Seminar in Composition. (2 cr [max 4 cr]; A-F only. Prereq—Composition emphasis or Δ)
Aesthetic and professional issues in composition. Survey of professional activities, including: e(ρ)sm(e) and grant writing and concert production.

Musa 8571. Composers’ Laboratory. (3 cr [max 12 cr]; A-F only. Prereq—8570–8579)
Preparing original music composition to specification for possible radio/TV/theatre/film use. Analytic projects based on research into current practice of music criticism/music journalism. Philosophical and sociological research into creative process.

Musa 8575. Women Composers. (3 cr; A-F only. Prereq—Δ)
Contributions by women composers to development of European-American art music; primarily from 17th through 20th centuries. Historical and current issues affecting women’s access to professional music sphere. Music analysis, listening list, research, and performance components.

Musa 8580. Topics in Tonal Analysis. (3 cr [max 12 cr]; A-F only. Prereq—8581 or #)
Selected issues of tonal analysis from repertoire of 18th and 19th centuries. Contrapuntal writing modeled after presentation in Schenker’s Counterpoint.

Musa 8582. Schenkerian Theory and Analysis II: 18th Century. (3 cr; A-F only. Prereq—8581 or #)
Application of Schenkerian theory to 18th-century music, coordinated with critical study of major music treatises from that era.

Musa 8583. Schenkerian Theory and Analysis III: 19th Century. (3 cr; A-F only. Prereq—8581 or #)
Application of Schenkerian theory to music from 19th century, coordinated with critical study of major music treatises from that era.

Musa 8590. Topics in 20th-Century Analysis. (3 cr [max 12 cr]; A-F only. Prereq—Grad music major, Δ)
Seminar explores literatures of 20th-century art music.

Musa 8631. Seminar: Music in Medieval Europe. (3 cr; A-F only. Prereq—Undergrad music degree)
Selected genres of polyphonic and monophonic music, 9th-14th centuries, for analysis and cultural criticism. Social roles of music and performance traditions; current musicalological issues.

Musa 8632. Seminar: Music in Early Modern Europe. (3 cr; A-F only. Prereq—Undergrad music degree)
Transformation of chanson, madrigal, mass, and motet from 1400 to 1580. Analysis and cultural criticism; social roles of music and performance traditions; current musicalological issues.

Musa 8640. Seminar in Musicology. (3 cr [max 12 cr]; A-F only. Prereq—Musicology or theory emphasis or Δ)
Topics vary; readings, research, strategies, and methods.

Musa 8644. Seminar: Advanced Research in Historical Musicology. (3 cr; A-F only. Prereq—Undergrad music degree)
Major reference and research materials in musicology and related disciplines, including databases. Historical methods and historiography. Locating and interpreting primary sources of music and archival documents. Developing research strategies for degree papers and theses. Forms of documentation and historical writing.

Musa 8645. Current Musicology: Readings. (3 cr; A-F only. Prereq—Musicology or theory emphasis or Δ)
Readings and topics in recent scholarly and analytical work.

Musa 8647. Seminar: The Critical Editing of Early Music—Method and Practice. (3 cr; A-F only. Prereq—Undergrad music degree)
Preparation of critical editions from primary sources of vocal and instrumental music (partbooks and tablatures). Nature of musical sources, both manuscripts and prints. Stemmatological filiation, editorial judgment and method, presentation of text.

Musa 8651. Sonata Theory. (3 cr; A-F only. Prereq—Δ)
Principles of the classic sonata: norms, types, and deformations. Structural analysis, analytical methodologies, and fundamentals of sonata hermeneutics.

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

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

Musa 8864. Current Issues in Ethnomusicology. (3 cr; A-F only. Prereq—Δ)

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

Musa 8999. Directed Research. (1-3 cr [max 12 cr]; A-F only. Prereq—Δ)
Directed research.

Musa 8999. Recital Credits: Doctoral. (4 cr [max 20 cr]; A-F only. Prereq—DMA student, #)
Registration for recital credits coincides with performance of D.M.A. recital (five recitals for 20 credits).

Music Applied (Musa)

School of Music
College of Liberal Arts

Note: Musa 5101 through Musa 5123 are private instruction and the prerequisites are (2 cr [max 48 cr]; A-F only. Prereq—Audition, #)

Musa 5101. Piano—Elective.
Musa 5106. Voila—Elective.
Musa 5107. Cello—Elective.
Musa 5108. Double Bass—Elective.
Musa 5109. Flute—Elective.
Musa 5111. Oboe—Elective.
Musa 5112. Clarinet—Elective.
Musa 5113. Saxophone—Elective.
Musa 5114. Bassoon—Elective.
Musa 5115. French Horn—Elective.
Musa 5116. Trumpet—Elective.
Musa 5117. Trombone—Elective.
Musa 5118. Euphonium—Elective.
Musa 5119. Tuba—Elective.
Musa 5121. Percussion—Elective.
Musa 5122. Harp—Elective.
Musa 5123. Guitar—Elective.

Note: Musa 5401 through Musa 5423 are private instruction and the prerequisites are [2-4 cr [max 24 cr]; A-F only. Prereq—Audition, #)

Musa 5401. Piano—Secondary.
Musa 5402. Harpsichord—Secondary.
Musa 5403. Organ—Secondary.
Musa 5404. Voice—Secondary.
Musa 5405. Violin—Secondary.
Musa 5406. Viola—Secondary.
Musa 5407. Cello—Secondary.
Musa 5409. Flute—Secondary.
Musa 5411. Oboe—Secondary.
Musa 5412. Clarinet—Secondary.
Musa 5413. Saxophone—Secondary.
Musa 5414. Bassoon—Secondary.
Musa 5415. French Horn—Secondary.
Musa 5416. Trumpet—Secondary.
Musa 5417. Trombone—Secondary.
Musa 5418. Baritone—Secondary.
Musa 5419. Tuba—Secondary.
Musa 5421. Percussion—Secondary.
Musa 5422. Harp—Secondary.
Musa 5423. Guitar—Secondary.

Note: Musa 5101 through Musa 5123 are private instruction and the prerequisites are (2-4 cr [max 48 cr]; A-F only. Prereq—Audition, #)

Musa 5101. Piano—Major.
Musa 5102. Harpsichord—Major.
Musa 5103. Organ—Major.
Musa 5104. Voice—Major.
Musa 5105. Violin—Major.
Musa 5106. Voila—Major.
Musa 5107. Cello—Major.
Musa 5108. Double Bass—Major.
Musa 5109. Flute—Major.
Musa 5111. Oboe—Major.
Musa 5112. Clarinet—Major.
Musa 5113. Saxophone—Major.
Musa 5114. Bassoon—Major.
Musa 5115. French Horn—Major.
Musa 5116. Trumpet—Major.
Musa 5117. Trombone—Major.
Musa 5118. Euphonium—Major.
Musa 5119. Tuba—Major.
Musa 5121. Percussion—Major.
Musa 5122. Harp—Major.
Musa 5123. Guitar—Major.

For definitions of course numbers, abbreviations, and symbols, see page 167.
Courses

MusA 8313. Saxophone—Major.
MusA 8314. Bassoon—Major.
MusA 8315. French Horn—Major.
MusA 8316. Trumpet—Major.
MusA 8317. Trombone—Major.
MusA 8318. Euphonium—Major.
MusA 8319. Tuba—Major.
MusA 8321. Percussion—Major.
MusA 8322. Harp—Major.
MusA 8323. Guitar—Major.
MusA 8324. Accompanying/Coaching.

Note: MusA 8501 through MusA 8524 are private instruction and the prerequisites are (2-4 cr [max 8 cr]; A-F only. Prereq–Audition)

MusA 8501. Piano: Beyond Requirement.
MusA 8502. Harpsichord: Beyond Requirement.
MusA 8503. Organ: Beyond Requirement.
MusA 8504. Voice: Beyond Requirement.
MusA 8506. Viola: Beyond Requirement.
MusA 8507. Cello: Beyond Requirement.
MusA 8509. Flute: Beyond Requirement.
MusA 8511. Oboe: Beyond Requirement.
MusA 8512. Clarinet: Beyond Requirement.
MusA 8513. Saxophone: Beyond Requirement.
MusA 8515. French horn: Beyond Requirement.
MusA 8516. Trumpet: Beyond Requirement.
MusA 8517. Trombone: Beyond Requirement.
MusA 8518. Euphonium: Beyond Requirement.
MusA 8519. Tuba: Beyond Requirement.
MusA 8521. Percussion: Beyond Requirement.
MusA 8522. Harp: Beyond Requirement.
MusA 8523. Guitar: Beyond Requirement.

Music Education (MuEd)

School of Music

College of Liberal Arts


MuEd 5112. Research in Music Education: Techniques. (3 cr; A-F only. Prereq–Grad music major or #) Methods and techniques employed in investigating and reporting music education problems; proposal development; bibliographic skills involved in conducting a significant review of related research.

MuEd 5115. Research in Music Education: Measurement. (3 cr; A-F only) Assessment of music behaviors, including test design, interpretation of test results, and evaluation and reporting of student achievement; published tests in music; uses of assessment and measurement in the classroom and in research.

MuEd 5116. Research in Arts Education: Qualitative. (3 cr; A-F only. Prereq–Grad student in arts or #) Practical/systematic introduction to qualitative research procedures in arts education. Prepares students to develop research proposals. Students participate in a joint field exploration. Those who have established research interests may also work in another setting relevant to their long-term research goals.

MuEd 5211. Foundations of Music Education. (3 cr; A-F only) An overview of the historical, philosophical, and psychological foundations of music education.

MuEd 5313. Youth Music: Preferences, Influences, and Uses. (2 cr; A-F only) Youth music preferences and their determinants; how music influences youth behavior; students’ and teachers’ uses of commercial styles. Particularly appropriate for educators and parents.

MuEd 5433. Techniques and Materials: Choral Ensembles. (2 cr; A-F only. Prereq–Music or music ed major or #) Research and literature on vocal and choral music education; choral curriculum issues; repertoire selection; rehearsal techniques.

MuEd 5606. Movement-Based Methods for Music Education. (2 cr; A-F only. Prereq–Music or music ed major or #) Participation in movement activities; study of Dalcroze philosophy and techniques; applications of movement to music education; examination of research.

MuEd 5611. Teaching Music with Related Arts. (2 cr; A-F only) Methods and materials for teaching music in cultural context including other art forms.

MuEd 5647. Teaching the Percussion Instrument. (2 cr; A-F only) Contemporary approaches for teaching percussion in the schools; development of curricular materials and practice in performance techniques.

MuEd 5655. New Dimensions in Music Education. (2 cr; A-F only) Analysis of recent curricular trends and current issues.

MuEd 5664. Teaching Music on the Internet. (3 cr; A-F only) Home page development techniques, investigation of software and materials, audio and video utilities, and research applications.

MuEd 5667. Computer-Based Music Instruction. (3 cr; A-F only. Prereq–Music or music ed major or #) Design and development of computer applications for the music classroom. Creating interactive audio and video presentations for music theory, ear training, composition, analysis, music history, and appreciation.

MuEd 5668. Computerized Music Notation. (3 cr [max 6 cr]) Fundamentals of music notation and printing utilizing the computer, MIDI keyboards, and Finale software program. Preparation of instrumental and vocal scores, part extraction and page layout. Basic techniques for sequencing and transcription.

MuEd 5669. Psychology of Music. (3 cr; A-F only. Prereq–Pay 1001 or Pay 3604 or #) Basic study of the psychology and psychoacoustics of music including hearing, music perception and cognition, values and preferences, musical abilities, musical systems, media music effects, the influence of music on human behavior, and psycho-socio-physiological processes involved in musical behavior.

MuEd 5750. Topics in Music Education. (1-4 cr [max 16 cr]; A-F only. Prereq–Grad student in music education/therapy or education or special education or grad minor in gerontology or spirituality/health or nursing student or psychology student) Focuses on single topic, specified in Class Schedule.

MuEd 9991. Independent Study. (1-4 cr [max 8 cr]; A-F only) Prereq–Music ed or music therapy major or grad, # Independent study consultation project explored by the student in consultation with the appropriate instructor.

MuEd 8281. Seminar: Philosophical Issues. (3 cr; A-F only. Prereq–Doctoral student in music or music education or #) Issues in philosophical foundations of music education.

MuEd 8282. Seminar: Historical Issues. (3 cr; A-F only. Prereq–Doctoral student in music or music education or #) Issues in historical foundations of music education.

MuEd 8283. Seminar: Psychological Issues. (3 cr; A-F only. Prereq–Doctoral student in music or music education or #) Issues in psychological foundations of music education.

MuEd 8284. Seminar: Research and Scholarly Issues. (3 cr; A-F only. Prereq–Doctoral student in music or music education or #) Scholarly/professional expectations of music educators and music therapists in academia and other positions of leadership. Writing for a variety of professional purposes/publications.

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

MuEd 8880. Master’s Research Project. (1-5 cr [max 5 cr]; A-F only. Prereq–Grad music ed major, #) Individual Plan B projects.

MuEd 8994. Directed Research. (1-8 cr [max 8 cr]; A-F only. Prereq–#)

Nanoparticle Science and Engineering (NPSE)

Institute of Technology

NPSE 8001. Introduction to Nanoparticle Science and Engineering. (3 cr; A-F only) A broad, interdisciplinary overview of the emerging field of nanoparticle science and engineering. This introductory course, designed for students with diverse backgrounds in science and engineering, covers a wide spectrum of topics—from the synthesis of nanoparticles, to nanoparticle growth and transport, to characterization methods for nanoparticles, to novel nanoparticle-based materials and devices.

NPSE 8002. Nanoparticle Science and Engineering Laboratory. (3 cr; A-F only. Prereq–8001, [IT grad student or #) Practical exposure to computational and experimental techniques in nanoparticle research. Required for Ph.D. students minoring in nanoparticle science and engineering.

NPSE 8101. Nanoparticle Science and Engineering Seminar. (1 cr; S-N only. Prereq–IT grad student or #) Broad overview of current research in nanoparticle science and engineering. Topics include areas of nanoparticle synthesis, nanoparticles characterization, nanoparticle-based materials and devices, environmental impact of nanoparticles, and instrumentation for nanoparticle research. Speakers from the University of Minnesota as well as external experts.

Natural Resources Science and Management (NR)

Department of Forest Resources

College of Natural Resources

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

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

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

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

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

Neuroscience (NSc)

College of Biological Sciences

NSc 5031. Perception. (3 cr. §Psy 5031W. Prereq–Psy 3031 or Psy 3031 or #) Cognitive, computational, and neuroscience perspectives on visual perception. Color vision, pattern vision, image formation in eye, object recognition, reading, impaired vision. Course is biennial; fall of odd years.

NSc 5037. Psychology of Hearing. (3 cr. §Psy 5037. Prereq–Psy 5031 or #) Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical and other applications.


NSc 5461. Cellular and Molecular Neuroscience. (4 cr. A-F only. Prereq–NSc grad student or #) Lectures by team of faculty, problem sets in important physiological concepts, discussion of original research papers.

NSc 5462. Neuroscience Principles of Drug Abuse. (2 cr. §Phsl 5462. Prereq–#) Current research on drugs of abuse, their mechanisms of action, characteristics shared by various agents, and neural systems affected by them. Offered biennially, spring semester of even-numbered years.

NSc 5481. Invertebrate Neurobiology. (3 cr. A-F only. §Ent 5481) Fundamental principles/concepts underlying cellular bases of behavior and “systems” neuroscience. Particular invertebrate preparations. Offered annually the last 10 weeks of spring semester.

NSc 5540. Advanced Survey of Biomedical Neuroscience. (2 cr. Prereq–#; intended for members of biomedical community or students with advanced scientific backgrounds) Current topics in biomedical neuroscience, accompanied by supporting, fundamental concepts. Intensive, one week course.

NSc 5551. Itasca Cell and Molecular Neurobiology Laboratory. (4 cr. S-N only. Prereq–NSc grad student or #) Intensive, writing-intensive instruction to cellular and molecular aspects of research techniques in contemporary neurobiology; held at Itasca Biological Station. Electrophysiological investigations of neuronal properties, neuropharmacological assays of transmitter action, and immunohistochemical studies in experimental preparations.


NSc 5651. Behavioral Neuroscience. (3 cr. A-F only. Prereq–Grad NSc major or grad NSc minor or #) Neural coding/representation of movement parameters. Neural mechanisms underlying higher order processes such as memorization, memory scanning, and mental rotation. Emphasizes experimental psychological studies in human subjects, single cell recording experiments in subhuman primates, and artificial neural network modeling.


NSc 8207. Seminar: Psychopharmacology. (1-3 cr. §Phsl 8207, Psy 8070. Prereq–#) Faculty and postdoctoral fellows interested in psychotropic drugs and chemicals participate. Some seminars devoted to biomedical ethics. Neurochemistry, pharmacology, and behavior as antecedent or consequent variables.

NSc 8211. Developmental Neurobiology. (3 cr. A-F only. Prereq–Neuroscience grad student or #) How neuronal types develop. Emphasizes general mechanisms. Experimental data demonstrating mechanisms.

NSc 8216. Selected Topics in Autonomic and Neuroendocrine Regulation. (1-3 cr. S-N only. §Phsl 8216. Prereq–#) Advanced seminar. Course is offered fall and spring semesters.

NSc 8217. Systems and Computational Neuroscience. (2 cr. S-N only. Prereq–5561 or #) Advanced seminar.

NSc 8221. Neurobiology of Pain and Analgesia. (2 cr. Prereq–#) Pain and analgesia. Course is triennial.

NSc 8222. Central Regulation of Autonomic Function. (3 cr. A-F only. §Phsl 8222. Prereq–5561) Neural/hormonal sensory pathways affecting central autonomic nuclei involved in maintenance of homeostasis. Current research on physiological control systems at cellular, organ, and integrative levels. Course is offered fall of odd-numbered years.


NSc 8248. Directed Readings in Auditory Physiology. (1-2 cr. §Phsl 8248) Current research on biophysics and physiology of auditory system; topics selected for each student. Written reviews prepared and discussed.

NSc 8320. Readings in Neurobiology. (1-4 cr. max 4 cr.) Topics in neurobiology and neurophysiology.

NSc 8321. Career Skills and Understanding Responsibilities as a Neuroscientist. (5 cr. max 2 cr. S-N only. Prereq–Neuroscience grad major or #) Information that falls outside of core neuroscience academic curriculum. Areas of practical value for graduate school and career development. Career skills, writing skills, responsible conduct in research.

NSc 8333. FTE: Master’s. (1 cr. Prereq–Master’s student, adviser approval) NSc 8334. Laboratory Neuroscience. (1-3 cr. max 10 cr. S-N only. Prereq–Grad NSc major or #) Guided research.

NSc 8411. Teaching in Neuroscience. (1 cr. max 4 cr; S-N only. Prereq–Graduate approval) Grad student serves as primary instructor in 4151 and work with fellow students and faculty mentors to design curriculum, classroom sessions, exams, and course evaluations.

NSc 8444. FTE: Doctoral. (1 cr. Prereq–Doctoral student, adviser and DG consent)

NSc 8481. Advanced Neuropharmacology: Principles and Applications. (3 cr. A-F only. §Phsl 8481, Psyc 8481) Prereq–Surveys courses in [biochemistry, cell biology] or #) Delivery of compounds to central nervous system (CNS) to activate proteins in specific brain regions for therapeutic benefit. Pharmaceutical/pharmacological issues specific to direct drug delivery to CNS.

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

NSc 8777. Thesis Credits: Masters’. (1-18 cr. max 50 cr) Prereq–Max 18 cr per semester or summer; 24 cr required)

Neuroscience Department (NSc)

Department of Neuroscience

Medical School

NSc 5101. Introduction to Neuroscience for Graduate Students. (3 cr. A-F only. Prereq–[Bio 3021 or Biol 4331]) intended for grad students outside neuroscience program who require comprehensive intro) Basic principles of cellular/molecular neurobiology and nervous system. A term paper supplements lectures. Multiple-choice exams.

NSc 5110. Dental Neuroscience for Graduate Students. (2 cr. A-F only. Prereq–[Bio 3021 or Biol 4331]) intended for grad students who require a comprehensive grad-level neuroscience course) Structure/function of human nervous system. Lectures and reading assignments emphasize topics pertinent to dentistry.

NSc 5111. Medical Neuroscience for Graduate Students. (5 cr. A-F only. Prereq–[Bio 3021 or Biol 4331]) intended for grad students who require a comprehensive medically-oriented neuroscience course) Survey of molecular, cellular, and systems neuroscience as related to medicine. Lecture/lab.

NSc 5540. Advanced Survey of Biomedical Neuroscience. (2 cr. Prereq–#; intended for members of biomedical community or students with advanced scientific backgrounds) Current topics in biomedical neuroscience. Supporting, fundamental concepts. Intensive, one week course.

NSc 5913. BrainU 101: Neuroscience in the Classroom. (3 cr. A-F only. Prereq–Elementary or middle school or high school or preservice] teacher, #, application) Two-week summer workshop. Week one focuses on training teachers in neuroscience through lectures, activities, and discussion sessions. Week two focuses designing inquiry-based classroom investigations based on neuroscience education given during week one. Follow-up activities held during the academic year include BrainU staff/faculty classroom presentations and use of training materials.

NSc 5914. BrainU 202: Neuroscience in the Classroom. (3 cr. A-F only. Prereq–[5913 or Biol 5190], #, application) One-week summer workshop. Focuses on critiquing previously implemented neuroscience class activities, developing assessment tools, learning peer mentoring, and expanding neuroscience content knowledge. Follow-up activities held during academic year include BrainU staff/faculty classroom presentations, use of training materials, and peer mentoring sessions.

For definitions of course numbers, abbreviations, and symbols, see page 167.
Courses

Neurosurgery (NSu)
Department of Neurosurgery
Medical School

NSu 8318. Neuroradiological Conference. (1 cr; S-N only) Neuroradiological conference.

NSu 8320. Neurosurgical Conference. (1 cr; S-N only) Neurosurgical conference.


Nursing (Nurs)
School of Nursing

Nurs 5016. Critical Reading of Scientific Literature in Adolescent Health. (1 cr. Prereq–Grad-level research methods course, inferential statistics course) or (LA) Application of research methods and statistics courses to critical reading of empirical literature on adolescent health. Relevance of research findings to adolescent health practice.


Nurs 5035. Pract Nurs Care of Clients With Complex Health Conditions. (5 cr. A-F only. Prereq–Nursing Post Baccalaureate Certificate Program student) #) Clinical decision-making, comprehensive nursing care of clients with complex health problems. In collaboration with a clinical preceptor and a faculty advisor, students develop an individualized learning contract to meet course objectives.

Nurs 5040. Seeking Solutions to Global Health Issues. (2-3 cr [max 3 cr]. Prereq–Grad student or student in nursing honors or CLA upper div honors or #) Global health issues from interdisciplinary perspective. Emphasizes ethical/cultural sensitivity/complexities. Students propose realistic actions that could be taken to resolve these issues.

Nurs 5111. Learning Theories for Nursing Education. (1 cr) Overview of selected learning theories used in academic, patient, and staff education in nursing.

Nurs 5113. Web-based Teaching/Learning Strategies. (2 cr; S-N only. Prereq–#) Skills necessary to design, produce, implement, and evaluate effective technology enhanced learning environments. Pedagogical/technological issues surrounding teaching with technology.

Nurs 5141. Ethical Issues in Health Care of Elders. (3 cr. Prereq–Grad student or nursing or #) Health care related ethical issues that confront elders, their families, healthcare providers, and society.

Nurs 5170. Research Topics. (1-16 cr [max 16 cr]. S–Prereq–#) Exploration of research topic to meet individual student needs.

Nurs 5171. SPSS Programming and Data Analysis. (2 cr. Prereq–Inferential statistics, (grad or professional student) or #) Skills needed to collect/analyze data using SPSS for Windows. Review of statistical methods.

Nurs 5172. Decision Making in Health Care. (2 cr. Prereq–Grad student) #) Selected classical conceptual models of decision making, their particular perspectives/limitations/usefulness for decision making about health care issues. Models/components used to assess, evaluate, teach, or help healthy people, patients, families, health care professionals, or policy making groups in making health care decisions.

Nurs 5200. Holistic Health Assessment and Therapeutics for Advanced Practice Nurses. (3 cr. Prereq–#) Health assessment knowledge/skills for advanced practice nursing with patients across age span, including pregnancy. Selected nursing interventions, complementary therapies examined for application to specific populations/instances.

Nurs 5202. Introduction to Complementary Healing Practices. (3 cr) Historical and cultural context of the allopathic and complementary healing traditions. Philosophies and paradigms of selected complementary therapies and culturally based healing traditions; descriptions of selected interventions.


Nurs 5233. Assessment of Psychopathology for Advanced Practice Psychiatric/Mental Health Nursing. (4 cr. Prereq–Nurs grad or #) Advanced concepts from nursing theory and research, social sciences, neuropsychology, and neurophysiology used in the assessment of psychiatric symptoms and disorders across the age continuum. During clinical, develop proficiency in the assessment of psychopathology in clients with psychiatric symptoms.

Nurs 5234. Clinical Pharmacotherapeutics. (3 cr. Prereq–Grad student in advanced practice in primary care, physiology course) or (LA) Foundation in pharmacotherapeutics across life span. Pharmacodynamics/kinetics/epidemiology, clinical profiles of medication use, and appropriate drugs for selected client conditions, and prescriptive writing privileges for advanced practice nurses.

Nurs 5252. Psychopharmacology for Advanced Practice Psychiatric/Mental Health Nursing. (3 cr. Prereq–Grad student or RN (with master's degree) or #) Advanced concepts in neuroscience, psychopharmacology, and clinical management related to psychopharmacologic treatment of psychiatric disorders/symptoms. Application to problems in various clinical settings.

Nurs 5258. Acute Care Pharmacotherapeutics. (3 cr; A-F only. Prereq–Grad–Grad student) Analysis of pharmacodynamics, physiological bases, therapeutic effects, and non-intended effects (common errors, adverse effects, side effects) for selected pharmacologic agents within drug categories commonly used in acute care.

Nurs 5300. Health Behavior Intervention: Theory and Application. (3 cr. Prereq–Grad or #) Interdisciplinary course examines theoretical foundations and research base of intervention strategies to promote health behavior acquisition, behavioral change, and maintenance for adults (individuals and groups). Critical examination of health behavior and patterns and health risk assessment; approaches to program creation.

Nurs 5340. Group as a Health-Care Intervention. (2 cr. Prereq–Grad or #) Theoretical concepts and research findings from the areas of group therapy and dynamics are applied in the development of a model for using group as an intervention for various client populations.

Nurs 5501. Professional Issues in Nursing-Midwifery. (1-2 cr [max 2 cr]. S-N only. Prereq–Nurs grad major) #) Analysis of professional issues that confront and impact the practice of certified nurse-midwives. History and development of the professional organization including certification, legislation, ethical dimensions, public policy, and clinical practice issues.

Nurs 5520. Women's Issues: A Health Perspective. (3 cr. Prereq–Upper div or grad student) Multidisciplinary exploration and analysis of a broad range of women's health issues: physiological, developmental, historical, sociocultural, feminist, nursing and medical. Topics include health promotion and reproductive health issues across the life span.

Nurs 5522. Sociopolitical Context of Women's Health. (1-2 cr [max 3 cr]. S-N only. Prereq–Grad student) Women's health issues from multidisciplinary perspective. Sexual/reproductive health issues across life span. Sociocultural issues affecting health, such as poverty/violence.

Nurs 5601. School Nursing in the Educational System and the Community. (1-3 cr [max 3 cr]. A-F only. Prereq–3 yrs of college level courses, #) School health problems, assessment/intervention strategies. Integration of research findings. Applications with individuals, families, communities.
Courses

Nurs 5804. Advanced Health Assessment and Interventions with Adolescents. (2 cr. Prereq—Cpy 5303 or equiv or #) Integrates knowledge from nursing, public health, health behavior, and adolescent development as framework for developing health assessment/ intervention strategies for clinical practice with adolescents.

Nurs 5800. Nursing Topics. (1-4 cr [max 8 cr]. Prereq—#) Course allows students to study a topic not included in regular courses, or for faculty to offer a course to determine interest in a topic.


Nurs 5802. Spirituality and Nursing Practice. (2 cr. Prereq—For undergrad cr: nurs or or RN; for grad cr: nurs grad student or #) Explorations of the concept of spirituality as integral to the whole person. Discussion of spiritual nursing care interventions.

Nurs 5803. Transcultural Nursing: Theories and Issues. (2 cr. Prereq—Cultural anth course or #) Study of cultural factors that influence theories, issues, and nursing care practices in diverse cultures and subcultures. Emphasis on nursing within international systems of health care and nursing practices related to various health-illness systems in this country and worldwide.

Nurs 5804. Therapeutic Healing Touch: Research and Practice. (2 cr; S-N only. Prereq—Upper div or grad student in [health sciences or health care]) Therapeutic/Healing Touch as energetic based, biofield healing modality. Art/science of this modality. Research literature related to Therapeutic Touch/Healing Touch. Explorations for effects. Practice of Therapeutic Touch, intervention techniques.

Nurs 5805. The M Technique. (1 cr; S-N only. Prereq—Undergrad nursing student or grad student in health sciences or health professional) Scientific/theoretical foundations/practice of ‘m’ technique, a touch therapy for promoting relaxation by topically administering essential oils. Appropriate applications. Demonstration/practice of technique. Interdisciplinary course.


Nurs 5807. Stories of Illness. (3 cr) Subjective experiences of various physical/mental illnesses. Social context of illness, society’s responses to illness. Ethical implications for patients/practitioners. Uses fiction, art, film, music, first-person accounts of illness, and anthropological, sociological, and historical literature.

Nurs 5808. American Indian Health and Health Care. (2 cr. Prereq—Upper div or grad student or #) Examines health of native nations in Minnesota within historical/cultural contexts. Epidemiology of major health conditions, health services, traditional Indian medicine, health beliefs. Opportunities for contact with Native American community.

Nurs 5809. Seminars in Critical Care. (2 cr) Analyzes current research/developments in treatments, care delivery, and ethical issues affecting critically ill patients and their families. Students participate with team of multidisciplinary faculty from Center for Critical Care in critiquing/presenting literature and discussing applications to clinical practice.

Nurs 5810. Health Activism. (3 cr) Interdisciplinary skill-building workshops. Sessions taught by community leaders/activists. Community project focuses on issues of health disparities, environmental justice, and access to care.

Nurs 5830. Advanced Clinical Nursing, 1-6 cr [max 2 cr]. Prereq—Graduate nursing major or #) Independent study or faculty seminar on special clinical topic.

Nurs 5900. Introduction to Principles and Practice of Anesthesia. (3 cr. A-F only. Prereq—Grad student in nursing) Safe/efective administration of anesthesia for nurse anesthetists. Application in operating room setting under one-to-one guidance of a certified registered nurse anesthetist (CRNA).

Nurs 5901. Basic Principles and Practice of Nurse Anesthesia. (2 cr; A-F only. Prereq—5900) Students apply principles of anesthesia to formulate nurse anesthesia care plans for care of adults undergoing anesthesia.


Nurs 5920. Nurse Anesthesia Care: Pediatric Patients and Patients With Trauma. (3 cr; A-F only. Prereq—5910) Second in a series of three courses. Theory/application of principles used to deliver anesthesia by nurse anesthetists to pediatric patients and to trauma patients.

Nurs 5930. Nurse Anesthesia Care: Obstetric and Gynecology Patients. (3 cr, A-F only. Prereq—5920) Third of three courses. Theory/application of principles used to deliver anesthesia by nurse anesthetists for complex patients with obstetric or gynecologic conditions and for effective management of pain. Increasing autonomy in decision-making processes and clinical experiences.

Nurs 5995. Research Dissemination. (2 cr. Prereq—Doctoral student or #) Knowledge dissemination skills for advancement of health/nursing science/practice. Emphasizes interpretation/diffusion of research findings to health professional and scientific audiences in various venues and communication modalities.

Nurs 8100. The Discipline of Nursing. (3 cr. Prereq—Grad nurs major or #) Knowledge structures used in nursing; theories, models, and conceptual frameworks. Articulation and evaluation of personal conceptual framework for advanced nursing practice.

Nurs 8112. Theoretical Foundations of the Discipline. (3 cr. Prereq—8100 or equiv, knowledge of phil of sci) Paradoxes in nursing and related methods of inquiry, knowledge structures, and projection of needs for further knowledge development and testing.

Nurs 8113. Theory Development in Nursing. (3 cr; S-N only. Prereq—8100 or equiv; 8112 or #) Strategies for theory development; synthesis of theoretical formulations in nursing using selected inductive and deductive theory development strategies.


Nurs 8121. Health Behaviors and Illness Responses. (3 cr. A-F only. Prereq—Doctoral student or #) Theories of health behaviors and responses to illness are analyzed/critiqued. Multivariate research designs. Specification of testable, descriptive, dynamic models for health/illness that incorporate culture, biology, environment, and health systems for diverse individuals, families, communities, and populations.

Nurs 8122. Stress, Coping, and Health. (2 cr. Prereq—Research course, grad nurs major, #) Stress and coping theories and related research; efficacy and adequacy of stress-management interventions/programs; directions for future research.

Nurs 8123. Complementary Therapies: Theory and Research. (2 cr. Prereq—Research course) Scientific basis of selected complementary therapies such as therapeutic touch, imagery, massage, and massage; hypotheses related to selected interventions; appropriate methodologies.

Nurs 8124. Family Health Theory. (2-3 cr [max 3 cr]. Prereq—8100 or #) Emerging theory in family nursing science. Related theories. Research on family systems for structuring a systemic framework to examine clinical problems related to family health care. Applications to selected phenomena of interest to health care.

Nurs 8134. Nursing Interventions and Outcomes. (3 cr; A-F only. Prereq—8112, PhD student or #) Design/evaluation of intervention/outcomes research. Analysis of classification systems for nursing interventions/outcomes. Use of advanced experimental design and multivariate statistical approaches to test theory/multi-level, theory-based interventions with various populations.

Nurs 8140. Moral and Ethical Positions in Nursing. (3 cr. Prereq—Grad nurs major or #) Synthesis of ethical positions, from nursing perspective, on health-related issues at individual, group, population, and policy levels. Normative ethics, theoretical basis for positions taken, and contextual implications for subsequent action.

Nurs 8150. Moral and Ethical Development in Nursing Science. (3 cr. Prereq—Grad nurs major, S-N only. Prereq—Grad nurs major or #) Interactions among research and theory in moral judgment and behavior, applied ethics, and nursing.


Nurs 8170. Research in Nursing. (3 cr. Prereq—8170 or integral stat course taken within two yrs) Research process/methods appropriate for problems relevant to nursing. Critique of research studies, proposal development.

Nurs 8171. Qualitative Research Design and Methods. (3-4 cr [max 4 cr]. Prereq—8170 or equiv) Overview and comparative analysis of selected qualitative research methods and analytic strategies. Focuses on developing rigorous qualitative designs that contribute to development of nursing and health care knowledge for diverse populations.


Nurs 8173. Principles and Methods of Implementing Research. (3 cr. Prereq—Grad nurs major or #) Integrates scientific, statistical, and practical aspects of research. Inter-relationships among design, sample selections, subject access, human subjects requirements, instrument selection and evaluation, data management, analyses plans, grant writing, and research career issues. Field experiences required.

For definitions of course numbers, abbreviations, and symbols, see page 167.

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Nurs 8175. Quantitative Research Design and Methods. (3 cr. A-F only. Prereq–[8170 or equiv], B (or applied statistic) designs for quantitative description and quasi-experimental/experimental evaluation of scientific problems across domain of nursing. Emphasizes evaluation of logic of design/attrition of causality from health and social science perspectives.

Nurs 8176. Research on Decision Making in Health Care. (3 cr. Prereq–One graduate-level research course, #) Conceptual models/studies on decision making about health care. Formulating research proposals to investigate health care decisions by health care professionals, health care policy makers, patients/clients, or families.

Nurs 8177. Advanced Nursing Research Practicum. (2 cr. S-N only. Prereq–8181 or 81811). PhD nursing student, #, adviser consent. Students collaborate with research team under supervision of faculty mentor in designing/conducting a health-related research project.

Nurs 8178. Methods for the Study of Family Health Phenomena. (3 cr. Prereq–8124, 8100 or equiv or #) Conceptual and methodological approaches in study of family health phenomena from nursing perspective. Research designs formulated to study questions in this area.

Nurs 8180. Doctoral Proseminar I: Scholarly Development. (1 or 5 cr. S-N only nursing student) Transition to doctoral study. Begins socialization process to role of nursing scholar/scientist. Career trajectories of nursing scholars who have pursued various roles.


Nurs 8190. Critical Review in Nursing Research. (2 cr. A-F only. Prereq–Advanced statistics course or #) Skills needed to critique a body of scientific literature in focused areas of nursing research and related fields. Construction of literature reviews for planning research projects and for research utilization.

Nurs 8193. Special Topics in Nursing Research. (1-6 cr. [max 6 cr. Prereq–#]) Seminar and/or individual study of research design, methodologies, or instruments.

Nurs 8194. Problems in Nursing - Plan B. (1-6 cr. [max 6 cr. Prereq–#]) Using a scholarly process to address a specific issue relevant to science/practice of nursing

Nurs 8240. Advanced Practice Nursing: Roles and Issues. (2 cr. Prereq–Admission to advanced practice area of study or #) Current most relevant professional/health care issues affecting diverse advanced practice nursing roles. Role theory, practice models, interdisciplinary team function, reimbursement, certification, scope of advanced nursing practice.

Nurs 8241. Health Care Leadership for a Changing World. (2 cr. [max 3 cr. Prereq–AHSc grad student or #) Application of leadership theory/research to strengthen students. Capacity to facilitate change in health care delivery system.

Nurs 8242. Population Focused Health Care Delivery Systems. (2 cr. Prereq–Grad nurs student or #) Health care organization/delivery systems, their relation to health of diverse populations. Models of population focused care, use of research to improve health care delivery, effect of economic/social factors on health/services.


Nurs 8304. Advanced Practice Nursing for Acute Health Needs II. (3 cr. Prereq–[5200, 8100, [8170 or advanced physiology], 8302, [pathophysiology or immunobiology], advanced pharmacology]. Evaluation of theories/models/research in management of acute symptomology. Application of transaction theory/research to support clinical decision making for adults experiencing alterations in metabolic, alimentary, and regulatory phenomena. Emphasizes client outcomes related to advanced practice nursing outcomes.


Nurs 8306. Psychological and Immunological Responses in Cancer and Acute Care. (3 cr. Prereq–Grad nurs major or #) Research-based evaluation and management of hematological and immunological responses to cancer and acute life-threatening illness. Exploration of theories and models used to explain and predict psychological adaptation in clients and their family members.

Nurs 8307. Oncology Clinical II. (3 cr. Prereq–[8306 or 83306, grad nurs major, Minnesota RN (licensure) Synthesis of research and integration of knowledge in clinical management of complex physical and psychosocial care in cancer. Application of advanced practice and theoretical models to guide decision making and coping responses in clients and their families.


Nurs 8311. Specialized Focus in Research-based Clinical Reasoning and Management in Acute Care. (1-4 cr. Prereq–[5200, 5222, 8100, 8140, 8170, 8240, 8303, 8305, advanced pharmacology, [pathophysiology or immunobiology]). Synthesis/Utilization of knowledge/research in care of adults with acute/critical illness. Participation (in a clinical area of interest) in advanced decision making and in management of clients requiring restorative care.

Nurs 8314. Intervention Models for Adults/Elders with Chronic Health Conditions. (3-4 cr. [max 4 cr. A-F only. Prereq–[5200, 5222, 8590, 8100, 8140, 8170, #]) Development of theory/research-based nursing intervention models for adults/elders with chronic health conditions. Students implement/evaluate intervention models in an advanced practice role with chronically ill adults/elders.

Nurs 8315. Advanced Practice Nursing for Adults. (4-5 cr. [max 5 cr. A-F only. Prereq–[5200, 5222, 5800, 8100, 8140, 8170, #]) Development of clinical expertise in provision of advanced nursing care to adults with acute health problems needing restorative care. Students utilize theory/research to manage/evaluate acute health problems in a selected adult specialty area.

Nurs 8316. Implementing Advanced Practice Roles in Adult Nursing. (4 cr. A-F only. Prereq–[5200, 5222, 5800, 8100, 8140, 8170, 8314, 8315]). Clinical nurse specialist roles of case management, teaching, consultation, and collaboration. Students use theory/research to provide advanced nursing care to adults within context of a selected specialty area.

Nurs 8320. Multidisciplinary Seminar on Social Perspectives of Aging. (3 cr) Literature/policy on key social aspects of aging, emphasizing service, policy, and ethical implications; generation of research questions.


Nurs 8322. Primary Health Care for Elders. (3-6 cr. [max 6 cr. A-F only. Prereq–8322, #]) Data-based primary care management of common acute/chronic conditions of elderly. Physiological, psychosocial, and pharmacological interventions. Age-related, cultural, family, and community variations. Implementation, evaluation of practice.

Nurs 8323. Advanced Nursing Care of the Elderly II: For Nurse Practitioners. (6 cr. A-F only. Prereq–Grad student in nursing. 8xxx advanced gerontological nurs course, grad nurs major, #) Synthesis and application of theory and research to effectively implement advanced gerontological nursing practice. Focuses on comprehensive primary care management across settings, evaluation of care, role analysis, and impact of contextual factors on health care services for the elderly.


Nurs 8333. FTE: Master’s. (1 cr. Prereq–Masterr’s student, adviser and DGS consent)

Nurs 8340. Advanced Practice Psychiatric/Mental Health Nursing with Individuals and Their Families. (7 cr. Prereq–[5200, 5222, 5225, 8100, 8121, 8140, 8170]. Evaluation of theory and research; their application to advanced clinical management of biological, psychological, and social responses of individuals and families to psychiatric illness. Developing clinical expertise in assessment, diagnosis, treatment planning, and management of individuals and their families.


Nurs 8451. Primary Care Practicum: Health Assessment and Care of Well Children. (2-3 cr [max 3 cr]; A-F only. Prereq–5200, #8450, #) Focus on age-specific, family-centered nursing assessment and interventions to promote wellness of children, infants through adolescence. Emphasizes compiling/evaluating interventions for children/families. Practicum includes exposure to models of primary prevention.

Nurs 8452. Primary Care: Common Acute Health Conditions Affecting Children. (2 cr [max 2 cr]; A-F only, Prereq–5200, #8450, #8452, #8453) Research-based evaluation and management of common acute conditions affecting children from infancy through adolescence. Exploration of theories and models used to explain and predict physiologic and psychologic adaptation of children and their families.

Nurs 8453. Primary Care Practicum: Common Acute and Chronic Health Conditions Affecting Children. (3 cr. Prereq–8411, #8442, #8452) Focus on age-specific, family-centered nursing assessment and intervention of minor acute and chronic conditions of children within family context. Emphasis on nursing intervention strategies include diagnostics, therapeutics, education, and follow-up evaluation of outcomes.


Nurs 8459. Advanced Nursing Care of Children With Acute Illness for Pediatric Clinical Nurse Specialists. (2 cr. Prereq–Nursing grad student admitted to pediatric clinical nurse specialist area of study or #) Synthesis/application of theory/research to effectively implement pediatric clinical nurse specialist role. Focuses on comprehensive care management across settings, evaluation of care, role implementation, and contextual factors affecting health care for children with special health needs and families.


Nurs 8501. Reproductive Health Care for Women. (3-8 cr [max 8 cr]; Prereq–#8500, #8501) Theory, current research underlying clinical practice in assessing/managing issues related to women’s reproductive/sexual health throughout life cycle.

Nurs 8502. Reproductive Health Care for Women at Risk. (2-6 cr [max 6 cr]; Prereq–#8501 or #8520) Theoretical and research basis for advanced practice nurse care of women and infants at risk for medical and/or psychosocial problems. Selected high-risk perinatal and complicated gynecological and neonatal conditions.

Nurs 8503. Nurse-Midwifery Care of the Childbearing Family. (4-10 cr [max 10 cr]; A-F only, Prereq–#8521, #8522, #8402) Theoretical/research-based nurse-midwifery intrapartum care, management, support of women and their families. Labor, birth, immediate postpartum period, and newborn care. Development/implementation of nurse-midwifery care. Draws from research that provides basis for practice.

Nurs 8504. Nurse Midwifery and Women’s Health Care Practitioner Primary Care Practicum. (2-3 cr; 5-N only, Prereq–#8500, #8501, #8503, #8520) Application of advanced practice comprehensive health histories and physical assessments in formulating client centered databases. Development/implementation of care plans. Follow-up evaluation of primary care delivered to adult populations. Focuses on women.

Nurs 8505. Advanced Concepts in Women’s Health for the Nurse Practitioner. (3-8 cr [max 8 cr]; A-F only, Prereq–#8501, #8521) Theoretical and research basis for women’s healthcare nurse practitioner practice building on foundations of gynecological and antepartum care. Preparation of childbearing family for birth and selected complex health concerns for women.


Nurs 8602. Public Health Nursing Intervention Practicum. (3 cr; 5-N only, Prereq–#8402, #8401) Applying principles, theory, and research about epidemiology/public health/public health nursing interventions to population-focused health issues. Collaborating with community-based preceptors to achieve public health objectives.
Courses

Nurs 8603. Public Health Nursing Leadership Practicum. (3 cr; S-N only. Prereq–8100, 8170, 8241, 8242, 8600) Synthesis of leadership and advanced public health nursing theories and research; their applicability within public health nursing leadership situations.

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

Nurs 8701. Nursing and Health-Care Systems Administration I. (4 cr; A-F only. Prereq–8701) Intensive study of nursing and healthcare administration and leadership. Application of nursing, organizational, care delivery, and population health improvement theories to health systems administrative practice. Planning, organizing care systems, assembling, and developing material and human resources.

Nurs 8702. Nursing and Health-Care Systems Administration II. (4 cr; A-F only. Prereq–8701) Intensive development of competencies associated with skilled administration of healthcare services. Application of organization, nursing, political, and economic theories in operationalizing and evaluating administrative and leadership practice of nurses in healthcare delivery systems.


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

Nurs 8800. Methods for the Study of Family Health Phenomena. (2 cr. Prereq–8124, 8175 or equiv or #) Exploration of conceptual and methodological approaches in study of family health phenomena from a nursing perspective. Formulation of research design to study questions in family health.

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

Nutrition (Nutr)

College of Agricultural, Food and Environmental Sciences and College of Human Ecology


OMS 8614. Advances in Nutrition: Advanced Energy Balance. (2 cr. Prereq–Grad student in nutr or related field) Recent literature on energy balance and body composition in animals and humans.

OMS 8615. Advances in Nutrition: Exercise Metabolism. (2 cr. Prereq–Grad student in nutr or related field) Review of research on effects of diet on exercise metabolism.

OMS 8616. Advances in Nutrition: Free Radicals, Trace Elements, and Other Micronutrients. (2 cr. Prereq–Grad student in nutr or related field) Free radical chemistry, cellular biology, and micronutrients in biological systems. Role of free radicals and micronutrients in antioxidant protection in humans and animals.


OMS 8620. Advances in Nutrition. (2-3 cr [max 6 cr]. Prereq–#) Recent research or special topics (e.g., obesity, vitamin biochemistry, nutrition education).

OMS 8621. Presentation Skills. (1 cr; S-N only) Orientation to nutrition graduate program. Presenting scientific seminars, using electronic presentation programs/equipment.

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

OMS 8695. Independent Study: Nutrition. (1-4 cr [max 6 cr]. Prereq–#) Written report for master’s plan B project.

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

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

Operations and Management Sciences (OMS)

Department of Operations and Management

Curtis L. Carlson School of Management

OMS 5170. Simulation Modeling and Analysis. (4 cr; A-F only. Prereq–MBA 6120 or BA 1550 or #) Techniques and application of computer simulation modeling and analysis. Includes animations of existing or proposed real-world facilities and processes. Experiments in simulation programming language and environment. Simulation models and animations demonstrating actual operation of models. Planning, analysis, and interpretation of simulation experiment results.

OMS 8651. Experimental Design. (3 cr [max 4 cr]; A-F only. Prereq–MBA 6120 or equiv or business admin PhD student or #; offered alt yrs) Analysis of variance for one-way, two-way, and multi-way data. Basic concepts of statistical design and analysis of results. Randomized block, Latin square, cross-over, factorial designs, confounding, estimation and comparison of effects, response surfaces, and applications to management.

OMS 8652. Regression Analysis. (3 cr [max 4 cr]; A-F only. Prereq–MBA 6120 or equiv or business admin PhD student or #; offered alt yrs) Regression and correlation models, inferences in simple and multiple regression, multicolinearity, indicator variables, variable selection techniques, treatment of assumption violations, applications to management problems, basic concepts of experimental design.

OMS 8661. Linear Programming. (3 cr [max 4 cr]; A-F only. Prereq–Business admin PhD student or #) Revised simplex, primal-dual, and large-scale methods, including decomposition and partitioning and methods for bounded variables.

OMS 8671. Simulation Analysis. (3 cr [max 4 cr]; A-F only. Prereq–#; CIIE 8031; Business admin PhD student or #; offered alt yrs) A treatment of underlying probabilistic and statistical aspects of computer simulation. Random number generators, variate and process generation, statistical analysis of simulation output, ranking and selection of simulation models, and variance reduction techniques.

OMS 8672. Stochastic Modeling and Analysis. (3 cr [max 4 cr]; A-F only. Prereq–Business admin PhD student or #; offered alt yrs) Probabilistic modeling of dynamic processes, including Markov chains; Poisson, renewal, continuous-time Markov processes, and queuing models. Statistical estimation of selected models; applications to managerial problems, such as brand shift, industrial migration, manufacturing, and computer/communications networks.

OMS 8681. Queuing Theory: A Computational Approach. (3 cr [max 4 cr]; A-F only. Prereq–8672, business admin PhD student or #) Theory of Stochastic Service Systems (theory of queues) from an algorithmic point of view. Prepares students to model and analyze complex stochastic service systems via classical methods and algorithmic methods and approximations.

OMS 8711. Research in Operations Strategy. (3 cr [max 4 cr]; A-F only. Prereq–8672, business admin PhD student or #) Operations performance: competitive advantage; focused factory, product, and process innovation; and operations strategy implementation. Research results and methods.
OBS 824. Genetics and Human Disease. (1 cr. Prereq–Dental specialist or oral research trainee or #) Principles of medical genetics. Emphasizes oral diseases. Twins, chromosomes, recombinant DNA, major gene traits, genes in populations, chromosomal abnormalities, complex traits, facial clefts, dental caries, periodontal diseases.

OBS 825. Topics in Cariology. (2 cr. A-F only. Prereq–Dental specialist or oral research trainee or #) Lectures, assigned readings, and discussions of basic epidemiological, biological, and chemical aspects of dental caries. Etiology, epidemiology, and pathogenesis of dental caries. Influence of dietary, salivary, plaque, and microbial factors on caries process.


OBS 827. Structural and Biological Aspects of Dental Biomaterials. (1 cr. Prereq–Dental specialist or oral research trainee or #) Relates composition/structure of dental biomaterials to their behavior in a biological environment. Cause/mechanism of such effects. Materials that have beneficial effects. Dental implantology, guided tissue regeneration.

OBS 828. Molecular Basis of Cellular and Microbial Adhesion. (2 cr. A-F only. Prereq–Dental specialist or oral research trainee or #) Biochemical basis of adhesion phenomena. Cells of immune system, development of organs, tissue formation, bacterial colonization of the human.

OBS 830. Oral Biology Seminar. (1 cr. A-F only. S-N only. Prereq–Dental specialist or oral research trainee or #) Faculty and student discussion of current topics in oral biology.

OBS 832. Mucosal Immunobiology. (2 cr. A-F only. §OMB 8371, MICA 8371. Prereq-MICA 8001 or equiv or #) Host immune processes at body surfaces. Innate/adaptive immunity at mucosal surfaces. Interactions/responses of various mucosal tissues to pathogens. Approaches to target protective vaccination to mucosal tissues. Lectures, journal.

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

OBS 8666. Doctoral Pre-Thesis Credits. (1–12 cr [max 60 cr]. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

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

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

Otolaryngology (Otol)

Department of Otolaryngology

Medical School

Otol 5101. Introduction to the Basic Sciences in Otolaryngology. I: Ear. (2 cr. A-F only. Prereq–Otolaryngology major or #) Multidisciplinary introduction to the basic sciences of the ear. Acoustics and psychoacoustics, temporal bone anatomy, external and middle ear mechanisms, cochlear physiology, auditory neurophysiology, ear embryology, ear biochemistry, immunology, fine structures, vestibular mechanisms and measurement. S-N grading option for nonmajors only.

Otol 5102. Introduction to the Basic Sciences in Otolaryngology II: Head and Neck. (2 cr. A-F only. Prereq–Otolaryngology major or #) Multidisciplinary introduction to the basic sciences of the head and neck. Laryngeal anatomy and physiology, nasal anatomy and physiology, immune biology, embryology of head and neck. S-N grading option for nonmajors only.

Otol 5993. Directed Studies. (1–12 cr [max 24 cr]. A-F only. Prereq–#) Directed readings and preparation of reports on selected topics.

Otol 8230. Clinical Otorhinolaryngology. (4 cr. A-F only. Prereq–Grad otol major) Diagnostic and management instruction and experience in all phases of clinical otorhinolaryngology. Both inpatient and outpatient services are provided at Fairview-University Medical Center, St. Paul Ramsey Medical Center, Veterans Administration Medical Center, and Hennepin County Medical Center. Clinical practica and weekly special group conferences.

Otol 8231. Surgery of the Ear, Nose, and Throat. (3 cr. A-F only. Prereq–Grad otol major) Surgical training and experience with broad scope of surgical problems encountered in otorhinolaryngology provided at Fairview-University Medical Center, St. Paul Ramsey Medical Center, Veterans Administration Medical Center, and Hennepin County Medical Center. Clinical practica and weekly special group conferences.

Otol 8232. Maxillofacial Surgery. (1 cr. A-F only. Prereq–Grad otol major) Basic science and management principles of maxillofacial diseases. Problems of maxillofacial trauma. Experience with these problems in the hospitals of the training program, especially the county hospitals.


Otol 8234. Anatomy of the Head and Neck and Temporal Bone Dissection. (2 cr. Prereq–Grad otol major or #) Head and neck anatomy studied from cadaver through programmed learning. Temporal bones dissected to learn anatomy and to practice otologic surgical procedures. S/N for nonmajors only.


Otol 8236. Pharmacology in Otolaryngology. (1 cr [max 12 cr]. A-F only. Prereq–Grad otol major) Principles of pharmacology as they relate to otorhinolaryngology.

Courses

Otol 8238. Pathology of the Ear, Nose, and Throat. (1 cr [max 12 cr]; A-F only. Prereq–Grad otol major)
Gross pathology and histopathology of diseases of the ear, nose, throat, and related regions.

Otol 8239. Otoneurology. (1-2 cr [max 12 cr]; Prereq–Grad otol major or #) Instruction and experience in diagnosis and management of otoneurologic problems, including training in electroneystagmographic analysis of vestibular function.

Otol 8240. Allergy. (1 cr [max 12 cr]; A-F only. Prereq–Grad otol major)
Concepts and management of otolaryngologic allergy.

Otol 8241. Cancer of the Head and Neck. (1 cr [max 12 cr]; A-F only. Prereq–Grad otol major)
Clinical head and neck oncology; etiology, treatment (both surgical and nonsurgical), and other principles of management.

Otol 8242. Audiology and Speech Pathology. (2 cr. Prereq–Grad otol major or #) Clinical audiology and speech-language pathology, including diagnosis and treatment of conductive, sensorineural, and central hearing loss; voice disorders; swallowing disorders; velopharyngeal insufficiency related to cleft lip/palate and craniofacial anomalies; alaryngeal speech; and speech disorders related to head and neck cancer.

Otol 8243. Introduction to Research Methodology. (1 cr. Prereq–Grad otol major or #) Statistical methods, experimental design, and execution of otolaryngologic research. Ethics of research with human and animal subjects.

Otol 8244. Seminar: Current Literature. (1 cr. Prereq–Grad otol major or #) Presentation and discussion of selected articles. Required for all otolaryngology graduate students.

Otol 8247. Anatomy and Physiology of Hearing and Balance. (3 cr. §NSc 8247. Prereq–#) Structure and function of auditory and vestibular systems. Network analysis of middle and inner ear mechanics, hair cell biophysics, auditory nerve and CNS electrophysiology, information processing, neural mechanisms subserving balance and gaze, cellular morphology, and computer models.

Otol 8248. Directed Readings in Auditory Physiology. (1-2 cr [max 2 cr]; §NSc 8248. Prereq–#) Current research on biophysics and physiology of auditory system; topics selected for each student. Written reviews prepared and discussed.

Otol 8249. Current Topics in Cochlear Anatomy. (1 cr. Prereq–#) Review of current research papers concerning cochlear anatomy and pathology.

Otol 8250. Advanced Biochemistry of the Auditory System. (1 cr. Prereq–Mobl 6100, Mobl 6101 or equiv or #) Review of recent progress in biochemical aspects of auditory end organs.

Otol 8262. Advanced Clinical Audiology. (2 cr. Prereq–Grad otol major; 8242 or #) Comprehensive reading and practicum in auditory evaluation of patients. Assumes basic knowledge of clinical audiology. Each session devoted to aspect of auditory evaluation or aural rehabilitation, including behavioral audiometry, electrophysiologic evaluation, hearing aid selection, and cochlear implants.

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

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

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

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

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

Pharmaceutics (Phm)

Pharmacy (Phcl)

Pharmaceutical Research. (3 cr; A-F only. Prereq–Grad Pharm Phm major)
Pharmaceutical research with human and animal subjects. Experimental investigation of problems in pharmaceutics.

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

Phm 8411. Stabilization of Pharmaceutical. (3 cr. Prereq–Physical and organic chem survey courses) Application of physicochemical principles (e.g., chemical kinetics) to elucidate and minimize stability problems in pharmaceutical systems.

Phm 8421. Advanced Pharmacokinetics. (4 cr; A-F only) Topics in kinetics of drug absorption, distribution, metabolism, and excretion.

Phm 8441. Solid-State Properties of Drugs. (2 cr; A-F only. Prereq–Physical chem survey course or #) Physical and physicochemical properties of drugs in solid state as related to drug delivery.

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

Phm 8451. Industrial Pharmacy. (2 cr) Design, manufacture, and evaluation of modern pharmaceutical dosage forms and delivery. Preformulation studies: oral liquid and solid pharmaceutical dosage forms and optimization. Pulmonary, transdermal, and parenteral deliveries, including veterinary drug delivery systems.


Phm 8481. Advanced Neuropharmacology. (3 cr; A-F only. §Phm 8481. Nsc 8481. Prereq–Survey courses in [biochem, cell biology] or #) Delivery of compounds to the central nervous system (CNS) to activate proteins in specific brain regions for therapeutic benefit. Pharmaceutical/pharmacological issues specific to direct drug delivery to CNS.

Phm 8556. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

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

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

Phm 8900. Spec Topics in Pharmaceutics. (1-4 cr; A-F only)

Pharmaceutical Research. (3 cr; A-F only. Prereq–Grad Pharm Phm major)

Pharmaceutical Research. (3 cr; A-F only. Prereq–Grad Pharm Phm major)

Pharmacology (Phcl)

Phcl 5101. Pharmacology for Pharmacy Students. (3 cr; A-F only. Prereq–2nd yr pharmacy student or #) Action/fate of drugs.

Phcl 5102. Pharmacology for Pharmacy Students. (2 cr; A-F only. Prereq–5101 or #) Action/fate of drugs.

Phcl 5103. Pharmacology for Dental Students. (3 cr. Prereq–enrolled dental student or #) Pharmacological principles/actions of drugs.

Phcl 5109. Problems in Pharmacology. (1-18 cr [max 18 cr]. Prereq–upper div or grad student or #) Research projects and special problems by arrangement.

Phcl 5110. Introduction to Pharmacology. (2 cr; A-F only. Prereq–Grad student or #) Basic principles of Pharmacology. Focuses on molecular mechanisms of drug action.

Phcl 5111. Pharmacogenomics. (3 cr; A-F only. Prereq–Grad student or #) Human genetic variation, its implications. Functional genomics, pharmacogenomics, toxicogenomics, proteomics. Interactive, discussion-based course.

Phcl 5210. Pharmacology. (1 cr; A-F only. Prereq–Grad student or #) Principles of pharmacology. Meets with 6110.

Phcl 5211. Pharmacology. (2 cr; A-F only. Prereq–5210 or #) Continuation of 5210. Meets with 6111. Lectures on the major classes of drugs.

Phcl 5212. Pharmacology. (3 cr; A-F only. Prereq–5211 or #) Continuation of 5211. Meets with 6112.

Phcl 5462. Neuroscience Principles of Drug Abuse. (2 cr. §NSc 5462. Prereq–#) Current research on drugs of abuse, their mechanisms of action, characteristics shared by various agents, and neural systems affected by them. Offered biennially, spring semester of even-numbered years.

Phcl 8110. Advanced Pharmacology I. (3 cr; A-F only. Prereq–Biochem and physiology background, 6110 or 6111 or #) Supplement to Phcl 6110 and 6111. Contemporary research concepts and experimental approaches in the different areas of investigative pharmacology. Mechanisms of action of drugs on systems (whole animal), organ, and cellular levels.

Phcl 8111. Advanced Pharmacology II. (3 cr; A-F only. Prereq–Biochem and physiology background, 6110 or 6111 or #) Supplement to Phcl 6110 and 6112. Contemporary research concepts and experimental approaches in the different areas of investigative pharmacology. Mechanisms of action of drugs on cellular and molecular levels.

Phcl 8221. Seminar: Selected Topics in Pharmacology. (1 cr [max 8 cr]. Prereq–6112 or #) Student-presented seminars.
Phil 8207. Seminar: Psychopharmacology. (1 cr. §NSc 8207, Psy 8070. Prereq–#) For graduate students and postdoctoral investigators 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.

Phil 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.

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

Phil 8221. Neurobiology of Pain and Analgesia. (2 cr. Prereq–#) Course offered triennially.

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

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

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

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

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

**Philosophy (Phil)**

**Department of Philosophy**

**College of Liberal Arts**


Phil 5202. Symbolic Logic II. (4 cr. Prereq–2501 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 #) Attemps to answer, “What is logic?” Scope of logic. Disputes about alternative logics. Theories concerning logical truths (e.g., conventionalism: view that logical truths are contingent).

Phil 5222. Philosophy of Mathematics. (3 cr. Prereq–College level logic or mathematics course or #) Major philosophical questions arising in connection with mathematics: What is mathematics about? How do we know the mathematics we do? What is the relation between mathematics and the natural sciences. Selected readings of leading contributors such as Frege, Dedekind, Russell, Hilbert, Brunner, Godel, Quine.

Phil 5323. Education and Social Change. (4 cr, A-F only. §Phil 4325) Connections between education, social change. Theories of democratic/popular education, their application through in-depth practicum in community education setting.

Phil 5324. Ethics and Education. (3 cr. §Phil 4324. Prereq–6 cr in [philosophy or education]. What constitutes good education in terms of educational outcomes and of processes that promote learning. Connections between concepts of good education and of good society.

Phil 5325. Biomedical Ethics. (3 cr. Prereq–Grad or #) 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 5601. History of the Philosophy of Science. (3 cr. Prereq–#) History of logical empiricism, from its European origins in first half of 20th century to its emergence as nearly universal account of science in post-war Anglo-American philosophy.

Phil 5602. Scientific Representation and Explanation. (3 cr. Prereq–#) Contemporary issues concerning representation and explanation of scientific facts.

Phil 5603. Scientific Inquiry. (3 cr. Prereq–#) Philosophical theories of methods for evaluating scientific hypotheses, of role of experimentation in science, and of how hypotheses come to be accepted within a scientific community.

Phil 5605. Space and Time. (3 cr. §Phil 4605. Prereq–Courses in [philosophy or physics] or #) Philosophical problems concerning nature/structure of space, time, and space-time.

Phil 5606. Philosophy of Quantum Mechanics. (3 cr. Prereq–#) Problems of interpretation in ordinary (nonrelativistic) quantum mechanics. Two-slit experiment, Schrödinger 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 5611. Philosophy of the Social Sciences. (3 cr. §Phil 4611. Prereq–[3 cr of [philosophy or social science], grad student] or #) Criteria for describing/explaining human actions. Problems of objectivity, reduction, freedom.


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

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

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

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


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 8131. Epistemology Survey. (3 cr) Survey, against background of traditional issues, of contemporary developments in theory of knowledge.

Phil 8133. Feminist Theories of Knowledge. (3 cr. §WoSt 8103) Interdisciplinary seminar; feminist approaches to knowledge and criticism of paradigms of knowledge operative in the disciplines. Feminists’ use of concepts of subjectivity, objectivity, and intersubjectivity; feminist empiricism, standpoint theory, and postmodern and postcolonial theorizing.

Phil 8180. Seminar: Philosophy of Language. (3 cr [max 6 cr. Prereq–#) Topics vary by offering.

Phil 8182. Formal Semantics of Natural Language. (3 cr, A-F only. §Ling 8221. Prereq–Phil 5201 or #) Truth-conditional model-theoretic semantics applied to treatment of opacity, intensionality, quantification, and related phenomena in natural language.

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

Phil 8210. Seminar: Logical Theory. (3 cr [max 6 cr. Prereq–[5201, 5205] or #) Topics vary by offering.

Phil 8220. Seminar: Philosophy of Mathematics. (3 cr [max 6 cr. Prereq–5202 or [4xxx or 5xxx] math course or #) Topics such as significance of limitative metamathemers (Godel, 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–#). Prereq–4xxx moral phil or 4xxx pol phil) Topics vary by offering.

For definitions of course numbers, abbreviations, and symbols, see page 167.
Phil 8330. Seminar: Moral Philosophy. (3 cr [max 9 cr].
Prereq-4310 or 4320 or 4330 cr or #)
Topics cover problems relating to ethical discourse.
Phil 8320. Seminar on Medical Ethics. (3 cr [max 6 cr].
Prereq-4000 or 5000 ethics course or #)
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-4321 or 4414 cr or #)
Topics vary by offering.
Phil 8444. FTE: Doctoral. (1 cr. Prereq-Doctoral student,
adviser and DGS consent)
Phil 8500. Workshop in Aesthetics. (1 cr [max 4 cr].
Prereq-4000 aesthetics course, #)
Topics vary by offering.
Phil 8510. Seminar: Aesthetics Studies. (3 cr [max 6 cr])
Topics vary by offering.
Phil 8550. Seminar: Philosophy of Religion. (3 cr [max 6 cr].
Prereq-4521 cr or #)
Topics vary by offering.
Phil 8600. Workshop in the Philosophy of Science. (1 cr [max 4 cr].
Prereq-4000 phil of sci course, #)
Topics vary by offering.
Phil 8606. Seminar: Philosophy of Medicine and the
Biomedical Sciences. (3 cr)
Aims and goals of medicine; concepts of health,
illness, and disease; nature of reasoning in clinical
medicine; theoretical evolution in medicine; and role
of values in practice of medicine and healthcare.
Phil 8610. Seminar: History of Modern Physical Sciences. (3 cr [max 6 cr].
Prereq-#)
Topics specified in Class Schedule.
Phil 8620. Seminar: Philosophy of the Biological Sciences. (3 cr [max 6 cr])
Topics vary by offering.
Phil 8640. Seminar: Philosophy of the Cognitive Sciences. (3 cr [max 6 cr].
SCEGC 8600. Prereq-#)
Philosophical framework for analyzing cognitive sciences.
Recent developments in metaphysics/ epistemology.
Nature of scientific theories, methodologies of cognitive sciences, relations among
concepts. Relation of cognitive science to epistemology and to various philosophical problems.
Topics vary by offering.
Phil 8660. Seminar: Social and Cultural Studies of Science. (3 cr [max 6 cr].
SST 8420)
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].
Prereq-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)
Phil 8670. Seminar: Philosophy of Science. (3 cr [max 6 cr].
Prereq-#)
Topics vary by offering.
Phil 8710. Seminar: Feminist Philosophy. (3 cr [max 6 cr].
Prereq-4622 or 5622 or WST 4122 or WST 5122 or #)
Topics vary by offering.
Phil 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr].
Prereq-Max 18 cr per semester or summer; 10 cr total required [PhA only])
PhD 8888. Thesis Credit: Doctoral. (1-24 cr [max 100 cr].
Prereq-Max 18 cr per semester or summer; 24 cr required)
PhD 8893. Directed Study. (1-3 cr [max 6 cr]. Prereq-#)
PhD 8894. 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 core gen psych, one course abnorm psych)
Issues related to medical/community management and to
roles of OT/PT with respect to clients with mental
health needs. Interaction between physical/mental
health and disability.

PMed 5122. Descriptive Neurology. (2 cr; A-F only.
Prereq–OT student or 
Relates neuroanatomical/neuropsychological
principles to neurological conditions commonly seen
in occupational/physical therapy practice.

PMed 5161. Theory of Physical Medicine and Rehabilitation
Applied to Medical Sciences. (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
Neuropsychology. (4 cr; A-F only.
Prereq–Registered
Occupational therapy student or 
Neuromotor structures as functional systems, basic
neuropsychologic concepts. Emphasizes applications
for understanding/treating physical dysfunctions.

PMed 5214. Clinical Practice of Physical Therapy. (1 cr; S-N
only. Prereq–Registered PT student)
Clinical visitation.

PMed 5215. Clinical Practice of Physical Therapy I. (1 cr
[max 2 cr]; S-N only.
Prereq–Reg 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 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 aspects of
disability, use of community resources. Offered
summer session.

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

PMed 5311. Clinical Biomechanics. (5 cr; A-F only.
Prereq–Intro, intro physics)
Analysis of motion,leftrightarrow andthermodynamics:
forces/structures internal/external to body
responsible for normal/abnormal human movement.
Analysis techniques, independent assignments.
Muscle function, palpation, posture. Gait of normal
individuals, analysis to detect deviation from norm.

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

PMed 5284. Musculoskeletal II. (4 cr; A-F only.
Prereq–Enrolled 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
ambulation, joint mobilization, splinting, patient
education. Second of two-course sequence.

PMed 5287. Neuromuscular II. (4 cr; A-F only.
Prereq–Enrolled PT student)
Assessment and rehabilitation of patients with
neuromuscular conditions (e.g., cerebral vascular
stroke, Parkinson’s disease, myasthenic syndrome).
Using treatment procedures, orthotics, and equipment
to improve function and prevent, stabilize, or decrease
impairments.

PMed 5288. Neuromuscular III. (4 cr; A-F only.
Prereq–Registered PT student)
Pediatric assessment/rehabilitation for neurological,
orthopedic, cardiac, prematurity, transplant,
and behavioral conditions. Preparation for adult
assessment/treatment with neurological, general
medical, and vascular disease. Students use etiologic
knowledge to assess patients in clinic and establish
treatment plans and goals.

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

PMed 5313. Therapeutic Occupation. (4 cr; A-F only.
Prereq–Enrolled 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–5393 or #)
Assessment/concepts/techniques. Application to
patient populations with both mental health/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 or #)
Applies critical thinking model to assessment/ intervention of selected patient populations with
mental/physical problems requiring specialized approaches.
Focus on rehabilitation/behavioral treatment of
populations with multiple performance component
deficits. Fieldwork.

PMed 5344. Neurorhabilitation: 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 [max 2 cr]; A-F only.
Prereq–Enrolled OT 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
indigenous/family influences on individual health and
decision making. Students identify current trends in
health care and determine responses to them at social,
political, or legislative level.
Skills needed to plan, implement, and evaluate adult educational programs/materials for patient/family education, peer/professional education, and education of others in order to carry out therapeutic interventions. Student teaching unit, community based activity.

PMed 5376. Adult Education and Planning. (1 cr; A-F only. Prereq–5373 or #) Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory/skills.

PMed 5380. Management of Occupational Therapy Services. (3 cr; A-F only. Prereq–[5360, 5375, 5376] or #) Analysis of scientific literature, development of research proposals.


PMed 5393. Orthotics. (3 cr; A-F only. Prereq–5341 or #) Analysis, design, and construction of orthotic devices.

PMed 5395. Independent Study in Occupational Therapy. (1-4 cr [max 16 cr. Prereq–Enrolled OT student or #) Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory/skills.

PMed 5398. Fieldwork Education in Occupational Therapy III: Optional. (1-6 cr [max 6 cr; S-N only. Prereq–Occupational therapy student 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/skills.

**PMed 8322. Fieldwork Education in Occupational Therapy III: Optional. (1-6 cr [max 6 cr; S-N only. Prereq–Occupational therapy student 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/skills.**

**Physical Therapy (PT)**

**Department of Physical Medicine and Rehabilitation**

**Medical School**

**PT 8131. Research Seminar I.** (1 cr; A-F only. Prereq–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 8132. Research Seminar in Physical Therapy II.** (1 cr; A-F only. Prereq–8131, 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. Prereq–Master’s student, adviser and DGS consent) Supervised clinical practice in affiliated hospitals and community agencies. Students apply critical thinking through supervised application of theory/skills.

**School of Physics and Astronomy**

**Institute of Technology**


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

**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 5071. Physics for High School Teachers: Experimental Foundations and Historical Perspectives.** (3 cr. Prereq Gen physics. #; no cr for physics grad or grad physics minor) In-depth examination of a conceptual theme in physics, its experimental foundations and historical perspectives. Kinematics and dynamics from Aristotle through Einstein; nature of charge and light; energy and thermodynamics; electricity, magnetism, and quantized fields; structure of matter.

**Phys 5081. Introduction to Biophysical Physics.** (3 cr. Prereq 4911. Prereq–Working knowledge of [thermodynamics, statistical mechanics]) Introduction to biological and soft condensed matter physics. Emphasizes physical ideas necessary to understand behavior of macromolecules and other biological materials.

**Phys 5201. Thermal and Statistical Physics.** (3 cr; A-F only. Prereq–4201, Prereq–2801 or equivalent) Principles of thermodynamics and statistical mechanics. Selected applications such as kinetic theory, transport theory, and phase transitions.

**Phys 5401. Physiological Physics.** (4 cr. Prereq–1301 or 1401) Musculoskeletal system, circulatory system/membrane transport, biological control systems, propagation/action potential in nervous system, biomagnetism, electromagnetism at cellular level.

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

**Phys 5761. 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 5762. Solid State Physics for Engineers and Scientists.** (4 cr. Prereq–5701 or #) Diamond and paramagnetics; ferromagnetism and antiferromagnetism; optical phenomena; lasers; superconductivity; surface properties; ferroelectricity.

**Phys 5995. Colloquium Seminar.** (1 cr; S-N only. Prereq–Grad student or advanced undergrad in physics) Colloquium of School of Physics and Astronomy.

**Phys 5990. Introduction to Research Seminar.** (1 cr [max 3 cr]. S-N only. Prereq–Grad student or advanced undergrad in physics) Introduction to the research activities of the School of Physics and Astronomy.

**Phys 5993. Directed Studies.** (1-5 cr [max 15 cr. Prereq–#) 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–#) Directed research, 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. Invariance 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 instants 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 Physics Teaching and Higher Education. (1 cr [max 3 cr]) Lectures and informal discussions of courses and curricula, techniques, and materials important in undergraduate physics instruction; relation to general problems of higher education.

Phys 8161. Atomic and Molecular Structure. (3 cr. Prereq–Level of mathematics associated with BS in physical sciences) Emphasizes interpretation of quantum numbers and selection rules in terms of symmetry. Experimental data summarized and compared with theoretical predictions.

Phys 8200. Seminar: Cosmology and High Energy Astrophysics. (1 cr [max 6 cr]; S-N only. Prereq–#) Current topics in cosmology and high energy astrophysics.


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

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

Phys 8550. Plan B Project. (4 cr. Prereq–#; may be taken once to satisfy Plan B master’s 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) 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 heliosphere and in astrophysical environments; solar physics, including radiation and magnetic field effects; solar wind and magnetospheric physics; 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]) Prereq–Max 18 cr per semester or summer; doctoral student who has not completed prelim exams

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


Phys 8750. Advanced Topics in Condensed Matter Physics. (3 cr [max 9 cr]) Prereq–8712 or #) Sample research topics: magnetism, superconductivity, low temperature physics, superfluid helium.

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

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

Phys 8801. Nuclear Physics I. (3 cr. Prereq–5001 or concurrent reg in 5001) 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 Credit: Doctoral. (1-24 cr [max 100 cr]) Prereq–Max 18 cr per semester or summer; 24 cr required.


Phys 8950. Advanced Topics in Elementary Particle Physics. (3 cr [max 9 cr]) Prereq–8802 or #) Research topics.

Phys 8994. Research in Physics. (1-12 cr [max 24 cr]) Prereq–#) Research under faculty direction.

Physiology (Phsl)

Department of Physiology

Medical School

Phsl 5061. Principles of Physiology for Biomedical Engineering. (4 cr. Prereq–Biomedical engineering grad, one yr college chem and physics and math through integral calculus) Human physiology with emphasis on quantitative aspects. Organ systems (circulation, respiration, renal, gastrointestinal, endocrine, muscle, central and peripheral nervous systems), cellular transport processes, and scaling in biology.

Phsl 5094. Research in Physiology. (1-5 cr [max 20 cr]) Prereq–Independent lab research project in physiology, supervised by physiology faculty.

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

PIPa 5102. Epidemiology and Genetics of Host-Parasite Interactions. (3 cr; A-F only. Prereq–[5201 or equiv], GDG 3022) 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.


PIPa 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.

PIPa 5202. Field Plant Pathology. (2 cr) 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.

PIPa 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. Representative species of fungi observed and manipulated.


PIPa 5300. Current Topics in Molecular Plant Pathology. (1 cr [max 2 cr. Prereq–Biol 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 discipline).

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

PIPa 5302. Genomics of Plant-Associated Microbes. (3 cr; A-F only. Prereq–Biol 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, sequencing, gene silencing, knock-out, ESTs, microarrays, bioinformatics. Online training modules, field trips, guest lectures, individual/group projects.

PIPa 5399. Special Workshop in Plant Pathology. (1-4 cr [max 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.

PIPa 5005. Supervised Classroom or Extension Teaching Experience. (2 cr; A-F only. §Agro 8005, BAE 8805, Hort 8005, Soil 8005. Prereq–#) 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.

PIPa 8090. Advanced Procedures and Research in Plant Pathology. (1-8 cr [max 8 cr]) Special assignment in lab and field problems in pathological research.

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


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


PIPa 8333, FTE: Master’s. (1 cr. Prereq–Master’s student, adviser and DGS consent) PIPa 8444, FTE: Doctoral. (1 cr. Prereq–Doctoral student, adviser and DGS consent)

PIPa 5500. Perspectives in Plant Pathology. (2 cr [max 4 cr]; S-N only) Integrative overview of the field. For Ph.D. students nearing end of formal classroom experience.

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

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

PIPa 8888. Thesis Credit: Doctoral. (1-24 cr [max 100 cr]. 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 [max 3 cr]) Topics specified in Class Schedule.

Plsh 5993. Directed Readings. (1-3 cr [max 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. §Pol 4210. Prereq–§3210, grad student)


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

Pol 5253. Modernity and its Discontents: Late Modern Political Thought. (4 cr §). §Pol 4253. Prereq–§: 3253) Theoretical responses to and rival interpretations of Western economy, society, politics, and democratic culture in the modern age: philosophy of history; class struggle; end of metaphysics and death of God; technology and bureaucracy; psychology of culture in Hegel, Marx, Toqueville, Mill, Nietzsche, Weber, Freud.

Pol 5275. Contemporary Political Thought. (3 cr. Prereq–§: 4275. grad student; 1201 recommended) 20th-century crisis of Western humanism in major works of contemporary political thought from World War II to present. Force and freedom. Ideology and truth. Authority and resistance. Thinkers may include Arendt, Canuto, Beauvoir, Fanon, Foucault, Habermas, Rawls, Sartre, Said. Ideas may include communitarianism, feminism, postcolonialism, postmodernism, socialism.

Pol 5280. Topics in Political Theory. (3-4 cr. Prereq–§: 4280. grad student) Topics in historical, analytical, or normative political theory. Topics vary, see Class Schedule.

Pol 5306. Presidential Leadership and American Democracy. (3 cr. §Pol 4308. Prereq-Grad student or #) Examines whether president's political and constitutional powers are sufficient to satisfy citizens' high expectations and whether president should be expected to dominate American politics.


Pol 5309. Justice in America. (3 cr. Prereq-§: 4309; [1001 or 1002], [non-pol sci grad major or equiv or #]) American judiciary, selection of judges, how/why these individuals/institutions behave the way they do. What influences judicial decisions. What impact decisions have. Why people comply with them.

Pol 5310. Topics in American Politics. (3 cr. Prereq-Grad student or #) See Class Schedule for description.


Pol 5322. Rethinking the Welfare State. (3-4 cr. Prereq-§: 4322; grad student) Competing arguments about welfare states in advanced industrial countries. Whether welfare states result from sectional interests, class relations, or citizenship rights. Compares American social policy with policies in other western countries.


Pol 5331. Thinking Strategically in Domestic Politics. (3-4 cr. Prereq-§: 4331; grad student) Applications of rational-choice and game theories to important features of domestic politics in the United States and elsewhere.

Pol 5410. Topics in Comparative Politics. (3 cr. Prereq-§: 4410; grad student) Topics of current analytical or policy importance. Topics vary, see Class Schedule.


Pol 5421. Governments and Markets. (3-4 cr. §: 5-3 only. Prereq-§: 4481; 1054 or 3051 or non-pol sci grad student or #) Connection between democracy and markets. Focuses on countries in North America, Europe.


Pol 5501. Supreme Court and Constitutional Interpretation. (3 cr. Prereq-Grad student or #) Historical/analytical approach to Court's landmark decisions. Theory/techniques of judicial review. Court's authority related to wider political/social context of American government.

Pol 5502. Supreme Court, Civil Liberties, and Civil Rights. (3 cr. Prereq-§: 4502; 1001 or 1002 or equiv or non-pol sci grad student or #) Supreme Court's interpretation of Bill of Rights, 14th amendment. Freedom of speech, press, religion, Crime/punishment. Segregation/desegregation, affirmative action. Abortion/privacy.

Pol 5525. Federal Indian Policy. (3 cr. §A-F only. Prereq-§: 4525; Amin 4525; grad student) Formulation, implementation, evolution, comparison of Indian policy from pre-colonial times to self-governance of new millennium. Theoretical approaches to federal Indian policy. Major federal Indian policies. Views/attitudes of policy-makers, reactions of indigenous nations to policies. Effect of bodies of literature on policies.

Pol 5561. Comparative Legal Systems. (3 cr. §Pol 4561. Prereq-Grad student or #) Survey of principal legal systems of Western world. Role of legal system in relation to various political/economic systems. Contrast between common law and civil law traditions.


Pol 5766. American Political Culture and Values. (3-4 cr. Prereq-§: 4766; 1001 or equiv or non-pol sci grad student or #) Individualism, freedom, equality. Dominant beliefs about democratic principles, materialism, capitalism, citizenship, patriotism/heroism.

Pol 5767. Public Opinion and Voting Behavior. (3 cr. §Pol 4767. Prereq-Grad student or #) Major factors influencing electoral decisions. Political attitude formation/change. Data analysis lab required.

Pol 5810. Topics in International Politics and Foreign Policy. (3-4 cr. [max 8 cr]. Prereq-§: 4810; grad student) Selected issues in contemporary international relations. Topics vary, see Class Schedule.

Pol 5833. The United States in the Global EconomyUS For Econ Policy. (3-4 cr. Prereq-§: 4833; grad student; 3835 recommended) Domestic/international politics of United States. Foreign economic policy (trade, aid, investment, monetary, migration policies). Effects of policies and international economic relations on U.S. economy/politics.

Pol 5872. Global Environmental Politics. (3 cr. Prereq-§: 3872; non-pol sci grad only) Emergence of the environment as a key aspect of the global political agenda. Non-governmental and government international organizations. Politics of protection of the atmosphere, rain forests, seas and other selected issues. International security and the environment.


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


Pol 5887. Thinking Strategically in International Politics. (3 cr. A-F only. Prereq-§: 4887; grad student) Applications of game theory to international politics. Conflicts/cooperation, global environmental commons, deterrence/reputation.

Pol 5889. Governments and Global Trade and Money. (3 cr. §Pol 4889. Prereq-3035 or grad student or #) Politics of international trade and monetary affairs, including north-south and east-west relations.

Pol 5970. Individual Reading and Research. (1-4 cr. [max 4 cr. Prereq-§: 2]) Guided individual reading or study.

Pol 8101. Introduction to Political Science. (3 cr. [max 4 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, behavioralism, rational choice, and critical theory); problems of theory, interpretation, concept-formation, comparison, measurement and experimentation; designs for research.


Courses

Pol 8120. Core Course in Political Methodology: Modelling Political Processes. (3 cr. Prereq–Pol sci grad major or #) Methods used and potential for creating models of political processes. Designing political institutions, discerning/forecasting election outcomes, producing early warnings of international conflicts, increasing turnout in elections. Using mathematics to study political strategy and collective decision making in committees/legislatures. Using statistics to measure political variables, design experiments with human subjects, and test micro/macro political theories.

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 model in political science.

Pol 8124. Game Theory. (3 cr. Prereq–B1122, grad pol sci major 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 or #) Intersection of statistical methodology and deductive modeling; issues in merging inductive and deductive research. Sample topics: parties and elections, probabilistic voting, strategic modeling of international relations.

Pol 8160. Topics in Models and Methods. (1-3 cr [max 12 cr]. Prereq–Grad pol sci major or #) Seminars on selected topics.

Pol 8201. Understanding Political Theory. (3 cr [max 4 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 Americanism, 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 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 Wolfenstein; 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, Tocqueville, 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 Immanuel Kant’s “The Idea of World War I” to the present. Survey of range of texts or intensive focus on such authors as Adorno, Arendt, Derrida, Foucault, Habermas, Horkheimer, Rawls, Said. Sample topics: feminism, postmodernism, communitarianism, Frankfurt School, postcolonialism.

Pol 8301. American Politics. (3 cr [max 4 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 movement formation, maintenance, and decline. How interest groups and social/political movements attempt to influence public policy. Impact/effectiveness groups/movements as agents of democratic representation, particularly for marginalized groups.

Pol 8307. Prossematics in Political Psychology I. (1 cr; S-N only. §Sep 8211. Prereq–Grad pol sci major or pol psych minor or #) Readings, discussion, and guest speakers. Topics vary by semester.

Pol 8308. Prossematics in Political Psychology II. (1 cr; S-N only. §Sep 8212. 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 and enforcement 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 politics and institutional politics.

Pol 8333. FTE: Master’s. (1 cr. Prereq–Master’s student, adviser and DGS consent) Theoretical approaches: incrementalism, innovation and policy learning, comparative policy outputs, policy process models, interest groups, and selected areas of public policy.


Pol 8360. Topics in American Politics. (1-3 cr [max 3 cr]. Prereq–Grad pol sci major or #) Readings/research in special topics or problems.

Pol 8401. International Relations. (3 cr. Prereq–Grad pol sci major or #) Basic theories/approaches to study of international politics. Surveys representative work/central issues of scholarship.

Pol 8402. Conflict Dynamics and Security. (3 cr. Prereq–Grad pol sci major or #) Introduction to contending theories of international conflict and national security.
Pol 8403. International Norms and Institutions. (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. §CSDS 8404. Prereq–Grad pol sci major or #) Asymmetry of relations and processes of international relations; systemic conditions and implications of informal empire 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, labor markets, creation and maintenance of international regimes, and “globalization” of economic liberalism.

Pol 8406. Politics of International Finance. (3 cr; A-F only. Prereq–Grad pol sci major or #) Relationship between workings of the international political system and that of international markets for currency and capital.

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

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–Grad 8410 or #) U.S. policy toward foreign states and peoples: heritage, motivations, policy processes, what the public generally knows and wants, specific policies. Rise of internecine issues and decline of enemy-focused internationalism; implications for process and content of U.S. foreign policy.

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

Pol 8460. Topics in International Relations. (3 cr. Prereq–Grad pol sci major or #) Reading 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 coalition bases, parties and social movements, and constitutional structures. Theories have broad relevance for the field of comparative politics.

Pol 8605. Government and Politics in Africa. (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.

Pol 8608. Government and Politics of Russia and the Commonwealth of Independent States. (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 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 theory on development, democracy and redemocratization, 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 8637. Comparative Political Economy. (3 cr; A-F only. Prereq–Grad pol sci major or #) Examination of 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–Grad pol sci 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.

For definitions of course numbers, abbreviations, and symbols, see page 167.
Courses


Port 8333. FTE: Master’s. (1-3 cr. Prereq—Master's student, adviser and DGS consent) 

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

Port 8920. Seminar: Lusophone Literatures and Cultures. (2 cr or [max 4 cr]. Prereq—Jr. Problems pertaining to Portuguese, Brazilian, and/or Lusophone African cultures and literatures. Topics specified in Class Schedule. 

Psychology (Psy)

Department of Psychology

College of Liberal Arts

Psy 5012. Learning and Cognition in Animals. (4 cr. Prereq—3011 or 4011 or honors or grad student or #) Review/evaluation of key questions, methods, theories, and data about forms of learning and elementary cognitive processes. Emphasizes animal models. Implications for human learning/behavior. 

Psy 5014. Psychology of Human Learning and Memory. (3 cr. Prereq—3011 or 3051 [except for honors/grad student]) 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 for honors/grad student]) Human cognitive abilities (perception, memory, attention) from different perspectives (e.g., cognitive psychological approach, cognitive neuroscience approach). 

Psy 5016. Mathematical Models of Human Behavior. (3 cr. Prereq—Math 1271 or #) Mathematical models of complex human behavior, including individual/group decision making, information processing, learning, perception, and overt action. Specific computational techniques drawn from decision theory, information theory, probability theory, machine learning, and elements of data analysis. 

Psy 5031. Perception. (3 cr. §Psy 5031W, Prereq—3031 or 3051 or #) Cognitive, computational, and neuroscience perspectives. Topics include color vision, pattern vision, image formation in the eye, object recognition, reading, and impaired vision. 

Psy 5034. Psychobiology of Vision. (3 cr. §Psy 5034. Prereq—3031 or #) Analysis of the properties and biological bases of visual perception in 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 5036. Computational Vision. (3 cr. Prereq—[3031 or 3031], [Math 1272 or equal] 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. §Psy 5037. Prereq—3031 or #) Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing, perception of complex sounds including music and speech, clinical, and other applications. 

Psy 5038. Introduction to Neural Networks. (3 cr. Prereq—[3081 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 concepts. Applications to sensory processing, perception, learning, memory. 


Psy 5054. Psychology of Language. (3 cr. Prereq—3005W or honors or grad student) Theories/experimental evidence in past/present conceptions of psychology of language. 

Psy 5061. Neurobiology of Behavior. (3 cr. §Psy 3061. Prereq—3005W or Biol 1009 or #) Physiological/neuromodulatory 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 psychopathological disorders. 

Psy 5101. Personality Psychology. (3 cr. §Psy 3101. Prereq—§: 3101; 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. §Psy 3135. Prereq—3005W or 5862 or equiv or #) Differential methods in study of human behavior. Psychological theories of individual differences, age, sex, heredity, and environment in individual/group differences in ability, personality, interests, and social attitudes. 


Psy 5138. Psychology of Aging. (3 cr. §Psy 3138. 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—3201 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. §A-F only. Prereq—3201 or honors or grad student or #) Introduction to interpersonal relationship theory/research findings. Emphasizes conceptual/methodological issues. 

Psy 5255. Applied Social Psychology. (3 cr. Prereq—3201 or graduate student or #) Applications of social psychological research/theory to domains such as physical/mental health, education, the media, desegregation, the legal system, energy conservation, public policy. 

Psy 5262. Social Psychology and Health Behavior. (3 cr; #A-F only. Prereq—3201 or grad student) Survey of social psychological theory/research pertaining to processes by which people develop beliefs about health/illness. Relationship between these beliefs, adoption of health-relevant behavior. Effect of psychological factors on physical health. 

Psy 5270. Personality and Social Behavior. (3 cr; A-F only. Prereq—3101 or 3201 or honors or grad student or #) Conceptual/methodological strategies for scientific study of individuals and their social worlds. Applications of theory/research to issues of self, identity, and social interaction. 

Psy 5501. Vocational and Occupational Health Psychology. (3 cr. Prereq—3005 or #) Survey of history, concepts, theories, methods, and findings of vocational/occupational health psychology. Burnout, personality, violence, stressors/stress-relations, counter productive behaviors, coping in workplace. Vocational development/assessment, career decision-making/counseling, person-environment fit. 

Psy 5604. Abnormal Psychology. (3 cr. §Psy 3604. Prereq—honors or grad student or #) Comprehensive review of psychopathological disorders. Etiology, diagnostic criteria, clinical research findings. 

Psy 5666. Clinical Psychophysiology. (3 cr. Prereq—3005 or equiv, 3061 or 3064, 3004 or 5061 or #) How psychophysiological methods such as autonomic and central nervous system recording are used in the study of major psychopathological disorders. 

Psy 5707. Personnel Psychology. (4 cr. Prereq—[3005W or equiv], 3711 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 treatment interactions. 

Psy 5708. Organizational Psychology. (4 cr. §Psy 5702, Psy 5705, Psy 4500 [or equival], 3711 or #) Psychological causes of behavior in work organizations. Consequences for individual fulfillment and organizational effectiveness. Individual differences, social perception, motivation, stress, job design, leadership, job satisfaction, teamwork, organizational culture. 


Psy 5960. Topics in Psychology. (1-4 cr [max 8 cr]. Prereq—1001, [1 or 2 cr grad student]) Special course or seminar. Topics listed in psychology office. 

Psy 8004. Philosophical Psychology. (2 cr. §S-N only. Prereq—logic or phi course, psych, ICD, or phi PhD student, or #) Selected philosophical and methodological problems. 

Psy 8010. Advanced Topics in Learning. (2 cr; S-N only. Prereq—5202 or #) Contemporary topics in learning and behavior theory.
Courses

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

Psy 8026. Neuro-Immune Interactions. (3 cr. §CMB 8361, NSc 8026. Prereq-MCbi 4131 or equiv, NSc 5111 or equiv) Regulatory systems (neuroendocrine, cytokine, and autonomic nervous systems) linking brain and immune systems in brain-immune axis. Functional effects of bidirectional brain-immune regulation.


Psy 8036. Topics in Computational Vision. (3 cr [max 12 cr], Prereq–Psy 5031 or 5363 or equiv or #) Recent research in visual psychophysics, visual neuroscience, and computer vision.


Psy 8055. Seminar: Cognitive Neuroscience. (1-4 cr [max 3 cr] Prereq–Psy 5051 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–Psy 5012 or 5061 or 5062 or 5064 or Nsc 5051 or 8010 or Phyl 6301 or Nsc 8401 or #) Neurobiological substrates of psychological processes such as memory, attention, and emotion. Neurobiological substrates of mental dysfunction.


Psy 8107. Personality, Culture, and Society. (3 cr; A-F only. Prereq–Psy 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. Prereq–#) Historical perspectives and current theories concerning interpersonal strategies of impression management and interplay between private and public self.

Psy 8204. Social Psychology of Prejudice and Intergroup Relations. (3 cr) Race, ethnicity, gender, and national origin. Approaches, findings, and controversies in research on social psychology of prejudice, racial attitudes, and intergroup relations. Topics related to work on political science and sociology.


Psy 8206. Proseminar: Research in Social Psychology. (2 cr [max 6 cr]; S-N only. Prereq–Psy, PhD student, Psy 8205) Contemporary theoretical positions and related research.

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


Psy 8211. Proseminar in Political Psychology I. (1 cr; S-N only. §Pol 8307. Political Psychology grad major) Readings, discussion, and guest speakers. Topics vary each semester.

Psy 8212. Proseminar in Political Psychology II. (1 cr; S-N only. §Pol 8308. Political Psychology grad major) Readings, discussion, and guest speakers. Topics vary each semester.

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

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

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

Psy 8501. Counseling Psychology: History and Theories. (3 cr. Prereq–Counseling psych grad student or #) History of counseling psychology and current theories related to the practice of counseling psychology. Historical and contemporary theories and research.

Psy 8502. Assessment in Counseling Psychology. (3 cr. Prereq–Counseling psych grad student or #) History of counseling psychology and current theories related to the practice of counseling psychology. Historical and contemporary theories and research.

Psy 8503. Interviewing and Intervention. (3 cr. Prereq–Psy 8501 or #) Vignettes-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 [max 6 cr]; S-N only. Prereq–Psy, Counseling psych grad student, Psy 8502 or Psy 8503 or equiv, #) Applied practice experiences in counseling psychology settings.

Psy 8511. Counseling Psychology Beginning Practicum: General. (1-6 cr [max 18 cr]; S-N only. Prereq–Psy, Counseling psych grad student, Psy 8501 or Psy 8502 or equiv, #) Applied practice experiences in counseling psychology settings.

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

Psy 8514. University Counseling Practicum I. (4-6 cr [max 6 cr]; S-N only. §Psy 8513. Prereq–Counseling psych grad student, Psy 8501, 8502, 8503 or equiv, #) Integrates science with supervised practice in University Counseling and Consultation Services (UCCS) involving career, academic, and personal counseling clientele.

Psy 8515. University Counseling Practicum II. (4-6 cr [max 6 cr]; S-N only. §Psy 8514. Prereq–Counseling psych grad student, Psy 8501, 8502, 8503 or equiv, 8514, #) Integrates science with supervised practice in University Counseling and Consultation Services (UCCS) involving career, academic, and personal counseling clientele.

Psy 8541. Seminar: Multicultural Issues in Counseling Psychology. (3 cr. Prereq–Counseling psych grad student or #) Ethical principles and codes of conduct for psychologists. Ethical dilemmas faced by psychologists, practitioners, and teachers.

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 psychologists, practitioners, and teachers.

Psy 8545. Counseling Psychology Process and Outcome Research. (3 cr. Prereq–Psy, Counseling psych grad student or #) Research problems specific to professional issues, research design, methodological issues, analogue research, process/outcome research.

Psy 8550. Assessment: WAIS-III. (3 cr. Prereq–Counseling psych grad student or #) Skills acquisition for administering, scoring, and summarizing results of Wechsler Adult Intelligence Scale-III (WAIS-III).

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

Psy 8560. Counseling Psychology Advanced Practicum I: General. (1-6 cr [max 6 cr]; S-N only. Prereq–Psy, Counseling psych grad student or equiv, 8510 or 8514, #) Applied practice experience in counseling psychology settings and seminars. May include guest speakers, readings, and student presentations.

Psy 8561. Counseling Psychology Advanced Practicum II: General. (1-6 cr [max 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.

Psy 8562. Counseling Psychology Advanced Practicum III: General. (1-6 cr [max 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.
Courses

Psy 8565. Counseling Psychology Advanced Practicum I: Vocational Assessment. (1-6 cr [max 6 cr]; S-N only. Prereq–[[5801, 5802, 5803] or equiv], [5814, 5815] or equiv, counseling psych grad student) or #) Applied practice experience in vocational assessment clinic of Department of Psychology. Career/vocational testing, assessment, decision making.

Psy 8566. Counseling Psychology Advanced Practicum II: Vocational Assessment Clinic. (1-6 cr [max 6 cr]; S-N only. Prereq–5851, 5852, [5803 or equiv], 5814, [5815 or equiv], counseling psych grad student, or #) Applied practice experience in Vocational Assessment Clinic of Department of Psychology. Career/vocational testing, assessment, decision making.

Psy 8567. Counseling Psychology Advanced Practicum III: Vocational Assessment Clinic. (1-6 cr [max 6 cr]; S-N only. Prereq–Counseling psych grad student, 5851, 5852, 5853 or equiv, 5814, 5815 or equiv, or #) Applied practice experience in Vocational Assessment Clinic of Department of Psychology. Career/ vocational testing, assessment, and 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 8571. Assessment I. (5 cr; A-F only. Prereq–Clinical psychology grad student) Theory and practice in clinical application of assessment techniques and interviewing. Lab: observations, administration, scoring, interpretation.

Psy 8512. Assessment II. (5 cr; A-F only, Prereq–Psy6611, clinical psych grad student) Theory and practice in clinical application of assessment techniques and interviewing. Lab: observations, administration, scoring, interpretation.

Psy 8620. Clinical Psychology Practicum. (1-6 cr [max 36 cr]; S-N only. Prereq–#) Field experience in professional work in clinical settings.


Psy 8622. Treatment I. (3 cr; A-F only. Prereq–Psy6111, CSPR grad student) Methodological issues in treatment research, theories of change/motivation. Empirically supported therapies for anxiety, mood, and personality disorders, psychosis, and addiction. Simulating therapeutic interactions to prepare students to provide therapy.

Psy 8640. Research Seminar. (2 cr; S-N only, Prereq–Clinical psych grad student) Current topics for first-year clinical psychology graduate students.

Psy 8866. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr], Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim exams) Senior thesis research, data collection, analysis, and preparation of a major research paper for the dissertation.

Psy 8701. Seminar in Industrial and Organizational Psychology I. (3 cr, A-F only) 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–#) Determinants of behavior, performance, job satisfaction that can be influenced after an individual enters an organization. Application of research/theory in motivating and managing human factors to enhancement of job performance/satisfaction.

Psy 8703. Seminar in Industrial and Organizational Psychology III. (3 cr; A-F only) Developing issues and trends in current research, research methodological advances, and implementation of relevant important and controversial developments.

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


Psy 8817. Seminar: Psychometric Methods. (1 cr) Reviews and individual research on current topics in psychometric measurement, statistics.


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

Psy 9935. Readings in Behavioral Genetics and Individual Differences Psychology I. (1 cr [max 10 cr]; S-N only. Prereq–Psych 5135, 5137 or equiv, or #) Each week participants read and discuss one or two primary research articles.


Psy 9960. Graduate Seminar in Psychology. (1-4 cr [max 36 cr], Prereq–Psychology grad student or #) Graduate seminar in subject of current interest in psychology.


Psy 9993. 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 9995. Research Problems. (1-6 cr [max 36 cr]) Research problems.

Public Affairs (PA)

Hubert 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 hth 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 public policy or #) Process of public policy analysis from problem structuring to communication of findings. Commonly used analytical methods. Alternative models of analytical problem solving.


PA 5004. Introduction to Planning. (3 cr; A-F only. Prereq–Major in urban/regional planning or #) History, institutional development of urban planning as a profession. Intellectual foundations, planning theory. Roles of urban planners in U.S./international settings. Scope, legitimacy, limitations of planning and of planning process. Issues in planning ethics and in planning in settings of diverse populations/stakeholders.

PA 5011. Public Management and Leadership. (3 cr; A-F only. Prereq–Major in public policy or #) Challenges facing higher-level managers in public/nonprofit organizations in a mixed economy and democratic republic. Distinctive features of public/nonprofit management, skills necessary for effective management, manager’s role as creator of public value. Lectures, case discussions.

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

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

PA 5021. Economics For Policy Analysis and Planning I. (2-3 cr [max 3 cr]; A-F only. Prereq–[[Econ 1101 or equiv], Major in public policy or [sci, tech, and environ policy] or #) Introduction to tools useful for public policy: intermediate microeconomics, macroeconomics, concepts of international trade.

PA 5022. Economics For Policy Analysis and Planning II. (1.5-3 cr [max 3 cr]; A-F only. Prereq–[[5021 or equiv], public policy major] or #) Application of economic reasoning to various public policy issues. Cost-benefit analysis, nonmarket valuation, and tax analysis.

PA 5032. Intermediate Regression Analysis. (1-2 cr [max 2 cr]; A-F only. Prereq.--[5031 or equiv], major in [public policy or [sci, tech, and environ policy]] or #) Bivariate/multivariate models of regression analysis, assumptions behind them. Problems using these models when such assumptions are not met.

PA 5033. Multivariate Techniques. (1-2 cr [max 2 cr]; A-F only. Prereq.--[5031 or equiv], major in [public policy or [sci, tech, and environ policy]] or #; [5032 or equiv] recommended) Public affairs topics using maximum-likelihood estimation approaches.

PA 5034. Community Analysis and Planning Techniques. (1.5 cr [max 3 cr]; Prereq.--[5031 or equiv], major in public policy or [sci, tech, and environ policy] or urban/regional planning) or #) Data analysis techniques for practitioners in fields of planning, management, and policy analysis who work at community and regional levels. Population analysis and forecasting techniques relevant for small geographic areas. Techniques for regional/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 public policy or [sci, tech, and environ policy] or urban/regional planning) or #) Introduction to survey research methods. Emphasizes applications to policy and applied research. Research design choices (e.g., descriptive, experimental, case studies), sampling, variable specification, measurement scales, interview surveys, 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 systems, 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. (3 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 5113. State and Local Public Finance. (3 cr. Prereq.--Grad or #) Theory/practice of financing. Providing public services at state/local level of government. Emphasizes integrating theory/practice, applying materials to specific policy areas, and documenting wide range of institutional arrangements across/within the 50 states.

PA 5122. Law and Public Affairs. (3 cr. Prereq.--Grad or #) Overview of selected American legal system. Role of courts, legislatures, and political actors in changing law. How law is used to change public policy.


PA 5132. Mediation Training. (3 cr. 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 key electronic 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 or #) Selected topics.


PA 5203. Geographical Perspectives on Planning. (3 cr. §Geog 5380W, §Geog 3808W, Geog 5605W, Geog 5605W. Prereq.--Grad student or #) Includes additional weekly seminar-style meeting and bibliography project on topic selected in consultation with instructor.

PA 5211. Land Use Planning. (3 cr. Prereq.--Grad student or #) Theoretical/spatial basis for land use planning at community/regional level. Role of public sector in guiding private development. Land use regulations, comprehensive planning, growth management, innovative land use planning/policies.

PA 5212. Managing Urban Growth and Change. (3 cr. Prereq.--Grad student or #) Theory/practice of planning, promoting, and controlling economic growth/change in urban areas. Economic development tools available to state/local policymakers, historic context of their use in the United States, legal, social, and economic implementation constraints. Interactions among economic, social, and demographic trends.

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


PA 5232. Transportation Policy, Planning, and Deployment. (3 cr. Prereq.--Grad or #) Development of transportation policy, making of transportation plans, deployment of transportation technologies. Lectures, interactive case studies, role playing.

PA 5251. Strategic Planning and Management. (3 cr. Prereq.--Grad student or #) Theory/practice of strategic planning/management for public/nonprofit organizations/networks. Strategic planning process, management systems; stakeholder analyses. Tools/techniques such as purpose expansions, SWOT analyses, oval mapping, portfolio analyses, and logic models.

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


PA 5254. Strategic Planning Tools and Techniques. (1.5 cr; A-F only. Prereq.--Grad student or #) Techniques may include purpose expansions, competitive/collaborative analysis methods, core/distinctive competency identification, portfolio methods, logic and business process models, scenario construction, balanced scorecards, and related strategy mapping tools.

PA 5255. Stakeholder Identification, Analysis, and Influence Techniques. (1.5 cr; A-F only. Prereq.--Grad student or #) Techniques include basic identification, power vs. interest grids, stakeholder influence diagrams, discerning the common good, support vs. opposition matrices, participation planning matrices, and ethical analysis.

PA 5261. Housing Policy. (3 cr. A-F only. §DHA 5463. Prereq.--Grad or #) Institutional/environmental setting for housing policy in the United States. Competing views of solving housing problems through public intervention in the market. Federal/local public sector responses to housing problems.
Courses


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 #) Principal methods, primary applications of evaluation research as applied to policies/programs in health/human services, education, or the environment. Conducting evaluations. Becoming a critical consumer of studies.

PA 5390. Topics in Advanced Policy Analysis Methods. (1-4 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 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. SWS 5107. Prereq–Grad or pub lish high or non-degree seeking 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 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 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 Legislature. (3 cr. Prereq–Grad or #) How the 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 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. SPh 6281. Prereq–Grad or #) How to assess and improve public health 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 5480. Topics in Race, Ethnicity, and Public Policy. (1-3 cr [max 9 cr]. Prereq–Jr or sr or grad student or #) Link between race/ethnicity and public policy. How to identify/measure racial/ethnic disparities and their historical/cultural origins and policy impacts and to craft politically feasible remedies. Topics may include criminal justice, housing, child welfare, and education.

PA 5490. Topics in Social Policy. (1-4 cr [max 9 cr]. Prereq–Grad student or #) Selected topics.


PA 5521. Development Planning and Policy Analysis. (4 cr. Prereq–[5031 or equiv], [5501 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. Microeconomic 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], [5502 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, and reform into 1990s. Emphasizes privatization, economic integration, exchange rate/trade, and domestic/adjustment policies.

PA 5531. Strategies for Sustainable Development: Theory and Practice. (2 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 5690. Topics in Women and Public Policy. (1-3 cr [max 9 cr]. Prereq–Grad student or #) Selected topics.


PA 5711. Science, Technology, and International Affairs. (3 cr. Prereq–Grad student or #) Effect of science/technology on relations among nations in such matters as autonomy, national security, economic strength, environment, cultural identity, and international cooperation. Negotiating international agreements with S&T implications.

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


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


PA 5890. Topics in Foreign Policy and International Affairs. (1-3 cr [max 9 cr]. Prereq–Grad student or #) Selected topics.

PA 5900. Computer Applications in Public Affairs (Summer). (5 cr. S–N only. Prereq–[4]) 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. (5-3 cr [max 6 cr]; S–N only. Prereq–[4]) Introduction to computer systems/applications in public affairs practice.
Courses

PA 5902. Computer Applications in Public Affairs. (1-3 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. Prereq—International HHH fellow) Computers/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 5910. Developing Your Public Service Career. (1 cr; S-N only. Prereq—major in [public affairs or public policy or urban/regional planning or [science, technology/environmental policy]] or #) Students investigate/analyze interests, skills, and abilities and combine them in a career plan. Students develop tools to demonstrate their abilities, document their experiences/knowledge, and explore public service career options.

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

PA 5941. Leadership for the Common Good. (4 cr. Prereq—Grad student in public affairs or #) Personal, leadership, 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. Prereq—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. (1-3 cr; max 9 cr) Prereq—Grad student or #) General topics in public policy.

PA 8001. Transforming Public Policy. (4 cr; A-F only. Prereq—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 improvement strategies, along with leadership implications for formulating and implementing them.

PA 8002. Synthesis Workshop. (4 cr; A-F only. Prereq—[8001 grad PA major or #]) Development of public policy to advance public interest, common good. Recommendations flow from interdisciplinary understanding of problem, stakeholder analyses, modeling/analysis. Political feasibility, marketing, entrepreneurship, advocacy.

PA 8081. Capstone Workshop. (3 cr; A-F only. Prereq—[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. 1.5 cr. Prereq—Master's student, adviser and DGS consent

PA 8105. Human Resources and Organizational Performance. (3 cr; HHR 4093. Prereq—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. Includes in-class discussions of conceptual materials with application in community. Student teams work for half a semester with local collaborations on management problems.

PA 8186. Public Services Redesign. (1.5 cr; A-F only) Theory, strategy, politics, and practical mechanics required to adapt public service systems given constraints on resources and continuing pressure for effectiveness/equity. In-class discussions with persons involved in redesign, Student presentations on current redesign issues.

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


PA 8202. Networks and Places: Transportation, Land Use, and Design. (4 cr; A-F only. Prereq—8121, [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. Economic, political, legal, institutional frameworks for planning. Parallel computer lab, practicum assignment.

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

PA 8204. Creating Good Work: Economic and Workforce Development. (4 cr; A-F only. Prereq—[5021 or 5022 or equiv], [5034 or 5034]) Job-oriented economic development. Theories on how/why jobs are created. Tools used by communities and economic developers (e.g., tax abatement, infrastructure, job training, entrepreneurship). Strategy, politics, effectiveness.

PA 8212. Networks and Places: Transportation, Land Use, and Design. (3 cr; A-F only. Prereq—8202 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 8226. 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. Student projects 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) Research Methods in Social and Labor Policy. (3-6 cr; A-F only. Prereq—5032 or 5033, 5022 or equiv) Use of social science research methods in analyzing and developing public policies.

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

PA 8406. Work and Family in the United States and the Third World. (3 cr; A-F only) Topicson based on students’ interests. Topics must 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 8596. Feminist Organizations. (3 cr; A-F only) Uses social movement literature and histories of U.S. women’s feminism to study feminist organizations. Reconstructing feminisms within organizations and movements examined through comparative studies of feminism in Latin America, Eastern Europe, Britain, and Italy. Methods and sources for studying feminism.

PA 8687. Women and Electoral Politics. (3 cr; A-F only) Political science and women’s studies literature on American women and electoral politics.

PA 8690. Advanced Topics in Women and Public Policy. (1-3 cr [max 6 cr]) Selected topics.

PA 8777. Thesis Credits: Master's. (1-18 cr [max 50 cr). Prereq—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) Compare/contrast 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.
Public Health (PubH)

School of Public Health


PubH 5070. Alcohol and Other Drugs: Epidemiology, Prevention, and Control. (3 cr. Prereq.–[Professional school student in PubH or CVM or Dr Dent or Med or Pharm] or [grad student in biostatistics or environmental health or epidemiology or health services research policy/administration or nursing] 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 5992. Readings in Clinical Research. (1-4 cr [max 20 cr]; Prereq.–CR grad student, #) Current readings in clinical research.

PubH 5760. Healthcare Financial Management: Public Sector Emphasis. (2 cr. Prereq.–[MHA 6750; Grad student 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 8100. Topics: Environmental Health. (1-4 cr [max 20 cr]; Prereq.–CR grad student) New course offerings or topics of interest in environmental health.

PubH 8120. Occupational Injury Prevention Research Training Program Research Seminar. (1 cr [max 12 cr]; Prereq.–[Epi 5120, 5330, 5450; Eh grad major; [MHA 6750] or equiv] or [Dent grad student or #] Facilitates student research training in occupational injury prevention. Roundtable discussions, interdisciplinary involvement.

PubH 8140. Validity Concepts in Epidemiologic Research. (2 cr. Prereq.–[Epi 5330, 5340; with grade of at least B]) Conceptual basis for validity in observational epidemiologic research. Recognizing, evaluating, preventing, and correcting for confounding specific error, measurement-error bias, and selection/follow-up bias.


PubH 8160. Advanced Toxicology. (2 cr. Prereq.–[5160, one course in biochem, one course in molecular bio] or [5330, 5340 recommended]) Cellular/molecular mechanisms by which xenobiotics cause toxicity. Investigative approaches to current research problems in toxicology/carcinogenesis. Apoptosis, cell cycle regulation, genetic toxicology, molecular mechanisms of chemical carcinogenesis, genetic basis for susceptibility to environmental toxicants.

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. [Stat 8317, 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 8194. Directed Research: Environmental Health. (1-6 cr [max 6 cr]; Prereq.–#) Research, with direction from faculty member, in environmental/occupational stresses on human health.

PubH 8300. Topics: Epidemiology. (1-4 cr [max 20 cr]) New course offerings or topics of interest in epidemiology.

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

PubH 8350. Advanced Epidemiologic Theory. (2 cr; S-N only. Prereq.–Epi PhD major or #) Integrates concepts of Epidemiology I/II. Current theoretical paradigms of epidemiology. Philosophy of causal inference in epidemiology. Estimation of causal parameters.

PubH 8355. Teaching Practicum in Epidemiology. (2 cr; S-N only. Prereq.–Epi grad major or #) Instruction/hands-on experience in teaching methods.

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 in epidemiologic research methods in chronic/behaviorally-based diseases other than infectious/cardiovascular diseases and cancer.

PubH 8378. Seminar in Epidemiology. (2 cr; S-N only. Prereq.–Epi grad or MPH major or #) Selected current problems.

PubH 8392. Readings in Clinical Research. (1-4 cr [max 4 cr]; Prereq.–Clinical research major, #) Current readings in clinical research.

PubH 8393. Directed Study: Clinical Research. (1-4 cr [max 20 cr]; Prereq.–Clinical research major, #) Directed research or field practice in clinical research.

PubH 8429. Probability Models for Biostatistics. (3 cr. Prereq.–[Epi 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. (3 cr. Prereq.–[Epi 8420, 8421, Stat 5102, advanced biostats] or stats major or #) Statistical methods for design and analysis of sequential experiments. Wald theorems, stopping times, martingales, Brownian motion, dynamic programming. Compares Bayesian/Squentist approaches. Emphasizes applications to interim monitoring of clinical trials, medical surveillance.

PubH 8431. Bayesian Decision Theory and Data Analysis. (3 cr [max 4 cr]; Prereq.–[5421 or experience with FORTRAN or with [C or S]]; Stat 5101, Stat 5102, Stat 8311, grad student in [biostatistics or statistical] or #) Theory/application of Bayesian methods. Bayesian methods compared with traditional, frequentist methods.

PubH 8436. Spatial Biostatistics. (3 cr. Prereq.–Stat 5101, Stat 5102, some experience with S-plus, [5470 or 8431], Stat 8311 recommended) Spatial data, spatial statistical models, and spatial inference on unknown parameters or unobserved spatial data. Nature of spatial data, special analysis tools that help to analyze such data. Theory, applications.

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

PubH 8542. Advanced Longitudinal Data Analysis. (3 cr. Prereq.–[Stat 5102, Stat 8311, experience with [SAS or S]+, advanced [biostats 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 8740. Topics: Biostatistics. (1-4 cr [max 20 cr]) New course offerings or topics of interest in biostatistics.

PubH 8649. 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]. Prereq.–Max 18 cr per semester or summer; doctoral student who has not passed prelim orally)

PubH 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]. 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.–[HSP/MA major, MPH or graduate student, or #]) First-time offering. Course title, content, instructor and credit load vary.


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

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 healthcare and social services perspective; grounded in research literature on evidence of program effects. Innovative programs addressing current fragmentation of services.

Courses

Recreation Resource Management (RRM)
Department of Forest Resources
College of Natural Resources

RRM 5101. Natural and Heritage Based Tourism. (3 cr; A-F only, §RRM 3101. Prereq—Grad student or #) Interactions of resource-based tourism with cultural/natural environments. Impacts of tourism on environment.

RRM 5201. Introduction to Travel and Tourism. (3 cr §§RRM 3201. Prereq—Grad student or #) Nature, structure and complexity of tourism industry. Overview of travel/tourism: definition, evolution, magnitude globally. Types/functions of various sectors, tourism distribution system, role of various stakeholders in creation/delivery of tourism. Motivations for travel as means of understanding demand for tourism.

RRM 5222. Managing Recreational Lands. (4 cr; A-F only. §§RRM 4222W. Prereq—Grad student or #) Recreation management tools from a public agency perspective. Social carrying capacity, recreation opportunity spectrum, limits of acceptable change, benefits based management, visitor experience/resorce protection. Various projects. Group project to develop a management plan.

RRM 5259. Visitor Behavior Analysis. (3 cr; A-F only. §§RRM 4259. Prereq—RRM major or ENR major or grad student or #) Application of social science theory/methods to recreation and resource-based tourism visitor behavior. Culture and cultural identity. Influences on behavior. Mitigating environmental impacts. Theory/analysis of surveys, observation, and content. Implications for sustainable resource management.

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. §§Rec 3101. Prereq—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. §§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. §§Rec 5115. Prereq—§§Kin 5115; Grad student, #) 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. §§Rec 5161. Prereq—1501 or 5101 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. §§Rec 3191. Prereq—3551 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. §§Rec 5211. Prereq—1501 or 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. §§Rec 5215. Prereq—TBA major or academic health professional or #; majors A-F only) Selecting appropriate techniques/tools, analysis of individual p/c/supports/deficits. Monitoring/record progress in RT and in collaborative services: standard notes; team meetings; on-line quality assurance, referral, augmentation/elimination of services.

Rec 5221. Comprehensive Therapeutic Recreation Services Development and Management. (4 cr. §§Rec 5221. Prereq—5211 or #, rec major or #; majors A-F only) Guided development of written plans including development of protocols and critical pathways, intervention 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. §§Rec 5231. Prereq—5211 or #) Definitions, philosophies, methodologies regarding therapeutic recreation services for persons in diagnostic groups of cognitive, physical, sensory, communication, and psychiatric impairments/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. §§Rec 5241. Prereq—5241 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. §§Rec 5271. 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 education, recreation, corporate, human service settings. Emphasizes adventure/wilderness program management.

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

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

Rec 5421. Sport Finance. (3 cr; A-F only. §Kin 5421. Prereq-Grad student or #) Introduction to financial analysis in sport. Cash flow statements, budgeting issues, traditional/innovative revenue producing strategies available to sport organizations. Discussion, practical analysis of current market.

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. §Kin 5511) Critically examines women’s involvement in contributions to sport, physical activity, and leisure.

Rec 5601. Sport Management Ethics and Policy. (3 cr; A-F only. §Kin 5601. Prereq–Grad student or #) Ethical concepts that underpin or inform sport policies. Evaluating sport policies from a normative point of view. Selected sport policy issues are used to illustrate relevance of ethical considerations in policy development, ethical implications of sport policy.

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

Rec 5801. Legal Aspects of Sport and Recreation. (4 cr; A-F only. §Kin 5801) 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]) Critical study and special problems in the field of leisure studies and in therapeutic recreation. Critical review of literature to evaluate efficacy of therapeutic techniques, evolution of doctrine of Sefirot, precursors of Zohar. Zohar (Book of Splendor) in 13th century. Literature on topic, prepare/deliver presentations, compose test questions. Offered by individual arrangement with faculty.

Rec 6777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only]) Research practicum on selected topic. Use of systematic literature search. Critical analysis of scientific literature. Specific measurement systems. Data collection/reduction methods of on-going or new research projects. Preparing/defending research reports.

Rec 6818. Teaching Practicum. (1-5 cr [max 5 cr]; A-F only. Prereq–[Rehabilitation science student or program permission]) Supervised experience in teaching/evaluation. Effective use of instructional materials in lecture/lab courses. Students create learning objectives for teaching unit(s), conduct a review of current literature on topic, prepare/deliver presentations, compose test questions. Offered by individual arrangement with faculty.

Rec 8189. Research Design in Physical Therapy. (3 cr; A-F only. §Kin 8189) Contemporary Jewish literature/philosophy. 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 8333. FTE: Master’s. (1 cr. Prereq–Master’s student, adviser and DGS consent) Critical appraisal of current medical literature. Fundamentals of research design, data analysis, and medical writing.


RSc 5135. Advanced Biomechanics I: Kinematics. (2 cr; A-F only. Prereq–Four) How to describe/move measurement. Emphasizes three-dimensional techniques. Basic/applied biomechanics, pathokinesiology, rehabilitation literature. Held with 8135. Assignments vary for those registered at different levels. Lecture, laboratory exposure, seminar discussion.

RSc 5294. Independent Study in Rehabilitation Science. (1-3 cr [max 3 cr]. Prereq–Rehabilitation science student or program approval) Independent exploration into topics related to rehabilitation science. RSc 5814. Age, Exercise, and Rehabilitation. (2 cr. Prereq–Rehabilitation science student or program permission) Overview of normal physiological responses to exercise in the elderly. Comparison of exercise-induced responses of physiological systems throughout aging process. Focuses on importance of exercise from rehabilitation perspective. Offered Fall semesters of even-numbered years.

RSc 5841. Rehabilitation Science Instrumentation and Methodology. (4 cr; A-F only. Prereq–[Phys 1031, Phys 1032] or equal). # [rehabilitation science student or program permission] Theory/application of kinesiological EMG and other common instruments used to measure human motion.

RSc 8100. Rehabilitation Science Seminar. (1-6 cr [max 6 cr]; A-F only. Prereq–Rehabilitation science student or program permission) Critically reading/discussing rehabilitation science literature. Identifying important researchable questions, methods to answer them. Speaking/writing persuasively on scientific topics.

RSc 8130. Current Literature Seminar. (1 cr; A-F only. Prereq–Grad student in PT or rehabilitation science major or #) Critical review of literature to evaluate efficacy of selected physical therapy interventions.

RSc 8135. Advanced Kinesiology. (2 cr; A-F only. Prereq–Rehabilitation science student or program permission) How to describe/move measurement. Emphasizes three-dimensional techniques. Lecture, lab exposure. Seminar discussion of basic/applied biomechanics, pathokinesiology, and rehabilitation literature.

RSc 8170. Special Topics in Rehabilitation Science. (1 cr [max 3 cr]; A-F only. Prereq–Rehabilitation science student or program permission) # Topics vary by semester. Papers required.

Rehabilitation Science (RSc)

Department of Physical Medicine and Rehabilitation

Medical School

RSc 5135. Advanced Biomechanics I: Kinematics. (2 cr; A-F only. Prereq–Four) How to describe/move measurement. Emphasizes three-dimensional techniques. Basic/applied biomechanics, pathokinesiology, rehabilitation literature. Held with 8135. Assignments vary for those registered at different levels. Lecture, laboratory exposure, seminar discussion.

RSc 5294. Independent Study in Rehabilitation Science. (1-3 cr [max 3 cr]. Prereq–Rehabilitation science student or program approval) Independent exploration into topics related to rehabilitation science. RSc 5814. Age, Exercise, and Rehabilitation. (2 cr. Prereq–Rehabilitation science student or program permission) Overview of normal physiological responses to exercise in the elderly. Comparison of exercise-induced responses of physiological systems throughout aging process. Focuses on importance of exercise from rehabilitation perspective. Offered Fall semesters of even-numbered years.

RSc 5841. Rehabilitation Science Instrumentation and Methodology. (4 cr; A-F only. Prereq–[Phys 1031, Phys 1032] or equal). # [rehabilitation science student or program permission] Theory/application of kinesiological EMG and other common instruments used to measure human motion.

RSc 8100. Rehabilitation Science Seminar. (1-6 cr [max 6 cr]; A-F only. Prereq–Rehabilitation science student or program permission) Critically reading/discussing rehabilitation science literature. Identifying important researchable questions, methods to answer them. Speaking/writing persuasively on scientific topics.

RSc 8130. Current Literature Seminar. (1 cr; A-F only. Prereq–Grad student in PT or rehabilitation science major or #) Critical review of literature to evaluate efficacy of selected physical therapy interventions.

RSc 8135. Advanced Kinesiology. (2 cr; A-F only. Prereq–Rehabilitation science student or program permission) How to describe/move measurement. Emphasizes three-dimensional techniques. Lecture, lab exposure. Seminar discussion of basic/applied biomechanics, pathokinesiology, and rehabilitation literature.

RSc 8170. Special Topics in Rehabilitation Science. (1 cr [max 3 cr]; A-F only. Prereq–Rehabilitation science student or program permission) # Topics vary by semester. Papers required.

RSc 8185. Problems in Rehabilitation Science. (1-3 cr [max 3 cr]; A-F only. Prereq–[Rehabilitation science student or program permission]) Research practicum on selected topic. Use of systematic literature search. Critical analysis of scientific literature. Specific measurement systems. Data collection/reduction methods of on-going or new research projects. Preparing/defending research reports.

RSc 8188. Teaching Practicum. (1-5 cr [max 5 cr]; A-F only. Prereq–[Rehabilitation science student or program permission]) Supervised experience in teaching/evaluation. Effective use of instructional materials in lecture/lab courses. Students create learning objectives for teaching unit(s), conduct a review of current literature on topic, prepare/deliver presentations, compose test questions. Offered by individual arrangement with faculty.

RSc 8192. Research Design in Physical Therapy. (3 cr; A-F only. §Kin 8192) Contemporary Jewish literature/philosophy. 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.

Rehabs 5333. FTE: Master’s. (1 cr. Prereq–Master’s student, adviser and DGS consent) Critical appraisal of current medical literature. Fundamentals of research design, data analysis, and medical writing.


RSc 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]. Prereq–Max 18 cr per semester or summer; doctoral student who has not passed prelim oral) RSc 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr]. Prereq–Max 18 cr per semester or summer; 10 cr total required [Plan A only])

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

Religions in Antiquity (RelA)

Department of Classical and Near Eastern Studies

College of Liberal Arts


RelA 5070. Topics in Ancient Religion. (3 cr [max 18 cr]. §§OENS 5070, Prereq–RelA 3071 or 3072 or 3073 or 5071 or 5073 or any RelA course or #) Study of a specific aspect of religion in Classical and Near Eastern antiquity such as healing cults, magic and divination, Enosticism, or prophecy and authority. Topics specified in Class Schedule.

RelA 5112. Jewish Mysticism, Magic, and Kabbalah. (3 cr; A-F only §JwSt 5112, JwSt 5112, RelA 3112) Mystical traditions from early rabbinic traditions to Zohar (Book of Splendor) in 13th century. Literature of heavenly ascent (Hechkatol, Merkavah), Book of Creation (Sefer Yetzirah), precursors of Zohar. the Bahir. Schools of Provonce, Gerona, and Zohar. Tension between legal/mystical aspects, magical theurgic techniques, evolution of doctrine of Sefirot, mystical interpretation of Scripture, erotic dimension.
RelA 5115, Mishnah and Midrash in Translation. (3 cr.; §WSt 3115, JwSt 5115) Rules in the Talmud. Jewish law studies as mirror of society and as way to actualize its value. Original socioreligious contexts, current applications. Selections include biblical interpretation, redaction, moral, theological, legal, and literary problems.

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

RelA 5503. History and Development of Israelite Religion I. (3 cr.; §ANE 3503, ANE 5503, CNES 5503, CNES 5583, RelA 3503) Survey of the evolution of Israelite religion. Cultic practices, law and religion, prophecy, religion and historiography. Relationship to surrounding religious systems.

RelA 5504. Development of Israelite Religion II. (3 cr.; §ANE 3504, ANE 5504, RelA 5504) 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. §WSt 5513) 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 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. (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. Information 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. Information Design: Theory and Practice II. (3 cr.; A-F only. Prereq—Grad student or #) Political, economic, social, and technical aspects of media selection and message design. Media analyses, scripts, budgets, treatments, project-design plans, interactive screens. Online design project.

Rhet 5196. Internship in Scientific and Technical Communication. (3-6 cr [max 6 cr]; S-N only. Prereq—STC or 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 5256. 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—[[STC or RSTC] major or grad student]], #) Topics specified in Class Schedule.

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

Rhet 5511. Research in Scientific and Technical Communication. (5 cr.; A-F only) Experimental/survey research techniques and/or information, employment-cycle, and problem-solving interviews. Emphasizes guides, schedules, questioning techniques, and communication theories. Descriptive statistics used to analyze data for various projects.

Rhet 5511. Research in Scientific and Technical Communication. (5 cr.; A-F only) 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. Arthurian media such as wall painting, architectural ornament, funerary sculpture, or manuscript illumination.

Religious Studies (ReIS) Department of Classical and Near Eastern Studies College of Liberal Arts

RelS 5111. Problems in Historiography and Representation of the Holocaust. (3 cr. §WSt 5111, JwSt 5111 or Hist 5225; 5525) RelS 5251, RelS 5115, Rhet 5511 or Hist 5225, 5525) An advanced course focused on issues concerning 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. §CNES 5251, RelS 5251. Prereq—One course in [archaeology or ancient history] or grad student) Archaeological sites in Israel dating to era of Herod the Great (37-4 BC). Palaces, religious edifices, and remains from Jewish/Arabian 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.

Rhet 5564. Science Writing for Popular Audiences. (3 cr.; A-F only. Prereq—Rhet 3562 or #) How science is “translated” for popular audiences. Rhetorical theory used to critique popularized articles. Developing a heuristic for writing articles. Controversial issues surrounding movement from science as “science” to science as “popular.”


Rhet 8011. Research Methods in Rhetoric and Scientific and Technical Communication. (3 cr.; A-F only. Prereq—STC/RSTC grad or #) Qualitative/quantitative research methods. Theoretical perspectives that demonstrate/test analytical approaches to scientific and 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, ethnographics, rhetorical/textual analysis, archival research, genre analysis, observational research, interviews, and descriptive statistics. Review responsibilities of conducting research.

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

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

Rhet 8505. Design Project. (5 cr.; A-F only. Prereq—STC/RSTC grad student, A, #) 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—5775/77 or equiv) Rhetorical theory in context of culture influenced by science/technology. Topics vary.


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. 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.”
Courses

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

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

Rhet 8995. Special Problems in Rhetoric and Scientific and Technical Communication. (1-3 cr [max 3 cr]) Research and readings on special problems or projects.

Russian (Russ)

Institute of Linguistics, ESL, and Slavic Languages and Literatures

College of Liberal Arts

Russ 5021. Russia Study Tour. (6-18 cr [max 18 cr]. Prereq–5002 or equiv) Study of Russian language & culture in an accredited institution in Russia.

Russ 5104. Introduction to Literary Analysis. (3 cr. Prereq–5002 or equiv) Reading and analysis of poetry and prose selections to understand rudiments of studying Russian literature. Readings are in Russian.

Russ 5105. Russian Poetry and Prose. (3 cr. Prereq–5002 or equiv) Appreciation of literary values through stylistic analysis and literary interpretation; analysis of humanistic elements. Readings in Russian.

Russ 5211. Modern Russian Literature in Translation. (3 cr. §Russ 3211) Literary, cultural, and political significance of modern Russian literary works.

Russ 5404. Tolstoy in Translation. (3 cr. §Russ 3404) Novels, stories, and philosophical writings of Leo Tolstoy.

Russ 5407. Stories and Plays of Anton Chekhov in Translation. (3 cr. §Russ 3407) Study of literary devices and themes in selected stories and major plays using the intrinsic approach.

Russ 5409. 19th-Century Russian Novel. (3 cr. §Russ 3409) The Russian realistic novel from origin to decline; social, political, and intellectual circumstances that led to its emergence as the dominant genre of the “age of realism” in Russia.

Russ 5411. Dostoevsky in Translation. (3 cr. §Russ 3411) Novels, stories, and other writings of Fyodor Dostoevsky.

Russ 5421. Literature: Middle Ages to Dostoevsky in Translation. (3 cr. §Russ 3421) Russian literature from about 1000 A.D. to mid-19th century; emphasizing writers of the first half of the 19th century.

Russ 5422. Literature: Tolstoy to the Present in Translation. (3 cr. §Russ 3422) Survey of Russian literature from mid-19th century to the present: realism, modernism, feminism and other trends.

Russ 5601. Methods of Translating Fiction from Russian to English. (3 cr. Prereq–3601, 3102 or equiv) Learning to appreciate a variety of literary styles through the experience of translation.

Russ 5900. Topics in Russian Language, Literature, and Culture. (1-4 cr [max 3 cr]. Prereq–1102 for language topics) Variable topics in Russian language, literature, and culture.


Sanskrit (Skt)

Department of Classical and Near Eastern Studies

College of Liberal Arts

Skt 5001. Beginning Sanskrit. (3 cr) Introduction to the classical language of ancient India.

Skt 5002. Beginning Sanskrit. (3 cr Prereq–5001 or equiv) Introduction to the classical language of ancient India.

Skt 5201. Intermediate Sanskrit. (3 cr. Prereq–5002 or equiv) Readings in Sanskrit literature.

Skt 5202. Intermediate Sanskrit. (3 cr) Readings in Sanskrit literature.

Skt 5710. Topics: Language and Literature. (3 cr) Selected reading and/or study of linguistic problems in Sanskrit.

Skt 5992. Directed Readings. (3 cr. Prereq–5002 or equiv) Guided individual reading or study.

Skt 8993. Directed Studies. (1-12 cr [max 30 cr])

Scandinavian (Scan)

Department of German, Scandinavian, and Dutch College of Liberal Arts

Scan 5501. Scandinavian Mythology. (3 cr) Study of Scandinavian mythology based on primary sources represented by Saxo Grammaticus, Snorri Sturluson’s Edda and Ynglinga Saga, and the Poetic Edda. Myths are analyzed using contemporary critical approaches. All readings in translation.

Scan 5502. The Icelandic Saga. (3 cr) Study of the sagas written in 13th-century Iceland. Discussion includes cultural and historical information about medieval Iceland and analysis of a selection of saga texts using contemporary critical approaches. All readings in translation.

Scan 5613. Contemporary Scandinavian Literature. (3 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.

Scan 5670. Topics in Scandinavian Studies. (3 cr [max 9 cr]) Topic may focus on a specific author, group of authors, genre, period, or subject matter. Topics specified in Class Schedule. Readings in English for nonmajors. May meet with 3670.

Scan 5701. Old Norse Language and Literature. (3 cr) Acquisition of a reading knowledge of Old Norse; linguistic, philological and literary study of Old Norse language and literature.

Scan 5704. History of the Scandinavian Languages. (3 cr) Investigation of the development of the Scandinavian languages from the earliest periods to the present.

Scan 5710. Topics in Old Norse Literature. (3 cr [max 9 cr]. Prereq–5701 or equiv) Topic may focus on Old Norse prose or poetry. Primary texts read in Old Norse. Critical literature about texts, medieval Icelandic culture in English. Topics specified in Class Schedule.

Scan 5993. Directed Studies. (1-4 cr [max 12 cr]. Prereq– Plan A) Guided individual reading and study.

Scan 8002. Introduction to Scandinavian Studies. (3 cr) Introduction to history of Scandinavian studies, to field of Scandinavian studies as an integral area with particular disciplines, and to study of Scandinavian languages, literatures, and cultures. Integrated sections on Scandinavian bibliography.

Scan 8500. Seminar in Medieval Scandinavian Languages and Literature. (3 cr [max 9 cr]) Sample topics: Volsunga Saga, studies in Snorri Sturluson’s Edda, dialogue analysis in the Icelandic saga.

Scan 8630. Seminar in Scandinavian Criticism. (3 cr [max 9 cr]) Sample topics: feminist theory in Scandinavia, writing literary history in Scandinavia.

Scan 8994. Directed Research. (1-3 cr [max 12 cr]. Prereq– Plan A may be taken as tutorial with #)

Scientific Computation (SciC)

Institute of Technology

SciC 8001. Parallel High-Performance Computing. (3 cr. Prereq–Undergraduate 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–Undergraduate 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–Undergraduate degree in field using sci comp or IR grad student or #) Fundamental concepts and techniques of finite element analysis. Variational equations and Galerkin’s method; weak formulations for problems of nonsymmetric differential operators; Petrov-Galerkin methods; examples from solid and fluid mechanics; properties of standard finite element families, implementation.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>SciC 8095</td>
<td>Problems in Scientific Computation. (1-3 cr [max 6 cr]. Prereq—Undergraduate degree in field using sci comp or #)</td>
<td>Selected topics in interdisciplinary aspects of scientific computing.</td>
</tr>
<tr>
<td>SciC 8190</td>
<td>Supercomputer Research Seminar. (1 cr [max 3 cr]. Prereq—Undergraduate degree in field using sci comp or #)</td>
<td>Series of seminars by distinguished lecturers.</td>
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<tr>
<td>SciC 8333</td>
<td>FTE: Master's. (1 cr. Prereq—Master's student, adviser and DGS consent)</td>
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<td>SciC 8444</td>
<td>FTE: Doctoral. (1 cr. Prereq—Doctoral student, adviser and DGS consent)</td>
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<tr>
<td>SciC 8594</td>
<td>Scientific Computation Directed Research. (1-4 cr [max 9 cr]. Prereq—Undergraduate degree in field using sci comp or #)</td>
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<tr>
<td>SciC 8666</td>
<td>Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr]. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)</td>
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<tr>
<td>SciC 8677</td>
<td>Thesis Credits: Master's. (1-18 cr [max 50 cr]. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])</td>
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<tr>
<td>SciC 8688</td>
<td>Thesis Credit: Doctoral. (1-24 cr [max 100 cr]. Prereq—Max 18 cr per semester or summer; 24 cr required)</td>
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<tr>
<td>Slavic</td>
<td>Institute of Linguistics, ESL, and Slavic Languages and Literatures</td>
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<tr>
<td>Slav 5900</td>
<td>Topics in Slavic Languages and Literatures. (3 cr)</td>
<td>Topics specified in Class Schedule.</td>
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<tr>
<td>Social and Administrative Pharmacy (SAPh)</td>
<td>Department of Pharmacy Practice</td>
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<tr>
<td>SAPh 8054</td>
<td>Advanced Studies in Pharmaceutical Care Practice. (4 cr; A-F only)</td>
<td>Analyzing practice/implementation of pharmaceutical care. Students confront their assumptions about pharmacy profession, pharmacy practice, and pharmaceutical care. Discussions, guest speakers, intensive literature searches/evaluation.</td>
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<tr>
<td>SAPh 8100</td>
<td>Seminar. (1 cr [max 8 cr]. Prereq—Grad SAPh major or #)</td>
<td>Contemporary issues and research problems in sociobehavioral pharmacy, pharmaco economics and policy, and clinical research.</td>
</tr>
<tr>
<td>SAPh 8173</td>
<td>Principles and Methods of Implementing Research. (3 cr. §NURS 8173. Prereq—Two grad stat courses)</td>
<td>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.</td>
</tr>
<tr>
<td>SAPh 8200</td>
<td>Research Problems. (1-8 cr [max 16 cr]. Prereq—Grad SAPh major or #)</td>
<td>Individually designed research experience directed at contemporary problems related to drug use process.</td>
</tr>
<tr>
<td>SAPh 8235</td>
<td>Pharmaceutical Economics and Policy. (3 cr; A-F only. Prereq—Grad SAPh major or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SAPh 8255</td>
<td>Pharmaceutical Marketing. (3 cr; A-F only. Prereq—Grad SAPh major or #)</td>
<td>Historical development of distributive systems, marketing channels, institutions, policies, and practices as they relate to pharmaceutical industry. Contemporary issues/ theories related to pharmaceutical marketing. Pharmaceutical proportion, especially directed to consumer advertising.</td>
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<tr>
<td>SAPh 8270</td>
<td>Clinical Conferences. (2 cr. Prereq—Grad SAPh major or #)</td>
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<tr>
<td>SAPh 8420</td>
<td>Social and Behavioral Aspects of Pharmacy Practice. (3 cr; A-F only. Prereq—Grad SAPh major or #)</td>
<td>Contemporary issues/ theory related to psychology of community, the individual, and the role of the pharmacist in the community. Consideration of factors such as health policy, regulation, economics, research and development, promotion that affect individual responses to drug therapy.</td>
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<tr>
<td>SAPh 8500</td>
<td>Pharmacy and Its Environment. (3 cr; A-F only. Prereq—Grad SAPh major or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SAPh 8700</td>
<td>Hospital Pharmacy Administration. (3 cr; A-F only. Prereq—Grad SAPh major or #)</td>
<td>History, classification, organization, and functions of hospital departments in relation to the pharmacy service.</td>
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<tr>
<td>SAPh 8800</td>
<td>Brief Treatment and the Task-Centered Approach. (2 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>Brief treatment model in work with individuals, families, and general populations, managed care, legal and ethical issues, interdisciplinary team work, and transition planning in health care.</td>
</tr>
<tr>
<td>SAPh 8810</td>
<td>Social Psychology of Health Care. (2 cr. Prereq—Grad SAPh major or #)</td>
<td>Behavioral and social aspects of recovery responses to drugs and other therapies, patients’ compliance with prescribed therapies, relationships between healthcare professional and patient.</td>
</tr>
<tr>
<td>SAPh 8840</td>
<td>Social Measurement. (3 cr; A-F only. Prereq—Intro stat course, understanding of simple correlations or #)</td>
<td>How social factors such as innovativeness, compliance, religiosity, and stress are measured and tested for reliability and validity. Relationships between theory, concepts, variables, data.</td>
</tr>
<tr>
<td>SW 5051</td>
<td>Human Behavior and the Social Environment. (2-3 cr [max 3 cr]. A-F only. Prereq—Grad student or 8 cr social sciences or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SW 5052</td>
<td>Ecologies of Child Development Within the Multigenerational Family. (3 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>Examines 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.</td>
</tr>
<tr>
<td>SW 5101</td>
<td>Historical Origins and Contemporary Policies and Programs in Social Welfare. (3-4 cr [max 4 cr]. A-F only. Prereq—Grad or 8 sem cr of social sciences)</td>
<td>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.</td>
</tr>
<tr>
<td>SW 5105</td>
<td>Women and Public Policy. (3 cr)</td>
<td>Study of feminist organizational issues and conflicts within organizations and movements; methods and sources for studying feminism.</td>
</tr>
<tr>
<td>SW 5107</td>
<td>Child Welfare Policy. (3 cr. GPA 5411. Prereq—Grad or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SW 5309</td>
<td>Case Management with Special Populations. (3 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SW 5313</td>
<td>Social Work with Older Adults. (2 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>The practice components of social work with older adults including assessment, intervention, and case management. Taught from the perspective of biopsychosocial strengths and challenges and within the context of current social policy and delivery systems.</td>
</tr>
<tr>
<td>SW 5314</td>
<td>Social Work in the Schools. (2 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>Application of social work methods in a school setting. Emphasizes assessment, diagnosis, consultation, advocacy, interdisciplinary team building, and crisis intervention.</td>
</tr>
<tr>
<td>SW 5315</td>
<td>Social Work Practice in Hospitals and Health Care Settings. (2 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SW 5316</td>
<td>Brief Treatment and the Task-Centered Approach. (2 cr. §SWP 5309. Prereq—§. 5309, grad or non-degree seeking student or #)</td>
<td>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.</td>
</tr>
<tr>
<td>SW 5317</td>
<td>Social Work With Involuntary Clients. (2 cr. Prereq—Grad or non-degree seeking student or #)</td>
<td>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.</td>
</tr>
</tbody>
</table>
Courses

SW 5318. Family Centered Home Based Services. (2 cr. §SW 8314. Prereq—§; 8314, grad or non-degree seeking student or #) Ecological, multisystems approach focusing on the family system. Triadic theory, meta-neutrality, strengths-focus, case management and team treatment. Family-based services evaluated for high-risk, multi-problem families and as an alternative to foster placement.

SW 5319. Adolescents: Norms, Culture, and Health. (2 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 certificate.

SW 5482. Child Abuse Prevention II: Program Development, Evaluation, and Advocacy. (3 cr. Prereq—§4581) 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. Prereq—§4519) Develop mediator skills for making informed decisions regarding the appropriateness of mediation for conflicts that frequently confront social worker practitioners such as divorce, neighborhood disputes, conflicts between parents and adolescents, conflicts between spouses, and conflicts between crime victims and offenders.

SW 5525. Global Perspectives on Social Welfare, Peace, and Justice. (3 cr. 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; grad student or adult special orth) 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 in culture, age, physical ability, and social orientation.


SW 5707. Interventions with Battered Women and Their Families. (2 cr. Prereq—§; 5705; grad or non-degree seeking student #) 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 non-degree seeking student or #) Assessment and intervention in situations involving substance abuse with special emphasis on cross cultural practice. Relationships of substance abuse to areas of current illness, and violence within families are examined.

SW 5709. Applied Psychopharmacology for Human Service Professionals. (2 cr. A-F only) Categories of psychoactive drugs. Medications to treat mental disorders. Legal drugs such as alcohol, nicotine, cocaine, and marijuana. What is occurring physiologically when someone takes a psychoactive drug.

SW 5711. Co-Occurring Addictive and Mental Health Disorders. (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 client and those who are part of his or her environment. Social, environmental, and multicultural factors. Meets partial state requirements for becoming licensed as an alcohol/drug counselor.

SW 5810. Seminar: Special Topics. (1-4 cr [max 10 cr] Topics specified in Class Schedule. §SW 5811. Social Work Ethics. (2 cr. Prereq—§-8801, grad student or non-degree seeking student or #) Acquire knowledge base and develop skills required to identify ethical issues, resolve ethical dilemmas, and make ethical decisions within the context of the professional practice of social work. Values and ethical standards of the profession and ethical decision-making models examined in-depth.


SW 5991. Independent Study in Social Work. (1-4 cr [max 4 cr]) Independent study in areas of special interest to students and faculty.

SW 8010. Seminar: Field Practicum I. (1-8 cr [max 6 cr]; S-N only, Prereq—82001) Integrates classroom learning with direct experience of a social work field internship. Professional support/learning groups focus on student-and facilitator-identified issues. Students discuss professional/personal biases, ethical dilemmas, and supervisory issues. Cross-cultural understanding, implications of cross-cultural practice.

SW 8020. Field Practicum II. (1-6 cr [max 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 8030. Advanced Standing Social Work Practicum. (1-8 cr [max 8 cr]; S-N only, Prereq—Adv-standing) Integrates classroom learning with direct experience of a social work field internship. Professional support/learning groups discuss issues raised in field placement. Courses focus on professional/personal biases, ethical dilemmas, supervisory issues, cross-cultural sharing, and implications of students’ privilege/power in relation to client systems.

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. Psychopathology 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) or #) 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.

SW 8103. Health and Mental Health Policy. (3 cr. Prereq—§8211, 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])


SW 8303. Advanced Mental Health Practice with Adults. (3 cr. §SW 5316. Prereq—8051 or §8051 or all foundation courses for full program or advanced standing or #) Theory/practice of cognitive, 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 8312. Advanced Social Work Practice With Groups. (3 cr. [Prereq–[SW 8201, SW 8202, adv standing] or #]) Advanced clinical work with groups. How to differentiate among available models of group work and select an appropriate model based on needs of client population and on context in which they are served.

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 collaboration in human services, health, and educational settings. Team building, decision-making models, engaging value differences, managing conflict on task/role/status disparities, relational communications. Emerging approaches to interorganizational collaboration.

SW 8314. Social Work Interventions With Families. (3 cr. [SWS 5318. Prereq–[5318; adv standing or SW 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. Prereq–Master’s student, adviser and DG&S consent)

SW 8444. FTE: Doctoral. (1 cr. Prereq–Doctoral student, adviser and DG&S consent)

SW 8501. Planning, Marketing, and Program Development. (3 cr. [Prereq–[Foundation curriculum, advanced standing] or #]) Planning, program development, marketing, and communications. 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 applied social work practice management and in community organization/change.

SW 8519. Mediation and Conflict Resolution for Social Workers. (3 cr. Prereq–[5519; 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. [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]. 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–#) Independent study under tutorial guidance.

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 conducted in conjunction with field learning experiences or other coursework.

SW 8702. Advanced Social Work Practice With Diverse Populations. (3 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. Prereq–[5811; 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 advanced standing or #) Principles, practices, and models of supervision in human service systems: administrative, educational, professional program 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 grad 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–Soc 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.

SW 8861. Theory and Model Development in Social Work. (3 cr. Prereq–Soc wk PhD student or #) Intervention research methods and contemporary social work practice models. Practice models studied include direct intervention in variety of systems from individual to community. Theoretical, value, empirical foundations of contemporary practice models examined through lens of intervention research.

SW 8863. Social Work Teaching Methods and Educational Issues. (3 cr. Prereq–Soc wk PhD student or 2nd-yr MSW student or #) Teaching methods, skills, strategies, and issues related to teaching, scholarship, and service roles in context of social work education. Familiarizes students with current issues, including curriculum development. Includes concurrent teaching experience in a social work class.

SW 8871. Social Work Research Seminar I. (3 cr. Prereq–Soc wk PhD student or #) First of two required Ph.D. seminars. Students review and expand their knowledge of basic concepts and methods of social research; current issues and controversies in social science and social work research and knowledge development. Development of research questions, sampling, measurement, data collection strategies in qualitative and quantitative research.

SW 8872. Social Work Research Seminar II. (3 cr. Prereq–8871 or #) Additional topics: methodologies and design of quasi-experiments, surveys, descriptive research, grounded theory, and analysis of quantitative and qualitative data.

SW 8875. Research Practicum. (2 cr [max 6 cr]; S-N only. Prereq–Soc wk PhD student or #) Experience in conduct of research, following completion of 8871 and 8872. Students work under faculty direction.

SW 8888. Thesis Credit: Doctoral. (1-24 cr [max 100 cr]. 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. Prereq–Master’s student, adviser approval, DGS approval) Directed research

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

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

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

For definitions of course numbers, abbreviations, and symbols, see page 167.
Courses

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

Sociology (Soc)

Department of Sociology

College of Liberal Arts

Soc 5090. Topics in Sociology. (1-3 cr [max 3 cr]. Prereq–1001 or #) Topics specified in Class Schedule.

Soc 5455. Sociology of Education. (3 cr. §EDPA 5041. Prereq–1001 or equiv or #) Structures and processes within educational institutions. Links between educational organizations and their social contexts, particularly as these relate to educational change.


Soc 8001. Sociology as a Profession. (1 cr [max 2 cr]. S-N only. Prereq–Grad soc major) Sample topics: role of sociology in society, professional organizations, employment opportunities, professional ethics, and writing for publication or grant proposals.


Soc 8090. Topics in Sociology. (1-4 cr [max 12 cr]. Prereq–#) Topics specified in Class Schedule.

Soc 8091. Independent Study. (1-5 cr [max 20 cr]) Independent study of an established 8xx course.

Soc 8093. Directed Study. (1-4 cr [max 20 cr]. Prereq–Grad soc major or #) Directed study in sociology.

Soc 8094. Directed Research. (1-4 cr [max 20 cr]) 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, how 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 8148. Law, Society, and the Mental Health System. (3 cr. Prereq–Grad student, 4148 or #) Intensive survey of 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–3811 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 development, and technological change. Economic status in relation to social status, including race, gender.

Soc 8211. Race Relations Theory. (3 cr) Major theoretical debates. Classics 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. §GWST 8202) 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 [max 12 cr]) Comparative perspectives on racial inequality; race, class, and gender; quantitative research on gender stratification; stratification in post-capitalist 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. Prereq–Master’s student, advisor and DGS consent)

Soc 8390. Topics in Political Sociology. (3 cr [max 12 cr]) Topics with common focus on social underpinnings of political behavior and political change. Sample topics: democracy and development, international and national 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. Prereq–Doctoral student, advisor and DGS consent)

Soc 8490. Advanced Topics in Social Organization. (3 cr [max 12 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, cohabitation, parenthood, and cultural variations in families.

Soc 8540. Topics in Family Sociology. (3 cr [max 12 cr]) Families and mental health; families, work, and the labor market; historical/comparative research on the family. Topics specified in Class Schedule.


Soc 8590. Topics in Life Course Sociology. (3 cr [max 12 cr]) Sociology of aging; sociology of youth, and mental health and adjustment in each life course. Topics specified in Class Schedule.

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

Soc 8701. Sociological Theory. (4 cr; A-F 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, macro and micro levels of analysis. Empirical literature on major substantive topics 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) Prominent 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.

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

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

Soc 8790. Advanced Topics in Sociological Theory. (3 cr [max 12 cr]) Sample topics: theories of conflict, theories of purposive action, Marxist theory, and structure-agency debate.

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 equiv, 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]. Prereq–Max 18 cr per semester or summer; 24 cr required)

Soc 8890. Advanced Topics in Research Methods. (3-4 cr [max 12 cr]. Prereq–grad soc major or #) Advanced quantitative methods (e.g., multilevel models) and historical/comparative, field, and survey research. Topics specified in Class Schedule.
Courses

South Asian Languages and Cultures (SALC)

Department of Asian Languages and Literatures

College of Liberal Arts

SALC 5011. Indo-Aryan Linguistics. (3 cr)
Phonological, morphological, and syntactic developments; Indo-European, Old Indo-Aryan, Middle Indo-Aryan, Hindi, and other major modern Indo-Aryan languages.

SALC 5090. Instruction in South Asian Languages. (3-5 cr [max 5 cr])
Individualized instruction in one of the South Asian languages.

SALC 5201. Ancient Indian Literature in Translation. (3 cr)
Literary achievements of Indian civilization from the ancient period.

SALC 5202. Modern Indian Literature in Translation. (3 cr)
Literary achievements of Indian civilization from the modern period.

SALC 5204. Folklore of India. (3 cr)
A study of the main genres of Indian folklore—folk tales, folk songs, folk epics, folk dramas, proverbs, and riddles—their relationship to Indian society and inter-relationship with literary traditions, both great and small.

SALC 5411. Introduction to Indian Philosophy. (3 cr)
Major concepts; principal schools of Indian philosophy; traditional and contemporary views.

SALC 5412. 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) [SALC 3413]
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 5414. Comparative Religions of South Asia. (3 cr) [SALC 3414]
Compared 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) [SALC 3456]
Survey of cinema of South Asia; aesthetic, social, economic, and political perspectives.

SALC 5500. Problems in Indian Philosophy. (3 cr) [SALC 3500]
Survey 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 [max 5 cr])
Selected topics on South Asian languages; no knowledge of South Asian languages required.

SALC 5720. Seminar in South Asian Literature. (3-4 cr [max 4 cr])
Selected topics on South Asian literature.

SALC 5730. Seminar in South Asian Culture. (4-5 cr [max 5 cr])
Selected topics on South Asian cultures.

SALC 5833. India's Gods and Goddesses. (3 cr)
Indian history examined by following development of the deities Krishna, Shiva, and Kali.

SALC 5993. Directed Studies. (1-5 cr [max 5 cr])
Guided individual reading and study of topics not covered in regular courses. Open to qualified students for one or more semesters.

SALC 5994. Directed Research. (1-5 cr [max 5 cr])
Directed research on topics of language, literature, or civilization selected by qualified students with consent of instructor and studied on tutorial basis.

SALC 8333. FTE: Master's. (1 cr) [Prereq–Master's student, adviser and DGS consent]

SALC 8444. FTE: Doctoral. (1 cr) [Prereq–Doctoral student, adviser and DGS consent]

SALC 8666. Doctoral Pre-Thesis Credits. (1-18 cr [max 50 cr])
Pre-req–Max 18 cr per semester or summer; 10 cr total required (Plan A only)

SALC 8777. Thesis Credits: Master's. (1-18 cr [max 50 cr])
Pre-req–Max 18 cr per semester or summer; 10 cr total required (Plan A only)

SALC 8790. Research. (1-5 cr [max 5 cr])

SALC 8888. Thesis Credit: Doctoral. (1-24 cr [max 100 cr])
Pre-req–Max 18 cr per semester or summer; 24 cr required

Spanish (Span)

Department of Spanish and Portuguese Studies

College of Liberal Arts

Span 5012. Advanced Problems in the Spanish Language. (1-2 cr; A-F only)
Development of oral proficiency in Spanish. Participants choose section of course based on their current ACTFL level of Spanish language proficiency. Problematic aspects of Spanish pronunciation, grammar, idiomatic expressions reviewed according to needs of class participants.

Span 5106. The Literature of the Reconquest and Feudal Spain. (3 cr) [Pre-req–Three 3xxx or 5xxx 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) [Pre-req–Three 3xxx or 5xxx literature courses in Spanish or Portuguese]
Major Renaissance and Baroque works of the Spanish Golden Age (16th- and 17th-century poetry, 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 Quijote. (3 cr) [Pre-req–Three 3xxx or 5xxx literature courses in Spanish or Portuguese]
Analysis of Cervantes’ Don Quijote 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) [Pre-req–Three 3xxx or 5xxx literature courses in Spanish or #]
Major literary works and intellectual movements and conflicts represented in written culture, of the 18th and early 19th centuries (1680-1855), 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) [Pre-req–Three 3xxx or 5xxx literature courses in Spanish or #]
Theoretical and representative examples of the realist/naturalist novel (Galdós, Pardo Bazán) in the context of its antecedents (“costumbrismo”), opposites (the idealist/sentimental novel), and turn-of-the-century innovations of modernism and the “generation of 1898.”
Courses

Span 5111. Contemporary Spanish Literature Since 1915. (3 cr. Prereq—Three 300x or 500x literature courses in Spanish or #) 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 300x or 500x literature courses in Spanish or Portuguese) Major dramatists of the Spanish comedia (e.g., Cervantes, Lope, Tirso, Calderon). Traditional genres such as tragedy, farce, interludes or auto sacramentales and problems of honor, blood purity, free will, city vs. country, and poetic justice examined against the background of cultural and social history.

Span 5234. Feminism and Literature in Spain. (3 cr. Prereq—Three 300x or 500x literature courses in Spanish or Portuguese or #) Spanish feminism: thought and practice; literature, cultural discourse, literary and critical theory.

Span 5272. Hispanic Modernism. (3 cr. Prereq—Three 300x or 500x 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 5316. Spanish Picaresque Narratives. (3 cr. Prereq—Three 300x or 500x literature courses in Spanish or Portuguese) Major picaresque narratives—Lazarillo, Guzmán, Buscán, Cervantes’ Picares, Estebanillo González.—in relation to Spanish ambience. Western tradition, European novel, realism. Literary autobiography, episodic structure, themes of rogery, delinquency, sin, marginality, social criticism, moral preoccupations. Comparison to European counterparts.


Span 5526. Creole Consciousness and Mercantilist Culture. (3 cr. Prereq—Three 300x or 500x 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.

Span 5527. National Literary Consciousness and Free Trade. (3 cr. Prereq—Three 300x or 500x 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 300x or 500x lit 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 300x or 500x literature courses in Spanish or #) Literary trends of the contemporary period (1950 to present) as a reaction to internal social demands for development of independent national cultures and in response to international cultural pressures.

Span 5531. Hispanic Literature of the United States. (3 cr. Prereq—Three 300x or 500x Spanish or Portuguese literature courses or #) Interdisciplinary approach providing a framework for deconstructing issues of national identity, marginalization, and gender. U.S. Hispanic theatre/ literature and its ethnic diversity, regional variations, cultural links, and scope of its genres.


Span 5536. Feminism and Literature in Latin America. (3 cr. Prereq—Three 300x or 500x literature courses in Spanish or Portuguese) Latin American feminism in thought and practice; literature, cultural discourse, literary theory.

Span 5701. History of Ibero-Romance. (3 cr. Prereq—3703, two other 3xxx or 5xxx linguistics courses or #) Origins and developments of Ibero-Romance languages; evolution of Spanish, Portuguese, and Catalan.

Span 5711. The Structure of Modern Spanish: Phonology. (3 cr. Prereq—3701, two 300x or 500x linguistics courses in Spanish or #) Formulating and evaluating a phonological description of Spanish. Approaches to problems in Spanish phonology within metrical, autosegmental, and lexical phonological theories.

Span 5712. The Structure of Modern Spanish: Morphology. (3 cr) Evaluating morphological theories and descriptions of Spanish. Examining of phonological and syntactic effects on morphology.

Span 5713. The Structure of Modern Spanish: Syntax. (3 cr. Prereq—3702, two 300x or 500x Spanish linguistics courses or #) Study and analysis of the principal constructions found in the syntax of Spanish.

Span 5714. Theoretical Foundations of Spanish Syntax. (3 cr. Prereq—5713 or #) Linguistic types/processes that appear across languages. Grammatical relations, word order, transitivity, subordination, information structure, grammaticalization. How these are present in syntax of Spanish.

Span 5715. The Structure of Modern Spanish: Semantics. (3 cr) Applying semantic theory to Spanish: conceptual organization and the structuring of experience; meaning and cultural values; semantic fields; categorization and prototypes; cognitive model theory; metaphor, metonymy, and mental imagery as source and change of meaning.

Span 5716. The Structure of Modern Spanish: Pragmatics. (3 cr. Prereq—#) Concepts used in current literature in Spanish pragmatics, such as deixis, presupposition, conversational implicature, speech act theory, and conversational structure.

Span 5721. Spanish Laboratory Phonology. (3 cr; A-F only. Prereq—[5711, honors] or grad student or #) Core literature on Spanish laboratory phonology. Phonology from a laboratory perspective. Students evaluate laboratory research methodologies, perform basic acoustic analyses, and design laboratory phonology studies.

Span 5731. Spanish Dialectology: Regional and Social Dialects of Modern Spain. (3 cr. Prereq—Three 300x or 500x 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 300x or 500x 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 5800. Spain’s Image and the Hispanic Culture (Towards the XXI Century). (1-3 cr. A-F only. Prereq—Three 300x or 500x literature courses in Spanish or Portuguese) Contemporary Spanish society from perspectives of humanities, social sciences. Major sociocultural changes in Spain during 20th century. Emphasizes current situation, developments leading into 21st century. Literature, history, politics, geographical/ regional diversity, art, music, cinema.

Span 5910. Topics in Spanish Peninsular Literature. (3 cr) Major topics in Spanish literature and culture and/or Spanish-American subjects.

Span 5920. Topics in Spanish-American Literature. (3 cr or [max 9 cr]) 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]) Problems in Hispanic linguistics; a variety of approaches and methods.

Span 5970. Directed Readings. (1-4 cr [max 9 cr. Prereq—MA or PhD candidate, #) Students must submit reading plans for particular topics, figures, periods, or issues. Readings in Spanish and/or Spanish-American subjects.

Span 5985. Sociolinguistic Perspectives on Spanish in the United States. (3 cr. Prereq—Three 300x or 500x 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—#) For definitions of course numbers, abbreviations, and symbols, see page 167. 311
Courses


Span 8300. The Construction of Spanish Literary History. (3 cr or 9 cr) Prereq—Two Sxx courses in Spanish literature and culture) Origins and development of Hispanic literary canon: sociocultural theories of Spanish literary histories as academic and historiographic disciplines. Critiques of modern literary theories through analysis of literary works by major writers.

Span 8312. Two Spanish Masterpieces: Libro de Buen Amor and La Celestina. (3 cr. Prereq—S106, S107 or Sxxx 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: Master’s. (1 cr. Prereq—Master’s student, adviser and DGS consent)

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

Span 8866. Doctoral Pre-Thesis Credits. (1-18 cr [max 60 cr] 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—S711, Ling 5502 or #) Critical examination of readings and research on specific topic.

Span 8730. Seminar in Spanish and Portuguese Syntax. (3 cr [max 9 cr] Prereq—S714 or #) Critical examination of readings and research on specific topic.

Span 8750. Seminar in Spanish and Portuguese Pragmatics. (3 cr [max 9 cr] Prereq—S716 or #) Critical examination of readings and research in specific topic.

Span 8777. Thesis Credits: Master’s. (1-18 cr [max 50 cr] 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—S751 or S532 or S585 or #) Current topics.

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

Span 9890. Spanish Seminar. (3 cr [max 9 cr] Prereq—Span Sxxx 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 9890. Advanced Research in Spanish-American Literary 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 premises and principles in theory of literary criticism and histories of literature.

Span 9890. 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 8900. Advanced Comparative Research of Caribbean Genres. (3 cr [max 9 cr] Prereq—S525 or #) Major literary works and genres of Caribbean literature studied against the background of sociohistorical vicissitudes of the process leading to the formation and consolidation of the national states.

Span 8990. Advanced Comparative Research of Caribbean Genres. (3 cr [max 9 cr] Prereq—S525 or #) Major literary works and genres of Caribbean literature studied against the background of sociohistorical vicissitudes of the process leading to the formation and consolidation of the national states.

Spanish and Portuguese (SpPt)

Department of Spanish and Portuguese Studies

College of Liberal Arts


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 guidance with their practical applications. Seminar 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 Sxx 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 Lusobo-Brazilian Cultural Discourses. (3 cr [max 9 cr] Prereq—Grad or #) 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.

Speech-Language-Hearing Sciences (SLHS)

College of Liberal Arts


SLHS 5401. Counseling and Professional Issues. (3 cr. Prereq—[1720 or 6620], grad student recommended) Basic counseling principles and current professional issues in communication disorders. Application of counseling theory to clinical practice. Analysis of regulation, practice, and future direction of communication disorders.


SLHS 5501. Fluency and Phonological Disorders. (3 cr. Prereq—Grad student or #) Description, nature, and treatment of fluency disorders in children/adults. Involvement in therapeutic/research activities.


SLHS 5603. Language and Cognitive Disorders in Children. (3 cr. Prereq—3xxx or CDis 3305 or equiv or grad student or #) Language assessment, teaching procedures used with children/adolescents. Procedures apply to children who face language disabilities such as developmental delays, autism, learning disabilities.

SLHS 5605. Language and Cognitive Disorders in Adults. (3 cr. Prereq—3xxx or CDis 3302, 4301 or CDis 3302, CDis 4301 or #) Neurogenic communicative and cognitive disorders in adults, including aphasia, right-hemisphere syndrome, traumatic brain injury, and dementia. Consideration of neurologic substrates, assessment and diagnosis, and clinical intervention.

SLHS 5606. Introduction to Augmentative and Alternative Communication. (3 cr) Description of the range of augmentative and alternative communication applications for persons with developmental and acquired disabilities.

SLHS 5607. Electronic Communication Aids. (3 cr. Prereq—5606 or #)

SLHS 5801. Audioligic Assessment I. (3 cr. Prereq—4801 or CDis 4801 or F) Basic audiometric battery, including pure tones, speech, masking, and inimmittance in adults. Industrial audiometry, otocoustic emissions.

SLHS 5802. Hearing Aids I. (3 cr. Prereq—[3305, 4301] or [CDis 3305, CDis 4801] or #) Survey of modern hearing aids including history of development, electroacoustic functions, clinic and laboratory measurement techniques, sound field acoustics, techniques for selection.

SLHS 5803. Hearing Loss in Children: Diagnosis. (3 cr. Prereq—4801 or CDis 4801 or F) Behavioral, physiological approaches to assessment and identification, development of the auditory mechanism, etiologies of hearing losses in infants, children, selection of sensory aids, principles of case management with children and families.

SLHS 5804. Cochlear Implants. (3 cr; A-F only. Prereq—[4802, 5801, 5802] or [CDis 4802, CDis 5801, CDis 5802] or #) Implantable auditory prostheses. History of device development, including cochlear implants with auditory brainstem implants. Signal processing. Techniques for selection, fitting, and rehabilitation. Behavioral/physiological changes across lifespan.

SLHS 5805. Auditory Processing Disorders. (2 cr; A-F only. Prereq—4802 or CDis 4802) Normal/disordered auditory processing abilities. Anatomy/physiology of central auditory pathway, assessments to evaluate auditory processing skills, techniques to address auditory processing weaknesses. Current/historical theories/controversies surrounding auditory processing assessment.

Courses

SLHS 5808. Hearing Disorders. (3 cr; A-F only. Prereq–[5801, 8802] or [CDis 8001, CDis 8002])
Disorders of auditory system, including anatomical, physiological, perceptual, and audiological manifestations of pathologies affecting hearing.

SLHS 5810. Laboratory Module in Audiology. (1-2 cr [max 5 cr]. Prereq–4801 or CDis 4801 or)
Intensive study of clinical methods in audiology. Supplements didactic courses in audiology curriculum. Laboratory study, individually or in small groups.

SLHS 5820. Clinical Research and Practice: Grand Rounds. (1-6 cr [max 6 cr]; S-N only. Prereq–4801 or CDis 4801 or equiv of)
Students participate in group discussions of current professional issues in audiology. Case presentations, guest presentations on current technology, clinical/ research ethics. Group meet for an hour weekly with faculty coordinator who leads discussion. Integrates academic/clinical education.

SLHS 5900. Topics: Communication Disorders. (1-3 cr [max 4 cr])
Topics listed in communication disorders office.

SLHS 5993. Directed Study. (1-12 cr [max 18 cr; Prereq–#])
Directed readings and preparation of reports on selected topics.

SLHS 6333, FTE: Masters. (1 cr. Prereq–Master’s student, adviser and DGS consent)

SLHS 8410. Seminar: Research. (3 cr)
Advanced study exploring application of experimental and quasi-experimental research designs used in single-subject and group research.

Advanced study to prepare doctoral students for careers in undergraduate and graduate teaching.

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

SLHS 8501. Interdisciplinary Management in Cleft Palate and Craniofacial Disorders. (3 cr. Prereq–3305 or CDis 3305 or #)
Communication problems associated with cleft palate and craniofacial disorders within interdisciplinary context; structural bases for speech problems, and physical and behavioral approaches to speech treatment; interdisciplinary medical and dental concerns and management.

SLHS 8530. Seminar: Speech. (3 cr [max 12 cr])
Advanced study and analysis of research in speech science and speech pathology.

SLHS 8602. Traumatic Brain Injury. (3 cr. Prereq–[3302, 4301] or [CDis 3302, CDis 4301] or #)
Survey of communicative/cognitive disorders in adults who have traumatic brain injuries. Demographics, neuropathologic substrates, assessment/diagnosis, clinical applications.

SLHS 8630. Seminar: Language. (3 cr [max 12 cr])
Advanced study and analysis of research in language acquisition, language science, and language disorders.

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

SLHS 8720. Clinical Education in Speech-Language Pathology. (1-8 cr [max 24 cr]; S-N only. Prereq–Grad CDis major, adviser, DGS consent)
Clinical experience.

SLHS 8777. Thesis Credits: Masters’. (1-18 cr [max 50 cr]. Prereq–Max 18 cr per semester or summer; 10 cr total required [Pan A only])

SLHS 8801. Audiologic Assessment II. (3 cr. Prereq–5801 or CDis 5801 or #)
Audiologic assessment response and balance function in adults. Case studies and development of clinical protocols allowing for integration of topics from both courses in this sequence.

SLHS 8802. Hearing Aids II. (3 cr. Prereq–5802 or CDis 5802 or #)
Instrumentation and methods for fitting and evaluating personal hearing aids; ear impression techniques and materials; repair and modification of hearing aids.

SLHS 8803. Signals and Systems in Audiology. (3 cr. Prereq–[3305, 3306, 4801] or [CDis 3305, CDis 3306, CDis 4801] or #)
Introduction to electronics, digital signal processing, and calibration of instruments used to assess hearing. Lab sessions on such topics as sound-field calibration, earphone calibration, filters, spectra of transient signals, and use of an artificial mastoid.

SLHS 8805. Hearing Science Foundations of Audiology. (3 cr. Prereq–Knowledge of acoustics, basic anatomy/physiology of ear, intro coursework in hearing/speech science)
Physiological/psychological acoustics. Emphasizes hearing loss. Models of middle ear, bone conduction hearing, cochlear mechanics, frequency selectivity, intensity resolution, temporal resolution, and binaural hearing.

SLHS 8806. Audiology Capstone. (1-6 cr [max 6 cr]; S-N only. Prereq–5802, 5807)
Students research a case history of patient with an auditory disorder, write paper that summarizes the literature on the disorder, and recommend assessment tools and treatment plans.

SLHS 8807. Audiologyic Assessment III. (2 cr. Prereq–5801, 8801)
Anatomy/physiology of vestibular movement, assessment techniques to evaluate balance function. Treatment options available for persons with balance disorders.

SLHS 8820. Clinical Education in Audiology. (1-8 cr [max 24 cr]; S-N only. Prereq–Grad CDis major)
Clinical experience.

SLHS 8830. Seminar: Hearing. (3 cr [max 12 cr])
Advanced study/analytics of research in hearing science and audiology.

SLHS 8840. Audiology Externship. (1-7 cr [max 7 cr]; S-N only. Prereq–[5802, 8807] or [CDis 8002, CDis 8802] or #)
Students intern at external clinical setting under supervision of certified audiologist. Entry-level knowledge/skills required for professional practice as clinical audiologist. External internship settings may include hospitals, schools, private otolaryngology practices, hearing aid dispensing practices, industrial settings, and community clinics.

SLHS 8888. Thesis Credit: Doctoral. (1-24 cr [max 100 cr]. Prereq–Max 18 cr per semester or summer; 24 cr required)
Prereq–#)
Directed research.

Statistics (Stat)

School of Statistics
College of Liberal Arts

Stat 5021. Statistical Analysis. (4 cr. §AnSc 2211, Stat 3011, College algebra or #; Stat course recommended)
Intensive introduction to statistical methods for graduate students needing statistics as a research technique.

Stat 5031. Statistical Methods for Quality Improvement. (4 cr. Prereq–3021 or 3022 or 4102 or 5021 or 5102 or 8102), Math 1272)

Stat 5041. Bayesian Decision Making. (3 cr. Prereq–4101 or 5021 or 5101 or #)

Logical development of probability, basic issues in statistics. Probability spaces. Random variables, their distributions and expected values. Law of large numbers, central limit theorems, generating functions, multivariate normal distribution.


Stat 5201. Sampling Methodology in Finite Populations. (3 cr–Prereq–3021 or 3021 or 5021 or #)

Stat 5302. Applied Regression Analysis. (4 cr. Prereq–4012 or 5021 or 5102 or #)

Stat 5303. Designing Experiments. (4 cr. Prereq–3022 or 4102 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 #)

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 5631. Topics in Statistics. (3 cr)
Topics vary according to student needs and available staff.

Stat 5632. 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 6061. Applied Statistical Methods I. (4 cr; A-F only. Prereq–Grad stat major or #)
The regression problem; linear regression with one or more predictors; using graphics in regression; model building; model assessment and diagnostics; outliers; generalized linear models; logistic, Poisson, and nonlinear regression.

Stat 6062. Applied Statistical Methods II. (4 cr; A-F only. Prereq–6061, grad stat major or insr consent)
Categorical data analysis: loglinear models, logit models, multinomialresponse models, exact and asymptotic inference, conditionalindependence; models of association. Experimental design: randomization,ANOVA, contrasts and multiple testing, factorial, blocking, covariates,split plots, random effects, fractional factorial, response surfaces.
Courses


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 8121. Theories of Inference. (3 cr. Prereq–8102, 8112, or #) Topics 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; nonparametric, sequential, likelihood, and Bayesian 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 8151. Statistical Decision Theory. (3 cr; S-N only. Prereq–8112, Math 8656) Comparison of inferential methods in statistics (including riskcomparison, 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 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–8102 or 8102 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 curvatures, super leverage, parameter plots, projected residuals, transform-both-sides methodology, Wald versus likelihood inference. Topics in linear and generalized linear models as they relate to 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 8666. Pre-Doctoral. (1-18 cr; max 60 cr) Markov chains in discrete and continuous time, renewal processes, Poisson process, Brownian motion, and other stochastic models encountered in applications.


Stat 8721. Programming Paradigms and Dynamic Graphics in Statistics. (3 cr. Prereq–8062, 8102) Alternative programming paradigms to traditional procedural programming, including object-oriented programming and functional programming. Applications to development of dynamic statistical graphs and representation and use of functional data, such as mean function in nonlinear regression models, and prior densities in Bayesian analysis.

Stat 8777. Thesis Credits: Master’s. (1-18 cr; max 50 cr) Stat 8868. Thesis Credit: Doctoral. (1-24 cr; max 100 cr) Pre-req–Max 18 cr per semester or summer; 10 cr total required (Plan A only)

Stat 8881. Statistical Consulting. (3 cr; S-N only. Prereq–Grad stat major or #) Principles of effective consulting/problem-solving, meeting skills, and reporting. Aspects of professional practice/behavior, ethics, and continuing education.

Stat 8881. Statistical Consulting Practicum. (3 cr; max 12 cr; S-N only. Prereq–Statistics grad student or #) Providing (under faculty supervision) statistical support to clients, primarily University researchers. Exercises in problem solving, ethics, listening/communication skills.


Stat 8888. Thesis Credit: Doctoral. (1-24 cr; max 100 cr) Pre-req–Max 18 cr per semester or summer; 24 cr required

Stat 8900. Student Seminar. (1 cr; max 2 cr; S-N only. Prereq–Statistics graduate student) Preparation or presentation of seminar on statistical topics.

Stat 8931. Advanced Topics in Statistics. (3 cr [max 12 cr]) Topics vary according to student needs and available staff.

Stat 8932. Advanced Topics in Statistics. (3 cr [max 12 cr]) Topics vary according to student needs and available staff.

Stat 8933. Advanced Topics in Statistics. (3 cr [max 12 cr]) Topics vary according to student needs and available staff.

Stat 8933. Advanced Topics in Statistics. (3 cr [max 12 cr]) Topics vary according to student needs and available staff.

Stat 8992. Directed Readings and Research. (1-6 cr; Prereq–4) Directed study in areas not covered by regular offerings.

Studies in Cinema and Media Culture (SCMC)

Department of Cultural Studies and Comparative Literature

College of Liberal Arts


SCMC 5993. Directed Study. (1-3 cr [max 6 cr]) Guided individual reading or study.

Studies of Science and Technology (SST)

Institute of Technology

SST 8000. Colloquium. (1.5 cr [max 3 cr]; S-N only. Prereq–Grad SST minor) Series of weekly lectures by nationally and internationally known scholars with diverse disciplinary and methodological backgrounds speaking on a variety of issues.