Mathematics (Math)

Institute of Technology

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General Education—The mathematics curriculum for the major begins with calculus (1251 or 1551H). However, the School of Mathematics offers “introductory” courses at a level below calculus. These courses include 1001 (Excursions in Mathematics), 1031 (College Algebra and Probability), and the pair 1051-1151 (Precalculus I-II). If you are considering one of these introductory courses, you must determine both the direction you wish to take in math and the appropriate level of entry.

The possible directions are finite mathematics (1311), short calculus (1142), or full calculus (1251 or 1351). The choice of direction is sometimes clarified by the requirements of your prospective major. If your direction is toward finite math or short calculus, then 1031 is the appropriate introductory course. If your direction is toward full calculus, then 1051-1151 is appropriate. Introductory courses are not required if your background and placement scores indicate otherwise. If you wish to change your direction after taking one of the introductory courses you may do so by taking one of the special 2-credit courses, 1038 or 1058.

To help determine the proper level of entry, you are required to take a mathematics placement exam. If you are a new CLA student, information about this exam is included in your orientation materials. The exam results will be combined with other background information about you, and you will be given an “index” and specific recommendations as to the appropriate level of your first University math course. Even if for any reason you do not receive testing information from other sources, you must still take the math placement test. This may be done in your college or department office according to its own conditions, or in the math office (4 Vincent Hall). There the exam, which takes 30-45 minutes, will be administered and graded promptly and a recommendation given.

If you are coming from another institution and are seeking advanced placement, a careful reading of the calculus course descriptions of both schools is necessary. The general rule is that you are not required to take any University course for which the subject matter has been covered in course(s) taken elsewhere, and for which credit has been granted. Credits for such courses taken elsewhere are usually awarded as part of the admissions process. If you wish to appeal the credit awards, you must initiate that process in your college office. Mathematics advisers, available by appointment (4 Vincent Hall, 612/625-4848), do not make rulings about credits, but will assist you for the purpose of placement or appeal. You may be asked to show materials (college bulletin and/or textbook and/or syllabus) to expedite these processes.

When negotiations fail, the math department may in some cases give exams for credit in certain Math courses at the level of calculus or above. If you wish to be tested on that basis (for credit) you must obtain a petition to that effect from your college office, bring it to the math office (4 Vincent Hall), and be prepared to explain to the director of undergraduate studies how you happened to learn the material without already receiving University credit. Exams for credit are not given in courses below the level of calculus or in 3105-6-7.

Degrees—The School of Mathematics offers a program leading to the B.A. degree in the College of Liberal Arts and one leading to the bachelor of science (B.S.Math) degree in the Institute of Technology. Information about the
B.S. Math program may be found in the Institute of Technology Bulletin.

By fulfilling certain requirements beyond those for the B.A., you can earn the additional phrase “with Actuarial Specialization” or “with Specialization in Mathematics Education” on your transcript.

Honors—Information about honors courses and graduation with honors may be obtained in the undergraduate mathematics office in Vincent Hall.

B.A. Major Sequence

Lower Division Requirements—You are required to complete the seven courses, 1251-1252-1261-3251-3252-3261-3262. The alternate sequence 1351-2-3 may be substituted for the first three. Honors students complete the five courses, 1551H-1552H-1553H-3551H-3552H. If you wish to take an honors course, you must be interviewed at the IT Honors office, 136 Lind Hall. An honors student who does not take 1552H at this University may be required to take 3262.

Upper Division Requirements—You are required to take a minimum of 10 approved upper division courses from this bulletin. There are also distribution requirements in the three categories of analysis, algebra, and depth, each of which is explained below.

A minimum of five courses is required in algebra and analysis (either 3-2 or 2-3). The depth requirement involves the selection of one or two “areas of specialization.” If three courses are taken in both algebra and analysis, the depth requirement is waived. If a total of five courses are taken in algebra and analysis (combined), the depth requirement is either three courses in a single area of specialization or two courses in each of a pair of areas of specialization.

Courses that fulfill the analysis requirement are 5606-5607-5608 or 5612-5613-5614. Courses that fulfill the algebra requirement are 5245-5246-5247 or 5282-5283-5284. In both categories, the second-named sequence is more intensive and intended primarily for students planning to go to graduate school.

The possible areas of specialization are as follows: logic (5162-5163-5164), geometry (5331-5332-5333-5337), topology (5341-5342-5343), differential geometry (5375-5376-5377), methods of applied mathematics (5457-5458-5459), numerical analysis (5473-5474-5475 or CSci 5301-5302-5304-5305-5306), ordinary differential equations (5521-5522-5523), dynamical systems (5531-5532-5533), partial differential equations (5571-5572-5573), probability (5681-5682-5683), statistics (Stat 5131-5132-5133), combinatorics/graph theory (5701-5702-5703), and actuarial mathematics (5056-5057-5058-5059). Other pairs or triples from the department offerings listed below may be substituted with adviser approval. No more than one of the following may be elected: Stat 5131, Math 5679, Math 5681.

General Requirements—A math course numbered over 5000 is approved for the major unless otherwise stated in the course description. A limited number of approved courses outside the math department are listed above among the areas of specialization. No other courses outside the mathematics department may be substituted. The total number of credits required for the B.A. is 180. Courses in the major must be taken A-F and must be completed with a grade of C or better.

Actuarial Science Specialization—This specialization has requirements in addition to those of the basic math major.

Additional lower division requirements: a course in computer science, such as 3113 or 3102; Econ 1104-1105 or 1101-1102-3101; Acct 1050; BFin 3000; Ins 5100.

Additional upper division requirements: one of the 5xxx algebra courses taken must include linear algebra as a topic. The areas of specialization are to be statistics and actuarial mathematics, and a minimum of three courses in each category is required. The statistics requirement may be fulfilled by either Stat 5131-5132-5133 or by the combination of Stat 5131-5132-5133 and 3xxx statistics courses.
5121-5122 and Math 5679 or 5681. Variations not explicitly stated may be substituted with adviser approval.

Mathematics Education Specialization—This specialization has requirements in addition to those of the basic math major.

Additional lower division requirement: a course in computer programming. CSci 3102 or 3113 are recommended.

Additional upper division depth requirements: there must be an area of specialization in geometry. Two additional courses must be chosen from the following list: Stat 5131-5132, Math 5209, 5679, 5681-5682, 5701-5702-5703. If a second area of specialization is required, the two courses selected from this list must be linked. Any other required math elective is to be taken from the previous list or the following list: 5151, 5152, 5162-5163-5164, 5341-5342, 5473, 5568. Some of the total 180 degree credits may be taken in the College of Education and Human Development.

Mathematics Minor—It is possible to obtain a minor in mathematics by completing the lower division requirements for the major, together with three of the 5xxx courses that are approved for the major. At least one of the 5xxx courses must be a prerequisite for one of the other two. At most one course in another department may be offered as part of a minor program. Courses in the minor must be taken A-F and completed with a grade of C or better.

Course Offerings—All prerequisites must be completed with a grade of C or better.

Math 1001. Excursions in Mathematics. (4 cr; prereq 3 yrs high school math, placement exam or GC 0631 with a grade of C or better)
Topics indicating breadth of mathematics, its applications, and nature and power of abstract reasoning. Not a prerequisite for any other mathematics course.

Math 1008. Trigonometry. (4 cr, §1201, §1151; prereq plane geometry, 2 yrs high school algebra)
Analytic trigonometry, identities, equations, properties of the trigonometric functions; right and oblique triangles.

Math 1031. College Algebra and Probability. (4 cr, §1051, §1111, §1151, §1201; prereq 3 yrs high school math, placement exam or GC 0631 with a grade of C or better)
Algebra and analytic geometry explored in greater depth than is usually done in three years of high school mathematics. Additional topics from combinations, permutations, and probability. A suitable prerequisite for 1131 or 1142, but not for 1251.

Math 1038. College Algebra and Probability Submodule. (2 cr, §1031, §1111; prereq 1051)
Same as 1031, strictly for students who have taken Math 1051 and thus covered about one half of the material already. Prerequisite strictly enforced.

Math 1051. Precalculus I. (4 cr, §1031, §1111, §1201, §1008, §1151; prereq 3 yrs high school math, placement exam or GC 0631 with a grade of C or better)
Algebra, analytic geometry, and trigonometry beyond the usual coverage found in a three-year high school mathematics program. First of two courses (see 1151). Prepares students for the full calculus sequence. Not an acceptable prerequisite for 1131.

Math 1058. Precalculus I Submodule. (2 cr, §1051, §1151, §1111, §1201, §1008; prereq 1031)
Same as 1051, strictly for students who have taken 1031 and thus covered about one half of the material already. Prerequisite strictly enforced.

Math 1131. Finite Mathematics. (5 cr; prereq 3½ yrs high school mathematics or a grade of C or better in 1031 or 1111; for students in prebusiness and social and behavioral sciences)
Elementary computer programming, financial mathematics, probability, linear algebra, linear programming, Markov chains.

Math 1142. Short Calculus. (5 cr, §1251; prereq 3½ yrs high school mathematics or a grade of C or better in 1031 or 1111 or 1201; for students requiring a minimal amount of calculus)
Derivatives, integrals, differential equations, maxima and minima, partial differentiation, applications.

Math 1151. Precalculus II. (4 cr, §1008, 1111, §1201; prereq 3½ yrs high school mathematics, placement exam or Math 1051 with a grade of C or better)
Second of two courses (see 1051) in algebra, analytic geometry, and trigonometry. Prepares students for the full calculus sequence. Not an acceptable prerequisite for Math 1131.

Math 1251-1252. One-Variable Differential and Integral Calculus I-II. (4 cr per course, §1142, §1211-1221, §1411H-1421H, §1451H-1452H; prereq 4 yrs high school math including trigonometry, placement test or a grade of C or better in Math 1151 or equiv, a grade of C or better in 1251 required for 1252)
Calculus of functions of one variable and related geometry and applications.

Math 1261. Calculus III. (4 cr, §1353; prereq 1252 or 1352 or equiv)
Further topics in calculus: parametric curves, polar coordinates, power series and the Taylor polynomial. Linear algebraic equations, Gaussian elimination, determinants. Applications.

Math 1268. Short Course: Introduction to Linear Algebra. (2 cr, §1261, §3221, §3142; prereq any course in differential equations)
Matrices, Gaussian elimination, determinants. Course offers in isolation the linear algebra of Math 1261. Designed for transfer students who have already had a course in differential equations. Meets only for the first four weeks of the quarter, concurrent with Math 3221.
Math 1351-1352-1353. Calculus: Concepts, Explorations, and Applications. (4 cr each, §1251 for 1351, §1252 for 1352, §1261 for 1353; prereq solid background in precalculus and geometry and visualization of functions and graphs, #, familiarity with graphing calculator recommended, grade of C or better required to continue in the sequence.) Reformed approach to calculus: cooperative learning/small groups, labs, projects. Technology and applications emphasized throughout, with interdisciplinary modules. Meets MW (50-minute) and TTh (75-minute workshops).

1351: functions, differentiation; 1352: antiderivatives, integration; 1353: differential equations, parametric curves, series, basic linear algebra.

Math 1551H-1552H Honors: One-Variable Differential and Integral Calculus I-II. (4 cr per course, §1251-1252, §1411-1421, §1211-1221; prereq consent of IT Honors Office, a grade of C or better in 1551H required for 1552H) Honors-level treatment of calculus of functions of one variable and related geometry and applications, including infinite sequences and series.

Math 1553H-3551H-3552H. Honors: Linear and Nonlinear Analysis I-II-III. (4 cr per course; parts of this sequence may not be taken for credit by students with previous 3xxx Math courses—adviser approval required; prereq 1251-1252 or 1551H-1552H or equiv; a grade of C or better required to continue in sequence) 1553H: vector geometry and linear algebra; 3551H: ordinary differential equations; 3551H-3552H: multivariable differential calculus; 3552H: multivariable integral calculus; recommend taking courses in consecutive quarters.

Math 1711H-1721H-1731H. Secondary Students Honors Calculus I-II-III. (4 cr per qtr; prereq #, ∆) Accelerated honors sequence for selected mathematically talented high school students. Essentially the same as 1551H-1552H, plus applications to science and engineering. Emphasis on theory and computations. Students who complete 1731H take 3511H next.

Math 3001. Actuarial Science Seminar. (1 cr; prereq 48 cr; S-N only) Actuarial science and related fields as careers. Lectures by practicing actuaries and others. Sample employment interviews at insurance or consulting companies.

Math 3105-3106-3107 (formerly 1105-1106). Topics in Elementary Mathematics. (4 cr; prereq Math 1031 or equiv, C or better to continue in sequence) Topics suitable for elementary school teachers presented in a cooperative learning environment. 3105: number sequences, counting, graph theory; 3106: probability, statistics, number systems; 3107: algebraic structures, matrices, rates of change, geometry.

Math 3142. Linear Algebra. (5 cr, §1241, §1261; prereq 1252 or 1221) Practical course in linear algebra, including vector spaces, matrices, determinants, linear algebraic equations and Gaussian elimination, basis and dimension, linear transformation, eigenvalues and eigenvectors, bilinear forms, diagonalization.

Math 3221. Introduction to Linear Algebra and Differential Equations. (5 cr, §3066, §3261, §3552H, §1261; prereq one yr calculus) Combines the linear algebra from Math 1261 with the major topics of Math 3261. Designed for transfer students with one year of calculus. Students who have some linear algebra, or who have taken Math 1261 at this University, should take 3261 instead. Algebra part available separately as Math 1268.


Math 3252. Multivariable Integral Calculus. (4 cr, §for students with 3311, 3331 or 3211, 3331, §3511H, §3552H; prereq 1252, 3251 or §3251) Double and triple integrals; change of variable procedures, emphasizes polar and spherical coordinates; mass and centroid; integration on curves and surfaces; vector fields and theorems of Green, Gauss, and Stokes.

Math 3261. Differential Equations With Linear Algebra. (4 cr, §3211, §3321, §3531H, §3511H; prereq 1252 or 1221, 1261 or 1241 or 3142) Differential equations, including first order equations, linear equations with constant coefficients, and linear systems. Companion topics from linear algebra: general vector spaces, independence, spanning sets, basis, dimension, eigenvalues, and eigenvectors.

Math 3262. Sequences, Series, and Foundations. (4 cr; prereq 1261) Elements of logic; mathematical induction; the real number system; general, monotone, and recursively defined sequences; convergence; infinite series and convergence; Taylor’s series; power series with applications to differential equations; Newton’s method.


Symbols and abbreviations: f,w,s,su—fall, winter, spring quarter, summer session; Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / #—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / !—In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Math 3511H. Honors: Linear Analysis. (5 cr, §1261; prereq 1731H) Continuation of 1731H for mathematically talented high school students. Ideas and computations of linear algebra, including linear independence, linear transformations, matrices, and determinants. Students who complete this course may enter 3511H or any course for which 1261 is the prerequisite.

Math 3551H-3552H. Honors: Linear and Nonlinear Analysis II-III. For description, see 1553H.

Math 5056. Theory of Interest. (4 cr; prereq 1252 or equiv) Time value of money. Annuities, sinking funds, bonds, and similar items. Primarily for mathematics and business majors interested in actuarial science.

Math 5057-5058-5059. Actuarial Mathematics I-II-III. (4 cr; prereq 5056, one qtr 5xxx probability or statistics course) Survival function; actuarial notation; actuarial present values for life insurance and life annuities; equivalence principle: net premiums and reserves; multiple life functions and multiple decrement models; valuation of pensions; expense modeling; modified reserves; other topics at instructor’s discretion.

Math 5105-5106-5107 (formerly 5005-5006-5007) The Diversity of Mathematics. (4 cr ea, §1105, §3105 for 5105; §1106, §3106 for 5106; §3107 for 5107; prereq 1031 or equiv or #; cr only for grad students in elementary education) Mathematical enrichment for elementary school instructors. Topics such as number theory (primes and congruences), fractions and decimals, regular and semi-regular polyhedra, map coloring, graph theory, game theory. Additions and deletions at instructor’s discretion.

Math 5151. Elementary Set Theory. (4 cr; prereq a 32xx math course or equiv or #) Basic properties of operations on sets, cardinal numbers, simply ordered sets, well-ordered sets, ordinal numbers, axiom of choice, axiomatics.

Math 5152. Elementary Mathematical Logic. (4 cr, §5162; prereq a 32xx math course or equiv or #) Grammar and semantics of first- and second-order languages; relational structures; a deductive system for first-order logic; completeness theorem; axiomatics of formal theories.

Math 5162-5163-5164. Mathematical Logic. (4 cr per qtr; prereq 1 yr of calculus or equiv or Phil 5202 or #) 5162: Theory of computability, notion of algorithm, Turing machines, primitive recursive functions, recursive functions, Kleene Normal form, recursion theorem. 5163: Probability and truth in formal systems: propositional and predicate logic, models of axiom systems, Gödel completeness theorem, nonstandard analysis. 5164: Gödel incompleteness theorem: decidable and undecidable theories, models of arithmetic.

Math 5209. Theory of Numbers. (4 cr; prereq a 32xx math course or equiv or #) Elementary theory of numbers up to classical results about congruences to a prime modulus (e.g., Fermat’s theorem). Usually covers one more advanced topic such as continued fractions, Gaussian integers, or quadratic reciprocity.

Math 5242-5243. Linear Algebra With Applications. (4 cr per qtr, §5247, §5284; prereq 1261 or 3142 or equiv) Systems of linear equations, finite dimensional linear spaces, bases, linear transformations, matrices, determinants, eigenvalues, reduction to canonical forms, quadratic and bilinear forms, applications.

Math 5245-5246-5247. Introduction to Modern Algebra I-II-III. (4 cr per qtr, §5282 for 5245, §5283 for 5246, §5284 for 5247; prereq 32xx math sequence or equiv or #) Algebra at a more concrete level than 5282-5283-5284. Group theory, including normal subgroups, homomorphism, theories of Lagrange and Cayley. Ring theory including ideals, integral domains, Euclidean rings, polynomial rings; fields. Linear algebra including an abstract approach to vector spaces; linear transformations and their structure. Taking this course nonsequentially is not recommended.

Math 5282H-5283H-5284H. Fundamental Structures of Algebra. (4 cr per qtr; prereq 32xx math sequence or equiv or #; some previous abstract math recommended) Theory course, principally for students planning mathematics graduate work. Group theory: normal subgroups, homomorphism, theorems of Lagrange and Cayley. Ring theory: rings, ideals, integral domains, Euclidean rings, polynomial rings, fields. Linear algebra: abstract approach to vector spaces, linear transformations; the theory of canonical forms, including the Jordan and rational.

Math 5331-5332-5333. Geometry I-II-III. (4 cr per qtr, §3161 for 5331, §5083 for 5332; prereq 1261 or equiv) Advanced Euclidean geometry; axiomatic and analytic hyperbolic geometry; projective geometry; symmetry and geometric transformations and their connections to linear algebra, group theory, and complex arithmetic; finite geometries; convex geometrical figures.

Math 5337. Computational Methods in Elementary Geometry. (4 cr; prereq multivariable calculus [e.g., 3251] or #) Technological tools such as interactive computer graphics programs and videos of computer animations introduced and used to explore mathematical concepts from various branches of geometry.

Math 5341-5342. Introduction to Topology. (4 cr per qtr; prereq one soph sequence or #; some previous abstract mathematics recommended) Set theory: axioms of choice, Zorn’s lemma. Metric spaces; completeness, compactness, continuity. Basic point set topology: countability and separation axioms, Urysohn’s lemma, compactness, connectedness, product spaces.

Math 5343. Introduction to Algebraic Topology. (4 cr; prereq 5342) Classification of two-manifolds, fundamental group, homology theory.

Math 5375. Differential Geometry. (4 cr; prereq 3252 or equiv or #) Plane and space curves. Frenet formulas, elementary theory of surfaces.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>Math 5376-5377</td>
<td>Differential Geometry. (4 cr per qtr; prereq 5375, 3261 or 3142 or equiv) Differential forms. Advanced theory of surfaces, integral geometry, Riemannian geometry.</td>
</tr>
<tr>
<td>Math 5381-5382-5383</td>
<td>Introduction to Computational Algebraic Geometry. (4 cr ea; prereq multivariable differential calculus [e.g., 1261 and 3251]) Geometry of curves and surfaces defined by polynomial equations. Emphasis on concrete computations with polynomials using computer algebra packages, and on interplay between algebra and geometry. Abstract algebra presented as needed.</td>
</tr>
<tr>
<td>Math 5404</td>
<td>Variational Problems. (4 cr; prereq 3252, 3261 or equiv or #) The calculus of variations and its applications. Topics may include fundamental theory, Euler-Lagrange equations, necessary and sufficient conditions, stability, isoperimetric problems, rudiments of the Mayer-Lagrange-Bolza problem, multiplier rule, direct methods, Rayleigh-Ritz method, eigenvalue problems, multiple integrals.</td>
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<tr>
<td>Math 5428</td>
<td>Mathematical Modeling. (4 cr; prereq 2 yrs of elementary calculus) Methodology and practice in developing and analyzing mathematical models of problems which arise in physical, social, and engineering sciences. Team approach to case studies.</td>
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<tr>
<td>Math 5457-5458-5459</td>
<td>Methods of Applied Mathematics. (4 cr per qtr; prereq 3252, 3261 or equiv; 3262 recommended) Modern analytic tools used in applications of mathematics; emphasis on technique. Linear algebra, ordinary and partial differential equations, calculus of variations, Fourier series, complex variables, optimization, numerical methods.</td>
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<tr>
<td>Math 5463-5464-5465</td>
<td>The Mathematics of Industrial Problems. (4 cr per qtr; prereq 2 yrs of calculus including 3262 or equiv, familiarity with FORTRAN or PASCAL or C) Industrial problems such as crystal precipitation, air quality modeling, color film developing, laser semiconductors. Theoretical foundations and computational methods involving ordinary and partial differential equations, calculus of variations, and numerical analysis.</td>
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<tr>
<td>Math 5467</td>
<td>Introduction to the Mathematical Theory of Wavelets. (4 cr; prereq 2 yrs of calculus or #) Background theory and experience in wavelets (families of functions useful for representing and approximating other functions). Inner product spaces, operator theory, Fourier transform, Gabor transform, multiscale analysis, discrete wavelets, self-similarity. Computing techniques.</td>
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<tr>
<td>Math 5473-5474-5475</td>
<td>Analysis of Numerical Methods. (4 cr per qtr; prereq 3252, 3261 or equiv; some computer skill recommended) Interpolation, approximation by polynomials; solution of linear, nonlinear systems of equations; methods for eigenvalue problems; numerical integration; numerical solution of ordinary differential equations. Selected topics if time permits.</td>
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<tr>
<td>Math 5477-5478-5479</td>
<td>Applied Numerical Analysis of Partial Differential Equations. (4 cr per qtr; prereq 5242 or equiv, 5608 or equiv, 5513 or equiv, computer skills or #) Numerical methods for partial differential equations of fluid dynamics, elasticity, electrodynamics, and other selected systems. Computer experiments.</td>
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<tr>
<td>Math 5512</td>
<td>Differential Equations with Applications. (4 cr; prereq 3261 or equiv) Further topics in basic differential equations: Laplace transform, series solutions, systems, numerical methods, plane autonomous systems and stability.</td>
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<tr>
<td>Math 5514</td>
<td>Integral Equations. (4 cr; prereq 3261 or 5512 or equiv or #) Integral equations; Fredholm formula, Neumann series, Laplace transforms, successive approximations and numerical methods. Relation of integral equations to systems of linear algebraic equations and to differential equations.</td>
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<tr>
<td>Math 5521-5522-5523</td>
<td>Introduction to Ordinary Differential Equations. (4 cr per qtr; prereq one soph math sequence or #) 5521: Brief coverage of elementary methods for general differential equations; linear systems with constant coefficients, including fundamental matrix solutions; variation of parameters in linear systems; existence and uniqueness of solutions. 5522: Basic local existence and uniqueness theory for initial value problems; stability of equilibria, flows and dynamical systems; nonlinear oscillations, particularly van der Pol’s equation. 5523: Poincare-Bendixson theory; applications to ecology, differentiation of flows and stability of periodic orbits.</td>
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<tr>
<td>Math 5531-5532-5533</td>
<td>Dynamical Systems and Chaos. (4 cr per course; prereq multivariable calc and linear algebra [e.g., 1261-3251-3252-3261 or equiv]) Dynamical systems theory with emphasis on iteration of mappings of the line, the circle, and the plane. Fixed points, periodic points, stability, bifurcations, invariant Cantor sets, rotation number, Smale horseshoe, fractal dimension, Julia sets, Mandelbrot set, nonlinear oscillations, computer experiments.</td>
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<tr>
<td>Math 5533H (formerly 3541H)</td>
<td>Honors: Complex Analysis and Related Topics. (4 cr, §3331, §5568; prereq 3531H or 3552H) Differentiation of complex-valued functions of a complex variable; major theorems on analytic functions; power series, Laurent series, and topics in sequences and series.</td>
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<tr>
<td>Math 5567</td>
<td>Fourier Series and Boundary Value Problems. (4 cr, §5571; prereq 3261 or equiv or #) Partial differential equations of theoretical physics, Fourier series, orthogonal systems. Sturm-Liouville systems, solution of boundary value problems by separation of variables, applications.</td>
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Math 5568. Elementary Theory of Complex Variables. (4 cr, §3541H, §5553H, §5572; prereq 3252 or equiv)

Math 5569. Operational Mathematics. (4 cr, §5573; prereq 5568)
Laplace transforms, Fourier transforms, inversion theorems; applications to differential equations.

Math 5571-5572-5573. Elementary Partial Differential Equations. (4 cr per qtr, §5568 for 5572, 5573; prereq §5608 or 5613 or equiv)

Math 5606-5607. Advanced Calculus: A Rigorous Approach. (4 cr per course, §5612 for 5606, §5613 for 5607; prereq 2 yrs calc)
Analysis on the real line: introduction to logic and proof, construction of the real numbers, completeness of the real numbers, infinite sequences and series; continuity for functions, derivatives, Riemann integrals, convergence of sequences and series of functions.

Math 5608. Multivariable Advanced Calculus. (4 cr; §5614; prereq 3252; 5606-5607 recommended)
Continuity for vector valued functions; the derivative as a linear mapping; the differential matrix; implicit function theory; multivariable integration theory and related topics. Course is slightly below the level of 5612-13-14 but well above 3xxx courses.

Math 5612H-5613H-5614H. Introduction to Analysis (4 cr per qtr; prereq 3252, ¶3262, or 3552H; principally for students planning grad work in math, as preparation for grad courses in analysis)

Math 5679. Probability. (4 cr, §5681, §Stat 5131; prereq 3252 or equiv)
A one-quarter course in probability, not recommended for those going on in probability or statistics. Probability spaces, expectation; conditional probability and expectation, probability distributions and densities, repeated trials and independence. Mathematics majors cannot get credit for more than one of the trio 5679, 5681, Stat 5131.

Logical development and various applications of probability. Probability spaces, random variables and their distributions, expected values, law of large numbers and central limit theorem, generating functions. Topics from random walks and Markov chains, branching processes. Poisson point processes, martingales, stationary sequences, second-order processes, stochastic differential equations.

Math 5701. Enumerative Combinatorics. (4 cr; prereq 3251 or equiv, jr; soph level linear algebra helpful)
Basic enumeration. Sets, permutations, distributions, partitions, generating functions (exponential and ordinary), recurrence relations, the method of inclusion-exclusion, and Polya theory.

Math 5702. Graph Theory and Optimization. (4 cr; prereq 3251 or equiv, jr; soph level linear algebra helpful)
Basic concepts in graph theory. Connectedness, Hamiltonian and Eulerian paths, trees, coloring, and matchings. Topics in optimizations: networks, flows, spanning trees, and graph algorithms.

Math 5703. Constructive Combinatorics. (4 cr; prereq 5701 or equiv, some knowledge of a programming language)
Algorithmic and bijective approaches to permutations, subsets, trees, tableaux, and partitions, ranking and unranking algorithms. Connections with generating functions. The Lagrange inversion formula.

Math 5711. Linear Programming and Application. (4 cr; prereq a course in linear algebra)
Geometry of linear programming, interpretation of solutions to linear programs, applications. Simplex method; connections to geometry; duality theory; sensitivity analysis; applications to cutting stock, allocation of resources, and scheduling problems; Dantzig-Wolfe decomposition; interior methods.

Math 5712. Combinatorial Optimization. (4 cr; prereq Math 5711)
Graph algorithms and integer programming techniques. Flows; matching and transportation problems; spanning trees, distance in graphs; branch and bound; cutting planes; heuristics; applications to traveling salesman and knapsack problems.

Math 5900. Tutorial Course in Advanced Mathematics. (Cr ar; prereq #)
Qualified students whose needs are not met by courses offered may make arrangements to study content of other courses.
Microbiology (MicB)

Medical School

Staff—Head, Ashley T. Haase, 1460 Mayo Memorial Building; Director of Undergraduate Studies, Palmer Rogers, 925 Mayo Memorial Building

Professors: Anderson, Cleary, Dunny, Dworkin, Faras, Germaine, Gray, Haase, Hanson, Johnson, Plagemann, Rogers, Schlievert, Zissler

Associate Professors: Bey, Conklin, Flickinger, Jemmerson, Jenkins, Reilly, Sadowsky, Scherer, Schiff, Sherman, Southern

Assistant Professor: Mathur

Microbiology is the branch of biological science that deals with the nature and activities of microorganisms, the distinctive microscopic life forms that recycle the elements in aquatic, atmospheric, and soil environments. Their potentials may be directed to the benefit of people through applications in industry, agriculture, and medicine, or to their harm in disease and spoilage. As remarkably useful model systems for research, microorganisms play a key role in the development of modern biology.

The Department of Microbiology offers a program leading to the B.A. degree in the College of Liberal Arts and one leading to the B.S. degree in the College of Biological Sciences. Information about the B.S. program may be found in the College of Biological Sciences Bulletin.

The major sequence leading to the B.A. degree permits the selection of microbiology or related courses appropriate to your interests in such areas as pathogenic mechanisms, ecology of microorganisms, or microbes and humans.

B.A. Major Sequence

Required Preparatory Courses—Biol 1201-1202-1203 or Biol 1009, 1103 or 1106 or 3011 or 3012; Chem 1051-1052, 3100-3101, 3301-3302, 3305-3306, and 3303 or BioC 3021 or BioC 5331; Math 1251-1252, 1261 or Stat 3011-3012 or PubMed 5450-5452; Phys 1041-1042 or 1104-1105-1106-1107-1108-1109 or 1251-1252-1253-1254 or 1451-1452-1453-1454

Major Requirements—3103 or 5105 or VPB 3103 or Biol 5013; three of the following: MicB 5218, 5232, 5321, 5352, 5424, 5611; two of the following: MicB 5234, 5322, 5425, 5990 (minimum of two 4 cr qtrs in one faculty lab); 5900 8-10 3xxx-5xxx cr in microbiology or related courses (depending on your interests; related courses may be in biology, plant biology, food science and nutrition, genetics and cell biology, medical technology, public health, lab medicine, or ecology, evolution, and behavior). A minimum of two courses will complete the major. Students are urged to include genetics and ecology in their programs; Genetics: GCB 3022, Biol 5003, EEB 5044; Ecology: Biol 5041, EEB 3001.

MicB 3103. General Microbiology. (5 cr, §5015, §Biol 5013, §VPB 3103; prereq soph with C average in prereq courses to major sequence or jr with 10 cr chemistry and 5 cr biological sciences or #; UC only) Morphology, physiology, taxonomy, and ecology of bacteria. Applications of fundamental principles. Lab.

VPB 3103f,s. General Microbiology. (5 cr, §Biol 5013, §MicB 3103, §MicB 5105, §Biol 5013; not open to veterinary medical students; prereq 10 cr chemistry, 4 cr biological sciences) Morphology, genetics, physiology, and ecology of microorganisms. Application of principles of microbiology to immunity and medicine.

Biol 5013f,w,s. Microbiology. (5 cr, §Biol 3013, §MicB 3103, §MicB 5105, §VPB 3103; prereq 5 cr biological sciences, 10 cr organic chemistry or #) Dunny, Hanson, Sherman; Taxonomy, anatomy, physiology, biochemistry, and ecology of microbes. Molecular structure in relation to bacterial function. Lab.

MicB 5105f,w,s. Biology of Microorganisms. (5 cr, §Biol 3013, §MicB 3103, §MicB 5105, §VPB 3103; prereq 5 cr biological sciences, 10 cr organic chemistry or #) Dunny, Hanson, Sherman; Taxonomy, anatomy, physiology, biochemistry, and ecology of microbes. Molecular structure in relation to bacterial function. Lab.

FSCN 5120w. Food Microbiology. (5 cr; prereq MicB 3103) Relationship of environment to occurrence, growth, and survival of microorganisms in foods; evaluation of microbiological quality of dairy and food products; characteristics and activities of bacteria, yeasts, and molds related to food spoilage; use of microorganisms in manufacture of dairy and food products; recognition and control of food-borne pathogens and food poisoning.
FScN 5122. Control Systems in Food Microbiology. (2 cr; prereq 5120)
Control and destruction of microorganisms in foods; hazard analysis; critical control points; chemical, physical, and microbiological considerations in cleaning and sanitizing food contact surfaces and equipment; microbiological criteria for raw and processed foods; sampling methodologies.

FScN 5123. Food Fermentations and Biotechnology. (4 cr; prereq 5120, 5122)
Characteristics of microorganisms involved in dairy and food fermentations and factors influencing their activity; natural and controlled fermentations; lactic bacteriophages and their control; application of biotechnology to food-grade microorganisms; rapid detection systems; regulation of microbial products derived from biotechnology.

Biol 5125s. Recombinant DNA Laboratory. (4 cr, §Biol 5125; prereq #; application necessary)
Basic recombinant DNA techniques. Methods for growing, isolating, and purifying recombinant DNAs and cloning vectors.

PubH 5171f. Environmental Microbiology. (3 cr; prereq MicB 3103 or #)
Survival, dissemination, transportation, and significance of microorganisms in the environment; application of principles to environmental health problems.

MicB 5218w. Immunology. (3 cr; prereq Biol 5001)
Gray
Cellular, protein, and genetic bases of humoral immunity; methods used to measure antibodies and antigens. T lymphocytes: interaction of T helper cells with B lymphocytes and other T cells in cell-mediated immunity. Clinical immunology: immunodeficiency, allergy, auto-immunity, transplantation.

MicB 5232w. Medical Microbiology. (3 cr; prereq 5216 or 5218, 5105 or 3103 or 8110 or Biol 5013; not open to medical students) Cleary
Pathogenic bacteria and fungi, mechanisms of pathogenicity and virulence; properties of microorganisms and their animal hosts that influence the outcome of host-parasite relations analyzed from genetic and metabolic view.

MicB 5234w. Immunology and Medical Microbiology Laboratory. (3 cr; prereq 5218 or §5218, 5232 or §5232) Cleary, Gray
Exercises demonstrating the principles that determine the outcome of host-parasite interactions. Experiments focus on methods basic to host defense and immunology, including the immunochemical and microbiological methods used to diagnose infectious diseases.

MicB 5235f. Microorganisms and Disease. (3 cr; prereq 10 cr chemistry, 5 cr biological sciences or #; not open to microbiology majors) Johnson
Nature of microorganisms, immunology, medical bacteriology, virology, mycology, parasitology, and principles of disease control.

MicB 5321f. Physiology of Bacteria. (3 cr; prereq 3103 or 5105 or Biol 5013 or VPB 3103, Biol 5001, 3 cr genetics) Rogers
Chemical and physical organization of bacteria as related to function; growth; energy metabolism, including oxidations and fermentations; nutritional requirements; antimicrobial agents; autotrophic mechanisms; microbial differentiation.

MicB 5322f. Microbial Diversity and Physiology Laboratory. (2 cr; prereq 5321 or §5321 or equiv) Dworkin, Rogers
Isolation from natural sources and study of the physiology and metabolism of a wide variety of microorganisms such as Clostridium, yeast, Caulobacter, myxobacteria, Leptospira, photosynthetic bacteria, Bdellovibrio, luminescent bacteria, others.

MicB 5352s. Applied Microbiology. (4 cr; prereq 5321 or # offered 1997-98 and alt yrs) Flickinger
Microbial adaptation to various environments; role of microorganisms in the earth’s biogeochemical cycles. Application of microbial systems to industrial processes; basic principles of fermentation technology; microbial bioconversions and product formation. Biodegradation of chemicals.

MicB 5424s. Biology of Viruses. (3 cr; prereq 5321 or Biol 5001 or #) Plagemann
Structure, composition, and properties of bacterial, plant, and animal viruses; interaction with cells, effects on host cell metabolism; biochemistry of viral replication; techniques in study of viruses and viral infections; viral tumorigenesis.

MicB 5425s.1 Virology and Microbial Genetics Laboratory. (3 cr; prereq 5424 or equiv, Biol 5001 or 5003, GCB 3022 or 5022 or #) Plagemann, Schiff
Lab course familiarizes students with modern techniques in virology and microbial genetics: animal cell culture, virus infectivity titrations, analysis of viral nucleic acids and proteins by radiolabeling, gel electrophoresis and blot hybridizations, cell transformation by tumor viruses and DNA, analysis and mapping of mutants in microorganisms.

MicB 5611s. Microbial Ecology. (3 cr, §Soil 5605; prereq 3103 or 5105 or Biol 5013 or Soil 5610 or #; A-F only) Sadowsky
Interrelationship of microorganisms with terrestrial, aquatic, and organismal environments; survey of bacterial, fungal, and algal components of ecosystems; evolution and structure of microbial communities; population interactions within ecosystems; quantitative and habitat ecology; biogeochemical cycling; and biotechnological approaches to study of microbial ecology.

MicB 5900f.s. Topics in Microbiology. (1 cr per qtr; prereq sr microbiology major, MicB 5105 or Biol 5013; A-F only)
Seminars on research programs, historical perspectives, significant emerging fields, professional societies and publications, career opportunities.

MicB 5970f,w,s,su. Directed Studies. (Cr ar; prereq #; A-F) Rogers, staff
Guided individual studies.

MicB 5990f,w,s,su. Undergraduate Research. (Cr ar; prereq #; A-F) Rogers, staff
Guided individual research.

1 Microscope fee charged.
Middle Eastern Studies
See Area Studies Programs and Institute of Linguistics and Asian and Slavic Languages and Literatures.

Military Science
See Reserve Officers Training Corps.

Modern Greek
See Classical and Near Eastern Studies.

Music (Mus)

Staff—Director, Vern Sutton, 200 Ferguson Hall; Director of Undergraduate Studies, Stephen Schultz; Associate Director/Director of Graduate Studies, David Grayson; Assistant Director, Rodney Loeffler; Assistant to the Director, Linda Fisher; Music Librarian, Laura Probst; Head, Band/Winds/Jazz Studies, David Baldwin; Head, Orchestra/Strings, Mark Bjork; Head, Choral/Opera/Vocal Studies, Lawrence Weller; Head, Composition/Theory, Michael Cherlin; Head, Keyboard, Dean Billmeyer; Head, Music Education/Therapy, Paul Haack; Head, Musicology/Ethnomusicology, James Hepokoski

Regents’ Professor: Argento

Ethel Hitchcock Endowed Chair in Accompanying and Coaching: Garrett

Professors: Anderson, Artymw, Baldwin, Braginsky, Haack, Hepokoski, Jackson, Kirchhoff, T. Lancaster, Lubet, Maurice, McCurdy, O’Reilly, Remenikova, Sutton, Zaimont

Associate Professors: Ashworth, Billmeyer, Cherlin, Damschroder, del Santo, Furman, Grayson, Kagan, Kim, Konkol, McCoy, McNab, Schultz, Shockley, Ware, Weller

Assistant Professors: Becher, Bjork, Meza, Shaw


The School of Music offers the B.A. and B.M. degrees in music, music education and in music therapy.

The B.A. program is for students who wish to major in music while enrolling in a diversified program of elective coursework outside the major. The program is divided into two tracks allowing for concentration of study in either an academic area or in performance.

The B.M. program is for students who wish to complete professional studies in performance, jazz studies, music education, or music therapy. A total of 180 credits (200 for instrumental music education, 191-197 for vocal/choral music education, and 190 for music therapy), including electives in music and nonmusic studies, are required for graduation; a minimum of 117 of these credits must be in music. Before entering the junior year of applied study, you must take a qualifying examination in which you perform (play or sing) in the area of your specialty.

The B.M. program in music education is offered in the College of Liberal Arts, with teaching licensure through the College of Education and Human Development. There are two undergraduate majors in music education: music education (with concentrations in instrumental or choral/general music) and music therapy.

To be admitted to the major for any of the degree programs, you must audition and be placed in a suitable level of applied music study. Transfer students are placed on the basis of an entrance audition and examinations in music theory, music history, and piano.

You should consult with a School of Music adviser in selecting appropriate courses. All music and music education courses required for a degree must be taken with the A-F grading option; no S-N credits will be counted toward the fulfillment of degree requirements (MuEd).
3850 in music therapy is the one exception to this rule [S-N required]. You must earn a grade of C or better in major courses in order to satisfy degree requirements and to be allowed to continue in sequence courses.

Requirements for the B.A. and B.M. degrees are outlined on page 8 of this bulletin. Note that B.M. students are exempt from the second language proficiency requirement.

The School of Music is a full member of the National Association of Schools of Music.

Note: Courses preceded by the concurrent symbol (¶) in School of Music course listings must be taken simultaneously with the course being described.

Study Abroad—Applied music studies or relevant academic research in Europe or a non-Western country is encouraged. Upon faculty review, credits can be applied toward the B.M. or B.A. degrees. For more information on study abroad opportunities and procedures, see the Foreign Study section of this bulletin.

Core Curriculum for all B.A. and B.M. degrees in music: (46 cr)
(Preparatory courses in music theory [1003, 2 cr] and ear training [1004, 2 cr] will be required of all students not able to pass diagnostic examinations upon entrance to the program. These credits may not be counted toward graduation requirements in music.)

- Music theory: 1531-1532; 1533-3531-3532 (3 cr per qtr)
- Ear training: 1511-1512; 1513-3511-3512 (1 cr per qtr)
- Class piano: 1151-1152-1153 or 1521-1522-1523 (2 cr per qtr)
- Music history: 1602 (3 cr); 3604-3605-3606 (5 cr per qtr)
- Basic conducting: 3441 (2 cr)

Ensembles: see departmental guidelines for ensemble classification/requirements; total credits required are listed below. Note: A primary ensemble must be taken concurrently with major level applied lessons.

B.A. Major Sequence—Academic Track

Major Requirements in addition to core curriculum—Applied music (major instrument or voice): 6 qtrs (12 cr min) of 12xx or higher

- Major project (paper): 3995
- Music electives: 18 cr of 3xxx-5xxx (15 cr min in musicology/theory; remaining 3 cr may not be applied or ensemble study)

B.A. Major Sequence—Performance Track

Major Requirements in addition to core curriculum—Applied music (major instrument or voice): 9 qtrs (18 cr) (6 qtrs min at 12xx; 3 qtrs at 32xx)

- Ensemble: 9 qtrs (9 cr min)
- Major project (recital): 3995 (2 cr)
- Music electives: 9 cr (4 cr min in musicology/theory; remaining 5 cr may not be applied or ensemble study)

B.M. Major Sequence—Performance

Major requirements in addition to core curriculum—Applied music (major instrument or voice): 3 qtrs (12 cr min) of 12xx; 3 qtrs (12 cr min) of 13xx; 6 qtrs (24 cr min) of 33xx

- Advanced music theory: 3534, 5532 (3 cr per qtr)
- Major project (recital): 3995 (2 cr)
- Music electives: to total a minimum of 117 credits in music

Special Requirements:
String, Woodwind, Brass, and Percussion majors:
- Ensemble: 12 qtrs
- Chamber Ensemble: 5 cr
Piano major:
- Ensemble: 3 qtrs
- Accompanying: 3451-2-3 (1 cr per qtr)
- Piano Literature: 5744, 5745, 5746 (2 cr per qtr)
- Additional recital (jr yr): no credit
Voice major:
- Ensemble: 12 qtrs
- Diction for Singers: Mus 1161-1162-1163, 1164-1165-1166 (1 cr per qtr)
- Languages: French, German, Italian (5 cr each; substitutes for the 12 cr of upper division, elective coursework required outside the major)
- Vocal Repertoire: 3741-2 (2 cr per qtr)
Classical Guitar major:
- Ensemble: 6 qtrs
- Baroque Performance Practices: 5182 (4 cr)
Organ major:
  Ensemble: 6 qtrs
  Organ Literature: 5747, 5748, 5749 (2 cr per qtr)

Harp major:
  Ensemble: 12 qtrs

B.M. Major Sequence—Jazz Studies

Major Requirements in addition to the core curriculum—Applied music (major instrument or voice): 6 qtrs (12 cr min) of 12xx or higher; 3-6 qtrs (6 cr min) of 32xx
  Band/Choir: 3 qtrs (3 cr min)
  Jazz Ensemble: 1340, 5340 5 qtrs (5 cr min)
  Jazz Combo: 4 qtrs (4 cr)
  Jazz Improvisation: 3331, 3332, 3333 (2 cr each)
  Afro-American and African studies: Afro 1301, 3108
  Jazz Pedagogy: 5341 (2 cr)
  Jazz Theory: 5342 (2 cr)
  Jazz Class piano: 3351, 3352
  Jazz Arranging: 5336; 5337 (2 cr per qtr)
  Recital (sr year): 3995 (2 cr)
  Music electives: to total a minimum of 117 cr in music

B.M. Major Sequence—Music Education and Music Therapy

The B.M. in music education is offered in the College of Liberal Arts, with teaching licensure through the College of Education and Human Development. There are two undergraduate majors in music education: music education (with concentrations in instrumental/general or choral/general music) and music therapy.

Precollege Music Preparation—An extensive background in high school instrumental or vocal music ensembles is expected. Private lessons in voice or on a band/orchestral instrument are a very desirable aspect of preparation. You must meet the School of Music entrance requirements for performance in one of the following areas of applied music: voice, piano, organ, classical guitar (for the choral/general concentration); a standard band or orchestral instrument (for the instrumental concentration); and either of those for the therapy concentration. Piano lessons as well as beginning-level music theory (fundamentals) and music history/literature preparation via classes or individual study with texts, computer programs, and recordings will be advantageous. Conducting and leadership experiences also prove helpful.

Admission—You must complete two years (90 credits) of coursework in music and liberal arts areas before admission to the music education program. A minimum cumulative grade average of C+ (2.50) must be earned in all music coursework. An overall grade average of C (2.00) must be earned for all courses (music and nonmusic).

You must also complete an interview with a major adviser in music education or music therapy before your application for admission will be given final consideration.

Major requirements in addition to core curriculum in the first two years:
  General Psychology: Psy 1001 (5 cr)
  Music Education majors: MuEd 1201—Introduction to Music Education (1 cr)
  Music Therapy majors: MuEd 1801—Introduction to Music Therapy (1 cr)

Choral/General Music Education Concentration

This program is for vocalists, keyboard performers, or classical guitarists desiring to teach choral and classroom music in the elementary and secondary schools. Students completing this program will meet the requirements for licensure to teach choral and general classroom music grades K-12 in Minnesota.

Music Courses

Applied Music: Min 11 qtrs (22 cr) with majors in voice, piano, organ, or guitar:
  12 cr lower division lessons: MusA 1201—Piano, MusA 1203—Organ, MusA 1204—Voice or MusA 1223—Guitar

Symbols and abbreviations: f, w, s, su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / §—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / ‡—Credit will not be granted if credit has been received for the course listed after this symbol / ‡—Concurrent registration is required (or allowed) in the course listed after this symbol / ∆—Approval of the instructor is required for registration / ¶—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / ,—In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

10 cr upper division lessons: MusA 3201—Piano, MusA 3203—Organ, MusA 3204—Voice or MusA 3223—Guitar
Secondary Applied Study: (min 6 cr)
  For non-voice majors: MusA 1404—Voice, Secondary Required (6 cr)
  For non-keyboard majors: Mus 1151-1152-1153—Piano Class Lessons (2 cr/qtr) and MusA 1401—Piano, Secondary Required (6 cr)
  For keyboard majors: Mus 1521-1522-1523—Keyboard Skills (2 cr/qtr)
  Ensemble: Minimum of 11 quarters required, to be selected in consultation with your adviser.
  Mus 3331—Jazz Improvisation I (2 cr)
  Mus 1161-66—Diction for Singers I-VI (1 cr/qtr)

Professional Education Courses
  MuEd 3301—Teaching Elementary Vocal and General Music (4 cr)
  MuEd 3302—Teaching Secondary General Music (4 cr)
  MuEd 3322—Techniques of Classroom Instruments (2 cr)
  MuEd 3415—Choral Laboratory I (4 cr)
  MuEd 3416—Choral Laboratory II (4 cr)
  MuEd 3650—Student Teaching in Music (18 cr)
  EPsy 5119—Learning and Cognition (4 cr)
  EPsy 5139—Interpersonal and Personality Effects on Learning (4 cr)
  EPsy 5229—Measurement and Assessment (2 cr)
  Kin 5530—Biological and Physical Foundations of Education (2 cr)
  EdPA 5090—School and Society (3 cr)
  PubH 3004—Basic Concepts in Personal and Community Health (5 cr)

Admission to Student Teaching
You should meet with your major adviser early in the spring quarter of your junior year to plan your student teaching experience. You must have completed all professional education courses (with the exception of EdPA 5090 and EPsy 5229), all major courses in theory, ear-training, music history, secondary applied study, and a minimum of 9 credits in ensembles with a GPA of C+ (2.50) in all major and professional education courses. Grades for ensemble courses are not counted in calculating the GPA. Twelve credits of applied music in 1xxx courses and a minimum of 6 credits in 3xxx courses must be completed in the study of the major instrument or voice.

Instrumental/General Music Education Concentration
This program prepares you to teach band, orchestra, and general music in elementary and secondary schools. Students successfully completing the program will meet licensure requirements to teach band, orchestra, and general classroom music grades K-12 in Minnesota.

Music Courses
Applied Music: Min. 9 qtrs (18 cr) on principal instrument (standard band or orchestral instrument)
  12 cr lower division principal lessons (12xx or higher)
  6 cr upper division principal lessons (32xx)
  (See Applied Music listings for specific course numbers.)
  Secondary Applied Study: (min. 6 cr)
  You must select two secondary instruments as well as voice for study for one quarter each (MusA 14xx, 2 cr/qtr; see Applied Music listings for specific course numbers).
  Mus 3331—Jazz Improvisation I (2 cr)
  Ensemble: required during 10 quarters of on-campus study (minimum 12 cr) to be selected in consultation with your adviser.
  Marching band experience is recommended if your major performance instrument is in brass, woodwind, or percussion. Chamber ensemble experience is required during two quarters of on-campus study (minimum 2 cr).
  10 credits from Mus 3410—Concert Band, Mus 1480—Marching Band, or Mus 3420—Orchestra
  2 credits from any of the following: Mus 5360—Woodwind Ensemble, Mus 5380—Brass Choir, Mus 5390—Percussion Ensemble, Mus 3440—Ensemble, Mus 5340—Jazz Ensemble (1 cr each).

Professional Education Courses
MuEd 3301—Teaching Elementary Vocal and General Music (4 cr)
Symbols and abbreviations: f.w.s.su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / ∆—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / UC—University College (formerly CEE)

MuEd 3302—Teaching Secondary General Music (4 cr)
MuEd 3322—Techniques of Classroom Instruments (2 cr)
MuEd 3500—String Techniques I (3 cr)
MuEd 3501—String Techniques II (3 cr)
MuEd 3503—Woodwind Techniques (4 cr)
MuEd 3504—Brass Techniques (4 cr)
MuEd 3505—Percussion Techniques (4 cr)
MuEd 3515, 3516—Instrumental Laboratory I, II (4 cr each)
MuEd 3650—Student Teaching in Music (18 cr)
EPsy 5119—Learning and Cognition (4 cr)
EPsy 5139—Interpersonal and Personality Effects on Learning (4 cr)
EPsy 5229—Measurement and Assessment (2 cr)
Kin 5530—Biological and Physical Foundations of Education (2 cr)
EdPA 5090—School and Society (3 cr)
PubH 3004—Basic Concepts in Personal and Community Health (5 cr)

**Admission to Student Teaching**

See information above for Choral/General Concentration.

**Major in Music Therapy**

The music therapy program prepares you to serve in educational and medical environments to influence changes in the behavior of children and adults through music. Upon successful completion of the course of study and the six-month internship, you are eligible to become a registered music therapist through application to the National Association for Music Therapy (NAMT).

**Music Courses**

Applied Music: Min 9 qtrs (18 cr) selected in consultation with your adviser.
- 6-12 cr of 12xx (principal study in a standard band or orchestral instrument or voice, piano, organ or guitar)
- 6-12 cr of 14xx (secondary required study) or class lessons.

(See Applied Music listing for course numbers.)

Guitar Proficiency
Mus 3331—Jazz Improvisation I (2 cr)
Ensemble: Minimum 9 credits (1 cr/qtr for 9 quarters; 3 qtrs primary ensemble, 6 qtrs elective ensemble)

**Related Course Requirement**

Psy 3604—Abnormal Psychology (4 cr)
Biol 1009—General Biology (5 cr)
CBN 3001—Elementary Anatomy (4 cr) or CBN 1027—Anatomy for Physical Education Students (4 cr)

**Behavioral/Social/Health Science; Special Education Courses**

Total of 14 credits required to include:
EPsy 5139—Effects on Learning (4 cr)

**Professional Education Courses**

MuEd 3322—Techniques of Classroom Instruments (2 cr)
MuEd 3415—Choral Laboratory I (4 cr)
MuEd 3500—String Techniques I (3 cr) or MuEd 3501—String Techniques II (3 cr)
MuEd 3503—Woodwind Techniques (4 cr)
MuEd 3504—Brass Techniques (4 cr)
MuEd 3505—Percussion Techniques (4 cr)
MuEd 3515—Instrumental Laboratory I (4 cr)
MuEd 3800—Observation in Music Therapy (2 cr)
MuEd 3801, 5802—Psychology of Music I, II (4 cr each)
MuEd 3804—Music Therapy Techniques I (4 cr)
MuEd 3805, 3806—Music Therapy Techniques II, III (3 cr each)
MuEd 3850—Field Experiences: Music Therapy (6 cr; 1-2 cr per qtr)
MuEd 3851, 3852—Internship: Music Therapy (6 cr each)

Courses in dance and dance therapy are recommended.

**Admission to Internship**

You should meet with your major adviser early in the spring quarter of your junior year to plan your
internship experience. You must have completed all coursework to be eligible to register for MuEd 3851, 3852. A GPA of C+ (2.50) is required in all related courses and professional education courses, and you must have satisfactorily completed all field experience requirements.

Minor Sequence

All three plans for the music minor require the following preparatory courses in music theory, ear-training, and class piano: Mus 1531-1532, Mus 1511-1512, Mus 1151-1152-1153 (14 cr).

All music minor programs must be approved by the director of undergraduate studies; all credits must be taken A-F; a maximum of 4 upper division credits (2 of applied lessons) may be transferred to the minor.

**Plan A:** *Music in Society and Culture (15 cr)*

**Minor Requirements**—15 upper division credits in musicology (cannot include nonmajor courses).

**Plan B: Performance (16 cr)**

Admission to the performance minor requires successful completion of an entrance audition.

**Minor Requirements**—8 cr applied music (MusA 38xx) with concurrent registration in ensembles; 4 cr ensembles; 4 cr upper division musicology or theory course(s) (cannot include nonmajor courses).

**Plan C: Jazz Studies (15 cr)**

Admission to jazz studies requires successful completion of an entrance audition.

**Minor Requirements**—6 cr applied music (MusA 38xx) with concurrent registration in ensembles required; 3 cr jazz ensemble; 6 cr chosen from: Jazz Improvisation (Mus 3331-3332-3333, 2 cr per qtr) and/or Black Music: A History of Jazz (Afro 3108, 4 cr).

Introductory and Survey Courses (For Nonmusic Majors) (Mus)

**Mus 1001f,w,s. Fundamentals of Music.** (4 cr, §1003, §1004; for nonmusic majors)
Investigation of music notation and fundamental concepts underlying musical structure. Intervals, clefs, chords, scales, cadences, harmonic analysis; rhythm and meter. Emphasis on active participation: playing the piano, singing, clapping rhythms, aural perception. Weekly lab assignments in vocal and piano performance.

**Mus 1051-1052-1053. Piano Class for Nonmusic Majors.** (2 cr per qtr)
For nonmusic majors with little or no keyboard background. Functional skills such as reading, harmonizing, playing by ear, and improvising; basic technique and elementary repertoire.

**Mus 1804. World Music.** (4 cr) Kagan
Music in universal perspective. Traits, distinguishing styles, and cultural factors that influence musical creativity. Music of different cultures compared to examine forms and traits, to develop listening abilities, and to develop an understanding of human musical expressions.

**Mus 3021 Introduction to Music.** (5 cr)
Survey of European and American “art” and “popular” music in the context of those cultures; aural analyses of musical styles and forms.

**Mus 3027. Lyric Song in Medieval and Renaissance Culture.** (4 cr; for nonmusic majors)
Jackson
Oral, popular, and courtly song traditions in sociocultural contexts. Status and roles of women. Analysis and criticism approached from different disciplinary perspectives.

**Mus 3029. Music in the 20th Century.** (4 cr; for nonmusic majors)
Aural perception of modern styles; cultural perspectives through primary source readings.

Instrumental and Jazz Ensembles (Mus)

**Mus 1340f,w,s. Jazz Ensemble.** (1 cr per qtr [6 cr max]; prereq audition, # McCurdy)
A 20-member performing organization covering significant jazz compositions and arrangements written specifically for this medium.

**Mus 1440f,w,s. Ensemble.** (1 cr per qtr; prereq #)
Performance of chamber music: duos, (sonatas), trios, quartets, quintets, and other ensemble combinations for instruments and/or voices.

**Mus 1480. Marching Band.** (1 cr per qtr; prereq # Becher)
A 250-member performing organization open to players from all colleges; performs at University football games and other athletic functions.

**Mus 3020. Campus Orchestra.** (1 cr; prereq audition, #)
An orchestra for interested players who are not music majors and/or are unable to register for University Orchestra. Standard chamber orchestra and string orchestra literature rehearsed and performed.

**Mus 3290. Jazz Singers.** (1 cr per qtr; prereq # McCurdy)
Sight reading, study and performance of representative vocal jazz literature.

**Mus 3410f,w,s. University Wind Bands.** (1 cr per qtr; prereq audition, #)
Wind ensemble and symphony bands perform standard and contemporary literature; concerts and tour appearances. Players from all colleges may participate.
Mus 3420f,w,s. Orchestra. (1 cr per qtr; prereq audition, #)
Symphony orchestra performs standard repertory and major works with chorus; concerts and tour appearances. Players from all colleges may participate.

Mus 3440f,w,s. Ensemble. (1 cr per qtr; prereq audition)
For description, see Mus 1440.

Mus 5330. Concerto Grosso Ensemble. (1 cr; prereq #) Kim
Study and performance of string orchestra and small chamber orchestra literature.

Mus 5340f,w,s. Jazz Ensemble. (1 cr per qtr [6 cr max]; prereq audition, #) McCurdy
For description, see Mus 1340.

Mus 5360. Woodwind Ensemble. (1 cr per qtr; prereq audition) Anderson
Practice and performance of chamber music for combinations of woodwind instruments in small groups (three or more players) and in large homogeneous instrumental choirs.

Mus 5380f,w,s. Brass Choir. (1 cr per qtr; prereq #) Baldwin
Practice and performance of brass ensemble literature from the antiphonal music of Giovanni Gabrieli to works of the 20th century.

Mus 5390f,w,s. Percussion Ensemble. (1 cr per qtr; prereq #) Meza
Practice and performance of standard and contemporary compositions for percussion ensembles in various combinations.

Mus 5460f,w,s. New Music Ensemble. (1 cr per qtr; prereq #) Lubet
Practice and performance of recent music for various combinations of vocal and instrumental ensembles.

Instrumental and Jazz Studies (Mus)

Mus 3331. Jazz Improvisation I. (2 cr; prereq #) Hamilton
Rudiments; analysis; improvisation on blues in three major keys and standard American popular jazz compositions from swing era to early bebop; application of major and minor scales; ear training.

Mus 3332. Jazz Improvisation II. (2 cr; prereq 3331 or #) McCurdy
Transposition; analysis; improvisation on blues in three major keys and standard American popular jazz compositions from swing era to early bebop; II-V7-I progressions; ear training.

Mus 3333. Jazz Improvisation III. (2 cr; prereq 3332 or #) McCurdy
Transcriptions; analysis; improvisation on blues in minor keys and standard American popular jazz compositions from swing era to early bebop; turnbacks; original compositions.

Mus 3351, 3352, 3353. Jazz Class Piano. (2 cr per qtr; prereq 1153 or #) Hamilton
Keyboard skill development in chord-style symbolism, reading chord progressions, translating chord symbols into formula voicings, expanded harmonies, aural development, jazz style “comping.”

Mus 3441. Basic Conducting. (2 cr; prereq music major; Mus 1533) Becher
Beginning course in basic conducting techniques and role of the conductor.

Mus 5016s. Trumpet Pedagogy. (2 cr; prereq 12 cr lower div trumpet lessons) Baldwin
Principles of trumpet pedagogy. Discussion of literature, history, and current teaching aids.

Mus 5150. Body Awareness in Activity—The Alexander Technique for Musicians. (2 cr)
Lightner
Alexander technique with applications to music performance. Emphasizes body/mind awareness to promote technical ease and freedom.

Mus 5300. Jazz Rhythm Section Techniques. (1 cr per qtr; prereq #) McCurdy
Study and function of instruments in the jazz rhythm section. Bass line construction, voicings for piano and guitar, and style patterns for percussion will be addressed in this course.

Mus 5301-5302-5303. Advanced Jazz Class Piano. (2 cr per qtr; prereq keyboard major, #) Hamilton
Jazz harmony and keyboard techniques for the advanced pianist with extensive knowledge of keyboard theory; reading chord progressions, realizing chord symbols, formula voicings, expanded harmonies, aural development, jazz style “comping” and improvisation techniques.

Mus 5321-5322-5323. Suzuki Violin Pedagogy. (2 cr per qtr; prereq undergrad or grad string major with violin as principal or #) Bjork

Mus 5324-5325-5326. Advanced Suzuki Violin Pedagogy. (2 cr per qtr; prereq 5321-5322-5323 or equiv) Bjork
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 5336. Jazz Arranging I. (2 cr; prereq 3532 or #) McCurdy
Beginning techniques of arranging for chamber jazz ensemble; vocal and instrumental.

Mus 5337. Jazz Arranging II. (2 cr; prereq 3532, 5336 or #) McCurdy
Intermediate and advanced techniques of arranging for chamber jazz ensemble; vocal and instrumental.

Mus 5341. Jazz Pedagogy. (2 cr; prereq #) McCurdy
Principles of jazz pedagogy. Teaching methods of jazz improvisation (vocal and instrumental), arranging, jazz history, bibliographies.

Mus 5342. Jazz Theory. (2 cr; prereq Mus 3532 or #) McCurdy
Beginning techniques for basic chord construction, extended chords, and nomenclature in jazz idiom.

Mus 5350. Orchestral Repertoire. (1 cr)
Investigation of practical and performance problems in standard orchestral repertoire with regard to style and interpretation.

Mus 5361-5362. Violin Pedagogy I-II. (2 cr per qtr; prereq 12 cr in 1205 or 1206 or 1305 or 1306 or #) Remenikova
Private and group teaching of violin students at beginning, intermediate, and advanced levels. Discussion and demonstrations of pedagogical techniques.

Mus 5364. Cello Pedagogy. (2 cr; prereq 12 cr in applied cello or MuEd 3501 or #) Remenikova
Principles of cello pedagogy. Private teaching of cello students at beginning, intermediate, and advanced levels. Discussion of problems, materials, theory, and methods in cello study.

Mus 5366. Guitar Pedagogy. (2 cr; prereq guitar principal or major or #) Van
Historical survey of methods and etudes from late eighteenth century to present, reflecting variety of content and approach.

Mus 5391. History and Acoustics of Single Reed Instruments. (2 cr; prereq upper div standing in major instrument or #) Anderson
Clarinet and saxophone history and literature, mechanical design and development, acoustics, modern schools of performance.

Mus 5392, 5393. Woodwind Literature and Pedagogy I and II. (3 cr per qtr; prereq upper div standing in major instrument, grad or #) Anderson
Study of the major teaching methods for woodwind instruments including solos and ensembles used primarily for pedagogical reasons. 5393: Study of major solo and chamber literature for five woodwind instruments.

Mus 5731-5732-5733. Percussion Literature. (2 cr per qtr; prereq upper div or grad perc major or #) Meza
Study, analysis, and performance of: 5731—orchestral/band repertoire for snare drum and percussion accessories, solo literature for percussion instruments; 5732—orchestral/band repertoire for mallet instruments, literature for percussion ensemble; 5733—orchestral/band repertoire for timpani, chamber music for mixed ensembles of percussion and non-percussion instruments.

Mus 5971w. Music Transcription for Winds. (2 cr; prereq 3532) Baldwin
Transcription of three works with score and parts copied in ink. Principles of music manuscript and examination of examples of transcription.

Choral/Opera/Vocal Studies (Mus)
(See also Applied Music)

Mus 1160f,w,s. Voice: Class Lessons. (2 cr per qtr [6 cr max])
Fundamentals of vocal production—posture, respiration, phonation, articulation.

Mus 1161-1162-1163. Diction for Singers I-II-III. (1 cr per qtr; prereq 1161 for 1162, 1162 for 1163, premusic or music major or minor or #)

Mus 1164-1165-1166. Diction for Singers IV-V-VI. (1 cr per qtr; prereq 1164 for 1165, 1165 for 1166, premusic or music major or minor or #)

Mus 1440f,w,s. Ensemble. (1 cr per qtr; prereq #)
Performance of chamber music of major and minor composers; sonatas, trios, quartets, quintets, other forms. Combinations of vocal and instrumental chamber ensemble materials.

Mus 3430f,w,s. Chorus. (1 cr; prereq #)
Sec 1—Women’s Chorus: Performance of concert music for women’s voices, 16th to 20th century.
Sec 2—Men’s Chorus: Performance of concert music for men’s voices, 16th to 20th century.
Sec 3—Concert Choir: Performance of concert music for mixed ensemble, 16-20th century.
Sec 4—Choral Union: Large oratorio chorus that performs major works for chorus with orchestra.
Sec 5—Conducting Class Ensemble: Participation in a lab ensemble for choral conducting class.

Mus 3440f,w,s. Ensemble. (1 cr per qtr; prereq audition)
For description, see 1440.

Mus 3741, 3742. Vocal Repertoire Survey. (2 cr per qtr; prereq upper div music major or #) del Santo
Survey of major vocal solo and chamber works from Classical through contemporary era. 3741: Classic through late-Romantic. 3742: Impressionists to present.

Mus 5150. Body Awareness in Activity—The Alexander Technique for Musicians. (2 cr) Lightner
Alexander technique with applications to music performance. Emphasizes body/mind awareness to promote technical ease and freedom.

Mus 5270. Stage Movement and Acting for Singers. (2 cr; prereq audition, #)
Basic techniques of stage movement and acting styles, application to various forms of music theatre.
Mus 5370. Vocal Pedagogy Practicum. (1 cr per qtr (max 3 cr); prereq sr or grad, #) Ware
Application of principles and techniques for group or individual adult instruction at beginning, intermediate, and advanced levels. Observation of faculty teaching students. Repeatable for a maximum of 3 credits.

Mus 5371f, 5372w, 5373s. Diction for Singers. (2 cr per qtr; prereq 12 cr of 1204 or #)
Weller
Principles and techniques of singing the English, Italian, German, and French languages. International Phonetic Association alphabet is used. 5371: English and Italian. 5372: German. 5373: French.

5374. Text and Language: A Singer’s Tools for Interpretation. (2 cr; prereq #) Maurice
Study of the specific meanings, properties, and inflections of words as used by singers for artistic interpretation; study of the role of the musical setting in defining meaning. Performance required.

Mus 5375. The Vocal Mechanism. (2-3 cr [var]; prereq sr or grad, #) Ware
Mental and physical preparations for singing. Voice production basics of singing and speaking—respiration, phonation, registration, resonation, articulation. Anatomy and physiology of the vocal mechanism. Efficient, healthy voice methods and techniques. Optional 1-credit research project related to course topics.

Mus 5376. Vocal Performance. (2-3 cr [var]; prereq sr or grad, #) Ware

Mus 5377. Vocal Pedagogy. (2-3 cr [var]; prereq sr or grad, 5375, #) Ware
Historical survey of voice pedagogues and comparative teaching methodology. Learning theory. General teaching methods and techniques. Teaching child, adolescent, and aging voice. Teaching pedagogy classes, individuals, and group voice. Optional 1-credit research project related to course topics.

Mus 5378. Vocal Conference/Workshop. (1-2 cr [var]; prereq sr or grad, #) Ware
Specific thematic content for each conference or workshop. Anatomy and physiology of vocal mechanism. Scientific research and applications. Vocal methods and techniques. Voice use and care.

Mus 5383. Choral Conducting Techniques. (2 cr; prereq #) Lancaster
 Conducting technique, rehearsal procedure, choral techniques. Shorter works from various eras.

Mus 5384, 5385. Choral Conducting. (4 cr per qtr; prereq # Lancaster
Conducting technique, rehearsal procedure, choral techniques. 5384: Music before 1750. 5385: Music after 1750.

Mus 5460f, w, s. New Music Ensemble. (1 cr per qtr; prereq # Lubet
Practice and performance of recent music for various combinations of vocal and instrumental ensembles.

Mus 5470f, w, s. Opera Workshop and Ensemble. (1 cr per qtr; prereq ability to sing arias satisfactorily by audition, #) Sutton
Preparation and performance of operatic arias, choruses, and scenes. Participation in fully staged or workshop productions of music-theatre repertoire.

Mus 5480. Opera Theatre. (2 cr; prereq advanced ability to sing arias satisfactorily by audition, #) Sutton

Mus 5490f, w, s. Chamber Singers. (1 cr per qtr; prereq audition) Lancaster
Mixed chorus of 24 voices. Performances each quarter.

Mus 5741, 5742. Vocal Literature. (4 cr per qtr; prereq 12 cr in 1104 or 1204 or 1304 or #) Wellar
Performance of representative songs from major and minor composers. Examination of solo art song repertoire of major national schools.

Composition/Theory (Mus)

Mus 1003. Introduction to Music Theory. (2 cr, § 1001; prereq music major or #)
Fundamental concepts of music theory and notation, including key signatures, scales, rhythm, and chordal construction.

Mus 1004. Introduction to Ear Training. (2 cr, § 1001; prereq music major or #)
Fundamental concepts of ear training and sight singing, with emphasis on intervals, scales, and basic rhythmic patterns.

Mus 1511w-1512s-1513f. Ear Training and Sight Singing I-II-III. (1 cr per qtr; prereq for 1511: 1004 or #, §1531; prereq for 1512: 1511, §1532; prereq for 1513: 1512, §1533)
Melodic, harmonic, and rhythmic dictation; sight singing; clef reading; musicianship drills.

Mus 1531. Theory I: Foundations of Tonal Music. (3 cr; prereq 1003, 1151 or 1521 or #, §1511)
Two-part counterpoint (species approach); consonance and dissonance; melodic contours; review of music fundamentals.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Mus 1532. Theory II: Diatonic Tonality. (3 cr; prereq 1531, 1152 or 1522 or equiv, ¶1512) Writing and analysis of basic diatonic tonal structures. Basic harmonic and contrapuntal relationships.

Mus 1533. Theory III: Harmony and Voice Leading. (3 cr; prereq 1532, 1153 or 1523 or equiv, ¶1513) Writing and analysis of diatonic and basic chromatic tonal structures. Binary and ternary form.

Mus 3511. Ear-Training and Sight-Singing IV. (1 cr; prereq 1513, 3531) Further development of aural skills presented in 1513.

Mus 3512. Ear-Training and Sight-Singing V. (1 cr; prereq 1513, 3532) Cherlin Development of aural skills for 20th-century music.

Mus 3531. Theory IV: Chromaticism. (3 cr; prereq 1533, ¶3511) Chromatic tonal practices; expanded chordal vocabulary; voice leading and analysis.

Mus 3532. Theory V: 20th-Century Theory. (3 cr; prereq 3531 or 1508, ¶3512) Cherlin Theories of 20th-century music.

Mus 3534. Form and Structure of Tonal Music. (3 cr; prereq 3531, 3511 or 1508, 1518 or placement exam) Cherlin, Damschroder Formal and structural analysis of the sonata, rondo, variation, minuet, and other standard categories of tonal composition. Exploration of text-music relationships in song, of 19th-century character pieces, and of motivic coherency in music. Intermediate ear-training.

Mus 3551-3552-3553. Composition. (2 cr per qtr; prereq 3532, ¶ Argento, Lubet, Zaimont Original works in various forms. Techniques and styles of composition; development of original approaches.

Mus 5460. New Music Ensemble. (1 cr; prereq #) Lubet Practice and performance of recent music for various combinations of vocal and instrumental ensembles.

Mus 5529. 20th-Century Music Theory and Analysis. (4 cr; co-req Mus 3512 or equiv exam, grad or #) Cherlin Introduction to topics in 20th-century theory and analysis designed for graduate student music majors.


Mus 5533. Music Since 1945. (4 cr; prereq 3532, ¶ Lubet Procedures and techniques of music composed since 1945.

Mus 5541. Counterpoint. (4 cr; prereq 3531, 3511 or equiv) Lubet Practice writing in polyphonic styles of Renaissance and Baroque.

Mus 5550. Composition. (2 cr per qtr [12 cr max]; prereq 3532 or equiv, 3553 or grad, ¶Argento, Lubet, Zaimont Original works in various forms.

Mus 5561f-5562w-5563s. Orchestration. (2 cr per qtr; prereq 3532) Argento, Zaimont Scoring instruments for ensemble combinations and full orchestra.

Mus 5571. Schenkerian Analysis for Performers. (4 cr; prereq 3534; offered alt yrs) Damschroder Theory and analysis of tonal music using principles developed by Heinrich Schenker. Basic concepts, notation, and their application to excerpts and short pieces from the 18th and 19th centuries.

Mus 5572. Chromaticism in Late-Tonal Music. (4 cr; prereq 3534; offered alt yrs) Damschroder Exploration of late-tonal chromatic practice through analysis of selected repertory, completion of written exercises (figured bass, harmonization of melodies, model composition), ear training, and keyboard drill.

Mus 5791. Electronic Music: History, Literature, Principles. (4 cr) The history of technological developments that made electronic music possible; composers and compositions reflecting an evolution of craft and connection with prevailing aesthetic values; study of the equipment, principles, and techniques used in the production of music through electronic means.

Mus 5793. Analog Synthesis and Recording Techniques. (2 cr; prereq 5791 or ¶5791) Studio work with stereo and quadraphonic tape recorders and selected microphones directed toward development of recording skills (e.g., splicing, dubbing, preparation of tape loops, and synchronization of recording on discrete channels); exploration of analog synthesis equipment and its compositional possibilities and techniques.

Mus 5795. Digital Music Synthesis and Processing Techniques. (2 cr; prereq 5793) Studio work with digital synthesizers and processors, recording equipment, and computers (using a variety of different software materials) directed toward the development of skills in the use of digital equipment for composition, teaching, and performance.

Mus 5797. Music and Text: Seminar on the Interrelations of Text and Music. (4 cr; prereq 3531, 3532) Cherlin Interrelations of poetic imagery, form, metrics, and sonic characteristics with aspects of musical form; including repertory from 18th through 20th centuries.

Keyboard Instruments (Mus) (See also Applied Music)

Mus 1051-1052-1053. Piano Class for Nonmusic Majors. (2 cr per qtr) For nonmusic majors with little or no keyboard background. Functional skills such as reading, harmonizing, playing by ear, and improvising; basic technique and elementary repertoire.

Mus 1151f-1152w-1153s. Piano: Class Lessons. (2 cr per qtr; prereq for 1151 music major, ¶ Shockley Keyboard skills in harmonization, improvisation, sight reading, accompaniment, repertory, technique. Group learning.

Mus 1440f,w,s. Ensemble. (1 cr per qtr; prereq #) Performance of chamber music: duos (sonatas), trios, quartets, quintets, and other combinations for instruments and/or voices.
Mus 1521f-1522w-1523s. Keyboard Skills. (2 cr per qtr; prereq keyboard major, #) Applied keyboard theory for harmonization, improvisation, playing by ear, transposition, and introductory score reading.

Mus 3440f,w,s. Ensemble. (1 cr per qtr; prereq audition) For description, see 1440.

Mus 3451-2-3. Accompanying Skills. (1 cr per qtr; prereq upper div piano or organ student or #) A practical introduction to every facet of the art of piano as an accompaniment and collaborative instrument.


Mus 5310. Piano Pedagogy Practicum. (1 cr per qtr [3 cr max]; ¶5351-5352-5353 or ¶5354-5355-5356 or #) Shockley Application of principles and techniques for group or individual instruction at elementary, early intermediate, and late intermediate levels in directed teaching setting.

Mus 5351f-5352w-5353s. Piano Pedagogy. (2 cr per qtr; prereq 12 cr in MusA 1201 or 1301 or #) Shockley Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at the elementary, early intermediate, and late intermediate levels.

Mus 5354-5355-5356. Advanced Piano Pedagogy. (2 cr per qtr; prereq grad piano major or 5353 or #; offered alt yrs) Shockley Demonstration and discussion of teaching techniques, methods, and materials for group and individual instruction at intermediate and early advanced levels.

Mus 5411. Instrumental Accompanying Skills and Repertoire. (2 cr; prereq accomp major) Garrett 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 5421,5422,5423. Vocal Accompanying Skills and Repertoire. (2 cr per qtr; prereq Italian, German, French diction; accomp or grad vocal major) Garrett Performance class in skills of vocal accompanying (Lieder, mélodie, opera) with emphasis on coaching techniques and performance skills of both pianists and singers.

Mus 5460f,w,s. New Music Ensemble. (1 cr per qtr; prereq #) Lubet Practice and performance of recent music for various combinations of vocal and instrumental ensembles.

Mus 5521f-5522w-5523s. Advanced Keyboard Skills. (2 cr per qtr; prereq 3532, sr or grad) Billmeyer Diatonic and chromatic harmony at the piano. Realization of figured basses of the 17th and 18th centuries. Performance of choral, orchestral, and chamber music of the 17th-20th centuries, from open score, using all clefs.

Mus 5744f, 5745w, 5746s. Piano Literature. (2 cr per qtr; prereq 12 cr MusA 1201 or 1301 or #; offered alt yrs) McNab Literature for the piano from the late baroque period to the mid-20th century.

Mus 5747, 5748, 5749. Organ Literature. (2 cr per qtr; prereq 3606, 3532, or #) Billmeyer Organ literature from the 14th century to present. Influence of organ design of various periods and national schools upon the literature and its performance.

Music Education/Music Therapy (MuEd)

MuEd 1201. Introduction to Music Education. (1 cr) McCoy Orientation to various areas and levels of music teaching through observation and school-centered experiences.

MuEd 1801. Introduction to Music Therapy. (1 cr) Furman Methods, materials, and applications of music therapy in various clinical settings with emphasis on field observations.


MuEd 3301. Teaching Elementary Vocal and General Music. (4 cr; prereq music ed major or #) McCoy Methods, materials, curriculum development, principles of learning; child voice; music reading, history, and appreciation; classroom instruments, creativity, and rhythm.

MuEd 3302. Teaching Secondary General Music. (4 cr; prereq music ed major or #) McCoy Methods, materials, curriculum, principles of learning; the adolescent voice; music reading, history, and appreciation; creativity; applications of technology for teaching middle, junior, and senior high school music.

MuEd 3322. Techniques of Classroom Instruments. (2 cr; prereq Mus 1001 or music or music ed major) McCoy Beginning and intermediate class and small group recorder and guitar instruction; techniques for using Orff instruments, auto-harps, keyboards, and other classroom instruments.
MaEd 3415. Choral Laboratory I. (4 cr; prereq music ed major or #) McCoy
Development of basic conducting skills and rehearsal techniques; methods and materials for school choral ensembles; school-based experiences; score reading and arranging.

MaEd 3416. Choral Laboratory II. (4 cr; prereq music education major) McCoy
Development of conducting skills and rehearsal techniques; emphasizes interpretation of choral compositions; methods and materials for choral ensembles.

MaEd 3500. String Techniques I. (3 cr; prereq music ed major or #) Bjork
Playing experience on violin and viola; basic concepts of teaching with study of methods and materials; techniques of individual and class instruction.

MaEd 3501. String Techniques II. (3 cr; prereq music ed major or #) Remenikova
Playing experience on cello and bass; basic concepts of teaching with study of methods and materials; techniques of individual and class instruction.

MaEd 3502. Woodwind Techniques. (4 cr; prereq music ed major or #) Schultz
Playing experience on all woodwind instruments; basic concepts of teaching; study of methods and materials; class instruction.

MaEd 3503. Percussion Techniques. (4 cr; prereq music ed major or #) Schultz
Playing experience on snare drum, timpani, keyboard, mallet instruments, drum set; basic concepts of teaching; study of methods and materials; class instruction.

MaEd 3504. Brass Techniques. (4 cr; prereq music ed major or #) Haack
Theory and technical development of instruments, elementary instruction in performing, special attention to routine class instruction.

MaEd 3505. Observation in Music Therapy. (2 cr; prereq ed student) Furman
Elementary lab and field studies of music therapy and music behavior.

MaEd 3800. Observation in Music Therapy. (2 cr; prereq ed student) Furman
Basic study of acoustics, ear and hearing, musical systems, and psycho-socio-physiological processes involved in musical behavior.

MaEd 3801. Psychology of Music I. (4 cr; prereq Psy 1001, 3604 or #) Haack
Basic study of acoustics, ear and hearing, musical systems, and psycho-socio-physiological processes involved in musical behavior.

MaEd 3804. Music Therapy Techniques I. (4 cr; prereq major in music therapy) Furman
Examination of specific techniques in quantification of study of music behavior; projects using behavioral applications.
MuEd 5621. Supervision and Administration of School Music. (3 cr)
Analysis and evaluation of instructional, supervisory, and administrative techniques; readings, new trends.

MuEd 5633. Techniques and Materials: Choral Ensembles. (3 cr) McCoy
Empirical research and literature on voice development in individual, class, and choral work; instructional techniques for choral music classes; choral repertoire for varied ensembles.

MuEd 5647. Teaching the Percussion Instruments. (3 cr) Schultz
Practical performance, demonstrations, and discussions of research in performance techniques. Contemporary approaches for teaching in the schools.

MuEd 5655. New Dimensions in Music Education. (3 cr) Haack
Study of contemporary music education through analysis of recent curricular trends and current issues.

MuEd 5666. Microcomputers in the Music Classroom. (3 cr) Schultz
Using the microcomputer to enhance instruction; materials for theory, ear training, composition, electronic music; developing a database for music libraries, instrument inventories, budgets.

MuEd 5667. Computer-Based Music Instruction. (3 cr) Schultz
Design, development, and implementation of computer applications for the music classroom, emphasizing the HyperCard environment with interactive audio, video, and MIDI.

MuEd 5668. Computerized Music Notation. (3 cr) Schultz
Fundamentals of music notation and printing utilizing the Macintosh computer, MIDI keyboards, and the Finale software program. Preparation of instrumental and vocal scores, part extraction, and page layout.

MuEd 5669. Conducting the Musical Show. (3 cr) Schultz
Rehearsal techniques, coordination of singing actors and instrumental accompaniment, conducting the pit orchestra; lab performance and listening activities focused on traditions and trends in the musical theater.

MuEd 5750. Topics in Music Education. (1-6 cr [max 12 cr])
Selected topics in music education. Each offering focuses on a single topic.

MuEd 5802. Psychology of Music II. (4 cr; prereq MuEd 3801) Haack
Elements of music and their psychological effects; music ability and its measurement; research methods applied in psychology of music studies.

MuEd 5804. Music in Therapy. (3 cr; prereq music education or music therapy grad or #) Furman
Principles and methods related to public school, hospital, and other community mental health and education settings; observation and lab sessions.

MuEd 5821. History of Music Therapy. (3 cr) Furman
Historical development of profession; outstanding persons and their contributions; incorporation of technique in increasing number of treatment populations.

MuEd 5831. Music for Exceptional Children. (3 cr) Furman
Trends; methods and materials for functional program of singing, playing, rhythm, listening, and creative activities for mentally and physically handicapped and gifted pupils.

MuEd 5970. Independent Study. (1-4 cr; prereq music educ/therapy maj or grad, #, ∆)
Independent study project organized by the student in consultation with the appropriate instructor.

Musicology/Ethnomusicology (Mus)

Mus 1602w. Music and Society. (3 cr; prereq 1003 or equiv or #) Kagan
Music and its cultural context in rural, urban, and tribal societies.

Mus 3604f-3605w-3606s. History of Western Music. (5 cr per qtr; prereq for 3604: 1153 or 1523, 1532 or #, prereq for 3605: 1533 or #, prereq for 3606: 3531 or #)
History of Western music in its social contexts. 3604: Antiquity through 1700. 3605: 1700-1900. 3606: 20th century.

Mus 3808. Music of East Asia. (4 cr; EAS 3808) Kagan
Religious, courtly, operatic, chamber, and folk music of China, Japan, Korea, and Tibet. Historical developments in and cultural determinants of style, repertoire, and usage.

Mus 5182. Baroque Performance Practices. (4 cr; prereq sr or grad, 3606, 3532 or #)
Ornamentation, phrasing, articulation, and improvisation in music of period 1550-1759. Instruction books of the period, analysis of performance of baroque music in baroque style.

Mus 5644. Studies in 20th-Century American Music. (4 cr; prereq 3606, 5532 or #) Hepokoski
Competing concepts of musical style and purpose in 20th-century America: some stylistic and cultural bases of both “art” and “popular” music and their often uneasy interrelationships. Areas covered typically include Ives, Copland, Carter, 1920s jazz. Broadway and popular song.

Mus 5645. 18th-Century European Music. (4 cr; prereq 3606 or equiv [12 undergrad cr in mus hist], 3534 or equiv, #for undergrads)
Survey of vocal and instrumental genres (opera, church music, orchestral music, chamber music, and keyboard music) as they developed from the High Baroque through the Classical era.
**MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS**

**Mus 5646. 19th-Century European Music.** (4 cr; prereq 3606 or equiv [12 undergrad cr in mus hist], 3534 or equiv, # for undergrads)
Survey of major composers, issues, and problems in the history of 19th-century European music: transformations of the sonata and symphony; “absolute” and “program” music, opera and “music drama”; aesthetic conceptions of music; structural and harmonic innovations.

**Mus 5647. 20th-Century European/American Music.** (4 cr; prereq 3606 or equiv [12 undergrad cr in mus hist], 5532 or equiv, # for undergrads) Jackson
Survey of major composers, issues, and problems in the history of 20th-century European/American music: principal trends and artistic movements; new musical aesthetics; transformations of 19th-century genres; new methods of organization.

**Mus 5666. Stravinsky.** (4 cr; prereq 12 cr in music history, 5532) Jackson
Changing styles and aesthetic principles of Stravinsky as seen in representative compositions and writings; contributions to artistic life in Europe and America (particularly ballet).

**Mus 5757, 5758. History of the Symphony.** (4 cr; prereq 3606, 3532)
The symphony from its beginnings to the present. Critical examination of representative compositions, readings from relevant primary and secondary source materials. 5757: Pergolesi to Liszt. 5758: Brahms to the present.

**Mus 5804. Folk and Traditional Music: Cross-Cultural Survey.** (4 cr) Kagan
Music of the peoples of the world in topical and geographic format. Comparative study of musical styles, behavior, and concepts in varied societies and cultures. Field recordings and filmed performances.

**Mus 5810. Asian Music in Performance.** (2 cr; prereq #, Kagan)
Development of vocal and instrumental skills developed through applied training and lecture demonstrations.

**Mus 5811. Traditional Indian Music: The Sacred and the Profane.** (4 cr) Kagan

**Mus 5841. Resources for Music Research.** (2 cr; prereq 3606 or #) Probst
Use of basic bibliographies and indexes, reference works, periodicals and historical editions; techniques for preparing an annotated bibliography.

**Mus 5863. Musical Instruments of the World.** (4 cr; offered alt yrs) Kagan
Organology; classification and comparative study of musical instruments in all cultures; history, distribution, structure, technology, acoustics. Instruments in literature, myths, iconography.

**Mus 5864. American Fiddle Traditions.** (4 cr; prereq #, Kagan)
The repertoire and performance practice of American fiddle music; rural and urban contexts; social, stylistic, and regional histories. Training in performance optional.

**Directed Studies/Topics Courses (Mus)**

**Mus 3970f,w,s. Directed Studies.** (1-15 cr per qtr; prereq #, ∆)
Guided individual reading or study.

**Mus 3995. Major Project.** (2 cr; prereq sr, #, ∆)

**Mus 5590. Topics in Music.** (1-5 cr per qtr; exact number of cr and prereq designated for each offering)
For topics, see current Class Schedule.

**Mus 5597. Directed Studies.** (1-5 cr; prereq #, ∆)

**Applied Music (MusA)**

Courses in applied music are classified according to nine modes: principal, major, secondary required, secondary elective, principal beyond requirement, major beyond requirement, minor, transfer (one quarter only), and elective. Most modes are offered at 1xxx (introductory) and 3xxx (intermediate), with 5xxx courses available only in the elective mode. A student may not register for a course in applied music until he or she has passed the required applied entrance examination. The examining committee determines the mode(s) for which a student may register. Consult the School of Music office, 100 Ferguson Hall, regarding the examination as well as the mode and level of music appropriate for fulfilling specific requirements for your degree program. There are special fees for applied studies courses. See the current Class Schedule for the fee schedule.

Credits and prerequisites for applied music courses are as follows:
- 1101 to 1123: (2 cr per qtr; prereq audition, ∆)
- 1201 to 1323: (2 or 4 cr; prereq audition, ∆)
- 1401 to 1723: (2 or 4 cr per qtr [12 cr max]; prereq music major, ∆)
- 1901 to 1923: (2 or 4 cr per qtr, 1 qtr only for transfer students; prereq music major, ∆)
- 3101 to 3123: (2 cr per qtr; prereq audition, ∆)
- 3201 to 3323: (2 or 4 cr; prereq 12 cr in corresponding 1xxx course, qualifying exam, ∆)
- 3401 to 3723: (2 or 4 cr per qtr [12 cr max]; prereq music major, ∆)
- 3801 to 3823: (2 cr per qtr [8 cr max]; prereq audition, ∆)
- 5101 to 5123: (2 cr per qtr; prereq audition, ∆)

Applied music courses in the various modes offered at the undergraduate level are listed on page 225.
## Applied Music (MusA)

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### Elective Courses

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College of Natural Resources

Credit for all courses listed in the CLA Bulletin and all courses approved for the Twin Cities campus liberal education curriculum (see Class Schedule) may be applied toward CLA baccalaureate degrees and the CLA residency requirement.

In addition, CLA students may apply toward their degrees up to 28 credits of other colleges’ courses that are not part of the liberal education curriculum. In some cases, these credits may also be applied toward CLA’s former general education requirements.

Your college advising office maintains a list of courses from other colleges which are approved for the former general education requirements.

Descriptions of courses offered by the College of Natural Resources can be found in the bulletin of that college.

Naval Science

See Reserve Officers Training Corps.

Norwegian

See German, Scandinavian, and Dutch.

Overseas Study

See Foreign Study.

Persian

See Institute of Linguistics and Asian and Slavic Languages and Literatures.

Philosophy (Phil)

Staff—Chair, Marcia Eaton, 330 Ford Hall; Director of Undergraduate Studies, Sandra Peterson, 259 Ford Hall; Director of Graduate Studies, C. Kenneth Waters, 385 Ford Hall

Professors: Bowie, Dahl, Eaton, Giere, Gunderson, Hanson, Hellman, Hopkins, Kac, Lewis, Mason, Owens, Savage, Scheman, Wallace

Associate Professors: Dolan, Peterson, Root, Waters

Assistant Professor: Holtman

Adjunct Faculty: Beatty (Ecology, Evolution, and Behavior, Associate Professor), Belfiore (Classical and Near Eastern Studies, Associate Professor), Meehl (Psychology, Regents’ Professor)

Philosophy is the study of the most fundamental concepts and principles bearing on the nature of reality, human conduct, and the various branches of knowledge.

General Education—If you are interested in moral and social issues, you will find 1003, 1004, 3302, 3304, 3305, and 5xxx ethics and political philosophy courses of value. Logic (1001), scientific reasoning (1005), epistemology (3105), introduction to formal logic (3201), philosophy of science (3601) and 5xxx epistemology, logic and philosophy of science courses may be of interest to science majors. Courses in aesthetics, philosophy of language, and history of philosophy may be of interest to nonspecialists.

Study Abroad—For information about study abroad, consult the department’s director of undergraduate studies and the Foreign Study section of this Bulletin.

B.A. Major Sequence

Major Requirements—At least eleven four- or five-credit courses with grades of C or higher (exception: two courses may have grades of S), at most two of which are 1xxx courses, at least three of which are 5xxx courses, and at least five of which are courses completed at the University of Minnesota, Twin Cities. The eleven courses must include at least one of 1001, 3201, 5201, and both 3001 and 3003, and at least one of 3105, 3601, 5105, 5601, and at least one of 3311, 5311, 5312, 5321. A senior project (3910) is also required.

Minor Sequence

Minor Requirements—Minimum of 20 3xxx-5xxx cr in philosophy. Course selections must be approved by a philosophy department faculty member.

Note: Detailed descriptions of course offerings may be obtained from the department office before the beginning of each quarter.

Phil 1001f,w,s. Introduction to Logic. (5 cr)
Application of formal techniques for evaluating arguments.

Phil 1002f,w,s. Introduction to Philosophy. (5 cr)
Problems, principal methods, and schools of philosophy; historical and contemporary views.

Phil 1003f,w,s. Introduction to Ethics. (5 cr)
Problems that arise when human beings attempt to think systematically about conduct and value.
Phil 1004. Introduction to Political Philosophy. (5 cr)
Central concepts, principal theories of political philosophy.

Phil 1005. Scientific Reasoning. (5 cr) Giere, Savage, Waters
Techniques for understanding and evaluating scientific information as presented in the popular media and in more specialized publications. Includes theories typical of the natural sciences and biology, as well as causal and statistical hypotheses typical of the social, behavioral, and biomedical sciences. Emphasis on general reasoning skills that do not require extensive training in particular sciences.

Phil 1006. Philosophy and Cultural Diversity. (5 cr, §1002)
Central problems and methods of philosophy through culturally diverse texts. Focus will be critical and comparative, reflecting a range of U.S. philosophical traditions.

Phil 1007. Introduction to Political Philosophy Practicum. (2 cr; prereq §1004)
Practicum in political philosophy.

Phil 3001f, 3002w, 3003s, 3004f. General History of Western Philosophy. (5 cr per qtr)
Major developments in Western philosophic thought from its beginnings among the Greeks to end of 19th century. 3001: Greek philosophy, pre-Socratics, Socrates, Plato, Aristotle. 3002: Stoicism, Epicureanism, medieval Christian synthesis. 3003: Modern philosophy from Descartes through Hume. 3004: Later modern philosophy from Kant through 19th century.

Phil 3003Hs. Honors Course: General History of Western Philosophy. (5 per qtr; prereq honors regis or #)
For description, see Phil 3003.

Phil 3005. Introduction to the Philosophy of Plato. (4 cr) Dahl, Hopkins, Peterson
Plato’s discussion of such topics as the soul, immortality, pleasure, the meanings of words, truth, knowledge, love. Methods of research on Plato.

Phil 3008. Introduction to Aristotle. (4 cr; prereq Phil 3001 or #) Dahl, Peterson

Phil 3105. Introduction to the Theory of Knowledge. (4 cr; prereq 1001 or #) Dolan, Hellman, Savage, Waters
Theories and problems concerning evidence, belief, and knowledge.

Phil 3231. Introduction to the Philosophy of Language. (4 cr; prereq 1001 or #) Dolan, Kac, Mason, Peterson, Root, Wallace
Elementary issues concerning the nature of reference, linguistic convention, linguistic truth, translation, synonymy or the relation between language and thought.

Phil 3234. Knowledge and Gender. (4 cr; prereq #) Scheman
Norms governing the social construction of the knowing subject; relationship of those norms to the norms of gender. Critical consideration of the nature of objectivity and rationality and of the claims that men and women think and learn in different ways.

Selected problems of current interest.

Phil 3305. Medical Ethics. (5 cr, §PubH 5623) Dolan, Hopkins
Moral problems confronting physicians, patients, and others concerned with medical treatment, research, and public health policy. Topics include abortion, living wills, euthanasia, genetic engineering, informed consent, proxy decision-making, and allocation of medical resources.

Phil 3307. Social Justice and Community Service: Basic Political Values. (4 cr) Wallace
Applications of concepts of justice, equality, freedom, community service, and power to current social problems. Perspectives from philosophy, history, literature, and student involvement in the community. Community service for an average of at least two hours per week.

Phil 3308. Social Justice and Community Service: Power and Democracy. (4 cr; prereq 3307) Wallace
Continuation of 3307. Teams develop plans to address current social problems. Community service for an average of at least two hours per week.

Phil 3311. Introduction to Ethical Theory. (4 cr) Bowie, Dahl
Nature and justification of moral judgments and moral principles; analysis of representative moral views.

Phil 3502. Introduction to Aesthetics. (4 cr) Eaton, Gunderson
Development of aesthetic theories from Plato to Tolstoy.

Phil 3601. Scientific Thought. (4 cr; prereq 1002, two natural science courses or completion of Group B distribution requirement) Hellman, Waters
Problems in the philosophy of science through the reading of historical and contemporary sources describing major scientific achievements and controversies.
Phil 3607. Philosophy of Psychology. (4 cr; prerequisite one course in philosophy or psychology or #) Gunderson, Savage
Major theories of mind, including the “invention” of the mind by Descartes, classical empiricism, the impact of Darwinism, Freud’s theories, Gestalt psychology, behaviorism, Chomsky’s rationalism, contemporary functionalism, the computer model.

Phil 3781. Existentialism. (4 cr; prerequisite 3003 or 3004 or #) Hopkins, Lewis, Mason
Major philosophical insights of one or more of the following existentialist thinkers: Heidegger, Sartre, Jaspers, Nietzsche, Kierkegaard, Camus, Merleau-Ponty.

Phil 3900H. Honors Course: Undergraduate Seminar. (2-4 cr per qtr; prerequisite honors regis, 8 cr 3xxx-5xxx philosophy courses)
Topics of contemporary interest, varying from quarter to quarter.

Phil 3910. Major Seminar. (4 cr; prerequisite philosophy major or #)
Development and presentation of the major project.

Phil 3970. Directed Studies. (1-5 cr per qtr; prerequisite #)
Guided individual reading or study.

Phil 3980. Directed Instruction. (1-5 cr per qtr; prerequisite #)

Phil 5004. Socratic Dialogues. (4 cr; prerequisite 3001 or #) Dahl, Lewis, Peterson
Early Socratic dialogues of Plato; Socratic method and paradoxes.

Phil 5005. Plato. (4 cr; prerequisite 3001 or #) Hopkins, Peterson
Major dialogues.

Phil 5008. Aristotle. (4 cr; prerequisite 1 qtr history of philosophy or #) Dahl, Peterson
Passages from major works.

Phil 5021. Medieval Philosophy. (4 cr; prerequisite 3001 or 3002 or #) Hopkins
Selected topics in writings of Augustine, Anselm, Aquinas, Scotus, and Ockham.

Phil 5034. Descartes. (4 cr; prerequisite 3003 or #) Lewis, Root
Philosophical works.

Phil 5035. Spinoza. (4 cr; prerequisite 3003 or #; offered when feasible) Lewis
The Ethics.

Phil 5041. Locke. (4 cr; prerequisite 3003 or #) Gunderson, Lewis
The Essay Concerning Human Understanding.

Phil 5043. Hume. (4 cr; prerequisite 3003 or #) Lewis
Treatise and Inquiry.

Phil 5046. Kant. (4 cr; prerequisite 3003 or 3004 or #) Dahl, Mason
Passages from major works.

Phil 5054. Kierkegaard. (4 cr; prerequisite 1 qtr history of philosophy or #; offered when feasible) Mason
Major philosophical works.

Phil 5068. Later Philosophy of Wittgenstein. (4 cr; prerequisite 3003 or 5231 or #) Mason, Scheman
Philosophical Investigations.

Phil 5076. Thoreau. (4 cr; prerequisite 4 cr in philosophy or #) Dolan
Walden and selected essays.

Phil 5101. Metaphysics. (4 cr; prerequisite 1 qtr history of philosophy or #) Dolan, Owens, Root
Philosophical theories concerning the nature of reality.

Phil 5105. Epistemology. (4 cr; prerequisite 1001 or #) Dolan, Savage, Wallace, Waters
Various theories of the origin, development, reliability, justification, and scope of knowledge.

Phil 5201. Symbolic Logic I. (5 cr; prerequisite 1001 or #) Dahl, Dolan, Hanson, Hellman, Kac
Development of a formalized language. Syntax and semantics of sentential and first-order logic. Deductive systems.

Phil 5202. Symbolic Logic II. (5 cr; prerequisite 5201 or #) Dolan, Hanson, Hellman, Kac, Wallace
Metatheoretic proofs and methods, including proof by mathematical induction; elements of set theory; metatheorems on soundness, consistency, completeness; extensions of elementary logic.

Phil 5203. Symbolic Logic III. (4 cr; prerequisite 5202) Dolan, Hanson, Hellman, Wallace
Elementary theory of Turing machines and recursive functions, proofs of limitative results, undecidability of first-order predicate logic, incompleteness of number theory, and undefinability of truth therein. Philosophical significance of these results.

Phil 5211. Modal Logic. (4 cr; prerequisite 5202 or Math 5162 or #) Hanson
Axiomatic and semantic treatment of propositional and predicate modal logics; problems of interpreting modal languages.

Phil 5221. Philosophy of Logic. (4 cr; prerequisite 5202 or Math 5162 or #) Hanson
Attempts to answer the question, “What is logic?” Topics include: the scope of logic; disputes about alternative logics; various theories concerning the nature of logical truth (e.g., conventionalism, the view that logical truths are contingent).

Phil 5222. Philosophy of Mathematics. (4 cr; prerequisite 5202 or 5xxx math courses) Hanson, Hellman
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?

Phil 5231. Philosophy of Language. (4 cr; prerequisite 1001 or 5201 or #) Dolan, Kac, Mason, Peterson, Root, Wallace
Central topics: Theories of reference, linguistic truth, relation of language and thought, translation and synonymy.
Phil 5232. Topics in the Philosophy of Language. (4 cr; prereq 3231 or 5231 or #) Dolan, Kac, Mason, Peterson, Root, Wallace
Detailed study of topics surveyed in Phil 5231 or other topics central to the philosophy of language.

Phil 5302. History of Ethics: Selected Classical Moralists. (4 cr; prereq 1003 or 1 qtr history of philosophy or #) Dahl
Moral philosophy outside of British tradition (see Phil 5301). Specific topics announced in Class Schedule.

Phil 5311. Ethical Theory. (4 cr; prereq 1003 or #) Bowie, Dahl, Holtman, Mason
Representative theories on the nature and justification of moral judgments.

Phil 5312. Foundations of Ethics. (4 cr; prereq 1003 or #) Dahl, Holtman, Mason
Discussion of the view that evaluative judgments cannot be based on factual considerations alone, and the relation of this view to the objectivity of ethics.

Phil 5321. Theories of Justice. (4 cr; prereq 1003 or 1004 or 5311 or #) Bowie, Holtman, Mason
Philosophical accounts of the concept and principles of justice.

Phil 5325. Biomedical Ethics. (4 cr; undergrads must obtain instructor's approval) Dahl, Dolan, Hopkins
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 5414. Political Philosophy. (4 cr; prereq 1004 or #) Bowie, Dolan, Holtman, Wallace
Central concepts and principal theories of political philosophy.

Phil 5501. Principles of Aesthetics. (4 cr; prereq 3502 or #) Eaton, Gunderson
Standards of evaluation; aesthetic experience; representation, meaning.

Phil 5521. Philosophy of Religion. (4 cr, §RelS 5521; prereq 8 cr in philosophy) Hopkins, Owens
Analysis of conceptual problems that arise from attempts to provide a rational justification for religious belief.

Phil 5601. The Evaluation of Scientific Hypotheses. (4 cr; prereq 3601 or #) Giere, Hanson, Hellman, Savage, Waters
An examination of philosophical theories of the nature of scientific methods for evaluating scientific hypotheses, of the role of experimentation in science, and, more generally, of how hypotheses come to be accepted within a scientific community.

Phil 5602. The Nature of Scientific Theories. (4 cr; prereq 3601 or #) Giere, Hellman, Savage, Waters
An examination of contemporary issues concerning the nature and role of theories in science: their structure, relations with models and laws, relations with other forms of representation, relations with experiment and with the world in general.

Phil 5603. Scientific Explanation. (4 cr; prereq 3601 or #) Giere, Hellman, Savage, Waters
An examination of contemporary views on the nature of scientific explanation and how it relates both to every day explanation and to other aspects of science, including the nature of scientific theories and the development of science.

Phil 5604. Determinism and Causation. (4 cr; prereq courses in philosophy of science or natural science) Hellman
The concepts of determinism and causation and their importance for science and human affairs.

Phil 5605. Time and Space. (4 cr; prereq courses in philosophy or natural sciences) Hellman, Savage
Major philosophical problems concerning the nature and structure of space, time, and space-time.

Phil 5606. Philosophy of Quantum Mechanics. (4 cr; prereq 3601 or Phys 3501 or Math 3142 or #) Hellman
Problems of interpretation of 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 5607. Philosophy of the Biological Sciences. (4 cr; prereq courses in philosophy of science or biology) Beatty, Waters
Major philosophical questions that arise in connection with biology: structure and status of evolutionary theory, reductionism in biology, legitimacy of teleology, nature of species, relation of biology to the social sciences.

Phil 5611. Philosophy of the Social Sciences I. (4 cr; prereq 12 cr in philosophy or social sciences or #) Root
Criteria for describing and explaining human actions; problems of objectivity, reduction, freedom.

Phil 5614. Philosophy of Psychology. (4 cr; prereq Psy 3051 or 5011 or Phil 3607 or 5601 or #) Gunderson, Owens, Savage
Problems of and prospects in recent developments in psychology, cognitive science, and philosophy of mind.

Phil 5615. Minds, Bodies, and Machines. (4 cr; prereq 4 cr in philosophy or #) Gunderson, Owens
Philosophical relevance of cybernetics, artificial intelligence, and computer simulation.

Symbols and abbreviations: f,w,s, su
—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / f —Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / f —All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / # —Credit will not be granted if credit has been received for the course listed after this symbol / #—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / #—Approval of the department offering the course is required for registration / #—Approval of the college offering the course is required for registration / H—Honors course (follows the course number) / / —In prerequisite listings, comma means "and" / UC —University College (formerly CEE)
**Phil 5617. 20th-Century Philosophy of Science: Logical Empiricism.** (4 cr; prereq philosophy major or philosophy grad or #) Giere, Savage
An examination of the historical development of logical empiricism from its European origins in the first half of the 20th century to its emergence as the nearly universal account of science in post-war Anglo-American philosophy.

**Phil 5618. 20th-Century Philosophy of Science: The Historical School.** (4 cr; prereq philosophy major or philosophy grad or #) Giere, Savage, Waters
The historical turn in Anglo-American philosophy of science beginning in the 1960s with the writings of Stephen Toulmin, Russell Hanson, Paul Feyerabend and Thomas Kuhn, and continuing with the works of Imre Lakatos, Larry Laudan, and Dudley Shapere.

**Phil 5622. Philosophy and Feminist Theory.** (4 cr; prereq 8 cr philosophy or women’s studies or #) Scheman
Examines encounters between philosophy and feminism, such as gender’s influence in traditional philosophical problems and methods and the social role of the theorist and of theorizing as they relate to the politics of feminism.

**Phil 5701. Survey of Contemporary Philosophy.** (4 cr; prereq 3003 or #)
Current systematic and critical philosophies as represented by principal exponents.

**Phil 5760, 5770. Selected Topics in Philosophy.** (4 cr per qtr; prereq four 3xxx-5xxx cr philosophy or #)
Philosophical problems of contemporary interest. Specific topics announced in Class Schedule.

**Phil 5781. Existentialism.** (4 cr; prereq 3003 or 3004 or 5054 or #) Hopkins, Lewis, Mason
Writings of existentialist philosophers since Kierkegaard.

**Phil 5970. Directed Studies.** (1-5 cr per qtr; prereq #)
Guided individual reading or study.

**Phil 5990. Directed Research.** (1-5 cr per qtr; prereq #)

**Physics (Phys)**

*Institute of Technology*

**Staff**—**Head,** Marvin L. Marshak, 145 Physics; **Directors of Undergraduate Studies,** Kenneth Heller, 148 Physics; **Director of Graduate Studies,** Robert Lysak, 375 Physics; **Administrator,** David Holets, 145 Physics

**Professors:** Bayman, Broadhurst, Campbell, Courant, Dahlberg, Dehnard, Ellis, Gasiorowicz, Giese, Glazman, Goldman, Halley, Heller, Hobbie, Hosotani, Huang, Kapusta, Kellogg, Lysak, Marquit, Marshak, McLerran, Olive, Pepin, Peterson, Poling, Rudaz, Ruddick, Shapiro, Shifman, Shklovskii, Stuewer, Tang, Vainshtein, Valls, Voloshin, Walsh, Weyhmann, Zimmermann

**Associate Professors:** Cattel, Cushman, Jones, Kakalios, Kubota, Rusack

**Assistant Professors:** Ganz, Wygant

**Adjunct Faculty**—Dasgupta (Indian Institute of Science), deForcrand (E.T.H., Zürich), Erickson (Augsburg College), Riederer (Mayo), White (Control Data Corporation)

Physics is the science concerned with the fundamental properties, laws, and structures common to all forms of matter, living and nonliving. Experimental and theoretical methods of investigation are combined to formulate the mathematical relationships that describe and predict, with increasing accuracy, the behavior of the physical world.

A bachelor’s degree in physics can be earned through either CLA or IT (for the IT program, see the *Institute of Technology Bulletin*). Both programs can serve as preparation for graduate school; work in industry; teaching; or professional study in law, business, or medicine. Courses for teachers may also be found in the *Extension Classes Bulletin*, the *Summer Session Bulletin*, and the *Institute of Technology Bulletin*.

Physics courses deal with a few fundamental principles that govern the universe. Topics used to illustrate these principles vary from year to year. For that reason we strongly recommend that all physics sequences be considered a single course to be taken without interruption.

Prerequisites for any physics course may be waived with permission of the department or instructor.

**General Education**—Courses not requiring a calculus background are 1001 with lab (1005), and 1041-1042 and 1911-1912, which include labs. Courses that use some calculus are 1104-1105-1106 with labs 1107-1108-1109. Courses firmly based on calculus are 1251-1252-1253-1254, which include labs, and 1451-1452-1453-1454, which include labs. To satisfy liberal education lab science requirements (see page 8), students must either take courses that include a lab or complete the additional lab course associated with the lecture course.

**B.A. Major Sequence**

**Required Preparatory Courses**—1251-1252-1253-1254 or 1451-1452-1453-1454; Math 1251-1252-1261 or equiv
Major Requirements—3512-3513, 3601, 3515, Math 3251-3252-3261 or equiv, 28 additional credits of 5xxx physics or astrophysics with at least 20 cr selected from 5021-5022, 5023-5024, 5101, 5201 and 5121-5122

Major Project: experimental project (5123) or a project arranged between the student and a faculty member (5970) or in certain cases, by additional coursework in a 5xxx physics course

 Majors are urged to take additional 5xxx physics, mathematics, history of science, and computer science courses. Students planning to pursue graduate work in physics are advised to take the honors requirement courses listed below as well as 5102, 5202, and at least one 5xxx mathematics course. 

Minor Sequence

Minor Requirements—Completion of the required preparatory courses for the major and at least 21 additional cr of 3xxx and 5xxx courses in physics, which must include the 3515 lab and two 5xxx courses (8-10 cr). Up to two 3xxx or 5xxx astronomy and astrophysics courses may be substituted for physics courses in the minor program. One or more courses in modern physics are recommended. Note that completion of mathematics beyond the required preparatory courses is a prerequisite for most 3xxx and 5xxx physics courses.

Honors Requirements—3512-3513, 3601, 3515; Math 3251-3252-3261 or equiv; 5021-5022, 5023-5024, 5101, 5121-5122, 5201; major project requirement as stated above.

Students majoring or minoring in physics must take all of the required physics and mathematics courses on an A-F basis (except courses which are offered S-N only) and must earn grades of at least C in all of these courses.

Phys 1001f,w,s,su. The Physical World. (4 cr [0 cr for IT students]; § any other physics courses; prereq 1 yr high school algebra; 4 class hrs per wk)

Fundamental laws and principles governing the physical world, discussed in context encountered in modern science and technology. Associated lab is 1005.

Phys 1005f,w,s,su. Physics Laboratory. (1 cr [0 cr for IT students]; prereq 1001 or 11001; 2 lab hrs per wk)

Lab experiments offered with Phys 1001.

Phys 1041f,w,su-1042w,s,su. Introductory Physics. (5 cr per qtr; prereq high school algebra and geometry; trigonometry recommended; 4 lect, 1 recitation, and 2 lab hrs per wk)

Lectures, recitation, and lab sessions. Primarily for students interested in topics useful in technical areas. Fundamental principles of physics in context of the everyday world. The use of kinematic dynamics and conservation principles with quantitative and qualitative problem-solving techniques to understand phenomena of mechanics, electromagnetism, and the structure of matter.

Phys 1104f-1105w-1106s. General Physics. (4 cr per qtr [0 cr for IT students]; prereq for 1104: high school calculus or Math 1142 or equiv, high school trigonometry or Math 1008 or Math 1151; §1107 for 1104, ¶1108 for 1105, ¶1109 for 1106; 4 lect, 1 recitation, and 2 lab hrs per wk)


Phys 1107f-1108w-1109s. General Physics Laboratory. (1 cr per qtr; prereq ¶1104 for 1107, ¶1105 for 1108, ¶1106 for 1109; 2 lab hrs per wk)

Phys 1251f,w,s,su - 1252f,w,s,su - 1253f,w,s,su, - 1254f,w. General Physics I-II-III-IV. (4 cr per qtr, ¶1451H-1452H-1453H-1454H; prereq Math 1251 or ¶Math 1251 for 1251, Math 1252 or ¶Math 1252 for 1252, Math 1251 or ¶Math 1251 for 1253; 3 lect, 1 recitation, 1 quiz hr as needed, and 2 lab hrs per wk for 1251, 1252, and 1253 and 4 lect hrs per wk for 1254)


Phys 1451f-1452w-1453s-1454f. Honors Physics I-II-III-IV. (4 cr per qtr, ¶1251-1252-1253-1254; prereq selection for IT honors curriculum or consent of IT honors office; 3 lect, 1 recitation, and 2 lab hrs per wk)

Comprehensive calculus-level general physics course for honors students. Newtonian principles of mechanics, electromagnetic forces and fields, introduction to 20th-century physics, thermal and other properties of matter.
Phys 1911-1912f. Laboratory-Based Physics for Teachers. (4 cr per qtr [no cr for IT students]; 6 lab hrs per wk)
Primarily for students intending to be elementary education majors and others desiring a hands-on physical science course. Topics applied to elementary school curriculum include the Earth’s motion, properties of matter, heat and temperature, kinematics, and electric current.

Phys 3501. Modern Physics. (4 cr [no cr for physics majors]; §3512-3513: prereq 1253 or 1453, Chem 1052, Math 3261)
Elementary quantum physics with examples from thermal radiation, atomic and molecular structure, and solid-state physics.

Phys 3512w-3513s. Quantum Physics I-II. (3 cr per qtr; prereq 1253 or 1291 or 1341 or 1441 or 1453, Math 3252 or Math 3252, 1254 or 1454 recommended; 3 class hrs per wk)
Quantum mechanics and selected topics from its application to atomic, molecular, condensed-matter, nuclear, elementary-particle, and statistical physics. Associated lab is 3515-3516.

Phys 3515w-3516s. Modern Physics Laboratory. (2 cr; prereq 3501 or §13501 or 3512 or §13512; 1 lab, 3 lab hrs per wk)
Lab experiments in atomic, solid state, and nuclear physics. Offered in conjunction with 3512-3513.

Phys 3601f. Special Relativity. (3 cr; prereq 1253 or 1453; 3 class hrs per wk)
Introduction to special relativity.

Phys 3970. Directed Studies. (1-5 cr per qtr; prereq #, Δ)
Independent, directed study in physics in areas arranged by student and faculty member.

Phys 5021f-5022w. Introduction to Analytic Mechanics. (4 cr per qtr; prereq Math 3261 or equiv; 4 lect hrs per wk)
Analytic course in Newtonian mechanics. Mathematics beyond prerequisites developed as required.

Phys 5023s-5024f. Introduction to Electric and Magnetic Fields. (4 cr per qtr; prereq Math 3261 or equiv; 4 lect hrs per wk)
Classical theory of electromagnetic fields using vector algebra and vector calculus.

Phys 5031f-5032w-5033s. Topics in Mathematical Physics. (4 cr per qtr; prereq two 5xxx mathematics courses; 4 lect hrs per wk)
Mathematical techniques for physics; application of mathematical methods to physical problems.

Phys 5051f-5052w-5053s. Classical Physics. (4 cr per qtr; prereq 5022, 5024, advanced calculus or #; 4 lect hrs per wk)
Classical mechanics, special relativity, and classical electrodynamics. Applications of advanced mathematical techniques.

Phys 5061f. Computational Methods in the Physical Sciences: I. (4 cr, §Ast 5061; prereq upper div status or grad or #; 2 lect, 6 lab hrs per wk)
Problem solving in the physical sciences with computer programs. Numerical methods; mapping problems onto computational algorithms. Arranged lab at scientific computer work station.

Phys 5062w. Computational Methods in the Physical Sciences: II. (4 cr, §Ast 5062; prereq 5061 or Ast 5061 or #; 2 lect, 6 lab hrs per wk)
Advanced techniques in computer simulation; examples chosen from classical statistical mechanics, classical electrodynamics, and fluid dynamics. Computer experiments illustrating these techniques with graphics.

Phys 5101f-5102w. Introduction to Quantum Mechanics. (4 cr per qtr; prereq 3513; 4 lect hrs per wk)
Mathematical techniques of quantum mechanics. Schrödinger equation and simple applications, general structure of wave mechanics, operator methods, perturbation theory, radiation of atoms.

Phys 5121f. Methods of Experimental Physics: I. (5 cr; prereq 3516 or #; 3 lect, 4 lab hrs per wk)
Contemporary experimental techniques. Introduction to modern analog and digital electronics from an experimental viewpoint.

Phys 5122w. Methods of Experimental Physics: II. (4 cr; prereq 5121 or #; 2 lect, 6 lab hrs per wk)
Contemporary experimental techniques. Use of the computers for data acquisition and experimental control. Experiments with data analysis.

Phys 5123s. Methods of Experimental Physics: III. (4 cr; prereq 5122 or #; 2 lect, 6 lab hrs per wk)
Contemporary experimental techniques. Students design and execute an experimental project. Lectures on specialized topics emphasizing research laboratories.

Phys 5124. Experimental Project. (Cr ar; prereq 5123, #)
Research project in an area of contemporary interest. Project must be approved by faculty coordinator before registration.

Phys 5151f-5152w-5153s. Quantum Mechanics. (4 cr per qtr; prereq 5102 or equiv, advanced calculus or #; 4 lect hrs per wk)
Development from first principles. Application of the Schrödinger equation, matrix representations, approximation methods.

Phys 5162. Introduction to Plasma Physics. (4 cr; prereq 5022, 5024 or #; offered alt yrs)
Magnetohydrodynamics and properties of collisionless plasmas, applications to magnetic field of Earth and sun and to plasma confinement. Transport phenomena and effects of collisions.

Phys 5201f, w-5202w. Thermal and Statistical Physics. (4 cr per qtr; prereq 3513 or equiv; 4 lect hrs per wk)
Applications of thermodynamics and statistical mechanics, and selected topics from their application to kinetic theory; transport theory and phase transitions.
Phys 5211s. Introductory Solid State Physics. (4 cr; prereq 5101, 5202 or equiv; 4 lect hrs per wk)
Properties of solids, including vibrational and electronic properties of solids and diffraction of waves in solids and electron-band structure. Other possible topics include optical properties, magnetic phenomena, superconductivity.

Phys 5231f-5232w-5233s. Introduction to Solid State Physics. (4 cr per qr; prereq grad or adv undergrad in sci or eng, 1254, 3512, or #; 4 lect hrs per wk)
Principles of solid physics for scientists and engineers. Crystal structure and binding; neutron and X-ray diffraction; phonons; thermal and dielectric properties of insulators; the free-electron model and band structure of metals; semiconducting behaviors and magnetism. Other possible topics include superconductivity, ferroelectricity, optical phenomena, surface and interface properties, and departures from crystalline order.

Phys 5301s. Introduction to Nuclear Physics. (4 cr; prereq 5101 or equiv; 4 lect hrs per wk)
Structure of atomic nuclei; single-particle and collective models; interactions between elementary particles and nuclei and nucleus-nucleus interactions from very low up to relativistic energies; tests of fundamental conservation laws; fission and fusion reactions; astrophysical applications. Survey for nonspecialists and a first course for those planning to specialize in nuclear physics.

Phys 5371s. Introduction to Elementary Particle Physics. (4 cr; prereq 5101 or equiv; 4 lect hrs per wk)
Properties and interactions of the fundamental constituents of nature. Survey for nonspecialists and those intending to specialize in elementary particle physics.

Phys 5400H. J unior Honors Seminar. (1 cr; prereq IT or CLA honors student; #; 1 1/2 sem hrs per wk; may be taken no more than three times)
Seminar for upper division physics majors in the honors program, prepares students for senior honors thesis projects and provide guidance in choice of future careers.

Phys 5401. Introduction to Contemporary Problems in Cosmic Ray and Space Physics. (4 cr; prereq #; primarily for students specializing in other branches of physics; offered alt yrs)

Phys 5410H. Senior Honors Program. (1 cr; prereq IT or CLA honors student; #; 1 1/2 sem hrs per wk; may be taken no more than three times)
Seminar for upper division physics majors in the honors program who are carrying out senior honors thesis projects.

Phys 5422. Introduction to Magnetospheric Physics. (3 cr; prereq 5022, 5024 or equiv)
Physics of the magnetosphere and its interaction with the solar wind; single particle motions, radiation belts, and plasma convection; magnetic structure and currents; collective behavior, magnetohydrodynamic description of plasmas; discontinuities, boundary layers, and shocks; plasma waves and instabilities.

Phys 5461. Physics and Chemistry of the Earth’s Upper Atmosphere. (4 cr; prereq general physics, calculus; 4 lect hrs per wk; offered alt yrs)
Survey of atmosphere above 15 kilometers; physics and chemistry of stratosphere, mesosphere, and thermosphere; temperature and density profiles; major and minor constituents and their distributions; aspects of pollutants; reactions and rates; global variations of constituents; the energy budget of the atmosphere.

Phys 5551f. Topics in Physics for Biology and Medicine: Mechanics and Molecular Physics. (5 cr; prereq general physics, calculus; offered alt yrs)

Phys 5552w. Topics in Physics for Biology and Medicine: Electricity and Signals. (5 cr; prereq general physics, calculus; offered alt yrs)
Electricity, circuits (electrocardiogram, networks, nerve conduction); transducers, amplifiers; oscillators; feedback control; signal analysis (Fourier analysis, correlation functions, power spectra).

Phys 5553s. Topics in Physics for Biology and Medicine: Light, Atoms, and Nuclei. (5 cr; prereq general physics, calculus; offered alt yrs)
Infrared, invisible, and ultraviolet light. X-rays (production, absorption, dosimetry). Nuclei (nuclear size, mass, decay).

Phys 5561. Magnetism: Physics, Geophysics, and Engineering. (3 cr, §Geo 5561; prereq 1253 or 1453; 3 lect hrs per wk)
Elementary statistical mechanics, rock magnetism, micromagnetic modeling. Applications of magnetism in geophysics, biomagnetism, magnetic sensors, and recording.

Phys 5801s. Modern Optics. (4 cr; prereq 5024 or #; 4 lect hrs per wk; offered alt yrs)
Modern theoretical and experimental optics broadly defined to include, for example, radio astronomy. Matrix methods in geometrical optics, including charged particle optics; optical detectors and noise; phenomena in intense coherent radiation, including nonlinear effects.
Phys 5805. Contemporary Optics. (4 cr; prereq #; 4 lect hrs per wk)
Fundamentals of lasers, including propagation of Gaussian beams, optical resonators, theory of laser oscillation, electro-optic and acousto-optic modulation, and nonlinear optics.

Phys 5911-5912. Concepts in Physics. (4 cr; prereq general physics or #; 3 lect, 2 lab hrs per wk; offered alt yrs)
Overview of physics with emphasis on 20th-century developments. Primarily for secondary teachers and science majors wishing a summary review of physics.

Phys 5924f. History of 19th-Century Physics. (4 cr, §HSci 5924; prereq general physics or #)
Experimental and theoretical discoveries in 19th-century physics (wave theory of light, atomic theory, heat, thermodynamics and statistical mechanics, electromagnetism and field theory) within context of educational, institutional, and political developments in Europe and the United States.

Phys 5925w. History of 20th-Century Physics. (4 cr, §HSci 5925; prereq general physics or #)
Experimental and theoretical discoveries in 20th-century physics (birth of modern physics, special theory of relativity, old and new quantum theories) within context of educational, institutional, and political developments in Europe and the United States.

Phys 5950. Colloquium Seminar. (Cr ar; primarily for beginning grads and advanced undergrads in physics, Δ; S-N only)
Colloquium of the School of Physics and Astronomy.

Phys 5970. Directed Studies. (1-5 cr; prereq #, Δ)
Independent, directed study in areas arranged by the student and a faculty member.

Phys 5980. Research Seminar. (1 cr; primarily for beginning grads and advanced undergrad majors in physics; 1 sem hr per wk)
Introduction to the research activities of the School of Physics and Astronomy.

Phys 5990. Directed Research. (Cr ar; prereq 3rd yr, Δ)
Problems, experimental or theoretical, of special interest to students. Written reports.

Physiology (Phsl)

Medical School

Staff—Head, Robert F. Miller, 6-255 Millard Hall; Director of Undergraduate Studies, W. Dale Branton, 6-270 Millard Hall; Director of Graduate Studies, Stephen A. Katz, 6-120 Owre Hall

Professors: Burkhardt, Ebner, Gallant, Georgopoulos, Lee, Levitt, Low, Miller, Newman, Poppele, Purple, Soechting

Associate Professors: Branton, Fohlmeister, Katz, Lukas, Osborn, O’Grady, Raabe, Wangenstein

Assistant Professors: Barnett, Boland, Iaizzo, Thompson

Instructor: Bloom

Physiology aims to understand the functions of the human body by pursuing systematic studies of cells, tissues, and organs. The emphasis is on discovering the mechanisms underlying normal and pathological functions in terms of the physical and chemical laws that govern them.

General Education—1001, for non-science majors.

B.A. Major Sequence

Required Preparatory Courses—Math through 1252; Chem through 1052; Phys 1251, 1252, 1253, or 1104/1107, 1105/1108, 1106/1109

Major Requirements—BioC 3021 or 5331; Biol 5003, 5004; Chem 3301/3305, 3302/3306; Phsl 3055, 3056

Two, adviser-approved, 3xxx-5xxx electives totaling at least 6 credits. Electives are generally chosen from courses in science or mathematics. A current list of electives are available from the physiology resources listed below.

Honors Requirements—In addition to the requirements of the college, honors students must complete at least two quarters of Phsl 3091 or Phsl 3092 (2 cr each quarter). Summa candidates must complete three quarters of Phsl 3091 or Phsl 3092 concomitant with authorship of an approved senior thesis. Students may not take more than a total of two credits of Phsl 3091/3092 per quarter.

A complete description of the undergraduate major in physiology, including electives, is available at http://enlil.med.umn.edu/www/phsl/undergrad on the World Wide Web. Information is also available from the Department of Physiology office, 6-255 Millard Hall (625-5902) or Dr. Dale Branton, director of undergraduate studies, (625-8977; e-mail: branton@maroon.tc.umn.edu).

Phsl 1001f. Human Physiology. (4 cr; prereq high school biology, high school chemistry or #; not open to health sciences students; 3 lect, 2 lab/dem hrs per wk) Bloom Human organ systems, normal and pathological functions, feedback regulation and control. Applications to everyday aspects of body function and health.

Phsl 3051w. Human Physiology. (5 cr; prereq 1 yr chemistry, biology; intermediate survey primarily for nursing and physical therapy students; 4 lect, 2 dem hrs per wk) Bloom
**Phsl 3052f, 3053 w. Principles of Physiology.** (3 cr per qtr; prereq 1 yr each college chemistry, physics, math through integral calculus,  ¤ winter qtr only) Levitt

**Phsl 3055f, 3056w. Principles of Physiology.** (5 cr per qtr; prereq 1 yr each college chemistry, physics, math through integral calculus,  ¤ winter qtr only) Levitt

**Phsl 3070f. Neurophysiology.** (2 cr; prereq biochemistry, human or mammalian anatomy; primarily for pharmacy students; begins 7th wk of qtr) Fohlmeister

**Phsl 3091. Honors Course: Readings in Physiology.** (Cr and hrs ar [may be repeated]; prereq  ¤; open to honors candidates in physiology only) Selected topics; written reviews prepared and discussed on tutorial basis.

**Phsl 3092. Honors Course: Problems in Physiology.** (Cr and hrs ar [may be repeated]; prereq  ¤; open to honors candidates in physiology only) Selected lab problems; written reports.

**Phsl 3970. Directed Studies.** (Cr ar; prereq #,  ¤) Guided individual reading and study on topics not covered in other courses.

**Phsl 5100w. Systems Physiology.** (5 cr; prereq biochemistry, anatomy; primarily for dental or pharmacy or med tech students; 4 lect, 2 dem hrs per wk) Katz
Integration of molecular, cellular, and organ physiology to understand human body function.

**Phsl 5113. Problems in Physiology.** (Cr and hrs ar [may be repeated]; prereq  ¤) Individual topics assigned for lab study, conferences and/or reading.

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**Plant Biology (PBio)**

(formerly Botany)

**College of Biological Sciences**

**Staff—Interim Head,** J. Stephen Gantt, 220 Biological Sciences Center; **Director of Undergraduate Studies,** Thomas K. Soulen, 660 Biological Sciences Center

**Professors:** Brambl, Brenner, Carter, Cushing, Doebly, Gengenbach, Gleason, Hackett, Koukkari, McLaughlin, Rubenstein, Wetmore, Wick

**Associate Professors:** Berman, Biesboer, Charvat, Furnier, Gantt, Olszewski, Silflow, Soulen, Wick

**Assistant Professors:** Marks, May

Plant biologists study such varied topics as the structure, function, development, classification, evolution, worldwide distribution, and importance of plants ranging from algae and fungi to flowering plants; the molecular basis of plant evolution and development; the mechanisms through which plants convert light into chemical energy; the use of plants in the interpretation of the prehistory and history of the world; and the impact of plants on human civilizations.

A major leading to the B.S. is available through the College of Biological Sciences. See also Biology.

**General Education—Courses especially appropriate for nonmajors include Biol 1103 and PBio 1009, 1012.**

**Minor Sequence**

**Required Preparatory Courses—Biol 1009 or 1202; 1103 or 3012 or 3812**

**Minor Requirements—Three courses plus one seminar to total a minimum of 15 cr in plant biology, chosen from:** 3131, 3109 or 5111, 3201, 5103, 5105

The program must be approved by the director of undergraduate studies.

**PBio 1009. Minnesota Plant Life.** (4 cr; suitable for nonmajors)
Identification of the more characteristic and conspicuous Minnesota plants, including many lower forms with discussion of basic distinctions, life cycles, habitat requirements, distribution, vegetation types, and ecological relations. Lectures, demonstrations, six field trips.

**PBio 1012. Plants Useful to Humans.** (4 cr; for majors or nonmajors)
Roles that plants play and have played in human biological and cultural development. Lectures and demonstrations.

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**Symbols and abbreviations:**

-  f,w,s,su—fall, winter, spring quarter, summer session
-  Cr—Credits per quarter
-  #—First number following course title
-  UC—University College (formerly CEE)
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Biol 1103. General Botany. (5 cr, §Biol 3012, §3812; prereq Biol 1009 or 1202; students who plan to major in biology in CLA or any bioscience major in CBS should take Biol 3102 or 3812) Organization levels of plants; plant function, growth and development, reproduction. Includes lab.

Biol 3012. Plant Biology. (5 cr, §Biol 1103, §Biol 3812; prereq Biol 1009 or 1202, Chem 1052) Plant diversity and evolution; structure and function of the plant cell and of the whole organism; growth and development of plants. Includes lab.

PBio 3109. Plant Anatomy. (5 cr; prereq Biol 1103 or 3012 or 3812; offered alt yrs) Structure and development of plants with special reference to vascular plants.

PBio 3131. Survey of Plant Physiology. (4 cr, §5131; prereq Biol 1103 or 3012 or 3812, BioC 3021 or 5331 or Biol 5001) Physiological principles underlying processes that occur in living plants, with emphasis on higher plants. Growth and development, mineral nutrition, transport, water relations, and metabolism, emphasizing photosynthesis and nitrogen assimilation. For lab, see PBio 5132.

PBio 3201. Introductory Plant Systematics. (4 cr; prereq Biol 1103 or 3012 or 3812) Systematics of the flowering plants of the world. Ecology, geography, origins, and evolution of flowering plants; family characteristics; floral structure, function and evolution; pollination biology; methods of phylogenetic reconstruction; molecular evolution; taxonomic terms; methods of collection and identification. Two field trips.

PBio 3960. Research Topics in Plant Biology. (1 cr; prereq Biol 1103 or 3012 or 3812; S-N only) For undergraduates interested in plant biology. Lecture, discussion, and demonstration of faculty research interests.

PBio 5103. Algae, Fungi, and Bryophytes. (5 cr; prereq Biol 1103 or 3012 or 3812; offered when feasible) Characteristics of groups, evolutionary relationships, life cycles, comparative morphology (including ultrastructure), comparative nutrition. Lab emphasizes living material and isolation of algae and fungi into culture.

PBio 5105. Morphology of Vascular Plants. (5 cr; prereq Biol 1103 or 3012 or 3812 or #) Ferns and their allies, Gymnosperms (cycads, Ginkgo, conifers) and Angiosperms (flowering plants). Comparative morphology of vegetative and reproductive structures; life cycles, evolutionary relationships.

PBio 5107. Mycology: Basidiomycetes. (4 cr; prereq PIa 5105 or equiv or PBio 5103 or introductory microbiology or #) Ecology, evolutionary relationships, systems (taxonomy and nomenclature), morphology (including ultrastructure and life cycles of the basidiomycetes). Laboratories parallel lectures, with living and preserved representatives of the Uredinales, Auriculariales, Septobasidiales, Exobasidiales, Sporobolomycetales, Ustilaginiales, Tilletiales, Tremellales, Dacrymycetales, Tulasnellales, Aphyllophorales, Agaricales, and Gasteromycetes.

PBio 5109. Molecular Genetics and Biochemistry of Yeasts and Filamentous Fungi. (4 cr, §PIa 5109; prereq one course each in genetics and biochemistry or #) Chromosome structure and function, regulation of nuclear gene expression, mitochondrial gene organization and expression, membrane and organelle biogenesis, cell cycle regulation, morphogenesis, mating and reproduction, recombination and gene switching, spore formation and germination, viruses, plasmids, and toxins.

PBio 5111. Plant Cell, Tissue, and Organ Development. (5 cr; prereq Biol 1103 or 3012 or 3812) Microscopic structure of vascular plants; development in root, stem, and leaf.

PBio 5131. Survey of Plant Physiology. (4 cr, §5131; prereq Biol 1103 or 3012 or 3812, BioC 3021 or 5331 or Biol 5001) Physiological principles underlying processes that occur in living plants, with emphasis on higher plants. Growth and development, mineral nutrition, transport, water relations, and metabolism, emphasizing photosynthesis and nitrogen assimilation. Weekly discussion section.

PBio 5132. Plant Physiology Laboratory. (2 cr; prereq 3131 or 5131 or §§3131 or 5131) Lab course to accompany PBio 3131 or PBio 5131.


PBio 5182. Plant Metabolism. (3 cr; prereq 5131 or equiv, course in biochemistry) Plant metabolism: photosynthesis, respiration, and the synthesis of macromolecules by plants. Structure-function relations at the plant, cell, and subcellular levels. Energy flow in the plant system and regulation of plant metabolism.


PBio 5184. Plant Growth and Development. (3 cr; prereq 5131 or 5131 or equiv) Survey of plant growth and development ranging from germination to death, with emphasis on physiology, biochemistry, and molecular biology. Topics include developmental processes related to: mobilization of macromolecules during germination; cell division and cell extension during axis growth; photomorphogenesis; chloroplast and microbody ontogeny; flowering, fruit, and seed formation; senescence; how plant growth substances control these developments.

PBio 5203. Herbarium Techniques. (1 cr; prereq 1009 or 3201 or equiv; S-N only) A “hands-on” approach to museum curation procedures in the herbarium. Students will be exposed to all aspects of herbarium management and will assist with some curation of plant specimens.

PBio 5221. Plant Molecular Evolution. (3 cr; prereq Biol 5003 or GCB 3022) Applications of molecular genetics to the study of processes and products of evolution. Topics include phylogenetic reconstruction, chromosomal evolution, multigene families, molecular aspects of morphological change, role of transposons in evolution, DNA sequence evolution, and measures of genetic diversity.

PBio 5231. Introduction to the Algae. (5 cr; prereq 10 cr in plant biology or biology or #; offered when feasible) Structure, reproduction, life histories of major algal divisions.

PBio 5960. Special Topics. (Cr ar; prereq #; ∆) Treatment in depth of a specialized botanical topic.

PBio 5970. Directed Studies. (Cr ar [10 cr max of 5970 or 5990 may be counted toward the major requirements]; prereq #; ∆; S-N only) Individual study of selected topics or problems, with emphasis on selected readings and use of scientific literature.

PBio 5990. Directed Research. (Cr ar [10 cr max of 5970 or 5990 may be counted toward the major requirements]; prereq #; ∆; S-N only) Lab or field investigation of selected areas of research.

Courses Offered at Lake Itasca Forestry and Biological Station

Biol 3812. Plant Biology. (5 cr, §1103, §3012; prereq 1009 or 1202, Chem 1052, ∆) Plant diversity and evolution: structure and function of plant cell and whole organism; growth and development of plants. Field trips at Itasca.

PBio 5801. Plains and Boreal Flora. (5 cr; prereq course in taxonomy, ∆; offered when feasible) Survey of summer flowering plants and ferns of the state with particular reference to local flora. Identification by technical keys; important plant families; field recognition of common species; habitat preferences; natural history and population biology of selected important species.

PBio 5811. Freshwater Algae. (5 cr; prereq 10 cr plant biology, biology or zoology or equiv; ∆; offered when feasible) Morphology, systematics, and distribution of local algal flora. Collection, preservation, numeration, and culture techniques; identification of field collections using appropriate technical literature. Ecological implications of species interactions, algal associations, and indicator taxa.

PBio 5890. Research Problems. (1-5 cr per qtr; prereq #, ∆) Individual research for undergraduates and graduates.

Polish

See Institute of Linguistics and Asian and Slavic Languages and Literatures.

Political Science (Pol)

Staff—Chair, Edwin Fogelman, 1414 Social Sciences Building; Director of Undergraduate Studies, Steven Smith, 1435 Social Sciences Building; Director of Honors, John Sullivan, 1246A Social Sciences Building; Undergraduate Advisers, 1482 Social Sciences Building

Regents’ Professor Emeritus: Turner

Regents’ Professor: Sorauf

Professors: Backstrom, Ball, Borgida (Psychology), Boyte (Humphrey Institute), Dietz, Duvall, Farr, Flanigan, Fogelman, Freeman, Gray, Holt, Jernberg (Humphrey Institute), Kvavik, Krislov, Kudrle (Humphrey Institute), Light, Murphy (History), Scott, Shively, Smith, Stimson, Sullivan, Weinsheimer (English)

Associate Professors: Disch, Jacobs, Kelliher, Nimtz, Sampson, Sikkink

Assistant Professors: Davidheiser, Legro, Oren, Price, Rahn, Richards

Political science is the study of government, politics, and political ideas. Introductory courses are concerned with general information about the American political system, the political systems of other areas in the world, the international political system, political ideas, and the principal terms and concepts of political science. 3xxx and
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

5xxx courses, which may be entered as soon as prerequisites are satisfied, involve deeper examination of selected fields.

Political science graduate students are not allowed to take 5xxx courses for graduate credit.

Honors Program—Qualified majors are encouraged to apply to the departmental honors program, which provides opportunities to participate in small seminars and to work closely with a faculty member on a research project. See handout from the undergraduate office.

Undergraduate Seminars, Fieldwork, Internships, and Scholarships—Undergraduate advisers can provide detailed information about special study opportunities offered by the department, including the A. I. Johnson scholarship/internship and a yearly competition for paid internships in the Washington, D.C., and Minnesota offices of members of Congress.

A maximum of 8 elective cr may be completed in fieldwork and internships.

Three-cr seminars in the 3x99 series include discussion of and individual research on specific topics, as listed in the quarterly Class Schedule. They offer close involvement with faculty members and opportunities for creative research. Enrollment in each seminar is limited to 15.

For the Nonmajor—All political science courses with the exception of honors courses are open to nonmajors on A-F or S-N grading. All 1xxx courses are suitable for students interested in an introduction to political science. Most 3xxx and 5xxx courses also are considered general in nature and many are taken by nonmajors.

Study Abroad—The department strongly urges students to incorporate an overseas study experience into their undergraduate program. Appropriate credits from such study, if planned in advance with an adviser, can be applied toward a political science major or minor. Even for students specializing in American politics, studying abroad provides an important comparative perspective. For information on options and procedures, see Foreign Study.

Foreign Languages Across the Curriculum (FLAC)—Students are encouraged to include courses conducted in a language other than English as part of their undergraduate career, whether they are offered on campus or abroad. The Foreign Languages Across the Curriculum (FLAC) program offers students a number of opportunities to take two- or four-credit courses in French, German, and Spanish, while one-credit FLAC sections are offered in conjunction with some four-credit courses taught in English. These one-credit sections have been offered in Spanish, though other languages are being considered. In spring quarter, FLAC courses offered in French, German, and Spanish provide students the opportunity to do all their coursework in one of these languages as participants in the Foreign Language Immersion Program (FLIP). For more information, consult the political science advisers in 1414 Social Sciences Building.

B.A. Major Sequence

Students seeking admission to the major must meet the following criteria: New Advanced-Standing students must complete two courses in political science with grades of C or better; other undergraduates must complete two of the six introductory courses in political science (1001, 1025, 1026, 1041, 1054, 1061, or 3051) with grades of C or better.

Major Requirements—1001, 3051, and one of the following: 1025, 1026, 1041, 1054, 1061; at least 39 cr in 3xxx-5xxx political science courses (including 3051), taken on A-F grading and with grades of C or better.

Of the required 3xxx-5xxx courses, at least two courses must be from the set of offerings in the political theory, comparative government and politics, or international relations subfields and at least two from the set of courses in politics and behavior, American governmental systems and processes, or public law subfields. No more than four courses taken in any one subfield will apply toward the major.

Coursework completed elsewhere can be used for credit in the major only with department approval. All majors must complete at least 20 cr of 3xxx or 5xxx political science courses on the Twin Cities campus.

Students ready to declare a major (or double major) should contact the undergraduate advising office where staff advisers, and a faculty adviser to be assigned at this time, will help in the selection of coursework appropriate to intellectual and career objectives.

Political science majors may complete one of the following optional concentrations. Students
declare the concentration in the undergraduate advising office at the time of filing for major status or any time thereafter. Students fulfill the requirements by completing any six of the courses listed with that concentration.

**Business and politics**—3085, 3110H, 5481, 5875, 5886, 5889, 3307, 3308, 3331, 5308, 5315, 5327, 5523

**Campaigns and elections**—3110H, 3085, 3659, 3471, 5461, 3766, 5737, 5738, 5767, 5306, 3308, 3331, 5306, 5308, 5767, 5737, 5769

**Citizenship and civic action**—3110H, 3659, 3661, 5654, 5655, 5656, 5657, 5766, 5885, 3739, 5765, 5303, 5323, 5502

**Global politics**—3110H, 3661, 3471, 3477, 5461, 3835, 3836, 5323, 5875, 5877, 5881, 5883, 5885, 5886, 5889

**Law and Politics**—3110H, 3679, 5655, 5656, 3872, 5657, 5881, 5883, 3309, 3331, 3323, 3561, 5501, 5502, 5523

**Minor Sequence**

Minor Requirements—3051, and one of the following: 1001, 1025, 1026, 1054, 1061; at least 16 cr in four related 3xxx or 5xxx political science courses from two fields.

Internships (3070, 3080), fieldwork (3751, 3352, 3353), and directed study (3970) cannot be used to fulfill minor requirements. Only one course from outside the University of Minnesota may be transferred to the minor program.

Students considering a minor should consult an undergraduate adviser about the proposed program and must obtain approval of the Director of Undergraduate Studies.

### General

**Pol 1001. American Government and Politics.**  
(5 cr) Gray, Jacobs, Rahn, Smith, Stimson  
Principles, organization, processes, functions of government, and the interplay of political forces in the United States. Attention throughout to current issues.

**Pol 1001H. Honors Course: American Government and Politics.**  
(5 cr; open to fr, soph) Gray, Jacobs, Rahn, Smith, Stimson  
Intensive introductory examination of principles, organization, processes, functions of government, and interplay of political forces in the United States. Attention throughout to current issues. Small group discussion opportunities.

**Pol 1025. World Politics.**  
(4 cr) Duvall, Freeman, Oren, Price, Sampson, Sikkink  
Contemporary international relations; forms of state interaction; problems of conflict and cooperation.

**Pol 1026. American Foreign Policy.**  
(4 cr) Sampson, staff  
Institutions and processes that determine American foreign policy; major developments in U.S. foreign policy since World War II; contemporary issues of U.S. policy.

**Pol 1041. Contemporary Political Ideologies.**  
(4 cr) Ball, Farr, Fogelman  
Major modern ideologies such as liberalism, democracy, conservatism, socialism, communism, fascism, nationalism, imperialism, racism. Adequacy of alternative ideologies for analysis and solution of political and social problems.

**Pol 1054. Government and Politics in a Changing World.**  
(4 cr) Davidheiser, Duvall, Holt, Kelliher, Nimtz, Sikkink  
Politics of democratic, communist, and Third World nations; examines the causes and consequences of different forms of political life.

**Pol 1061. Introduction to Political Thought.**  
(4 cr) Ball, Dietz, Disch, Farr, Fogelman  
Central issues in politics—justice, freedom, authority, order, conflict, and revolution—are examined through readings of major texts in Western political thought: Plato’s *Republic*, Machiavelli’s *Prince*, Hobbes’ *Leviathan*, and Marx (selections), among others.

**Pol 3051. Introduction to Political Analysis.**  
(4 cr) Farr, Fogelman, Holt, Shively, Sikkink, staff  
Formation of political communities, political participation, policy making, compliance, legitimacy, political development, types of political systems. Empirical and normative problems. Comparisons among major countries.
Pol 3085. Introduction to Political Research. (4 cr; prereq 3051 or #) Davidheiser, Flanigan, Richards, Shively, Smith, Sullivan, staff
The design of political research; theory construction, concept formation, problems of measurement, statistical tests for and measures of relationships; problems of inference and interpretation of findings.

Special Courses
Most 3xxx and 5xxx courses are listed under their specialized fields. “Special” courses, not assigned to these fields, are listed here.

Pol 3070. Directed Field Studies. (1-4 cr per qtr; prereq #; A-F only)
Faculty-supervised research related to work in political or governmental organizations.

Pol 3080. Internship. (4 cr per qtr [8 cr max]; prereq #; S-N only) Backstrom, staff
Internship with government or community organizations, arranged by the department and awarded competitively usually each spring quarter.

Pol 3109H. Honors Course: Seminar in Political Science Research. (4 cr; prereq pol sci honors major)
Design of a research project in political science; theory construction, measurement, research methods, and data collection.

Pol 3110H. Honors Work in Selected Fields. (1-6 cr per qtr [6 cr max]; prereq 3109H, pol sci honors major)
Individual research and writing of departmental honors thesis.

Pol 3970. Directed Studies. (1-6 cr per qtr; prereq #, A)
Guided individual reading or study.

Political Theory

Pol 3659. American Political Thought. (4 cr) Ball, Farr, Fogelman
From colonial times to present: Puritanism; Revolution; Constitution; utopianism; sectionalism and pluralism; anarchist, socialist, populist, and syndicalist thought; social Darwinism; conservatism; political thought in law and literature.

Pol 3661. Democratic Theory. (4 cr; prereq 3051 or 9 cr in social sciences or #) Ball, Disch, Farr
Postulates and implications; moral foundations; democratic theory and the economic order; liberty and authority; equality; representation; participation; majority rule; critics of democracy; social science and democratic theory.

Pol 5654. Development of Political Thought: Ancient and Medieval (Plato to Aquinas). (4 cr; 1061 recommended or 9 cr in social sciences) Ball, Dietz
Thucydides; classical Greek thought; Plato and Aristotle; rise of empire and Roman thought; Augustine; Middle Ages; Aquinas.

Pol 5655. Development of Political Thought: Early Modern. (4 cr; 1061 recommended or 9 cr in social sciences) Ball, Dietz, Farr
Renaissance; Machiavelli; More; Reformation; Luther; Calvin; liberalism; Hobbes and Locke; Enlightenment; Montesquieu; Rousseau.

Pol 5656. Development of Political Thought: Modern. (4 cr; 1061 recommended or 9 cr in social sciences) Ball, Dietz, Farr, Fogelman
French Revolution and reaction; Burke; utilitarianism; Bentham; Hegel; socialism; Marx; rise of democracy; Mill; Tocqueville; selected 20th-century thinkers.

Pol 5657. Development of Political Thought: Contemporary. (4 cr; 1061 recommended or 9 cr in social sciences) Dietz, Disch, Fogelman

Comparative Government and Politics

Pol 3471. Comparative Political Parties and Interest Groups. (4 cr; prereq 1054 or 3051 or #) Kvavik, Nimtz
Cross-national study of political parties and interest groups; organized expression of public and private interests in pluralist and corporatist politics; the nature of politics in single- and multi-party systems.

Pol 3477. Political Development. (4 cr; prereq 1054 or 3051 or #) Davidheiser, Duvall, Nimtz
Political processes and problems associated with economic development processes; the political economy of underdevelopment and development; problems of state building and the development of political institutions.

Pol 5410. Advanced Topics in Government and Politics. (4 cr; prereq 3051 or non-pol sci grad or #)
Topics of current analytic or policy importance in comparative politics. Topics vary.

Pol 5461. Western European Government and Politics. (5 cr; prereq 3051 or non-pol sci grad or #) Holt, Shively
Political institutions in their social settings; power and responsibility; governmental stability; political decision making, government and economic order.

Pol 5471. Politics of Russia and the Commonwealth of Independent States. (4 cr; prereq 3051 or non-pol sci grad or #) Davidheiser
Politics in the former Soviet Union, now the Commonwealth of Independent States. Course is composed of two parts, the evolution of the system: theories of revolution and their relation to Russia’s experience of 1917, and the emergence and breakdown of the stable Soviet system of government; current attempts to re-establish political stability and to cope with the pressing problems facing the political system in the Commonwealth and in Russia more narrowly.
Pol 5473. Chinese Government and Politics. (4 cr; prereq 3051 or non-pol sci grad or #) Kelliher
Traditional Chinese society; fragmentation of China and rise of the communists to power; sources and nature of communist Chinese ideology; institutional character of the Communist Party system; sources of power; role of the party and functional groups; patterns of change.

Pol 5477. Middle Eastern Government and Politics. (4 cr; prereq 3051 or non-pol sci grad or #) Krislov, Nimtz, Sampson
Domestic politics of Turkey, Iran, selected Arab states, and Israel, with emphasis on ruling elites and linkages between regimes and societies. Other topics include secular/religious tensions, political aspects of ethnic diversity, and political effects of economic change.

Pol 5478. Government and Politics of African Countries. (4 cr; prereq 3051 or non-pol sci grad or #) Nimtz
Political institutions and behavior in sub-Saharan African countries in their social and cultural settings; class and tribal structure; parties and elections; source and nature of ideologies; economic and social policies.

Pol 5479. Latin American Government and Politics. (5 cr; prereq 3051 or non-pol sci grad or #) Sikkink
Latin American political heritage, political processes, contemporary public policy issues; problems of social, economic, and political change in selected countries.

Pol 5481. The Politics of National Economic Relations. (4 cr; prereq 3051 or non-pol sci grad or #) Freeman
How politics shapes and is shaped by economic relations within nation-states; economic determinants of voting; political-business cycles; business and unions as interest groups; the political determinants of government spending patterns.

International Relations

Pol 3810. Topics in International Politics and Foreign Policy. (4 cr)
Analysis of selected issues in contemporary international relations. Topics vary. Examples: law of sea negotiations, international petroleum politics, limitation of arms races, creation of new international economic order.

Pol 3835. International Relations. (4 cr) Duvall, Legro, Oren, Sampson
Structure of international system; balance of power, bipolar and other international systems; theories of stability, change, conflict, and cooperation.

Pol 3836. Foreign Policy Decision Making. (4 cr) Sampson
Theories and examples of foreign policy decision-making processes, including policy formulation and implementation. Examples drawn from various foreign policy issues.

Pol 3872. International Organizations and the Environment. (4 cr; prereq pol sci major or international relations major or 12 cr social sciences or #) Richards, Sampson
Considers various understandings of international relations/ international organizations as they pertain to international efforts to improve the environment. Focuses on intergovernmental organization and governmental policy. Examines history of international environmental cooperation and analyzes selected recent topics, such as ozone depletion, ocean quality, or rain forest preservation. Topics vary.

Pol 3873. Global Citizenship and International Ethics. (4 cr; prereq 1025 or #)
Case studies of ethics of intervention, foreign aid, environmental practices, and women’s rights used to examine global ethical responsibilities of individual citizens and public officials; effectiveness of international social movements in influencing policy at domestic and international levels.

Pol 3899. Advanced Seminar. (4 cr; prereq jr or sr, #)
Advanced analysis with supervised research and writing in areas of international relations. Topics vary quarterly. See department office for current offerings.

Pol 5323. American Defense Policy. (4 cr; prereq 3836 or 6 cr in ROTC or non-pol sci grad or #)
Major policy issues such as American strategic theory and war capabilities; limited war theory and capabilities; arms control and disarmament. Defense policy-making process in the Executive Office, Congress, Department of Defense, military services, private sector. Implications of American defense policies for foreign and domestic policy.

Pol 5810. Advanced Topics in International Politics and Foreign Policy. (1-4 cr; prereq 3835 or 3836 or non-pol sci grad or #)
Topics of current analytic or policy importance in international relations/foreign policy. Topics vary.

Pol 5877. Comparative Foreign Policy. (4 cr; prereq 3836 or non-pol sci grad or #) Sampson
Comparative analysis of foreign policies of major states; national and international determinants of foreign policy behavior.

Pol 5881. International Law. (5 cr; prereq 3835 or non-pol sci grad or #)
How and why does international law matter? Obligation, territory, laws of war, international criminal law, human rights, environment and law of the sea.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Pol 5883. International Organizations. (4 cr; prereq 3835 or non-pol sci grad or #) Duvall
International politics of cooperation in institutional arenas; decision-making in the United Nations and related agencies; organizational impact on international conflict and international economic and social relations.

Pol 5885. International Conflict and Security. (4 cr; prereq 3835 or non-pol sci grad or #) Legro, Oren, staff
Use of military force in international politics. Topics include threat perception, nuclear strategy, arms races and race control, ethical perspectives on war.

Pol 5886. International Diplomacy, Bargaining, and Negotiation. (4 cr; prereq 3835 or non-pol sci grad or #) Legro
Strategies and processes of international diplomacy, bargaining, and negotiation to resolve contemporary international disputes, including international security, arms limitation, and disarmament.

Pol 5889. The Politics of Global Economic Relations. (4 cr; prereq 3835 or non-pol sci grad or #) Duvall, Freeman, Legro, Oren
Trade, aid, investment, and international monetary relations as political-economic processes; role of multinational corporations; problems of dependence and interdependence; strategic issues in East-West economic relations.

Politics and Behavior

Pol 3739. Politics of Race, Class, and Ethnicity. (4 cr; prereq 6 cr in social sciences) Nimtz
Cross-cultural study of politics of ethnic communities; emphasis on politics of black communities in the United States. Internal community politics and their local and national political systems.

Pol 3751. Fieldwork in Politics. (4 cr; prereq 1001 or equiv) Backstrom
Field study of political organizations, leadership, campaigns. Students arrange work assignments with candidates.

Pol 3766. Political Psychology. (4 cr; prereq 1001 or equiv or #) Rahn, Sullivan
Political learning: processes of political perception and information processing; subjectivity and political ideology; personality and political behavior; symbols and political psychology.

Pol 5710. Advanced Topics in Politics and Behavior. (4 cr; prereq 3051 or #)
Topics of current analytic or policy importance in the politics and behavior field.

Pol 5737. American Political Parties. (4 cr; prereq 1001 or #) Sorauf
The American two-party system; party influence in legislatures and executives; decline of parties and their future.

Pol 5738. American Political Campaigns and Elections. (4 cr; prereq 1001 or equiv or #) Backstrom
National, state, and local campaigns and elections; research in local political parties and campaigns.

Pol 5765. Political Psychology of Conformity, Enmity and Heroism. (4 cr; prereq 1001 or equiv or #) Sullivan
Conformity and obedience in politics; spiral of silence and group think; pathways from conformity and obedience to malignant political aggression; psychological basis, and political use of torture, terrorism and genocide; political altruism and heroism in the face of malignant aggression; role of ordinary people and extraordinary leadership; case studies.

Pol 5766. American Political Culture and Values. (4 cr; prereq 3085 or equiv or #) Sullivan
Empirical analysis of basic political values—individualism, freedom, and equality; dominant beliefs about democratic principles, postmaterialism, and capitalism; citizenship and political participation; political intolerance and patriotism; heroism and political leadership.

Pol 5767. Public Opinion and Voting Behavior. (5 cr; prereq 1001 or equiv or #) Flanigan, Stimson, staff
Major factors influencing electoral decisions; political attitude formation and change. Data analysis lab required.

American Governmental Systems and Processes

Pol 3306. The American Presidency. (4 cr; prereq 1001 or equiv or #) Jacobs, Smith
The office and individual presidents; organizational characteristics of the Executive Office and individual qualities of decision making; relationships with Congress, the bureaucracy, parties, interest groups, media, and public opinion.

Pol 3308. The United States Congress. (4 cr; prereq 1001 or equiv or #) Smith
Internal organization, committee system, party leadership, norms, recruitment; legislative policy making; relationship with the president and bureaucracy; interest group, political party, and constituency influences on the congressional process.

Pol 3309. Judicial Process. (4 cr; prereq 1001 or equiv or #) Krislov, Sorauf
Structure of American judiciary; selection of judges; process of litigation; influences on judicial decisions; impact of and compliance with decisions; role of Supreme Court in American political system.

Pol 3310. Topics in American Politics. (4 cr per qtr; prereq 1001 or equiv or #)
Topics specified in Class Schedule.

Pol 3331. Minnesota Government and Politics. (4 cr; 1001 recommended) Backstrom
The Minnesota political system; demographic and cultural setting, political and governmental processes, contemporary policies.

Pol 3352. Fieldwork in the Legislature. (4 cr; prereq 1001 or equiv or #) Backstrom, Gray
Field study of Minnesota Legislature; membership, leadership, influence, staffing, procedure, powers. Students arrange work assignments with legislators.
PSYCHOLOGY

Pol 5303. The American Democracy. (4 cr; prereq 1001 or equiv or #) Flanigan, Jacobs
The American political system, its institutions and processes. Political decision making, influence, and elites. Ideals and reality of democracy in the United States.

Pol 5315. State Government and Politics. (4 cr; prereq 1001 or equiv or #) Backstrom, Gray
Political institutions, political behavior, and public policies in American states; comparisons between states and between state and national political systems.

Pol 5322. American Social Policy. (4 cr; prereq 1001 or equiv or #) Jacobs
American government actions affecting the distribution of social benefits such as health care, education, and housing; social burdens such as taxation and regulation of social conduct. Relationships between government action and social problems; possibilities for change.

Pol 5323. American Defense Policy. (4 cr; prereq 3836 or 6 cr in ROTC or non-Pol science grad or #)
For description, see 5323 under International Relations subheading above.

Pol 5327. Local Government and Politics. (4 cr; prereq 1001 or equiv or #) Backstrom, Scott
Development and role of American local government; forms and structures; relationships with states and the federal government; local politics and patterns of power and influence.

Public Law

Pol 3323. Civil Liberties in America. (4 cr; prereq 1001 or equiv or #) Sullivan
Political importance of civil liberties in American society. Tolerance as a social phenomenon; issues such as free speech, religion, media control, and effects of campaigning.

Pol 3561. Comparative Legal Systems. (4 cr; jr or sr) Krislov
Elementary survey, primarily for social science students, of principal legal systems of the Western world. Organization, procedures, methods of growth, relation to political and economic systems, basic juristic conceptions. Roman law and European derivatives. Anglo-American law.

Pol 5501. Principles of American Constitution I. (5 cr; prereq 1001 or equiv) Krislov
Nature of constitutions, judicial review, organizations and powers of national government; national-state and interstate relations.

Pol 5502. Principles of American Constitution II. (5 cr; prereq 1001 or equiv) Krislov
Due process; civil rights and civil liberties.

Pol 5523. The Politics of the Regulatory Process. (4 cr; prereq 1001 or equiv or #, 3309 or 5501 or sr) Krislov
Operations of regulatory agencies considered in context of political and legal environment. Principles of federal administrative law, informal procedures, interest group activity; philosophy of regulation; politics and processes of deregulation.

Portuguese

See Spanish and Portuguese.

Psychology (Psy)

Staff—Chair, to be announced, N-218 Elliott Hall; Associate Chair, to be announced, N-218 Elliott Hall; Director of Undergraduate Studies, Paul W. Fox, N-246 Elliott Hall; Director of Graduate Studies, John P. Campbell, N-494 Elliott Hall; Director of Honors, Randy Fletcher, 255 Elliott Hall

Regents' Professor: Berscheid

Professors: Ackerman, Bouchard, Burkhart, butcher, Campbell, Dawes, Dunnette, Fox, Hansen, Iacono, Kanfer, Kersten, Legge, Leon, Lykken, McGue, Overmier, Snyder, Tellegen, Vemeister, Weiss

Associate Professors: Fletcher, Frazier, Gonzales, Grove, Peterson

Assistant Professors: Marsolek, Ones, Palace, Rothman

Psychology is concerned with the behavior of organisms in terms of environmental, genetic, physiological, and social determinants and correlates.

If you are contemplating a major in psychology, consult the Undergraduate Advising Office, 105 Elliott Hall.

General Education—Courses recommended for nonmajors include 1001, 3011, 3031, 3051, 3061, 3101, 3135, 3201, and 3604. Most 3xxx and a number of 5xxx courses are considered general in nature and may be elected by nonmajors with appropriate prerequisites.
Honors Program—Qualified majors are encouraged to enter the departmental honors program. This program provides opportunities to participate in the honors seminar and to work closely with faculty members on a research project.

Study Abroad—The department encourages students to incorporate overseas study into their academic programs. Such study can enhance the goals of a liberal education. With advance approval of an adviser, it is also possible to carry out independent study for psychology credit. For information on options and procedures, see Foreign Study.

B.A. Major Sequence

Required Preparatory Courses—1001, 1004-1005 (to be taken as soon as possible after 1001)

Major Requirements—At least 34 cr chosen as follows:
- 3801 or Stat 3011 (to be taken as soon as possible after 1001)
- Two courses from 3011, 3031, 3051, 3061 or 5061, 5011, 5012-5013, 5014, 5015, 5031, 5034, 5036, 5037, 5038, 5051, 5054, 5137, 5606
- Two courses from 3014, 3101, 3135 or 5135, 3201, 3604, 3617, 3666, 5121, 5136, 5138, 5141, 5202, 5204, 5205, 5206, 5207, 5501, 5701, 5702, 5703, 5705; CPsy 3303 or 5303, 3309 or 5301
- Major project: 3902
- Four elected 3xxx-5xxx psychology courses (a total of two from 3960, 3970, 3990 may be used)

All major courses must be taken A-F except Psy 3902. At least four upper division courses in psychology must be taken on the Twin Cities campus.

Psychology majors, especially those considering graduate work, are urged to elect math and natural, social, and biological science courses. Prospective graduate students also should take further work in statistics and computer programming.

Child psychology credits may not be counted toward the required 28 3xxx-5xxx cr outside the major. (Double psychology-child psychology majors are not permitted.)

Minor Sequence—

General Psychology

Required Preparatory Courses—1001, 3801 or Stat 3011 or equiv

Minor Requirements—Two courses from 3011, 3031, 3051, 3061 or 5061, 5011, 5012-5013, 5014, 5015, 5031, 5034, 5036, 5037, 5038, 5051, 5054, 5137, 5606; two courses from 3014, 3101, 3135 or 5135, 3201, 3604, 3617, 3666, 5121, 5136, 5138, 5141, 5202, 5204, 5205, 5206, 5207, 5501, 5701, 5702, 5703, 5705; one course from 3135 or 5135, 3666, 5121, 5136, 5138, 5141, 5501, 5701, 5702, 5703, 5705; one elective 3xxx or 5xxx psychology course from those listed as course options in the social science minor sequence.

All minor courses must be taken A-F. At least two upper division courses in psychology must be taken on the Twin Cities campus.

The minor program must be approved by a psychology undergraduate adviser.

Minor Sequence—

Natural/Biological Science

Required Preparatory Courses—1001, 3801 or Stat 3011 or equiv

Minor Requirements—Two courses from 3011, 5011, 5012-5013, 5014, 5015; two courses from 3031, 3051, 3061 or 5061, 5031, 5034, 5036, 5037, 5038, 5051, 5054, 5137, 5606

All minor courses must be taken A-F. At least two upper division courses in psychology must be taken on the Twin Cities campus.

The minor program must be approved by a psychology undergraduate adviser.

Minor Sequence—

Social Science

Required Preparatory Courses—1001, 3801 or Stat 3011 or equiv

Minor Requirements—Two courses from 3014, 3101, 3201, 3604, 3617, 5202, 5204, 5205, 5206, 5207; one course from 3135 or 5135, 3666, 5121, 5136, 5138, 5141, 5501, 5701, 5702, 5703, 5705; one elective 3xxx or 5xxx psychology course from those listed as course options in the social science minor sequence.

All minor courses must be taken A-F. At least two upper division courses in psychology must be taken on the Twin Cities campus.

The minor program must be approved by a psychology undergraduate adviser.

Psy 1001f,w,s. Introduction to Psychology. (5 cr)
The study of human behavior. Prerequisite for all advanced courses in psychology.

Psy 1001Hw. Honors Seminar: Introduction to Psychology. (1 cr; prereq ¶1001, fr or soph honors student; S-N only) Fletcher
Small group discussion of a variety of current topics in psychology.
Psy 1004f,w-1005w,s. Introductory Laboratory Psychology. (4 cr per qtr; prereq soph, 1001 or #) Fox, Peterson, staff
Experiments with contemporary subject matter such as sensory psychology, psychophysics, perception, motivation, verbal behavior, animal and human learning, problem solving, and psychological measurement.

Psy 3011f. Introduction to Psychology of Learning. (4 cr; prereq 1001) Peterson
Basic methods. Fundamental concepts and principles governing the learning process.

Psy 3031f. Sensation and Perception. (4 cr; prereq 1004) Burkhardt
Psychological, biological, and physical aspects of sensory experience in humans and animals. Emphasis on vision and hearing.

Psy 3051w. Introduction to Cognitive Psychology. (4 cr; prereq 1001) Marsolek
Research and theoretical concepts in study of cognitive factors in perception, memory, reading, and problem solving.

Psy 3061w. Introduction to Biological Psychology. (4 cr, §5061; prereq 1005 or Biol 1009 or #)
Basic neurophysiology and neuroanatomy, neural mechanisms of motivation, emotion, sleep-wakefulness cycle, and learning and memory in animals and humans. Neural basis of abnormal behavior and drug abuse.

Psy 3101f. Introduction to Personality. (4 cr, §5101; prereq 1001) Tellegen
Concepts and issues in personality theory, personality research, and personality assessment.

Psy 3135f. Introduction to Individual Differences. (4 cr, §5135; prereq 3801 or equiv) Bouchard
Differential methods in the study of human behavior. Overview of the nature of psychological traits and influence of age, sex, heredity, and environment in causation of individual and group differences in ability, personality, interests, and attitudes.

Psy 3201w. Introduction to Social Psychology. (4 cr; prereq 1001) Gonzales, Rothman
Overview of theories and research in social psychology with emphasis on attitudes and persuasion, social judgment, group behavior, the self, aggression, stereotyping, and applications.

Psy 3604f,s. Introduction to Abnormal Psychology. (4 cr, §5604H; prereq 1001) Butcher, Iacono
Abnormal psychology. Etiologies of behavioral disorders; available treatments.

Psy 3617f,s. Introduction to Clinical Psychology. (4 cr; prereq 3604 or 5604H, 3801 or equiv; A-F only) Grove
Historical developments and contemporary issues; relevant research and clinical trends in psychological assessment methods, intervention strategies, and clinical psychology.

Psy 3666s. Human Sexuality. (4 cr; prereq 1001) Palace
Overview of theories, research, and contemporary issues in human sexual behavior from an interdisciplinary perspective. Topics include: sexual anatomy and physiology, hormones and sexual differentiation, cross-cultural perspectives on sexual development, social and health issues, and sexual dysfunction and therapy.

Psy 3801f. Introduction to Statistical Methods. (4 cr; prereq 1001, GC 0631 or equiv) Cudeck
Quantification in research problems in psychology. Descriptive and inferential statistics, hypothesis testing. Examples from various areas of psychology.

Psy 3902f,w,s. Major Project in Psychology. (4 cr; prereq 1005, 3801, jr or sr psychology major)
Seminar for completion of the undergraduate major project paper.

Psy 3960f,w,s. Undergraduate Seminar. (1-5 cr per qtr; prereq 1001, #)
Current topics in psychology. Topics listed in psychology office.

Psy 3970f,w,s. Directed Studies. (1-8 cr per qtr; prereq #, ∆)
Independent reading leading to written paper or oral or written examination.

Psy 3990f,w,s. Directed Research. (1-8 cr per qtr; prereq #, ∆)
Individual empirical research projects leading to written report.

Psy 5011f. Theories of Learning and Cognition. (4 cr; prereq 3011 or #) Peterson
Learning theories and contemporary theories of information processing and cognition. Examples from human and animal research.

Psy 5012w-5013s. Psychology of Learning. (4 cr per qtr; prereq 1005, 3011 or EEB 3111 or #, except for grads) Overmier

Psy 5014s. Psychology of Human Learning and Memory. (4 cr; prereq 1005 or 3001 or 3051 or #, except for students in honors sequence and grads) Fox
Processes and principles in human learning, memory, and cognition.
**Psy 5015. Cognitive Processes.** (4 cr; prereq 3011 or 3051 or 5014, except for students in honors sequence and grads) Marsolek
Cognitive processes in human pattern recognition, attention, and memory.

**Psy 5031s. Perception.** (4 cr, §NSci 5031; prereq 3051 or 3031 or #) Legge
Data and principles of visual perception: color vision, object recognition, abnormal vision, physiological optics.

**Psy 5034s. Psychobiology of Vision.** (4 cr, §NSci 5034; prereq 3031 or #) Burkhardt
Analysis of the properties and biological bases of sensory perception in humans and animals. Emphasis on color vision, visual sensitivity and adaptation, and nerve cell circuits of eye and brain.

**Psy 5036w. Vision: Computational Theory to Neural Systems.** (4 cr; prereq 3031, CSci 3113 or equiv or #, Math 3261 or equiv) Kersten
Applications of psychology, neuroscience, and computer science to understanding design principles underlying visual perception. Comparisons of biological and physical processing of images with respect to image formation, encoding, filtering, scene inference, and recognition.

**Psy 5037f. Psychology of Hearing.** (4 cr; prereq 3031 or #) Viemeister
Biological and physical aspects of hearing, auditory psychophysics, theories and models of hearing perception of complex sounds including music and speech, and clinical and other applications.

**Psy 5038s. Introduction to Neural Networks.** (4 cr; prereq 3061 or 5061, Math 3261 or equiv or #) Kersten
Parallel distributed processing models in neural and cognitive science. Linear models, Hebbian rules, self-organization, non-linear networks, information optimization, and representation of information. Applications to sensory processing, perception, learning, and memory.

**Psy 5051s. Psychology of Human-Machine Interaction.** (4 cr; prereq 3051 or 3031 or #) Legge
Psychological perspectives on human-machine interaction and factors that limit performance. Cognitive and perceptual aspects of computer use, telepresence, and design and evaluation of sensory aids.

**Psy 5054w. Psychology of Language.** (4 cr; prereq 3011 except for students in honors sequence and grads) Fletcher
Theories and experimental evidence in past and present conceptions of psychology of language.

**Psy 5061f. Biological Psychology.** (4 cr, §3061; prereq 1005 or Biol 1009 or #)
Physiological and neuroanatomical mechanisms underlying behavior of animals. Neural basis of learning and memory, sleep, wakefulness, and attention processes. Effects of drugs on behavior.

**Psy 5101w. Personality.** (4 cr, §3101; prereq 5862 or 5862, honors candidate or grad) Tellegen
Introduction to and evaluation of major alternative theoretical perspectives, research methods, and empirical issues in the field of personality.

**Psy 5121f. History and Systems of Psychology.** (4 cr; prereq 8 cr of 5xxx courses in psychology, or equiv or grad or #) Ackerman
Survey of the history, methods, and content of modern psychological theory, research, and application. Schools of psychology (e.g., structuralism, functionalism, behaviorism, gestalt psychology) and central theories of psychology will be reviewed in their historical and philosophical context.

**Psy 5135f. Introduction to Individual Differences.** (4 cr, §3135; prereq 3801 or equiv, 5862 or #) Bouchard
For description, see Psy 3135.

**Psy 5136s. Human Abilities.** (4 cr; prereq 3135 or 5135, 5862 or equiv or #) Ackerman
Theory, methods, and applications of research in human abilities. Topics include intelligence, aptitude, achievement, specific abilities, information processing/learning and intelligence, aptitude/treatment interactions, and quantitative measurement issues.

**Psy 5137f. Introduction to Behavioral Genetics.** (4 cr; prereq 3135 or 5135 or #) McGue
Overview of application of genetic methods to the study of human and animal behavior. Emphasis on the use of genetic designs and methods to address psychologically relevant questions concerning the nature and etiology of individual differences in behavior. Examples include intelligence, schizophrenia, manic depressive illness, and alcoholism.

**Psy 5138w. Psychology of Aging.** (4 cr; prereq 3135 or 5135 or #) McGue
Analysis of behavioral changes that occur in mid and late adulthood, from psychological, biological, and sociological perspectives. Description of methodologies appropriate for studying behavioral change and application to cognitive, personality, and mental health changes associated with aging.

**Psy 5141s. Psychology of Women.** (4 cr; prereq 1001) Frazier
Survey of current theory and research regarding psychology of women and psychological sex differences, including topics that relate uniquely to women (e.g., pregnancy) as well as sex differences in personality, abilities, and behavior.

**Psy 5202s. Attitudes and Social Behavior.** (4 cr; prereq 3201 or #) Borgida
Survey of attitude theory, measurement, and persuasion research in social psychology. Focus on the structure, function, and formation of attitudes; relationship between attitudes and various social behaviors; basic principles of persuasion.

**Psy 5204s. Psychology of Interpersonal Relationships.** (4 cr; prereq 3201 or #) except for students in honors sequence and grads) Berscheid
Theory and research on interpersonal relationships, focusing on dyadic interaction processes and patterns and their implications for the individual. Topics include: issues in relationship research methodology; developmental, sociobiological, and social psychological approaches to relationships; processes of relationship initiation, development, maintenance, and dissolution.
Psy 5205w. Applied Social Psychology. (4 cr; prereq 3201 or grad or #) Gonzales
Overview of field. Applications of social psychology research and theory to the criminal justice system, media, behavioral medicine, desegregation, institutions, and energy conservation programs.

Psy 5206w. Research Methods in Social Psychology. (4 cr; prereq #) Rothman
Overview of experimental and quasi-experimental methods suitable for research in social psychology. Statistical, interpretive, operational, and ethical issues in social psychological research.

Psy 5207s. Personality and Social Behavior. (4 cr; prereq 3201 or 3101 or # except for students in honors sequence and grad) Snyder
Psychology of personality and social behavior. Topics include: conceptual and methodological strategies for scientific study of individuals and their social worlds; applications of theory and research to issues of self, identity, and social interaction.

Psy 5501f. Vocational Psychology. (4 cr; prereq 3801 or #) Dawis
Individual differences analysis of the work personality and work environment; vocational development and vocational choice; work adjustment; work motivation and performance; work satisfaction and satisfactoriness; psychological problems connected with work.

Psy 5604Hw. Abnormal Psychology. (4 cr, § 3604; prereq honors major; # for grad) Leon
Comprehensive review of psychopathological disorders. Etiology, diagnostic criteria, and clinical research findings emphasized.

Psy 5606f. Clinical Psychophysiology. (4 cr; prereq 1004, 1005 or equiv, 3061 or 5061, 3604 or 5604H or #) Iacono
Survey of psychophysiological methods as they are used in studies of the major psychopathological disorders.

Psy 5701w. Personnel and Industrial Psychology. (4 cr; prereq 3801 or equiv, 8 cr psychology or #) Campbell, Ones
Principles of individual differences and psychological measurement applied to problems of recruiting, selecting, and appraising members of ongoing organizations. Job analysis, job behavior description, models of complex performance, performance measurement, selection and placement strategies, utility of personnel decision making procedures, minority group employment issues.

Psy 5702s. Psychology of Individual Behavior in Organizations. (4 cr; prereq 3801 or equiv, 8 cr psychology or #) Kanfer
Psychological research and methodology applied to the study of human behavior in organizations. Measurement of work-related beliefs and attitudes, interpersonal relations, effects of group processes on problem solving and decision making, organizational socialization, leadership, supervision, organizational structure and climate.

Psy 5703f. Psychology of Organizational Training and Development. (4 cr; prereq 3801 or equiv, 8 cr psychology or #) Campbell
Theories, methods, and research pertaining to improving performance of individuals at work through learning and instruction: training-needs analysis, models of instructional design, aptitude-treatment interactions, training evaluation, knowledge structures, specific training programs.

Psy 5705w. Work Motivation. (4 cr; prereq 3801 or equiv, 8 cr psychology or #) Kanfer
Emphasis on motivational processes and job satisfaction in organizational contexts. Motivational process theories of task behavior and performance, goal setting, turnover/withdrawal, work attitudes, and interpersonal influences.

Psy 5862f. Psychological Measurement: Theory and Methods. (4 cr; prereq 3801 or equiv, honors candidate or grad or #) Weiss
Types of measurements (tests, scales, inventories) and their construction; theory and measurement of reliability and validity.

Psy 5865s. Measurement of Latent Traits. (4 cr; prereq 5862 or #; offered even yrs) Weiss
Theory and methods for measurement of latent psychological variables using dichotomous item-response theory methodology. One-, two-, and three-parameter models. Item calibration, scoring, information, and applications to instrument construction, equating, bias, adaptive testing, and mastery testing.

Psy 5900. Honors Seminar: Psychology. (1 cr; prereq psychology honors major or #; S-N only) Fletcher
Contemporary issues in psychological research. Initiation of 5901 project. Advanced study and career opportunities in psychology. Special learning opportunities available to psychology honors majors.

Psy 5901f,w,s. Honors Project. (4-8 cr; prereq sr, #)
Critical literature review or empirical study.

Psy 5960f,w,s. Topics in Psychology. (1-5 cr per qr; prereq 1001, #)
Special classes or seminars. Topics listed in psychology office.

Symbols and abbreviations: f,w,s—fall, winter, spring quarter, summer session / Cr—Credits per quarter, first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / ∆—Approval of the department offering the course is required for registration / H—Honors course (follows the course number) / —In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
Public Affairs (PA)

Hubert H. Humphrey Institute of Public Affairs

Descriptions of courses offered by the Hubert H. Humphrey Institute of Public Affairs can be obtained from the institute.

School of Public Health

The School of Public Health offers four individual graduate degrees and five dual-degree graduate and professional programs. The School’s mission is “to preserve and enhance the health of the public through education, research, and service programs designed to discover and transmit new knowledge aimed at the prevention of disease and disability, the improvement of health, and the planning, analysis, management, evaluation, and improvement of systems for the delivery of health services.”

CLA students may prepare, through study in a number of undergraduate programs, for application to graduate programs in the School of Public Health. Please consult the School of Public Health Bulletin for information about preparation and application requirements. Further information about Public Health degree programs is available from the School.

In addition to its extensive graduate-level curriculum, the School of Public Health offers four courses, open to non-majors, at the 3xxx-level. Information about these courses is available in the School of Public Health Bulletin, the Class Schedule, and the Course Guide.

Religious Studies

See Classical and Near Eastern Studies.

CLA courses addressing religious texts and experience are also listed under Anthropology, Art History, Cultural Studies and Comparative Literature, History, Humanities, Philosophy, Sociology, and South Asian and Middle Eastern Languages and Cultures.

Reserve Officers Training Corps (ROTC)

At the University of Minnesota, ROTC programs are offered by the U.S. Army, Navy, and Air Force. ROTC coursework is completed concurrently with degree work so that participants qualify for officer commissions in one of the four military services—Army, Marines, Navy, or Air Force—as they complete requirements for a University degree. ROTC coursework offers students the opportunity to widen their perspective; sharpen their sense of responsibility; develop their ability to organize, motivate, and lead others; and acquire a maturity of judgment that can be a source of strength and self-confidence throughout their careers.

Four-year and two-year programs are available, each offering a different approach toward earning an officer’s commission for students who meet selection requirements. Four-year programs consist of a Basic Course and an Advanced Course. The Basic Course is taken during the freshman and sophomore years, and the Advanced Course normally comprises the junior and senior years. Two-year programs consist of only the Advanced Course. Enrollment in an Advanced Course normally obligates students to a service commitment. Scholarships providing educational support for up to four years are available on a competitive basis.

To learn about the qualifications, curricula, benefits, and obligations of each service, consult the Army-Navy-Air Force ROTC Bulletin, or inquire at an ROTC office: Aerospace Studies, 3 Armory; Military Science (Army ROTC), 101 Armory; Naval Science, 203 Armory.

Note: ROTC courses that are not cross-listed with CLA courses count as liberal arts courses for the CLA graduation requirement if the ROTC program is completed. If the ROTC program is not completed, they count as non-liberal arts credits (28 credits maximum).

Aerospace Studies (Air)

Staff—Head, Col. William H. Campbell, Jr., USAF, 3 Armory

General Military Courses

Air 0100. Leadership Laboratory. (0 cr, cadets only)
Develops and prepares cadets’ leadership skills and knowledge base to become future officers in the U.S. Air Force.

Air 1104f. U.S. Air Force I. (1 cr)
An introduction to Air Force customs, courtesies, and officership.
Air 1105w. U.S. Air Force II. (1 cr)
An overview of the Air Force organization, installations, and basic communication skills.

Air 1106s. U.S. Air Force III. (1 cr)
A brief look at military history. Teaches leadership principles through group leadership problems.

Air 1204f. Early History of Airpower and Written Communication Skills. (1 cr)
The beginnings of human flight. Early military attitudes toward aviation and the development of employment concepts, tactics, and strategies. Development of air doctrine and the leaders who inspired/created it. Uses of air power in WWI, WWII, the Berlin Airlift, and the beginnings of the Cold War, Korea, the Cuban Missile Crisis, and Vietnam. Written communication used in the Air Force will be examined.

Air 1205w. Development and Modern Employment of Air Power, Introduction to Leadership, Ethics, and Values. (1 cr)
Uses of air power starting from the Cuban Missile Crisis, progressing through the Vietnam War up through the current modern employment of air power. An exploration of collaboration and competition in group problem solving. Information and examples of various methods or oral presentation including: memorized, manuscript, impromptu, and extemporaneous briefings. A short review of written communication. A basic introduction to leadership and followership, ethics, and values.

Air 1206s. Quality Air Force, Group Leadership Problems and Presentation Techniques. (1 cr)
An introduction to the Air Force’s concepts involving the quality movement and how the Air Force has adopted quality principles and practices in official management styles. A review of oral presentation styles; students will then present a short briefing on the topic and presentation style of their choice. Group Leadership Problems: developing skills in creative problem solving (brainstorming), exploring the effects of collaboration, and the effects of conflicting verbal and nonverbal communication cues.

Professional Officer Courses

Air 3301f. Air Force Communications and Leadership. (3 cr)
Air Force writing and military briefing skills. Leadership theory and applied leadership studies.

Air 3302w. Total Quality Management in the Air Force. (3 cr)
Commanding, counseling, officer professional development, establishing standards, ethics in military leadership. Introduction to the Quality Air Force (Total Quality Management).

Air 3303w. Air Force Management. (3 cr)
Role of officer as manager. Decision making, organizing, staffing, and controlling. Behavior processes.

Air 3401f. National Security Policy. (3 cr; prereq all aerospace 33xx courses)
Examines U.S. foreign policy development and implementation. Develops military communication skills.

Air 3402w. Military Law and Service Orientation. (3 cr; prereq all aerospace 33xx courses)
History and basic concepts of military justice; emphasis on origin, nature, and purpose or Uniform Code of Military Justice and Manual for Courts-Martial; relationship between military justice and military discipline; scope and nature of appellate review. Service orientation for newly commissioned officers.

Air 3403s. Air Force Roles, Active Duty. (3 cr; prereq all aerospace 33xx courses)
Air Force issues, roles, and missions preparing for active duty.

Military Science (Mil)
Staff—Head, Lt. Col. John W. Oravis, USA, 110 Armory, 624-7300; Scholarship Information, 101 Armory, 626-1584

Leadership Laboratory

Leadership Laboratory is a series of minicourses, covering military topics, taught to all cadets each quarter. These classes help students develop functional leadership skills in problem solving, decision making, personnel management, and other areas. Progressive and extensive practice in voice command, bearing, and physical fitness is emphasized. (Planned and directed largely by the Cadet Corps; 10 hours required each quarter.)

Lower Division

Military Science I
Mil 1010. Military Science I Leadership Laboratory. (1 cr per qtr [3 cr max])
Basic skills and knowledge in drill and ceremonies, first aid, self-defense, land navigation, small-unit operations, communications procedures, and physical conditioning.

Mil 1011f. Military Skills I. (2 cr)
Land navigation and first aid. Hands-on training in rappelling and marksmanship.

Symbols and abbreviations: f,w,s,—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / I—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / —All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / #—Approval of the instructor is required for registration / =—Approval of the department offering the course is required for registration / —Approval of the college offering the course is required for registration / H—Honors course (follows the course number) / —Prerequisite listings, comma means "and" / UC—University College (formerly CEE)
Mil 1012w. Rifle Marksmanship. (1 cr)
Small-bore rifle marksmanship techniques. Prone, kneeling, sitting, and standing firing positions. Range safety and equipment care.

Military Science II
Mil 1220. Military Science II Leadership Laboratory. (1 cr per qtr [3 cr max])
Leader responsibilities, leadership skills in a small unit, basic military skills, physical conditioning.

Mil 1221w. Learning to Lead. (2 cr)
Fundamental leadership traits, principles, and techniques. Assessment and development of leadership skills. Theory and practical application.

Mil 1222s. Military Skills II. (2 cr)
Advanced land navigation and first aid skills. Emphasis on hands-on training. One afternoon field trip to local training area.

Directed Studies
Mil 3970. Directed Studies. (Cr ar; prereq #)
Provides flexibility so a student can fit an ROTC course into his/her schedule if it might otherwise prohibit participation in ROTC. Instructor and student determine a mutually convenient time to meet. Course content remains the same as for regularly listed military science course.

Upper Division

Military Science III
Mil 3130. Military Science III Leadership Laboratory. (1 cr per qtr, 3 cr max; prereq #)
Leadership skills and knowledge for effectively commanding, controlling, and communicating the actions of a small unit and for acquiring requisite military skills in areas such as basic mountaineering, drill and ceremonies, small-unit operations, land navigation, marksmanship, and physical conditioning.

Mil 3131f. Land Navigation/Small-Unit Tactics. (3 cr; prereq #)
Read and interpret military maps; use basic land navigation techniques; develop skills and knowledge required for squad- and platoon-sized tactical operations.

Mil 3132w. Leadership Assessment and Training: Small-Unit Tactics. (3 cr; prereq #)
Lecture, discussion, and an oral presentation on applying principles of leadership while leading, communicating with, and training subordinates. U.S. Army infantry organizations.

Mil 3133s. Small-Unit Tactics. (3 cr; prereq #)
Small-unit operations in conventional and unconventional battlefield environments; employment in tactical situations.

Military Science IV
Mil 3140. Military Science IV Leadership Laboratory. (1 cr per qtr, 3 cr max; prereq #)
Practical application of skills and knowledge in leading, supervising, instructing, and training others and planning, organizing, coordinating, conducting, and evaluating Army ROTC daily activities and special events.

Mil 3141f. Military Management and Professionalism. (3 cr; prereq #)
Staff procedures in military organizations; writing skills, training, management, and professional development.

Mil 3142w. Leadership Communications and Ethics. (3 cr; prereq #)
Military leadership precepts and practices and communication concepts. Code of military ethics and professionalism.

Mil 3143s. Military Law. (2 cr; prereq #)
History and basic concepts of military justice; emphasis on origin, nature, and purpose of Uniform Code of Military Justice and *Manual for Courts-Martial*; relationship between military justice and military discipline; scope and nature of appellate review.

Naval Science (Nav)

Staff—Head, Capt. J. S. Fitzgerald, USN, 203 Armory

All NROTC Students—All Years
Nav 0204f, w, s. Professional Training in Naval Science. (0 cr, prereq #)
Basic training in the fundamentals of naval science, including drill, leadership/management and professional development.

All NROTC Students—First Year
Nav 1101f. Introduction to Naval Science I. (2 cr; prereq #)
Navy history and seapower, military organization, customs and traditions, officer and enlisted rank and rating structures.

Nav 1102w. Introduction to Naval Science II. (2 cr; prereq #)
Overview of naval warfare communities, the Uniform Code of Military Justice, basic shipboard organization, design and damage control.

Nav 1103s. Seapower and Maritime Affairs. (3 cr, §Hist 5021, §Hist 5022)
Historical aspects affecting the development of the U.S. Navy from the American Revolution to the present. Examination of several critical, contemporary issues in naval/maritime affairs.
All NROTC Students—Second Year

**Nav 1203s. Navigation I—Seamanship and Ship Operations.** (3 cr; prereq #)

**Nav 3301f. Naval Ships Systems I—Engineering.** (2 cr; prereq #)
Basic thermodynamics, main steam cycle, conventional fossil fuel propulsion systems and nuclear power. Internal combustion engine and gas turbine fundamentals.

**Nav 3302w. Naval Ships Systems II—Engineering.** (2 cr; prereq #)
Auxiliary ship support systems. Basic electrical theory and shipboard electrical distribution systems. Ship construction, stability, buoyancy, and compartmentation. Shipboard damage control.

**Navy Sequence—Third Year**

**Nav 1201f. Navigation II—Inland and Coastal.** (3 cr; prereq #)
Piloting, dead reckoning, fixes, running fixes, tides, currents and anchoring. Rules of the nautical road.

**Nav 1202w. Navigation II—Celestial and Electronic.** (4 cr; prereq #)

**Nav 3303s. Naval Ships Systems II—Weapons Systems.** (4 cr; prereq #)
Theory and principles of energy fundamentals, radar, electro-optics, underwater acoustics, electronic scanning, beam propagation and feedback systems, and digital and analog computation used in modern weapons systems and military technology.

**Marine Corps Sequence—Third Year**

**Nav 3352f. Evolution of Art of War I.** (2 cr; prereq #)
Principles of war. Evolution of warfare from 3500 B.C. through the French Revolution.

**Nav 3353w. Evolution of Art of War II.** (2 cr; prereq #)
Military technology and theory from the industrial revolution through the armistice preceding World War II.

**Nav 3354s. Evolution of Art of War III.** (2 cr; prereq #)
Warfare from World War II through Desert Storm.

**Navy Sequence—Fourth Year**

**Nav 3402w. Principles of Naval Management II.** (3 cr; prereq #)
Management at the shipboard level; formal shipboard organization, divisional organization and the Uniform Code of Military Justice.

**Nav 3403s. Principles of Naval Management III.** (2 cr; prereq #)
Advanced management at the shipboard level; naval correspondence and directives, security, and the Maintenance, Material Management system.

**Marine Corps Sequence—Fourth Year**

**Nav 3452f. Amphibious Warfare I.** (2 cr; prereq #)
The origins of amphibious warfare to the Gallipoli campaign.

**Nav 3453w. Amphibious Warfare II.** (2 cr; prereq #)
Amphibious warfare planning and operations from post-World War I through World War II.

**Nav 3454s. Amphibious Warfare III.** (2 cr; prereq #)
Post-World War II amphibious operations; present-day concepts of amphibious operational planning.

**Russian**

See Institute of Linguistics and Asian and Slavic Languages and Literatures.

**Russian Area Studies**

See Area Studies Programs.

**Sanskrit**

See Classical and Near Eastern Studies.

**Scandinavian Languages and Literature**

The Department of Scandinavian Languages and Literatures has merged with the Department of German to form the Department of German, Scandinavian, and Dutch.
Major Requirements and Course Descriptions

Slavic and Central Asian Studies

See Institute of Linguistics and Asian and Slavic Languages and Literatures.

Sociology (Soc)

Staff—Chair, William Brustein, 909 Social Sciences Building; Director of Undergraduate Studies, David Knoke, 939 Social Sciences Building; Director of Graduate Studies, Jane McLeod, 1033 Social Sciences Building; Director of Honors, David Knoke, 939 Social Sciences Building.

Professors Emeriti: Donohue, Ellenbogen, Johnson.


Associate Professors: Kennedy, McLeod, Savelberg, Spitzer.

Assistant Professors: Bian, Boyle, Broadbent, Pierce, Uggen.

Adjunct Professor: Carlson.

Adjunct Faculty—Brewer (Afro-American Studies), Eustis (Humphrey Institute), Finch (School of Public Health), Hearn (College of Education), Louis (College of Education), Litman (School of Public Health), Menanteau (Rural Sociology), Samaha (History), Snyder (Psychology), Sykes (Speech-Communication).

Sociology seeks to develop a scientific understanding of human social behavior. Two B.A. programs (one with a general focus and one with a focus on law, criminology, and deviance) and a B.S. program are offered. They emphasize the skills of social inquiry necessary for analyzing patterns of social relationships. The B.S. program is for students interested in a more rigorous mathematical concentration in research methodologies. You must see a sociology adviser to discuss your qualifications for the B.S. option. The study of sociology can contribute to careers in such areas as evaluation research for programs in the public and private sectors, criminal justice, teaching, and social service, and can offer preparation for advanced study in the social sciences, health fields, counseling, law, and business.

Current information about sociology B.A. and B.S. degree programs, minor programs, course offerings, faculty academic interest areas, the honors program, graduate and law schools, field experience, special course registrations, and other undergraduate academic opportunities is available in the Undergraduate Advising Office, 923 Social Sciences Building (612/624-4300).

Directed Studies, Field Experience—Students in sociology are encouraged to plan a field experience by participating in an internship. Consult the Undergraduate Advising Office and Office of Special Learning Opportunities, 220 Johnston Hall, for information about internships.

General Education—1001, 1003, and 1004 deal with a broad sociological analysis of American social life; 3xxx and 5xxx courses focus on more advanced study in substantive areas; 1001 is the prerequisite for most other courses in sociology.

Study Abroad—The department strongly urges students to include study abroad in their undergraduate program. Credits for appropriate study may be incorporated into a sociology major or minor by prior arrangement. Programs with a field component are well-suited to sociology projects. Current faculty interests include comparative study in China, France, Japan, Latin America, Germany, and the Scandinavian countries. The department also participates in faculty exchange programs in Austria, China, and Finland. See also Foreign Study.

Foreign Languages Across the Curriculum (FLAC)—Students are encouraged to include courses conducted in a language other than English as part of their undergraduate career, whether they are offered on campus or abroad. The Foreign Languages Across the Curriculum (FLAC) program offers students a number of opportunities to take two- or four-credit courses in French, German, and Spanish, while one-credit FLAC sections are offered in conjunction with some four-credit courses taught in English. These one-credit sociology sections have been offered in Chinese, French, German, and Japanese. In spring quarter, FLAC courses offered in French, German, and Spanish.
provide students the opportunity to do all their coursework in one of these languages as participants in the Foreign Language Immersion Program (FLIP). For more information, consult the sociology advisers in 909 Social Sciences Building.

**B.A. Major Sequences**

All major courses must be taken A-F. At least 12 cr in sociology must be taken on the Twin Cities campus.

**Required Preparatory Course**—1001

**Major Requirements**—General Option: 3201, 3401

3801-3802-3803 (should be taken as soon as possible, preferably in the sophomore or junior year)

5701 or 5703 or 5705 or 5711

16 additional cr in 3xxx-5xxx sociology courses

Major project (see advising office for details)

**Required Preparatory Course**—1001

**Major Requirements**—Sociology of Law, Criminology, and Deviance Option: 3201 or 3401

3801-3802-3803 (should be taken as soon as possible, preferably in the sophomore or junior year)

5701 or 5703 or 5705 or 5711

3101-3102

Three courses chosen from 5101, 5102, 5104, 5105, 5108, 5109, 5111, 5114, 5125, 5135, 5141, 5142, 5147, 5148, 5149, 5161, 5162

Major project (see advising office for details)

**B.S. Major Sequence**

All major courses must be taken A-F. At least 12 cr in sociology must be taken on the Twin Cities campus.

**Required Preparatory Course**—1001

**Major Requirements**—3201, 3401

3801-3802-3803 (should be taken as soon as possible, preferably in the sophomore or junior year)

5701 or 5703 or 5705 or 5711

16 additional cr in 3xxx-5xxx sociology courses

Major project (see advising office for details)

16 additional cr in 3xxx-5xxx sociology courses

Major project (see advising office for details)

27 cr in supportive field courses from an approved list; please see a sociology adviser to discuss your qualifications before considering this option.

**Minor Sequences—General Information**

Eighty percent of all upper division minor course credits must be taken A-F. At least 12 cr in sociology must be taken on the Twin Cities campus. Substitutions for courses infrequently offered may be arranged with prior consultation with the undergraduate adviser.

**Minor Sequence—General Sociology**

**Required Preparatory Course**—1001

**Minor Requirements**—3201 or 3401; 3801; one theory course chosen from 5701, 5703, 5705, 5711; 8 cr in 3xxx or 5xxx sociology courses in related subject matter

**Minor Sequence—Aging**

**Required Preparatory Course**—1001

**Minor Requirements**—3201, 3401, 3937, 5938, 4 cr in a 3xxx or 5xxx sociology course related to the student’s interest in gerontology (e.g., 3501, 3551, 5855, 5956)

**Minor Sequence—Criminology and Deviance**

**Required Preparatory Course**—1001

**Minor Requirements**—3101-3102, 12 cr in 3xxx-5xxx sociology courses listed under criminology and deviance

**Minor Sequence—Family**

**Required Preparatory Course**—1001

**Minor Requirements**—3201, 3401, 3501; two sociology courses chosen from 3xxx-5xxx courses under family sociology

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Symbols and abbreviations: f.w,s,su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / !—Work for this course will extend past the end of the term; a grade of K will be assigned to indicate that the course is still in progress / †—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / ¶—Concurrent registration is required (or allowed) in the course listed after this symbol / —Approval of the instructor is required for registration / —Approval of the department offering the course is required for registration / —Approval of the college offering the course is required for registration / H—Honors course (follows the course number) / ,—In prerequisite listings, comma means “and” / UC—University College (formerly CEE)
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Minor Sequence—Political Sociology

Required Preparatory Course—1001

Minor Requirements—3401, 3405, 3801, 5311, 5755

Minor Sequence—Social Organization

Required Preparatory Course—1001 or 1001H

Minor Requirements—3401, 3405 or 5405, 5411; one theory course chosen from 5701, 5703, 5705 or 5711; one sociology course from approved list, available in advising office

Minor Sequence—Social Psychology

Required Preparatory Course—1001

Minor Requirements—3201, 3214, 5205, 5211 or 5215; one theory course chosen from 5701, 5703, 5705 or 5711

General

Soc 1001f,w,s,su. Introduction to Sociology. (4 cr)
The scientific study of social behavior. Overview of major theories, methods, concepts, and research findings. Characteristics of basic social units (social relations, groups, organizations, institutions, society) and their patterns of interrelation and processes of change.

Soc 3101f,su. Introduction to American Criminal Justice. (4 cr; §CJ S 3101) Carlson, Kruttschnitt, Samaha, Savelberg, Ward
Components and dynamics as well as philosophical underpinnings of the criminal justice system.

Soc 3102w,su. Introduction to Criminal Behavior and Social Control. (4 cr; prereq 3101) Boyle, Kruttschnitt, Savelberg, Ward
Basic issues in criminology and the sociology of law and social control organizations.

Soc 5101. Sociology of Law. (4 cr; prereq 3101-3102 or §; 5705 recommended; offered alt yrs) Boyle, Cooperman, Savelberg
Sociological analysis of law and society. Social forces involved in creation of legal norms (both civil and criminal), procedures of enforcement, and impact of law on social change.

Soc 5102. Criminology. (4 cr; prereq 3101-3102 or § offered alt yrs) Kruttschnitt, Savelberg, Uggen
Nature and types of crime, problems in measurement of incidence and trends, and review of sociological theories of crime causation. Implications for crime prevention and control.

Soc 5104. Community-Based Corrections. (4 cr, §CJS 5113; prereq 3102 or #) Carlson, Ward
Theories behind and structures of diversion, probation, parole, and other community corrections programs that exist as alternatives to imprisonment.

Soc 5105. Contemporary Corrections. (4 cr; prereq 3101-3102 or #; 5161, 5162 recommended) Ward
Advanced study of correctional organizations such as prisons and jails, probation and parole, department and community corrections. Penal policies and practices in the United States compared with advanced penal systems in other countries.

Soc 5108. Current Issues in Crime Control. (4 cr, §CJ S 5207; prereq 3102 or #) Carlson, Kruttschnitt, Savelberg
Criminal justice policies examined from perspective of courts, legislature, community, and interest groups; impact of changes in policy on society and social control agencies.

Soc 5109. Domestic Criminal Violence. (4 cr; prereq 3101-3102 or #) Kruttschnitt
Survey of research on family violence within a criminological framework. Course addresses (1) the definition of domestic violence; (2) empirical and theoretical approaches to the study of domestic violence; and (3) the response of social control agencies.

Soc 5111. Sociology of Deviant Behavior. (4 cr; prereq 3101-3102 or #) Uggen
The nature of deviant behavior, the social process associated with the careers of deviants, and the relationship of deviancy to problems of social control.

Criminology and Deviance

Some courses in this section were formerly taught in the Department of Criminal Justice

Studies, which no longer exists. Students who took criminal justice studies (CJS) courses may not repeat for credit the same courses that are now taught in the Department of Sociology.

Soc 3101f,su. Introduction to American Criminal Justice. (4 cr; §CJ S 3101) Carlson, Kruttschnitt, Samaha, Savelberg, Ward
Components and dynamics as well as philosophical underpinnings of the criminal justice system.

Soc 3102w,su. Introduction to Criminal Behavior and Social Control. (4 cr; prereq 3101) Boyle, Kruttschnitt, Savelberg, Ward
Basic issues in criminology and the sociology of law and social control organizations.

Soc 5101. Sociology of Law. (4 cr; prereq 3101-3102 or #; 5705 recommended; offered alt yrs) Boyle, Cooperman, Savelberg
Sociological analysis of law and society. Social forces involved in creation of legal norms (both civil and criminal), procedures of enforcement, and impact of law on social change.

Soc 5102. Criminology. (4 cr; prereq 3101-3102 or § offered alt yrs) Kruttschnitt, Savelberg, Uggen
Nature and types of crime, problems in measurement of incidence and trends, and review of sociological theories of crime causation. Implications for crime prevention and control.

Soc 5104. Community-Based Corrections. (4 cr, §CJS 5113; prereq 3102 or #) Carlson, Ward
Theories behind and structures of diversion, probation, parole, and other community corrections programs that exist as alternatives to imprisonment.

Soc 5105. Contemporary Corrections. (4 cr; prereq 3101-3102 or #; 5161, 5162 recommended) Ward
Advanced study of correctional organizations such as prisons and jails, probation and parole, department and community corrections. Penal policies and practices in the United States compared with advanced penal systems in other countries.

Soc 5108. Current Issues in Crime Control. (4 cr, §CJ S 5207; prereq 3102 or #) Carlson, Kruttschnitt, Savelberg
Criminal justice policies examined from perspective of courts, legislature, community, and interest groups; impact of changes in policy on society and social control agencies.

Soc 5109. Domestic Criminal Violence. (4 cr; prereq 3101-3102 or #) Kruttschnitt
Survey of research on family violence within a criminological framework. Course addresses (1) the definition of domestic violence; (2) empirical and theoretical approaches to the study of domestic violence; and (3) the response of social control agencies.

Soc 5111. Sociology of Deviant Behavior. (4 cr; prereq 3101-3102 or #) Uggen
The nature of deviant behavior, the social process associated with the careers of deviants, and the relationship of deviancy to problems of social control.
Soc 5114. The Social Control of Women Offenders. (4 cr, §C 5 5114; prereq 3102 or #; offered alt yrs) Kruttschnitt
Historical and current explanations for female criminality; current trends in women's participation in crime and treatment of women by legal system.

Soc 5125. Policing in American Society. (4 cr; prereq 3101-3102 or #; 5161, 5162 recommended; offered alt yrs) Samaha, Sykes, Ward
Police organizations and operations from a social science perspective. Formal and informal policing: role and functions; legal bases; accountability and restraints; relations with policed populations, emphasizing minorities, youth, and recognized violators; use of violence; unethical and illegal practices; civil liberties; intra- and interorganizational relations; social theory and change.

Soc 5135. White Collar Crime. (4 cr; prereq 3101-3102 or #; 5161, 5162 recommended; offered alt yrs) Uggen
White collar crime, broadly construed; roots in American society, responses offered by theoreticians and amateur and professional politicians.

Soc 5141. Juvenile Delinquency. (4 cr; prereq 3101-3102 or #; 5161, 5162 recommended) Uggen
Advanced study of juvenile delinquency and societal response to it through regulatory agencies; special characteristics of juvenile justice institutions.

Soc 5142. Juvenile Justice Law and Organization. (4 cr, §C 5 5103; prereq 3101-3102 or #; 5161, 5162 recommended; offered alt yrs) Malmquist
Historical evolution of juvenile court; organizational relationships among court, police, and other agencies; policies regarding serious offenders and status offenders; processes of intake, diversion, pretrial detention, waiver to adult court, and sentencing; conflicts over due process and treatment objectives; current movements to abolish juvenile justice system.

Soc 5147. Sociology of Mental Disorders. (4 cr; prereq 1001 or #; offered alt yrs) Malmquist, M.Cleod, Spitzer
Social definitions and origins of mental illness, its epidemiology, patterns of reaction to mental illness, sociological analysis of mental health programs and their effectiveness. Social policy implications of mental health definitions.

Soc 5148. Criminal Psychopathology. (4 cr, §C 5 5205; prereq sr or grad; offered alt yrs) Malmquist
Psychiatric and psychological aspects of antisocial and criminal behavior as related to issues faced in the courts and criminal justice system.

Soc 5149. Killing. (4 cr; prereq sr or grad or law student) Malmquist, Ward
Sociological, legal, and psychological aspects of diverse types of killing. The topic of “normal” killings is contrasted with various pathological types. Special sub-topics include: mentally disturbed killings, sexual killings, killings within families, gang killings, and terrorist killings.

Soc 5161. Criminal Law in American Society. (4 cr, §C 5 5101) Samaha
Purposes and principles of criminal law; proper limits of criminal sanction and suggested reforms in existing criminal law.

Soc 5162. Criminal Procedure in American Society. (4 cr, §C 5 5102) Samaha
Power of the state to intrude into lives of citizens and deprive them of life, liberty, and property in order to enforce criminal laws; topics such as arrest, search and seizure, pretrial practices, and prisoners' rights. Suggested limits on discretionary power of police, prosecutors, judges, and corrections authorities.

Social Psychology

Soc 3201. Principles of Social Psychology. (5 cr; prereq 1001; required course for soc majors) Mortimer, Spitzer
Ideas and findings related to social psychology; experience in developing empirically based knowledge in social science.

Soc 3201H. Honors Course: Principles of Social Psychology. (5 cr; prereq sociology honors student, 1001 or 1001H or #) Mortimer, Spitzer
For description, see Soc 3201.

Soc 3214. Understanding Everyday Life. (4 cr; prereq soph, jr or sr) Fulton, Spitzer
Behaviors (activities, personal associations), orientations (values, attitudes, beliefs), and personal interpretations of “typical” individuals; their relationship to social characteristics; the effects of transitions—anticipated (e.g., educational/occupational choice, marriage) and unexpected (e.g., unemployment, illness).

Soc 5205. Symbolic Interaction. (4 cr; prereq 3201 or 5201 or equiv or #; offered alt yrs) Spitzer
Methods of acquiring knowledge in social psychology; outstanding examples of research. Social psychology of small groups, mass behavior, making political and economic choices. Current thinking and research in symbolic interaction in light of concepts and theories presented in introductory courses in social psychology.
### MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

#### Soc 5211. Social Processes in Small Group Settings. (4 cr; prereq 3201 or 5201 or equiv or #; offered alt yrs) Anderson, Leik
Small group research and theory focusing on laboratory and nonlaboratory investigation of interpersonal exchange, communication structures, status and power relations, coalition formation, reference groups, role differentiation, group uniformity, social influence, problem-solving behavior. Lab arranged.

#### Soc 5215. Self-Concept in Theory and Research. (4 cr; prereq jr or sr or grad, 16 cr in social sciences and/or education or #; offered alt yrs) Spitzer
Major sociological theories and assessment method characterizing study of the self; applications to and findings in topical areas such as crime and delinquency, mental illness, socialization, aging, drug abuse, group processes, and policy evaluation.

#### Social Change and Social Movements
For courses related to this area see: Soc 3457, Soc 5301, Soc 5305, Soc 5311, Soc 5703

#### Social Organization, Organizations, and Occupations
Other sociology courses related to this area include Soc 5415, Soc 5421, Soc 5441, Soc 5481, Soc 5855, Soc 5953, Soc 5958

#### Soc 3401. Principles of Social Organization. (5 cr; prereq 1001, 3801 or equiv; required course for soc majors) Galaskiewicz, Knoke, Nelson, Savelsberg
How and why social organization is possible. Major concepts and theories of social structure, primary forms of social organization (groups, communities, networks, formal organizations), basic social processes (integration, differentiation, regulation, change), and how social organization evolves from individual decision making. Course content varies.

#### Soc 3401H. Honors Course: Principles of Social Organization. (5 cr; prereq sociology honors student, 1001 or 1001H or #) Galaskiewicz, Knoke, Nelson, Savelsberg
For description, see Soc 3401.

#### Soc 3405. Inequality: Introduction to Stratification. (4 cr; prereq 1001) Aminzade, Brustein, Fulton, Nelson
Inequality—causes, dimensions, and consequences. Inequality in American society—class, gender, and race; cross-national patterns of inequality; relationship between economic and political inequality; role of schools in transmission of inequality; public policies affecting inequality.

#### Soc 3411. Understanding Formal Organizations. (4 cr; prereq 1001) Galaskiewicz
Formal organizations as major social actors in our work lives, personality development, social change and conflict. Life-course analysis of enterprises, bureaucracies, and voluntary organizations. Emphasis on organization control, conflict, coordination, and interorganizational sets and relationships.

#### Soc 3457. Comparative Scandinavian Societies. (4 cr; offered alt yrs) Cooperman, Reiss
Analysis of variations in historical development, social-economic patterns. Current social structures. Changes explored include migration patterns and national identity problems, class, gender and social mobility, occupational shifts related to economic changes. Welfare policy trends, regional and broader global contexts of policy decisions, questions.

#### Soc 3481. Modern Japanese Society. (4 cr, §EAS 3481; prereq Soc 1001 or #) Broadbent
Japanese social institutions including family, education, business and labor relations, government and the status of women. How they differ from the West and have contributed to Japanese economic success.

#### Soc 3601. Urban Community. (4 cr; prereq 1001 or 1002) Galaskiewicz

#### Soc 5311. Sociology of Conflict. (4 cr; prereq 3401 or 5401 or equiv or #; offered alt yrs) Cooperman, Leik, Savelsberg

#### Soc 5405. Social Stratification and Mobility. (4 cr; prereq 3401 or 3405 or 5401 or any 3xxx sociology course or equiv or #; offered alt yrs; some statistics recommended) Nelson
Form and content of hierarchical arrangements. Relationship of hierarchical arrangements to problems of social order and individual behavior.

#### Soc 5411. Formal Organizations. (4 cr; prereq 3401 or 5401 or equiv or 8 cr sociology or anthro or sociology or psychology or political science or economics or #) Galaskiewicz, Knoke
Sociological analysis of formal organizations. Theories of structure of and behavior in corporations and bureaucracies. Corporate structure explored from standpoint of role expectations, transaction costs, and structural responses to organizational failures. Other topics include power, conflict, and bargaining in organizational decision making; course content varies.
Soc 5421. Occupational Sociology. (4 cr; prereq 3201 or 3401 or 3405 or 5201 or 5401 or equiv or § offered alt yrs) Mortimer
Individual motivations and reactions to work; nature of professions and other occupational types; relations between occupational and organizational norms and values, between occupations and social structure—stratification system, family, political system, technological change; changes in composition of labor force.

Soc 5953. Sociology of Education. (4 cr, §EdPA 5190; prereq 1001 or equiv or § Louis
Advanced studies. School as socialization process, social structure of education, role of school in social change, other areas. Theory and empirical research.

Historical/Comparative Sociology
Other sociology courses related to this area include Soc 3405, Soc 3457, Soc 3481, Soc 3954, Soc 5114, Soc 5703, Soc 5705

Soc 3755. Introduction to Political Sociology. (4 cr; prereq 1001 or §, offered alt yrs) Aminzade, Brustein

Soc 3757. Politics and Society in Europe. (4 cr; §PolS 3461; prereq 1001 or PolS 3051 or § Brustein
Explores the changing politics and society of Europe. Particular focus on generational change and values, political parties, welfare state, the future of European integration, and political stability and democratization.

Soc 3951. Comparative Ethnic Group Relations. (4 cr; prereq 1001 or § Savelsberg, Sykes
Theories of ethnic stratification. Relations of minorities and elites viewed in historical and cross-cultural comparative perspective, examining the United States and other countries (e.g., South Africa, Mexico).

Soc 5305. Environmental Sociology. (4 cr; prereq 1001 or course in environmental subject or § Broadbent
Considers the interaction between social and natural systems, especially the societal causes of rising pollution and destruction of the ecosystem. Looks at culture, social relations, politics and economics as causes and potential avenues of cure of the problem.

Soc 5415. Comparative Social Structure. (4 cr; prereq 20 cr sociology, economics or political science or § offered alt yrs) Broadbent, Cooperman, Savelsberg
Comparative analysis of selected societies such as Western European, African, Middle Eastern. Analysis of changing social class, status, cultural patterns, and institutions. Regional and cross-national social patterns and social movements.

Soc 5481. Comparative Asian Development. (4 cr; §EAS 5481; prereq Soc/EAS 3481, sociology of development, Asian-related courses or § offered alt yrs) Broadbent
Comparison of the political-economic and sociocultural institutions creating high-speed growth and other social and political effects in the East Asian area, focusing on Japan and the “four little tigers”: Taiwan, South Korea, Hong Kong, and Singapore.

Soc 5483. Sociology of German Society. (4 cr; prereq 1001 or § Savelsberg
Mannheim, Elias, and Weberians suggest how history affects 20th-century events. National particularity and interrelatedness of contemporary institutions (family, education, work, social movements, government, law) and current events.

Soc 5755. Social Structure and Political Behavior. (4 cr; prereq 3401 or 5401 or equiv or § Aminzade, Broadbent, Brustein
Alternative theoretical perspectives on power, the state, political parties, and political change. Relationship between socioeconomic structures and political behavior. Nature and social origins of democratic and authoritarian forms of the state. Distribution of power in contemporary United States, Western Europe, and/or East Asia.

Family, Gender, and Sexuality
Other sociology courses related to this area include Soc 3937, Soc 5421, Soc 5938, Soc 5956

Soc 3501. The Family. (4 cr; prereq 1001 or § McLeod, Reiss
The family in contemporary American society with attention to historical and cross-cultural comparisons; interrelationships with other social institutions, socialization, patterns of mate selection, life cycle processes, and norms of human sexuality.
Soc 3524. America's Sexual Crisis. (4 cr) Reiss
Explanation of why American society has difficulty in
resolving sexual problems such as AIDS, pregnancy,
rape, and child sexual abuse. Analysis of current trends
in our societal ways of coping with sexual problems.

Soc 3551f,w. World Population Problems. (4 cr)
Kennedy
Population growth and natural resources, population
dynamics, fertility and mortality in less developed
nations, population forecasts, population policies to
reduce fertility.

Soc 3954. Sociological Perspectives on Race,
Class, and Gender. (4 cr; §Afro 3954) Brewer, Pierce
Societal-level analysis of race, class, and gender
inequality. How the three forms of inequality operate
independently and in conjunction with one another in
American institutions and society.

Soc 5441. Work-Family Linkages. (4 cr; prereq 8
cr sociology or #; offered alt yrs) Mortimer
Theoretical and methodological approaches to the
work-family interface; effects of spouses’ work
characteristics on the family, including child socialization;
family’s influence on male and female labor force
participation and occupational attainment; changes in
work organizations related to increasing prevalence of
female employment and dual-earner families.

Soc 5524. Cross-Cultural Construction of
Sexuality. (4 cr; prereq 8 cr sociology or #) Reiss
Ways in which society shapes sexual customs. How
sexuality is influenced by a society’s beliefs concerning
jealousy, gender roles, and normality. Comparison and
explanation of U.S. sexual customs and those in Western
and non-Western societies.

Soc 5554. Population Theory. (4 cr; prereq 3551
or #; offered alt yrs) Kennedy
What social science theory is; systematic evaluation of
writings in population as theoretical works.

Soc 5561. Demographic Methods. (4 cr; §PubH
5460; prereq 3551 or #; offered alt yrs) Kennedy
Demographic measures and concepts of fertility,
mortality, and migration. Stable population methods,
demographic estimates from incomplete data.

Social Theory

Soc 5701. Analytical Social Theory. (4 cr;
prereq 8 cr social sciences or #) Cooperman
Standards for evaluating sociological explanations. Main
types of sociological theory: systems, theories of
conflict, exchange, network, interpretive. Current issues
in theoretical analysis.

Soc 5703. Social Life and Cultural Change. (4 cr;
prereq 8 cr social sciences or #) Cooperman, Fulton,
Laslett
Theories of social change; methodological problems.
Comparative social thought and structure of antiquity as
basic data for analysis.

Soc 5705. Backgrounds of Modern Social
Thought. (4 cr; prereq 8 cr social sciences or #)
Brustein, Laslett, Marini
Originators of modern sociological theory examined
through original texts: Marx, Weber, Durkheim, Freud,
and Gilman. Division of labor, social cohesion and
social control, gender and social reproduction, class
relations and the social organization of production,
norms and values, and history.

Methodology

Soc 3801f,w. Sociological Methods I:
Descriptive Statistics. (5 cr; prereq intermediate
algebra or GC 0631) Bian, Leik, McLeod, McTavish
Descriptive statistics in analysis of sociological data,
measures of central tendency, deviation, correlation and
regression graphs, simple treatment of three and four
variables.

Soc 3801Hf. Honors Course: Sociological
Methods I: Descriptive Statistics. (5 cr; prereq
intermediate algebra or GC 0631 or #) Bian, Leik,
McLeod, McTavish
For description, see Soc 3801.

Soc 3802w,s. Sociological Methods II:
Statistical Inference. (5 cr; prereq 3801 or equiv)
Bian, Leik, McLeod, McTavish
Statistical inferences, probability, hypothesis tests, use
of statistical reasoning in analysis of sociological data.

Soc 3802Hw. Honors Course: Sociological
Methods II: Statistical Inference. (5 cr; prereq
3801H or equiv or #) Bian, Leik, McLeod, McTavish
For description, see Soc 3802.

Soc 3803f,s. Sociological Methods III:
Research Methods. (5 cr; prereq 3801, 3802 or
equiv or #) Anderson, Bian, Boyle, McLeod, McTavish
Principles of research design, data collection, and
analysis focusing on field observation and survey design
and analysis. Practice in data collection and analysis.

Soc 3803Hs. Honors Course: Sociology
Research Methods. (5 cr; prereq 3802H or equiv or
#) Anderson, Bian, Boyle, McLeod, McTavish
For description, see Soc 3803.

Soc 3811f,w. Computer Usage for Social
Statistics. (1 cr; ¶3801 recommended; S-N only)
Elementary computer usage in social statistics
applications. Use of statistical program packages for
analysis of sociological data.

Soc 5801. Computer Methods in Social
Research. (4 cr; offered alt yrs) Anderson
Basic concepts of information processing for social
sciences research; elementary computer programming;
practice in the use of computers for data analysis in the
social sciences; problems of computer usage in sociology.
Aging and the Life Course

Soc 3937. Social Gerontology: Elders in American Society. (4 cr; prereq 1001 or #) McTavish

Situations and problems facing aging people in modern societies. Aspects of human aging from a sociological perspective.

Soc 5855f,s. Sociology of Medicine and Health Care: An Introduction to Medical Sociology. (4 cr; §PubH 5790; prereq jr or sr or grad) Litman

Social factors associated with incidence of physical and mental illness and treatment. Social organization of medical institutions. Public needs and medical services. Sociology of aging, social problems of the aged.

Soc 5956. Sociology of Death. (4 cr; prereq jr or sr, 8 cr sociology or #) Fulton

Issues and problems that mortality presents in contemporary society.

Other Courses

Soc 3960. Topics in Sociology. (1-5 cr per qtr; prereq 1001 or #) Special one-time offerings for juniors and seniors; topics specified in Class Schedule.

Soc 3970f,w,s. Directed Studies. (1-5 cr per qtr; prereq #) Guided individual reading or study.

Soc 3991H. Junior Honors Seminar. (4 cr; prereq jr soc honors student, #)

Reading and discussion of faculty research literature; exploration of funding opportunities for research; and involvement in individually designed research or faculty research projects.

Soc 5960. Topics in Sociology. (1-5 cr per qtr; prereq 1001 or #) Special one-time offerings for juniors, seniors, and graduate students; topics specified in Class Schedule.

Soc 5966. Advanced Project Seminar. (4 cr; prereq all other required sociology coursework, Comp 3014, #)

Assists sociology majors in preparing research reports that satisfy the major project requirement. Provides guidance and direction in defining a research problem, collecting or selecting data, analyzing data, and writing a sociology research paper.

Soc 5970f,w,s. Directed Studies. (1-5 cr per qtr; prereq #) Guided individual reading or study.

Soc 5977-5978-5979. Proseminar. (3 cr per qtr; prereq for 5977: soc honors major or soc B.S. major, 3201, 3401, 3801, 3802, 3803, min 35 cr in soc; prereq for 5978: 5977; prereq for 5979: 5978)

5977: Exploration of contemporary research in sociology. Each research topic features presentation and open exchange with a faculty member in that area and subsequent discussion examining the ideas and methods presented. Selection of topic for senior thesis. 5978: Small working groups intensively concentrate on theoretical background, hypothesis generation and methodological development of individual senior thesis or project. 5979: Individual work on senior thesis or project; extensive consultation with seminar director or other faculty. Group discussion of individual projects.

South Asian and Middle Eastern Area Studies

See Area Studies Programs.

Spanish and Portuguese

Staff—Chair, Carol Klee, 34 Folwell Hall; Director of Graduate Studies, Joanna O’Connell, 13 Folwell Hall; Director of Undergraduate Studies, Francisco Ocampo, 4F Folwell Hall

Professors: Jara, Mirrer, Ramos-Gascon, Spadaccini, Vidal, Zahareas

Associate Professors: Klee, Ocampo, O’Connell, Sullivan

Assistant Professor: Arenas

The department’s undergraduate major programs focus on the communication skills, information and materials, and analytical and critical methodology necessary to explore Hispanic, Hispano-American, and
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Luso-Brazilian cultural traditions. Their broad ranges of approach emphasize the application of language skills to aspects of daily life, to intellectual endeavor, and to dealing with problems of society.

Course offerings emphasize four areas: (1) oral and written language fluency, (2) descriptive linguistics and language variation within a social context, (3) representative literature analyzed as artistic achievement and as cultural expression within a sociopolitical context, and (4) civilizations and cultures of areas in which Spanish or Portuguese is spoken.

For information about advising services, student participation in decision making, the Undergraduate Student Association, and cultural opportunities contact the department undergraduate office, 5c Folwell Hall.

General Education—Courses taught in English offer a broad selection of approaches to the literature, civilization, and culture of the Hispanic world. General interest courses include Span 1501, 1502, 1503, 3601, 3602, 3610, 3614, 3615, Port 3603, and SpPt 3610.

Study Abroad—An extended stay overseas is important to the development of language skills and cultural insights. All majors and minors are urged to incorporate at least one study abroad experience into their undergraduate academic program. The University offers numerous summer, quarter, semester, and full-year opportunities for study in Spain and Latin America, including the following programs sponsored by this department: Spanish in Cuernavaca, Mexico; Study Abroad in Venezuela; and the International Program in Toledo, Spain. Appropriate credits from study abroad easily can be applied toward a Spanish or Portuguese major or minor. For further information on options and procedures, consult with an undergraduate adviser in the department and see Foreign Study in this bulletin.

Foreign Languages Across the Curriculum (FLAC)—Students should also be aware that there are courses in other disciplines taught in Spanish on campus that they can include as part of their undergraduate program. The FLAC program offers students a number of opportunities to take two- or four-credit courses in Spanish in disciplines such as area studies, history, international relations, and sociology, while one-credit FLAC sections in Spanish are offered in conjunction with some four-credit courses taught in English. In spring quarter, FLAC courses offered in Spanish provide students the opportunity to do all their coursework in Spanish (some of the courses being offered by the Department of Spanish and Portuguese, some by other departments) as participants in the Foreign Language Immersion Program (FLIP). For more information, consult the department advisers in 34 Folwell Hall.

B.A. Major Sequence—Spanish

Required Preparatory Courses—1101-1102-1103-1104-1105-1106 or equiv Major Requirements—A total of 51 credits distributed as follows:
I. 22 required credits:
   Group I: Span 3015, 3016 (10 cr). These courses are a prerequisite to Group II courses.
   Group II: Span 3104, 3105, 3107 (12 cr). These courses are required for continuation to the next level in each area of the program (i.e., 3104 for upper-level literature courses, 3105 for upper-level culture courses, 3107 for upper-level linguistics courses).
II. 25 additional elective credits in approved upper-level (3xxx or 5xxx) literature, linguistics, and culture courses.
III. Completion of Span 3972—Graduation Seminar (4 cr)

All CLA B.A. candidates must complete a major project. Majors in Spanish and Spanish-Portuguese are required to conduct their research for the major project by registering and attending Span 3972 in one of the last two quarters of their senior year. The research topic is chosen, discussed, developed, and completed in a group setting, under the instructor’s supervision.

All major courses must be taken A-F, and grades of C or better must be earned in all courses. Spanish and Portuguese courses taught in English and credits earned in community tutorial programs are not acceptable for major credit.

For requirements for teaching licensure, see the College of Education and Human Development Bulletin.
Spanish and Portuguese

B.A. Major Sequence—Spanish-Portuguese

Required Preparatory Courses—Span 1101-1102-1103-1104-1105-1106 or equiv

Port 1001-1002-1003-1004-1005-1106 or equiv

Major Requirements—A combined major in Spanish and Portuguese is available. Students interested should discuss offerings with the Director of Undergraduate Studies.

Minor Sequence—Spanish

Required Preparatory Courses—1101-1102-1103-1104-1105-1106 or equiv

Minor Requirements—A total of 22 credits distributed as follows:

Group I: 3015, 3016, (10 cr).

Group II: Three courses at the 3xxx or 5xxx level

The program has three general areas: literature, linguistics, and culture. Each area has a prerequisite which will count as one of the three courses required for the minor. The prereq for literature is 3104; the prereq for culture is 3105; and the prereq for linguistics is 3107. All courses must be taken A-F, and grades of C or better must be earned in all courses. Courses taught in Spanish and credits earned in community tutorial programs are not acceptable for major credit.

Minor Sequence—Portuguese

See the Director of Undergraduate Studies.

Spanish (Span)

Span 1101-1102-1103. Beginning Spanish. (5 cr per qtr)

Basic listening, speaking, reading, and writing skills. Emphasis on the development of communicative competence. Some cultural readings.

Span 1104. Intermediate Spanish. (5 cr; prereq 1103 or 3 yrs high school Spanish)

Speaking and comprehension; development of reading and writing skills based on materials from Spain and Spanish America. Grammar review; compositions and oral presentations.

Span 1105. Intermediate Spanish. (5 cr; prereq 1104 or 4 yrs high school Spanish)

For description, see Span 1104.

Span 1106. Intermediate Spanish. (5 cr; prereq 1105 or 5 yrs high school Span)

For description, see Span 1104.

Span 1501. Culture, Civilization of Spain, Portugal: The Roots of Modern Spain, Portugal. (4 cr)

The cultural evolution of Iberian civilization from its origins to the present. Recurring artistic and intellectual problems. Taught in English.

Span 1502. Culture, Civilization of Latin America: Indian, European-Colonial, African Roots. (4 cr)

Cultural manifestations and societal changes in the New World. Major pre-Columbian societies, Spanish and Portuguese conquest of America, colonial life through the 18th century. Taught in English.

Span 1503. Culture, Civilization of Modern Latin America: Societies in Change. (4 cr)

Cultural implications arising from struggles for political and economic independence during the 19th and 20th centuries. Cultural characteristics of principal regions of contemporary Latin America. Causes of developmental differences. Taught in English.

Span 3015. Spanish Composition and Communication. (5 cr; prereq 1106 or equiv and Graduation Proficiency Test)

Emphasis on the development of communication skills, i.e., the ability to comprehend both written and spoken texts, and to speak, read, and write in Spanish, beyond the intermediate level.

Span 3016. Advanced Spanish Composition and Communication. (5 cr; prereq 3015 or equiv and Graduation Proficiency Test)

Continued emphasis on the development of communication skills, i.e., the ability to comprehend both written and spoken texts, and to speak, read, and write in Spanish, beyond the intermediate level.

Span 3021. Advanced Communication Skills. (5 cr; prereq 3016 or #)

Improving all areas of language skills to achieve greater fluency and accuracy in Spanish.

Span 3022. Business Spanish. (4 cr; prereq 2 yrs Spanish or #; UC only)

Vocabulary of Spanish business terms, skills in report writing, proper format for business communications, conversational fluency on trade-related topics.

Symbols and abbreviations: f—fall; w—winter; sp—spring quarter; su—summer session / Cr—Credit per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / —Work for this course will extend past the end of the term; a grade of F will be assigned to indicate that the course is still in progress / —All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / —Credit will not be granted if credit has been received for the course listed after this symbol / —Concurrent registration is required (or allowed) in the course listed after this symbol / —Approval of the instructor is required for registration / —Approval of the college offering the course is required for registration / UC—University College (formerly CEE).
Span 3104. The Art of Reading Literary Texts. (4 cr; prereq 3016 or #)
Critical reading of Spanish and Spanish-American texts; works representing principal genres—novel, drama, poetry, essay; diverse approaches to literature. Terminology of criticism, literary problems and techniques.

Span 3105. Introduction to the Study of Hispanic Cultures. (4 cr; prereq 3016 or #)
Hispanic cultures and societies—explore notion of cultural difference and awareness of cultural affiliation. History, theory of cultural differences, cultural mosaic of Hispanic world. Refine writing/expository skills in Spanish.

Span 3107. Introduction to the Study of Hispanic Linguistics. (4 cr; prereq 3016 or #)
Different components of Hispanic linguistics; relationships with social, cultural, and literary studies.

Span 3211. Spanish Literature: Aspects of Prose and Fiction. (4 cr; prereq 3104)
Representative novels and essays from the golden age to modern times: the picaresque novel, the short novella of Cervantes, Gracián, and costumbrista prose, realism, surrealism, existentialism.

Span 3212. Spanish Literature: Aspects of Poetry. (4 cr; prereq 3104)
Poetry of various periods: medieval romance and epic poems, goliardic verse, ballads, love sonnets, mystical poetry, 19th-century romantic verse, modern surrealist and imagist works.

Span 3213. Spanish Literature: Aspects of Drama. (4 cr; prereq 3104)
The theory and practice of drama as reflected in tragedy, comedy, historical plays, farce, and religious drama.

Span 3251. Spanish-American Literature: Aspects of Prose and Fiction. (4 cr; prereq 3104)
Clusters of representative works. Trends, themes, and structures from colonial times to the present. Historical comprehension of Spanish-American society through prose fiction.

Span 3252. Spanish-American Literature: Aspects of Poetry. (4 cr; prereq 3104)
National and international literary, social, and political movements as reflected in Spanish-American poetry. Major 20th-century poets such as Vallejo, Neruda, N. Guillén, and Paz.

Span 3253. Spanish-American Literature: Aspects of Drama. (4 cr; prereq 3104)
Spanish-American national drama from the 19th century to the present. Aesthetic trends and problems in relation to society.

Span 3254. Latin American Writing: Building the Nation. (4 cr; prereq 3104)
Analysis of the uses of writing by the liberal bourgeoisie in 19th-century Spanish America to promote its nation-building project. Analysis of major works in the period.

Span 3255. Vanguard, Society and Writing in Latin America. (4 cr; prereq 3104)
Lyric and narrative trends in 20th-century Latin America. Latin America and the decline of the West. The challenge to modernization and the internationalization of discourse. The defiance to the discourse of power in the 1970s and 1980s.

Span 3256. Spanish American Cultural Discourse. (4 cr; prereq 3104)
The cultural assumptions in current modes of interpreting Spanish American reality. Representative texts are analyzed.

Span 3501. Spanish Civilization: Roots of Modern Spain and Latin America. (5 cr; prereq 3105)
Spain and Latin America up to the early 19th century.

Span 3502. Spanish Civilization: Modern Spain. (5 cr; prereq 3105)
Evolution of Spanish culture from the beginnings of the new regime to the present. Conflicts between traditionalism and liberalism; Spanish artists’ and intellectuals’ view of Spain in the light of these conflicts.

Span 3510. Topics in Hispanic Cultures. (4 cr; prereq 3104 or 3105 or 3107)
Major topics in Hispanic cultures—Iberian peninsula, Latin America (including Brazil), the Caribbean, and Spanish-speaking USA—emphasis on cultural discourses other than literature. Possible topics include religions, folklore, popular culture, film, popular and classical music, oral tradition.

Span 3512. Spanish-American Civilization: Modern Latin America. (5 cr; prereq 3105)
Spanish-American civilization from 1800 to the present. Impact of independence movements on literature, art, and music. Relationship between political development and cultural phenomena in the 19th and 20th centuries. Popular culture. Folklore and the oral tradition (ballads, corridos, folktales, the lyric, others). The impact of 20th-century ideologies and technology on cultural development in Spanish-American republics.

Span 3614. Don Quixote: A Study of Lost Illusions. (4 cr)
Analysis of Cervantes’ Don Quixote and an examination of its reception from early 1600s to modern times. Book’s reception in Spanish America. Taught in English.

Span 3620. Topics: Spanish-American Literature in Translation. (4 cr per qtr [12 cr max])
Latin American groups of writers, universal themes, literary motifs, relationships between literature and other disciplines. Topics specified in Class Schedule. Taught in English.

Span 3701. Structure of Spanish and Portuguese: Phonology. (4 cr; prereq 3107 or #)
Phonology of modern Spanish and Portuguese. Regional and social variants of the languages in Spain, Portugal, and Latin America.
Span 3702. The Structure of Spanish: Morphology and Syntax. (4 cr; prereq 3107 or #) Morphology and syntax of modern Spanish. Survey of derivational and inflectional morphology; typical syntactic constructions.

Span 3721. Origins and History of Spanish and Portuguese. (4 cr; prereq Span 3107, Port 3003, or #) Principal stages in growth and development of Spanish and Portuguese languages as expressions of specific cultures. Fundamental concepts and methodology of Iberian historical linguistics.

Span 3730. Topics in Hispanic Linguistics. (4 cr per qtr [12 cr max]; prereq 3107 or #)

Span 3791. Topics in Spanish Peninsular Literature. (4 cr per qtr [12 cr max]; prereq 3104 or #) Focuses on a central theme related to important groups of writers, literary movements, trends, critical approaches, and methods. Topics specified in Class Schedule.

Span 3920. Topics in Spanish-American Literature. (4 cr per qtr [12 cr max]; prereq 3104 or #) For description, see Span 3910.

Span 3940. Figures in Spanish Peninsular Literature. (4 cr per qtr [12 cr max]; prereq 3104 or #) One major writer or group of writers whose work has had an impact on thought, literature, or social problems. Figures specified in Class Schedule.

Span 3950. Figures in Spanish-American Literature. (4 cr per qtr [12 cr max]; prereq 3104 or #) For description, see Span 3940.

Span 3970. Directed Studies. (1-5 cr per qtr; prereq #) Guided individual reading or study.

Span 3972. Graduation Seminar. (4 cr; prereq 30 cr of Span 3xxx or SpPt 3xxx courses and #) Work on the major project within the framework of this seminar.

Span 3972H. Honors Graduation Seminar. (4 cr; prereq 30 cr Span 3xxx or SpPt 3xxx courses, honors student and #) Honors thesis.

Span 5012. Advanced Problems in the Spanish Language. (4 cr; prereq 3702 or equiv and Graduation Proficiency Test or #) Problematic aspects of Spanish grammar. For advanced speakers of Spanish as a second language and native Spanish speakers.

Span 5015. Methods of Translation. (4 cr; prereq 10 cr from 3001-3005 series or #) Meaning, use, and theories of translation. Techniques and problems of translation from Spanish and Portuguese to English and vice versa. Translation patterns, use of special vocabularies and other adjuncts needed to understand both languages. Practical vocabulary and usage for various fields of work.

Span 5106. The Literature of the Reconquest and Feudal Spain. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses) Major literary works and genres of medieval Spain—from primitive lyric to La Celestina—examined against background of social and historical transformations of period.

Span 5107. The Literature of the Spanish Empire and Its Decline. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses) Overview of major 16th- and 17th-century Renaissance and Baroque works—poetry, nonfiction, prose, novel, drama—examined against background of establishment of Spanish Empire, internal economic crisis, and ideological apparatus developed by the modern state.

Span 5108. The Spain of Cervantes' Don Quixote: History and Fiction. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or #) Historical function of literary techniques, narrative perspectives, and ironic discourse of Cervantes' major work during the period of imperial decadence, 17th century. Tradition of Erasmian folly, madness as anachronism and social satire.

Span 5109. The Literature of Bourgeois Order: Enlightenment, Romanticism, and Positivism. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses) Overview of major literary works—poetry, essay, novel, drama—and of literary movements of 18th and 19th centuries, examined as aesthetic expressions of the long process of consolidation of bourgeois social order in Spain.

Span 5111. The Literature of the Spanish Crisis of the 20th Century. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses) Overview of major literary works and aesthetic trends from Spanish-American War of 1898 to post-Franco period, examined in terms of social, political, and intellectual crisis.

Symbols and abbreviations: f—fall, w—winter, s—spring quarter, su—summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / 1—Work for this course will extend past the end of the term; a grade of F will be assigned to indicate that the course is still in progress / #—All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence / §—Credit will not be granted if credit has been received for the course listed after this symbol / $—Concurrent registration is required (or allowed) in the course listed after this symbol / —Approval of the instructor is required for registration / —Approval of the department offering the course is required for registration / —Approval of the college offering the course is required for registration / H—Honors course (follows the course number)
Span 5221. Spanish Literature of the 17th Century: The Drama. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
Representative playwrights—Lope, Alarcón, Tirso, Calderón—and dramatic forms, especially comedia, tragedy, and auto sacramental. Approaches to golden age comedy. Themes of honor, purity of blood, country vs. city, free will, others, viewed against literary, cultural, and social history.

Span 5234. Feminism and Literature in Spain. (4 cr; prereq three 3xxx or 5xxx literature courses in Spanish or Portuguese or Δ)
Study of Spanish feminism in thought and practice, with a focus on literature, cultural discourse, and literary theory.

Span 5272. Hispanic Modernism. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
A critical purview of artistic and literary production in Hispanic cultures since the middle of the 19th century to the avant-gardes. Modernity and modernization in Hispanic world. The Spanish generation of 98. Castilian, Catalan, and Latin-American practices.

Span 5316. The Picaresque Novel. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)

Span 5525. Caribbean Literature: An Integral Approach. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
Review of literature of area; common traits and preoccupations. Conceptualization of region as a totality: themes, similar lines of development, generic tendencies, periods of development and crisis.

Span 5526. Creole Consciousness and Mercantilist Culture. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
Analysis of texts written between 1492 and 1780; the sociohistorical project to which the texts belong. Generic variants and approach to changing reality.

Span 5527. National Literary Consciousness and Free Trade. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
Analysis of literary movements between 1780 and 1900; reflection of process of formation of nation-states and incorporation of Latin America into international capitalist system as producer of foodstuffs and raw materials and importer of manufactured goods.

Span 5528. Popular Literary Consciousness 1900-1950. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
Spanish-American literature between eve and aftermath of the two world wars. Impact of modernization, industrialization, and nationalistic and populist thought on emergence of a distinctive style of writing, thematic trends, and conventions of literary genre.

Span 5529. National Affirmation and Transnationalization. (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ)
Analysis of literary trends from 1950 to present. Reaction to internal social demands for development of independent national cultures and conflicting influence of international economic system.

Span 5532. Literature and National Disintegration. (4 cr; prereq three 3xxx or 5xxx literature courses in Spanish or Portuguese or Δ)
Literary reaction to the contemporary structural changes in the world economic system (1970 to present). Effects on literature as institution. Texts related to revolutionary trends and social movements (feminism, theology of liberation, defense of human rights).

Span 5533. Latin American Cultural Discourse. (4 cr; prereq three 3xxx or 5xxx literature courses in Spanish or Portuguese or Δ)
Study of contemporary discourses that attempt global explanations of the development of Latin American culture and civilization: liberal diffusion, dependency theory, geopolitics, doctrine of national security, theology of liberation, human rights.

Span 5535. Hispanic American Literary History: An Overview. (4 cr; prereq three 3xxx or 5xxx literature courses in Spanish or Portuguese or Δ)
Purview of Hispanic-American literature from colonial times to present. Major cultural/historical divisions will be analyzed and characterized. A variety of historiographical approaches to the field will be recognized.

Span 5536. Feminism and Literature in Latin America. (4 cr; prereq three 3xxx or 5xxx literature courses in Spanish or Portuguese or Δ)
Study of feminist action and theory in Latin America with a focus on literature and literary theory.

Span 5701, 5702. History of Ibero-Romance. (4 cr per qtr; prereq 3701 or 3702 or #)
Comparative study of origins and development of Ibero-Romance languages; evolution of Catalan, Portuguese, and Spanish compared and contrasted. Methods in reading and analyzing non-literary and literary medieval texts.

Span 5711. The Structure of Modern Spanish: Phonology. (4 cr; prereq 3701, Ling 5302 or #)
Analysis and description of the structure of Spanish. Useful for students who plan to teach Spanish and for those whose primary language is Spanish. Formulation and evaluation of phonological descriptions of Spanish. Approaches to problems in Spanish phonology within metrical, autosegmental, and lexical phonological theories.

Span 5712. The Structure of Modern Spanish: Morphology. (4 cr; prereq 3702, Ling 5302 or #)
Analysis and description of the structure of Spanish. Useful for students who plan to teach Spanish and for those whose primary language is Spanish. Evaluation of morphological theories and descriptions of Spanish: of the lexicon, derivation, inflection, grammatical categories; examination of phonological and syntactic effects on morphology.
Span 5713. The Structure of Modern Spanish: Syntax. (4 cr; prereq 5012, Ling 5302 or #)
Linguistic types that appear across languages, such as grammatical relations, word order, transitivity, causative constructions, relative clauses; how these phenomena are present in Spanish syntax.

Span 5714. The Structure of Modern Spanish: Semantics. (4 cr; prereq 5713 or #)
Relationship between syntax and semantics. Application of structural semantics to the Spanish language, concepts of semantic and lexical fields. Cultural patterns in Hispanic world as reflected in semantic structures. Theories of meaning, euphemisms; taboos; semantics and social class. Semantic approaches to literary analysis.

Span 5715. The Structure of Modern Spanish: Pragmatics. (4 cr; prereq 5713 or #)
Concepts used in current literature in Spanish pragmatics.

Span 5731. Spanish Dialectology: Regional and Social Dialects of Modern Spain. (4 cr; prereq #)
Major dialect areas of Spain; distinguishing phonological, morphological, lexical, and syntactic variations. Impact of recent cultural, political, and socioeconomic transformations on the language.

Span 5732. Spanish Dialectology: Regional and Social Dialects of Modern Spanish America. (4 cr; prereq #)
Major dialect areas in modern Hispanic America. Norm, speech, and language related to former political and religious divisions of Hispanic America and to new national boundaries.

Span 5910. Topics in Spanish Peninsular Literature. (1-4 cr; prereq 3104 or SpPt 3104 or ∆)
Important groups, movements, trends, methods, genres. Topics may include conversos, mysticism, poesia tradicional, essay and enlightenment, novela realista, and avant-garde. Topics specified in Class Schedule.

Span 5920. Topics in Spanish-American Literature. (4 cr; prereq 3104 or SpPt 3104 or ∆)
Important groups, movements, trends, methods, genres. Topics specified in Class Schedule.

Span 5940. Figures in Spanish Peninsular Literature. (4 cr; prereq 3104 or SpPt 3104 or ∆)
One major writer or group of writers whose work has had an impact on thought, literature, or social problems. Figures specified in Class Schedule.

Span 5950. Figures in Spanish-American Literature. (4 cr; prereq 3104 or SpPt 3104 or ∆)
One major writer or group of writers whose work has had an impact on thought, literature, or social problems. Figures specified in Class Schedule.

Span 5985. The Study of Spanish in the United States: Theory and Field Methods. (4 cr; prereq 3701)
Sociolinguistic theory and field methods related to the study of Spanish in the United States; field experience in the Hispanic community of St. Paul.

Span 5990. Directed Research. (1-5 cr per qtr; prereq ∆)

Portuguese (Port)

Port 1001-1002-1003. Beginning Portuguese. (5 cr per qtr; prereq for 1002—1001 or #; prereq for 1003—1002 or #)
Speaking and understanding Portuguese; pronunciation (Brazilian speech emphasized); writing and reading skills; grammar; cultural aspects of language and civilizations of Portuguese-speaking world.

Port 1004. Intermediate Portuguese Grammar and Composition. (5 cr; prereq 1003)
Speaking and comprehension; development of reading and writing skills based on Portuguese-language materials.

Port 1005. Intermediate Portuguese. (5 cr; prereq 1004)
Speaking and comprehension; development of reading and writing skills grounded in materials that reflect the cultural diversity of the Portuguese-speaking world. Grammar review.

Port 1006. Intermediate Portuguese. (5 cr; prereq 1005)
Speaking and comprehension; development of reading and writing skills on materials from Portugal and Brazil. Grammar review; composition and short presentation.

Port 3001. Portuguese for Spanish Speakers. (5 cr; prereq knowledge of Spanish or #; UC only)
Study of Portuguese based on student knowledge of Spanish (speakers of other Romance languages admissible with permission of the instructor). Contrastive approach to the phonic and morpho-syntactic structures of Portuguese.

Port 3003. Conversation and Composition. (5 cr; prereq 1006 or equiv)
Speaking and writing skills. Cultural comparisons, current events. Grammar review. Writing workshops.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Port 3501. Foundations of Lusophone Cultures. (5 cr; prereq 1106) Foundations of Portuguese-language cultures from origins to present. Social and cultural currents that lay basis for modern Portuguese-speaking world.

Port 3502. Brazilian Culture. (5 cr; prereq 1106) Brazilian contemporary culture and society. History, culture, and social problems.

Port 3602. Introduction to Brazil. (4 cr) Brazilian contemporary culture and society. History (music, art, cinema, literature, architecture, theatre, popular culture, television), and social problems (ethnicity, rain forest).

Port 3603. Brazilian Literature in Translation. (4 cr) Representative figures or topics of Brazilian literature as reflection of Brazilian society. Modern Brazilian fiction. Topics specified in Class Schedule. In English.

Port 3910. Topics in Luso-Brazilian Literature. (4 cr per qtr; prereq Span 3104 or #) Sample topics: Portuguese lyric poetry; the Portuguese social novel; contemporary Portuguese literature; the Brazilian novel; recent currents in Brazilian poetry. Topics specified in Class Schedule.

Port 3970. Directed Studies. (1-5 cr per qtr; prereq Δ) Guided individual reading or study.

Port 5110. Topics in Portuguese Literature. (4 cr per qtr [12 cr max]; prereq 3211 or 3212 or 3213 or three 3xxx or 5xxx Spanish literature courses, Δ) Important authors, movements, currents, genres, socioaesthetic questions, literary techniques. Topics specified in Class Schedule.

Port 5521. Literature in Traditional/Expansionist Portugal. (4 cr; prereq three 3xxx Portuguese courses or Δ) Analysis of key literary movements and figures to about 1750. Literature as a dimension of a sociocultural movement involving modulations of traditionalist social formations and accommodation of overseas expansion.

Port 5522. Literature and Liberal Problems in Portugal. (4 cr; prereq three 3xxx Portuguese courses or Δ) Analysis of key literary movements and figures from about 1750 to present. Literature as a dimension of a sociocultural movement involving emulation and then various reconstitutions of society in attempts to “modernize.”

Port 5523. Nationalism in Brazilian Literature. (4 cr; prereq three 3xxx Portuguese courses or Δ) Major literary works—poetry, novel, essay, or drama—and literary trends from the colonial period and/or the 19th century as expressions of the nativist/nationalistic project in Brazil.

Port 5524. Brazilian Literature and Modernization. (4 cr; prereq three 3xxx Portuguese courses or Δ) Major literary works—poetry, novel, essay, memoir, or drama—and literary trends from the 20th century as expressions of the modernization process of Brazilian society. For creation and stabilization of an independent economic and cultural entity.

Port 5910. Topics in Luso-Brazilian Literature. (4 cr; prereq Span 3104 or Span-Port 3104 or #) Portuguese literature, music, film, oral traditions, and TV. Topics specified in Class Schedule.

Port 5920. Figures in Luso-Brazilian Literature. (4 cr; prereq three 3xxx Portuguese courses or Δ) Introduces Portuguese, Brazilian, or other major lusophone writers, whose work has had impact on thought, literature, or social problems. Figures specified in Class Schedule.

Port 5990. Directed Research. (1-5 cr per qtr; prereq Δ)

Spanish-Portuguese (SpPt)

SpPt 3980. Directed Instruction. (1-4 cr per qtr [8 cr max]; prereq #, Δ; S-N only) Undergraduates serve as teaching assistants in courses they have successfully completed for credit.

SpPt 5930. Selected Topics in the Hispanic Cultural Discourses. (4 cr; prereq reading knowledge of Spanish and Portuguese) Comparative topics in cultural discourse of Portuguese-speaking and Spanish-speaking nations. Common background and difference among Iberian or Latin American intellectual production. In Portuguese.

Speech-Communication (Spch)

Staff—Chair, Donald R. Browne, 460 Folwell Hall; Undergraduate Advising Office, 432 Folwell Hall

Professors Emeriti: Bormann, Howell, Jensen, Shapiro, Sykes, Ziebarth

Professors: Browne, Campbell, Goldstein, Hewes, Miller, Scott

Associate Professors: Albert, Rarick, Schiappa, Sheldon

Assistant Professors: Kinney, Omdahl, Wilson

Speech-communication involves the study of the communicative dimensions of human experience using both humanistic and social scientific methods. The department sees the various forms of human communication as
integrated and interdependent activities. Therefore, students are encouraged to select a variety of coursework within departmental offerings in rhetoric, electronic media, and communication theory.

General Education—The department recommends as courses for nonmajors 1101, 1313, 3211, 3401, 3402, 3411, 3431, 3441, 3601, 3605, 5231, 5402, 5431, 5615, 5617.

Study Abroad—The department encourages students to incorporate study abroad experiences into their major program. Spch 3451 and 3452 are a useful introduction to such an experience, but are not a requirement. Credit arrangements and project plans should be cleared with a senior faculty member before departure. For information on study abroad options and procedures, see Foreign Study.

B.A. Major Sequence

Required Preparatory Courses—1101, 1313

Required Core Courses—3211, 3401, 3501, 3601

Premajor Requirements for Admission to the Major—To be accepted into the major, students must first meet with a speech-communication adviser in 432 Folwell Hall to declare a premajor. We strongly encourage interested students to declare their pre-speech major before the junior year. After declaring a pre-speech major, a student must complete the following five courses to be admitted to the major: 1101, 1313, 3211, 3401 and 3601. Students must achieve a 2.0 GPA or better in the 3xxx courses; these may not be retaken to improve the GPA.

Admission to the Major—Once a student completes the coursework for the premajor with the required GPA, she or he must again meet with a speech-communication adviser to plan a major program. Students with questions about the premajor or major requirements are encouraged to contact the speech-communication undergraduate advisers.

Major Requirements—A minimum of 40 credits in upper division speech-communication coursework to include:

- Required Core Courses—3211, 3401, 3501, 3601 (to be taken as soon as possible)
- Elective Courses—An additional 24 credits of upper division 3xxx-5xxx level courses with a minimum of one 5xxx course and one course from the following: 3111, 3201, 3411, 3451, 3452, 3605, 5422.

All major courses must be taken A-F unless the course is only offered S-N. Independent study, directed instruction, directed study, internships, “X” or “Y” registration cannot be counted toward the 40 credit minimum. To graduate with a major, a student must have a cumulative GPA of 2.0 in all speech-communication coursework.

Senior Project—All speech-communication majors are required to complete a senior project before graduation. For details about project requirements, contact the speech-communication undergraduate advisers.

Honors Program—3191H, 3192H, 3193H, 3601H. Qualified premajor and major students are encouraged to enter the department honors program. The honors program provides honors seminars and supports a more ambitious senior project than is required of other students. Honors students will develop an individualized honors major program with the Director of Undergraduate Studies or other speech-communication faculty. Interested students should contact the speech-communication undergraduate advisers.

Individually Designed Programs—Students wishing to emphasize speech-communication in IDIM, BIS, ICP and other individually designed programs must take preparatory courses 1101 and 1313 and achieve a 2.0 GPA in any two of the following courses: 3111, 3201 and 3601.

The program must be planned in conference with and approved by a departmental adviser. Students are encouraged to see the department advisers quarterly.
MINOR REQUIREMENTS AND COURSE DESCRIPTIONS

Minor Sequence

Required Preparatory Courses—1101, 1313

Minor Requirements—Minimum of 20 credits in upper division 3xxx-5xxx speech-communication courses including two courses from 3211, 3401, 3601.

All minor courses must be taken A-F unless the course is only offered S-N. Independent study, directed instruction, directed study, internships, “X” or “Y” registration cannot be counted toward the 20 credit minimum. Students must have a cumulative 2.0 GPA in all speech-communication coursework to graduate with a minor.

Spch 1101f,w,s,su. Introduction to Public Speaking. (4 cr)

Spch 1313f,w,s,su. Analysis of Oral Argument. (4 cr) Schiappa
Strategies for analyzing and evaluating arguments received aurally. Problems in listening and responding to argument.

Spch 3110. Current Topics in Speech-Communication. (4 cr [may be repeated for credit with #]; prereq 3211, 3401, 3601 [whichever is relevant to the topic])
Current cases illustrating speech-communication theory and underlying issues.

Spch 3111. Leadership Communication. (4 cr)
Interdisciplinary study of theory and practice of leadership. Theoretical approaches to management. Interpersonal communication skills in leadership practice; persuasion and cross-value communication in effective leadership. Experience in task-oriented small group communication.

Spch 3131f,w,s,su. Small Group Communication Processes. (4 cr; prereq 1101 or #) Hewes
Cooperative thinking in task-oriented groups. Planning, preparing for, and participating in small groups in private and public contexts.

Spch 3191f, 3192w, 3193s. Honors Course: Tutorial Seminar in Speech. (4 cr per qtr; prereq honors candidate in speech-communication, #, ∆)

Spch 3201f,w,s. Introduction to Electronic Media Production. (4 cr)
Practice and theory. Electronic media projects; planning, scripting, production in various media.

Spch 3211. Introduction to U.S. Electronic Media. (4 cr) Browne, Rarick
Historical development and current issues in electronic media technologies and programming. Effects of governmental, industrial, and public organizations on message content. Problem areas of electronic media.

Spch 3291. New Telecommunication Media. (4 cr; prereq 3211 or #) Rarick
Development and current status of new telecommunication media such as cable TV, satellites, DBS, MDS, and video disk/cassettes. Technology, historical development, regulation, and programming of these media and their influence on broadcasting.

Spch 3401. Introduction to Communication Theory. (4 cr) Hewes, Omdahl
Social scientific perspectives on the study of human communication. Review of alternative ways of describing and explaining communication processes.

Spch 3402. Introduction to Interpersonal Communication. (4 cr) Hewes, Omdahl
Nature and function of communication between individuals in formal and informal relationships. Communicative interactions from theoretical and practical viewpoints.

Spch 3411f,w,s,su. Small Group Communication Processes. (4 cr; prereq 1101 or #) Hewes
Cooperative thinking in task-oriented groups. Planning, preparing for, and participating in small groups in private and public contexts.

Persuasion in interpersonal, organizational, intracultural, and intercultural relationships. Contemporary persuasion, with occasional historical segments.

Spch 3441f,w,s. Communicating in Organizations. (4 cr; prereq 1101 or equiv)
Theory and practice of communicating in organizations. How communication creates, maintains, and changes organizational culture. Role of individual communicator in organizational culture.

Spch 3451. Intercultural Communication: Theory and Practice. (4 cr; prereq planning an intercultural exper) Albert
Theories and factors influencing intercultural communication. Development of effective intercultural communication skills.

Spch 3452. Communication and the Intercultural Reentry. (4 cr; prereq return from an intercultural exper)
Communication processes during return to home culture after intercultural experience. Focus on communication and understanding impact of intercultural experience as the basis for social change.

Spch 3501. Introduction to Communication Research Methods. (4 cr) Kinney, Hewes
Quantitative research methods in speech-communication, including design of communication experiments, surveys, interaction coding, content analysis, observational research, and relevant statistical methods.
Spch 3601. Introduction to Rhetorical Theory. (4 cr; prereq 1101) Campbell, Scott
Theoretical systems intended to explain or direct the creation of public discourse. Traditional rhetoric to contemporary perspectives. Using theory to explain the practice of public discourse.

Spch 3605f,w,s,su. Persuasive Speaking. (4 cr; prereq 1101) Wilson
Persuasive speeches: directed practice. Persuasive speaking in contemporary life.

Spch 3625. Ethical Standards in Modern Communication. (4 cr; prereq 1101 or #) Rarick
Ethical issues in interpersonal communication, small group discussion, public speaking, and mass communication.

Spch 3970f,w,s,su. Directed Studies. (Cr ar [no major program cr for speech-communication majors]; prereq at least one speech-communication course, #; ∆)
Guided individual reading or study.

Spch 3980f,w,s,su. Directed Instruction. (1-4 cr per qtr [8 cr max; no major program cr for speech-communication majors]; prereq #; ∆; S-N only)
Supervised planning and teaching of undergraduate courses.

Spch 5110. Advanced Topics in Speech-Communication Theory. (4 cr per qtr [may be repeated for cr with #; prereq 3211, 3401, 3601 whichever is relevant to the topic])
Advanced theoretical problems. See department office for current offering.

Spch 5211. Contemporary Problems in U.S. Electronic Media. (4 cr; prereq 3211, sr) Browne, Rarick
Problems affecting U.S. commercial and educational electronic media. Topics may include media programming, controversial content, race/gender, management and government regulation, ethics.

Spch 5222. Educational Media Programming and Administration. (4 cr; prereq 3211 or #)
Goldstein
Electronic media applied to educational needs; current practices; research findings; relative effectiveness of differing types of media use; impact of various modes of transmission on programming and administration.

Spch 5231. Comparative Electronic Media Systems. (4 cr; prereq 3211 or #) Browne
Historical, political and sociological aspects of electronic media systems throughout the world—U.S., Canada, Great Britain, France, Germany, Russia, others. Regulation, impact on political, social and economic development.

International (nation-to-nation) electronic media in the U.S., Great Britain, Russia, Japan, and other countries. Theories of informing and persuading through electronic media; regulatory agreements; spectrum control; social and legal implications of new technologies.

Spch 5233. Electronic Media and National Development. (4 cr) Browne
Use of electronic media to effect changes in social, political, economic, and cultural life. Use by developing nations to improve agricultural practices, hygienic standards, literacy, awareness of civic responsibility.

Spch 5261. Communicative Processes in Electronic Media. (4 cr; prereq 3211 or #)
Electronic media as systems of communicative processes: the organizational processes of media communicators, media content as a link between communicators and audiences, and how viewers use media content.

Spch 5281. Electronic Media Audience Analysis and Programming. (4 cr; prereq 3211)
Rarick
Methods of measuring and analyzing electronic media audiences. Structure and appeals of media programming. Theory and research in media impact on audiences.

Spch 5401. Advanced Theories of Communication. (4 cr; prereq 3401 or grad)
Omdahl
Analysis of theories of communication and their usefulness for particular purposes. Historical and conceptual development of theories of communication.

Spch 5402. Problems in Interpersonal Communication. (4 cr; prereq 3401 or #) Hewes, Omdahl
Factors contributing to misunderstanding, not understanding, disagreement, and cessation of contact in dyads.

Spch 5403. Theory Construction and Analysis in Communication. (4 cr; prereq 3401 or #) Hewes, Omdahl
Problems in development of communication theory. Analysis of existing theory. Relationship of theory to research.

Spch 5404. Language, Culture, and Education. (4 cr; prereq 3401 or #) Sheldon
Psychological and social-psychological perspectives for study of language-communication; language variation (dialects, codes, registers); implications for program development and instructional practices.

Symbols and abbreviations: f, w, su—fall, winter, spring quarter, summer session / Cr—Credits per quarter; first number following course title / 1011, 1012, 1013—Series courses, separated by commas; may be entered any quarter / 1011-1012-1013—Sequence courses, separated by hyphens; must be taken in order listed / I—Work for this course will extend past the end of the term; a grade of W will be assigned to indicate that the course is still in progress / ∆—Approval of the college offering the course is required for registration / UC—University College (formerly CEE).
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

Nonverbal interpersonal communication. Nonverbal categories: gesture, facial expression, posture, clothing, environment.

Spch 5407. Communication and Interpersonal Conflict. (4 cr; prereq 3401, 3411) Kinney
Theory and research on the role of communication in conflict in groups, organizations, and interpersonal relationships. Communication in negotiations. Interventions into interpersonal conflicts.

Spch 5411. Small Group Communication Theory. (4 cr; prereq 3411 or #) Hewes
Theories of communication within the small, task-oriented group. Group cohesiveness, leadership, role structure, information processing, decision making.

Spch 5414su. Communication and Community. (4 cr; prereq 3411 or #; S-N only)
Authority and power in task-oriented groups. Tavistock-type small group, intergroup, and large group lab experiences. Verbal and nonverbal processes in and among groups that affect leadership and followership.

Spch 5421. Quantitative Research in Communication. (4 cr; prereq 3401 or 5403 or #) Hewes
Experimental and descriptive research; design and procedures; individual projects.

Spch 5422. Interviewing and Communication. (4 cr; prereq 1101, 6 cr social sciences or #) Richer
Theory and practice in the information interview. Interpersonal perception, empathy, and cognitive structure in dyadic communication. Experience in interviewing and communication analysis. Research in interpersonal and mass communication.

Spch 5431. The Process of Persuasion. (4 cr; prereq 3431) Albert, Kinney
Modern motivational communication. Social control through persuasive speech.

Spch 5441. Communication in Human Organizations. (4 cr; prereq 3401 or 8 cr social sciences, 3441 or #)
Communication in organizational settings. Organizational structure and dynamics and their effect upon the communication process. Individual projects.

Spch 5443. Theories of Organizational Communication. (4 cr; prereq 3401, 3441 or #)
Survey of theories of organizational communication and relevant empirical research. Implications of these theories for modern organizations, their members, and society.

Spch 5451. Intercultural Communication. (4 cr; prereq Anth 1102 or another cultural anthropology course or #; 3401 recommended) Albert
Successful interpersonal communication across cultures. Verbal and nonverbal communication.

Spch 5452. Intercultural Interaction: Theory and Application. (4 cr; prereq #) Albert
Small group interaction across cultures for international and U.S. students; readings, group discussion, role playing, simulations, lectures as methods.

Spch 5461. Conversation Analysis. (4 cr, §Ling 5751; prereq 3401, Ling 3001 or 5001 or #) Sheldon
Discourse processes in dyadic and multipart conversation. Application of concepts through analysis of conversations.

Spch 5462. Field Research in Spoken Language. (4 cr, §Ling 5752; prereq 5461 or #) Sheldon
Techniques for transcription, coding and analysis of conversational interaction. Application to recorded conversations.

Spch 5602. Contemporary Political Persuasion. (4 cr; prereq 1101, 5431 or #) Campbell, Scott
Contemporary political speech. Ideologies in political persuasion.

Spch 5611. Classical Rhetoric. (4 cr; prereq 1101) Schiappa, Scott
Greek and Roman theories of speechmaking; historical and philosophical context and influence on education.

Spch 5613. Explorations Into Argumentation. (4 cr; prereq 1101 or 1313 or #) Schiappa
Argumentation in a variety of contexts: law, science, management, religion, diplomacy, political campaigning, art, informal conversation, and folk literature; surveying issues in collegiate debate and contributions in argumentation theory.

Spch 5615. Introduction to Rhetorical Criticism. (4 cr; prereq 1101; 3601 recommended) Campbell, Schiappa, Scott, Wilson
Traditional and contemporary rhetorical theory; application to contemporary public address.

Spch 5617. History and Criticism of American Public Address. (4 cr; prereq 1101, Psy 1001) Wilson
History and criticism of religious and reform speech in the United States, 1620 to 1920.

Spch 5618. History and Criticism of American Public Address. (4 cr; prereq 1101, Psy 1001) Wilson
History and criticism of political speech in the United States from the Revolution to the present.

Spch 5621. Women’s Rights/Woman Suffrage RHETORIC. (4 cr, §WoSt 5100; prereq 5615 or #) Campbell
History and criticism of the rhetoric of the woman’s rights/woman suffrage movement in the United States, 1835-1926.

Spch 5622. Contemporary Feminist Rhetoric. (4 cr; prereq 5615 or #) Campbell
History and criticism of the rhetoric of the contemporary feminist movement in the United States, 1945-present.
Spch 5625. Issues in Communication Ethics. (4 cr; prereq 3625 or #) Rarick
Exploring ethical issues of interpersonal, small group, public, and mass communication, emphasizing the communicator, the receiver, the message, the medium, the situation, and the effects.

Spch 5970f, w, s, su. Directed Studies. (Cr ar; prereq 9 3xxx-5xxx speech-communication cr, #, Δ, S-N only)
Guided individual reading or study.

Statistics (Stat)

Staff—Director, School of Statistics, Seymour Geisser, 270 Vincent Hall; Chair, Department of Applied Statistics, Douglas Hawkins, 352f Classroom-Office Building; Chair, Department of Theoretical Statistics, Morris L. Eaton, 256 Vincent Hall; Director of Undergraduate Studies, Bernard W. Lindgren, 258 Vincent Hall; Director of Graduate Studies, Glen D. Meeden, 255 Vincent Hall

Professors: Bingham, Chaloner, Cook, Dickey, Eaton, Geisser, Hawkins, Larntz, Lindgren, Louis, Meeden, Oehlert, Sudderth, Tierney, Weisberg

Associate Professors: Geyer, Martin, Pruitt

Assistant Professors: Grund, Posse

Statistics, which deals with the collection, analysis, and interpretation of data, provides a logical framework for using data to draw inferences in scientific studies and for making decisions in industrial, business, and governmental enterprises.

B.A. Major Sequence

Required Preparatory Courses—Calculus through Math 1252

Major Requirements—Math 3251 and 3252, 5890 and either 3011-3012 or 5021

Either 5121-5122 and at least 16 cr chosen from list of electives, or 5131-5132-5133 and at least 12 cr chosen from electives

Electives: To be selected from 5091, 5201, 5271, 5301, 5302, 5401, 5421, 5601, 5911, IEOR 5551; IEOR 5030 or 5040; CSci 31xx; Math 5682-5683; PUBH 5454

Course selections must be approved by the Director of Undergraduate Studies.

Courses satisfying major requirements must be taken A-F. To count toward major requirements, course grades must be C or better.

Minor Sequence

Minor Requirements—Minimum of 15 cr in University statistics courses, including three 5xxx courses

Course selections must be approved by the director of undergraduate studies.

Stat 1001f, w, s. Introduction to Ideas of Statistics. (4 cr; prereq high school higher algebra) Controlled vs. observational studies; presentation and description of data; correlation and causality; sampling, accuracy of estimates; tests.

Stat 3011-3012f, w, s. Statistical Analysis. (4 cr per qtr; prereq college algebra)
Descriptive statistics; elementary probability; estimation; one- and two-sample tests; correlation; regression; ANOVA; randomized blocks; multiple comparisons; factorial experiments; multiple regression; goodness of fit; nonparametric methods; contingency tables; selected topics.

Stat 3091f, w, s. Introduction to Probability and Statistics. (4 cr, §5121, §5131; prereq differential and integral calculus)
Elementary probability and probability distributions, sampling and elements of statistical inference.

Stat 5021f, w, s. Statistical Analysis. (5 cr, §3012; prereq college algebra or #)
Intensive version of 3011-3012; primarily for graduate students needing statistics as a research technique.

Stat 5091. Statistical Methods for Quality Improvement. (4 cr; prereq 3012 or 3091 or 5021 or 5122 or 5132, Math 1252)
Application of statistical concepts of random variability and sampling, statistical process control, Shewhart and accumulative charting, analysis of plant data, applications of trend surface analysis, analysis of variance and design of experiments, quality improvement by reduction of random variability.

Symbols and abbreviations: f.w.s.—fall, winter, spring quarter, summer session / UC—University College (formerly CEE)
Stat 5121f,w-5122w,s. Theory of Statistics. (5 cr per qtr, §§5131-5132-5133; prereq Math 1252)
Univariate and multivariate distributions, law of large numbers, sampling, likelihood methods, estimation and hypothesis testing, regression and analysis of variance, confidence intervals, distribution-free methods.

Stat 5131f-5132w-5133s. Theory of Statistics. (4 cr per qtr, §§5121-5122; prereq Math 3252)
5131: Probability models, univariate and bivariate distributions, independence, basic limit theorems.
5132-5133: Statistical decision theory, sampling, estimation, testing hypotheses, parametric and nonparametric procedures for one-sample and two-sample problems, regression, analysis of variance. Treatment more mathematical than that in 5121-5122.

Stat 5151f-5152w-5153s. Theory of Statistics. (4 cr per qtr, §§5121-5122, §§5131-5132-5133; prereq Math 3311 or Math 3411, admission to graduate study in statistics)
A more in-depth version of Statistics 5131-5132-5133 for graduate students in statistics.

Stat 5161f-5162w-5163s. Applied Statistical Methods. (4 cr per qtr, §§5201, §§5301, §§5302, §§5421; prereq §§5131; admission to graduate study in statistics or #)
5161: Simple and multiple regression; graphics.
5162: Variance reduction designs for experiments; factorial, fractional, and confounded designs; optimal designs; analysis of covariance; unbalanced data analysis.
5163: Advanced topics in linear regression; nonlinear models; generalized linear models; categorical data analysis; logistic regression.

Stat 5201w. Sampling Methodology in Finite Populations. (4 cr; prereq 5021 or 5121 or 5131 or 5091 or #)
Simple random, systematic, stratified, and unequal probability sampling. Ratio and regression estimation. Multistage and cluster sampling.

Stat 5271. Bayesian Decision Making. (4 cr; prereq §§5122 or §§5132)
Axioms for personal probability and utility. Elements of statistical decision theory. Bayesian analysis of linear models.

Stat 5301f,s. Designing Experiments. (5 cr, §§5163; prereq 3012 or 5021 or 5133 or #)
Control of variation, construction, and analysis of complete and incomplete block, split plot, factorial, and groups of similar experiments. Confounding, crossover, and optimum seeking designs.

Stat 5302f,s. Applied Regression Analysis. (5 cr, §§5161; prereq 3012 or 5021 or 5133 or #)
Simple, multiple, and polynomial regression. Estimation, testing, and prediction. Stepwise and other numerical methods; examination of residuals; weighted least squares; nonlinear models; response surface. Experimental research and economic applications.

Stat 5401s. Introduction to Multivariate Methods. (4 cr; prereq 5133 or 5302)

Stat 5421. Analysis of Categorical Data. (4 cr, §§5162; prereq 3012 or 5021 or 5133 or #)

Stat 5601w. Nonparametric Methods. (4 cr; prereq 5021 or 5122 or 5132 or #)
Necessary discrete and continuous probability distributions. Goodness of fit, sign tests, order statistics, rank tests for location and for scale, two-sample and k-sample comparisons, association. Methods and applications.

Stat 5890. Senior Paper. (2 cr; prereq sr statistics major)
Satisfies senior project requirement for majors. Directed study. Paper on specialized area, a consulting project, or original computer program.

Stat 5900. Tutorial Course. (Cr ar; prereq #)
Study in areas not covered by regular offerings. Directed study.

Stat 5911. Topics in Statistics. (3 cr [may be repeated for cr with ∆]; prereq 3091 or 5021, #)
Topics vary.
Institute of Technology

The basic physical sciences and mathematics departments, which are administratively housed in the Institute of Technology, also are part of CLA. Credit for all courses listed in the CLA Bulletin, and all courses approved for the Twin Cities campus liberal education curriculum (see Class Schedule) may be applied toward CLA baccalaureate degrees and toward the CLA residency requirement.

In addition, CLA students may apply toward their degrees up to 28 credits of other colleges’ courses that are not part of the Liberal Education curriculum and do not appear in the CLA Bulletin.

Descriptions of courses offered by the Institute of Technology can be found in the bulletin of that college.

Theatre Arts and Dance

Theatre Arts Staff—Chair, C. Lance Brockman, 204 Middlebrook Hall; Director of Undergraduate Studies, 212 Middlebrook Hall; Director of Graduate Studies, Jean Montgomery, 234 Middlebrook Hall

Professors Emeriti: Adey, Ballet, Congdon, Graham, Josal, Nolte, Thompson, Whiting

Professors: Brockman, Reid

Associate Professors: Barker, Bellamy, Cheng, Gadberry, Gwinup, Kanee, Kobialka, Montgomery, Nash, Norwood

Assistant Professors: Hennum, Houfek, Maddux, Smith

Teaching Specialist: Wagner

Theatre arts is the study of the theories and practices of dramatic performance. Productions of the University Theatre provide a lab for courses. All University students are invited to participate in productions of the University Theatre.

Dance Staff—Director, Maria Cheng, 108 Norris Hall

Associate Professors: Barker, Cheng

Assistant Professors: Maddux, Smith

Affiliated Faculty: Aiken, Buraczeski, Chvala, Corning, Houlton-Gilliland, Gleason, Gordon, Killacky, Mann, Mathis, Sealy, Shaprio, Thompson, Young

The Dance Program offers the Bachelor of Arts and Bachelor of Fine Arts in modern dance. The B.A. degree balances a diversified liberal arts curriculum with general dance studies and requires 70 credits in dance coursework of the 180 needed for an undergraduate degree. The B.F.A. prepares the student for a professional career in modern dance and of the 180 credits needed to graduate, requires 117 in dance performance, creativity, academics and technique. All dance coursework required for either degree must be taken A-F. The general education requirement for both degrees are outlined in the following paragraphs.

Admission to the B.A. or B.F.A. program is by audition only. Admission to all technique classes is by placement audition.

The Dance Program is a member of the National Association of Schools of Dance.

General Education—Theatre Arts—Courses that may be of interest to nonmajors are Th 1101, 1102, 1301, 1405, 1504, 1805, 3115, 3171, 3172, 3173, 5171, 5172, 5173, 5181, 5182.

General Education—Dance—Courses that may be of interest to nonmajors are 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1031, 1032, 1033, 1034, 1035, 1101, 3401, 3402, 3486.

Study Abroad—Theatre arts encourages students to incorporate an overseas study experience into their undergraduate program. Appropriate credits from such study can easily be applied toward the theatre arts major or minor; among the study abroad opportunities is Literature and Theatre in London, which includes an internship option. Credits applied toward a dance major or minor (upon faculty review) may be received from on-site study of distinct dance traditions. Information on study abroad options and procedures is available in the theatre arts advising office. See also Foreign Study.
Theatre Arts

B.A. Major Sequence—Theatre Arts

Required Preparatory Courses—1101, 1321, 1504

Major Requirements—1331, 1341, 3171, 3172, 3173, 3513, 3515, 3711, 3712, 3901

12 cr in other 3xxx-5xxx courses chosen in consultation with adviser

The following order is recommended for completion of the major: Freshman year 1101, 1504, 1321; Sophomore year 1331, 1341, 3171, 3172, 3173; Junior year 3711, 3513, 3515, electives; Senior year 3712, 3901, electives.

Courses in art history, dance, dramatic literature, humanities, music, psychology, and art are recommended.

Minor Sequence—Theatre Arts

Required Preparatory Courses—1101, 1301 or 1321, 1504

Minor Requirements—2 out of 3 courses in Theatre History (3171, 3172, 3173), 3513, 3515, 3711

Th 1101f,w,s. Introduction to the Theatre. (4 cr) Norwood
Theatre appreciation through study of plays, playwrights, and theatre artists. Readings of plays from diverse periods and styles.

Th 1102. Drama and Media. (4 cr) Norwood
Film appreciation through comparative study of drama, theatre art, and cinema. Focus on diverse styles of film art. Lectures and film showings.

Th 1301f,w,s. Beginning Acting for Non-Theatre Majors. (4 cr; prereq 1101)
Background and techniques of the acting process as viewed and practiced in the theatre, in society, and in the student’s own relationships.

Th 1321f,w,s. Beginning Acting. (4 cr; prereq 1101, 1504)
Beginning techniques and exercises leading to performance, monologues and scenes.

Th 1331f,w,s. Beginning Movement for Actors. (2 cr; prereq 1321)
Fundamentals of body movement, relating to acting technique, leading to individual and group performances.

Th 1341f,w,s. Beginning Voice Production. (2 cr; prereq 1321 or §1321)
Exercises to develop abdominal breathing, tonal placement, and clear articulation. Analysis and performance of prose, poetry, and drama.

Th 1405Hs. Honors Course: Introduction to the Theatre. (2 cr; prereq 1101, #)
Enrichment course for students who have completed Th 1101 with outstanding records. Lab.

Th 1502f,w,s. Makeup for the Actor. (2 cr; prereq 1504, clean-shaven face)
Theory and practice in stage makeup.

Th 1504f,w,s. Elements of Technical Theatre. (4 cr; prereq 1101 or §1101)
The arts and crafts of the theatre: scenery, construction and painting, stage operation, theatre lighting, costuming. Lab.

Th 1805. American Ethnic Literature in Performance. (4 cr; offered when feasible)
Individual and group exploration and performance of selected poems, stories, and plays by Afro-American, Native American, and Chicano writers.

Th 3115. Introduction to Playwriting. (4 cr, §EngW 3110; UC only)
Introduction to playwriting techniques.

Th 3171, 3172, 3173. History of the Theatre. (4 cr per qtr; prereq 1101, theatre major) Kobialka
History of Western theatre and drama: theatrical practices, staging conventions and dramatic structure of plays. 3171: Ancient Greece through Renaissance. 3172: Neo-classicism through realism. 3173: Naturalism to present.

Th 3321-3322. Intermediate Acting. (4 cr per qtr; prereq 1331, 1341, theatre major or written #) Houfek, Reid
Integration of beginning acting, voice, and movement progressing to more advanced techniques and exercises in performance of scenes and monologues from modern drama.

Th 3323. Advanced Acting. (4 cr; prereq 3321-3322 or # by audition) Houfek
Integration of internal and external techniques in scenes from the classical repertoire.

Th 3341. Intermediate Voice Production. (2 cr; prereq 1341) Nash
Advanced techniques in breathing, tonal placement, vowel standardization and articulation applied to dramatic texts.

Th 3412Hf,w,s. Honors Course: Tutorial Seminar in Theatre Arts. (3-6 cr [limited to 3 cr for cum laude, magna cum laude; 3 to 6 cr for summa cum laude]; prereq candidate for honors in theatre arts, #)
Independent reading and research in preparing honors thesis or creative project.

Th 3513f,alt su. Technical Theatre Production I. (5 cr; prereq 1504) Brockman, Gwinup
Theory and practice of design and execution of stage scenery and properties. Lab.

Th 3515 s, alt su. Technical Theatre Production II. (5 cr; prereq 1504) Montgomery, staff
Theory and practice in design and execution of stage lighting and costuming. Lab.
Th 3711f,w,s,su. Introduction to Directing. (4 cr; prereq 1101, 1301 or 1321, 1504, major or minor) Kanee, staff
A creative approach to basic stage direction techniques, emphasizing elementary script analysis, rehearsal techniques, improvisation, blocking, and movement.

Th 3712f,w,s. Beginning Stage Direction. (4 cr; prereq 1504, 3711, jr or sr) Bellamy, Kanee
Theory of direction; concept and analysis. Short scene production techniques.

Th 3713. Intermediate Stage Direction. (4 cr; prereq 3712, jr or sr) Bellamy, Kanee
Analysis of scripts, study of dramatic structure, definition and study of genres and styles, discussion of rehearsal techniques and actor coaching. Rehearsal and production of scenes.

Th 3803f,w,s. Platform Performance. (4 cr; prereq management major)
Reading and analyzing selected poems, plays, and stories; interpreting literary insights through solo and group performance.

Th 3901. Theatre Arts/Dance Senior Seminar. (4 cr; prereq sr, theatre arts or dance major) Staff and guest artists
Seminar in contemporary perspectives on performing arts covering major 20th-century styles and forms such as dadaism, surrealism, futurism, expressionism, neo-romanticism, and performance art. Future directions in theatre and dance in the Twin Cities. Meets concurrently with Dnce 3901.

Th 3950. Topics in Theatre. (1-5 cr per qtr [12 cr max])
Independent study projects approved and supervised by a faculty member.

Th 5100f,w,s,su. Theatre Practicum. (1-6 cr per qtr; prereq # & A)
Individual creative projects in production of a play as an actor, designer, dramaturg, or playwright.

Th 5101f,w,s,su. Theatre Performance. (1 cr per qtr [9 cr max] prereq permission after casting and/or assignment to a production; S-N only) Montgomery
Participation in rehearsals and performances of a major University Theatre production. Credit awarded the quarter performance takes place.

Th 5115. Playwriting I. (4 cr; §EngW 5204; prereq written #)
Playwriting workshop for students with established competence.

Th 5116. Playwriting II. (4 cr; §EngW 5310; prereq 5115, written #) Staff or guest artist
Playwriting workshop for students with advanced competence.

Th 5131, 5132, 5133. Shakespeare. (4 cr per qtr; prereq 1101 or #) Norwood
Seminars in Shakespeare’s plays from the perspectives of live theatre, staging in the theatre, and film/television productions. Video clips from selected plays will be examined. 5131: the Comedies and Romances. 5132: the Histories. 5133: the Tragedies.

Th 5171, 5172, 5173. History of Theatre. (4 cr per qtr) Gadberry

Th 5181. Blacks in American Theatre. (4 cr, §Afro 5181) Bellamy
Historical survey of significant events in the development of American Black theatrical tradition; essays, plays, playwrights, and theatres from early colonial references to Black Arts Movement.

Th 5182. Contemporary Black Theatre: 1960-Present. (4 cr, §Afro 5182) Bellamy
Essays, plays, playwrights, and theatres that have contributed to contemporary Black theatre, from beginning of Black Arts Movement to present.

Th 5321. Career Preparation for Actors. (4 cr; prereq 3323 or grad)
Information and techniques necessary for professional acting careers.

Th 5322. Acting for the Camera. (4 cr; prereq 3202 or grad)
Differences between stage acting and acting for camera. Scenes enacted and played back on videotape for class critique. Students operate cameras.

Th 5331, 5332, 5333. Advanced Movement for Actors. (2 cr per qtr; prereq 3323, # by audition or grad) Hennum
Exploration of movement for advanced actors; awareness, flexibility, observation, releasing, mime and mask, improvisation, verbal and nonverbal physical techniques. 5331: Fundamentals. 5332: Intro to mime and mask. 5333: Mime and mask.

Th 5334-5335. Stage Combat. (2 cr per qtr; prereq 3323, # by audition or grad) Hennum
Exploration of advanced movement techniques for the stage with focus on physical life of scenes of a violent nature. 5334: Unarmed combat. 5335: Armed combat.

Th 5341. Shakespearean Text Analysis. (4 cr; prereq 3341, 3321-3322 or grad) Nash
Analysis and performance of Shakespearean text.

Th 5342. Singing for Musical Theatre. (2 cr; prereq 3321-3322, #) Nash
Analysis and performance of songs for musical theatre.
Th 5510. Drawing and Rendering for Theatre Designers. (2 cr; prereq 3513 or 3515 or grad, #) Brockman
Development of drawing and rendering skills necessary for presentation of scene and costume designs. Drawing in fall, rendering in spring.

Th 5511. Theatre Drafting and Graphics. (4 cr; prereq 3513, 3515 or equiv or #) Brockman, Gwinup, Montgomery
Practical study of drafting skills for theatre designer (scenery and lighting) and technical director. Interpretation of rendering, sketches, and models for realization on stage.

Th 5515. Design Composition and Collaboration. (4 cr; prereq 3513 or equiv, #) Brockman, Kanee
In-depth study of classical composition of art and its application to stage design and directing. Emphasis on creative development of good design composition through tools of classical composition and the organic collaborative process.

Th 5520. Scene Design. (4 cr [12 cr max]; prereq 3513, 5511, or #) Brockman
Theory and design of stage scenery. Development of the scenic model and rendering.

Th 5530. Costume Design. (4 cr; prereq 3515 or #)
Theory and design of costumes; special projects. Lab arranged.

Th 5532. Advanced Makeup for the Stage. (2 cr; prereq 1502 or equiv or grad)
Facial casting, prosthetics, and hair ventilating.

Th 5540. Lighting Design. (4 cr [12 cr max]; prereq 3515, 5711, 5511 or #) Montgomery
Theory of stage lighting design. Development of lighting plot and paperwork.

Th 5550. Theatre Sound Design. (2 cr; prereq 1504, 5564 or #) Gwinup
Theory and approaches to analysis and creation of auditory environment for theatrical productions. Listening, psychoacoustics, microphone techniques, script analysis, projects. Lab arranged.

Th 5560. Theatre Crafts Practicum. (1-4 cr per qtr [6 cr max for undergrads]; prereq 3513 and/or 3515, #, #)
Individual creative projects that further practical skills and knowledge in specialized craft areas of theatre.

Th 5561. Stage Craft. (4 cr; prereq 3513, 5511, #) Gwinup
In-depth study and practical application of scenic materials, tools, and construction processes used in theatre today. Lab arranged.

Th 5562. Scene Painting Techniques. (4 cr; prereq 3513 or #) Brockman
Practical study of materials, layout, and painting techniques used in theatre. Emphasizes painting styles and texturing techniques.

Th 5563. Costume/Properties Crafts. (4 cr; prereq 3513 or grad) Gwinup, guest artists
Accessories, fabric enhancement techniques, materials, construction techniques, tools, and processes used in costume and properties crafts.

Th 5564. Lighting and Sound Technology for the Theatre. (2 or 4 cr; prereq 3515 or equiv) Montgomery, Gwinup, guest artists
Lighting and sound technician’s skills and crafts: equipment, techniques, control operation, wiring, and maintenance from practical standpoint in lighting and sound technology. Lab arranged.

Th 5711. Advanced Stage Direction. (4 cr; prereq 3713 or grad or #) Bellamy, Kanee
Dramatic forms. Theory of rehearsal; production challenges and direction of two one-act plays.

Th 5712. Stage Direction of Non-Realistic Theatre. (4 cr; prereq 5711, grad or #) Kanee
Theory, technique and production of 20th century non-realistic theatre from Beckett to Müller; direction of two one-act or extended scenes from the genre.

Th 5716. Stage Management for the Theatre. (4 cr; prereq 3714 or #) Montgomery
Stage management as a specialized area. Theories and techniques of rehearsal and performance, organization and management in educational, community, and professional theatres.

Th 5718. Theatre Management and Promotion. (4 cr; prereq 1504) Wagner
Introduction to the theory, problems, and solutions of administrative planning, budgeting, advertising, and publicity for the not-for-profit theatre.

Th 5720f, w, s. Plays in Production and Performance. (2-4 cr per qtr [6 cr max for undergrads]; prereq 5712, #, #) Kanee, staff
Work in the field with a community, high school, touring or professional theatre group, or on campus to further develop expertise as a stage director.

Practical analysis of audience and financial development problems in U.S. theatre. Concentration on various solutions.

Th 5760f, w, s. Advanced Stage Management. (1-3 cr per qtr [6 cr max for undergrads]; prereq 5716 or #; #) Montgomery
Practical experience in stage management for University Theatre productions; rehearsal and performance.

Th 5920-5950. Topics in Theatre. (1-5 cr per qtr [12 cr max])
Topics and instructors specified in Class Schedule.

Th 5970f, w, s, su. Directed Studies. (1-6 cr per qtr; prereq 9 cr theatre, #, #)
Guided individual reading or study.
Dance

**B.A. Major Sequence—Dance**

**Major Requirements**—1101, 3010f, 3020w, 3030s, 3311f, 3312w, 3313s, 3401, 3402, 3511, 3666, 3901

6 cr to be selected from 3700 or 5700

4 cr in 1110 or 3330

6 cr in technique electives

16 cr in dance related academic electives

**B.F.A. Major Sequence—Dance**

**Major Requirements**—1101, 3333, 3010f, 3020w, 3030s, 3040f, 3050w, 3060s, 3070f, 3080w, 3090s, 3311f, 3312w, 3313s, 3401, 3402, 3511, 3666, 3901, 5010f, 5020w, 5030s, 5312f, 5131w, 5314s, 5616

7 cr from 1110 or 3330

18 cr to be selected from 3700 or 5700

4 cr in Topics: Dance Production

8 cr in dance related academic electives and visual arts

7 cr in technique electives

**Minor Sequence—Dance**

**Minor Requirements**—1101f, 1010f, 1020w, 1030s, 3311f, 3312w, 3313s, 3401, 3402; 9 additional cr to be chosen at or above 3xxx courses

**Dnce 1001-1002-1003. Fundamental Modern I-II-III.** (1 cr per qtr; prereq audition or Δ for 1002, # or Δ for 1002 for 1003)

Introductory application of basic principles of expressive body movement: alignment, proprioceptiveness, body mechanics, weight, momentum, line, intent.

**Dnce 1004-1005-1006. Fundamental Ballet I-II-III.** (1 cr per qtr; prereq audition or Δ for 1004 for 1005, # or Δ for 1005 for 1006) 

Gilliland

Introduction to principles and basic technique and vocabulary of ballet; work consists of barre, center and allegro.

**Dnce 1007-1008-1009. Fundamental Jazz I-II-II.** (1 cr per qtr [2 cr max each]; prereq audition or Δ for 1007; # or Δ for 1007 for 1008, # or Δ for 1008 for 1009)

Introduction to basic jazz technique.

**Dnce 1010-1020-1030. Beginning Modern I-II-III.** (2 cr per qtr [4 cr max each]; prereq audition or Δ for 1010, # or Δ or 1010 for 1020, # or Δ or 1020 for 1030) Cheng

Continuation of physical training with introduction of theory of space, time and energy. Specific emphasis on correct placement, power from pelvic center, rotation/turmoil, muscular tonality, articulation of joints, clarity of intent, physical stretch, strength and stamina.

**Dnce 1031-1032-1033. Ballroom I-II-III.** (1 cr per qtr; prereq 1031 for 1032, 1032 for 1033) Sealy

Elementary steps of the fox trot, waltz, swing, cha-cha, and rumba, with introduction of principles of partnering. Second quarter will focus on more advanced patterns and introduce the tango and samba. Third quarter will introduce the mamba and bolero with additional work on partnering, style and phrasing.

**Dnce 1034-1035. International Folk I-II.** (1 cr per qtr) Maddux

Introduction to basic folk steps including the schottische, polka, waltz and grapevine, technical emphasis on footwork and partnering.

**Dnce 1040-1050-1060. Beginning Ballet I-II-III.** (2 cr per qtr [4 cr max each]; prereq audition or Δ for 1040, # or Δ or 1040 for 1050, # or Δ or 1050 for 1060) Mathis

Continuation of fundamental training with added emphasis on correct placement, line and historical development; barre, center and allegro work of greater complexity.

**Dnce 1070-1080-1090. Beginning Jazz I-II-III.** (1 cr per qtr [2 cr max each]; prereq audition or Δ for 1070, # or Δ or 1070 for 1080, # or Δ or 1080 for 1090) Sealy

Continuing basic jazz technique with emphasis on body isolations, placement and musicality.

**Dnce 1101. Introduction to Dance.** (4 cr) Barker

Survey of the history and theory of dance in all its forms and all its aspects.

**Dnce 1110. Topics in Dance Theory.** (1-2 cr)

Topics specified in Class Schedule.

**Dnce 3010-3020-3030. Intermediate Modern I-II-III.** (2 cr per qtr [4 cr max each]; prereq audition or Δ for 3010, # or Δ or 3010 for 3020, # or Δ or 3020 for 3030) Smith

Expansion of movement vocabulary and physical range. Intensive work on articulation of spine, feet, legs and arms; greater speed, amplitude, power; longer dance phrases; more complex turns, balances, elevations.
Dnce 3040-3050-3060. Intermediate Ballet I-II-III. (2 cr per qtr [4 cr max each]; prereq audition or ∆ for 3040, # or ∆ or 3040 for 3050, # or ∆ or 3050 for 3060) Gilliland
Continuation of beginning technique with additional emphasis on stretch, strength, balance and musicality; longer phrases in adagio and allegro work; more complex elevations in petit allegro; practical work is conducted in context of study of technical development of ballet.

Dnce 3070-3080-3090. Intermediate Jazz I-II-III. (1 cr per qtr [2 cr max each]; prereq audition or ∆ for 3070, # or ∆ or 3070 for 3080, # or ∆ or 3080 for 3090) Young
Continuation of beginning jazz technique with development of more complicated rhythm structures, longer phrases and greater physical speed, attack and control.

Dnce 3311-3312-3313. Composition I-II-III. (2 cr for 3311, 3 cr for 3312, 3313; prereq 1030 or # or ∆ for 3311, # or ∆ or 3311 for 3312, # or ∆ or 3312 for 3313) Cheng
Exploration of movement vocabulary in relation to theme, space, time, energy and body parts; introductory work on solo, duet and trio forms.

Dnce 3330. Topics in Dance Theory. (1-2 cr; prereq 1030)
Topics specified in Class Schedule.

Dnce 3333. The Articulate Body: Kinesiology and Biodynamics of Dance. (4 cr; prereq dance major or minor, #) Gleason
Lectures and movement sessions in biodynamic considerations for optimal dance performance and metabolic demands of dance.

Dnce 3401. Dance History I. (4 cr; prereq 1101)
Human expression from its mystical and ritualistic functions in dance to a development toward dance as a theatre art beginning with primitive society to the Renaissance.

Dnce 3402. Dance History II. (4 cr; prereq 1101) Barker
Major theatre dance works; dancers and choreographers from the Renaissance to the present.

Dnce 3486. Ethnic Dance Traditions in American Society. (4 cr) Maddux
Survey of traditional dances as preserved and transformed by Native Americans, Afro-Americans, Latinos, Asian-Americans and Euro-Americans. Emphasis on interpretation of the roles in these cultures.

Dnce 3511. Music for Dance. (4 cr; prereq 1003, 1006 or equiv) Gordon
Elements of music theory, form, analysis, and history necessary for the dancer and choreographer.

Dnce 3666. Dance Philosophy and Esthetics. (4 cr; prereq 3401, 3402) Barker
Major developments in Western philosophic thought on dance and dance theory from its beginnings to present.

Dnce 3700. Dance Repertory Theatre and Reconstruction. (3 cr; prereq must be enrolled in a technique class, audition) Shapiro, Smith
Construction of a dance theatre work under the direction of a guest choreographer. Credit awarded the quarter performance takes place.

Dnce 3901. Theatre Arts/Dance Senior Seminar. (4 cr; meets with Th 3901; prereq sr standing in theatre arts or dance) Cheng, Killacky
Contemporary perspectives on performing arts covering major 20th-century styles and forms such as Dadaism, surrealism, futurism, Expressionism, Neo-Romanticism, and performance art. Future directions in theatre and dance as manifested in Twin Cities productions. Meets concurrently with Th 3901.

Dnce 5010-5020-5030. Advanced Modern I-II-III. (3 cr per qtr [9 cr max each]; prereq audition or ∆ for 5010, # or ∆ or 5010 for 5020, # or ∆ or 5020 for 5030) Cowles, guest artists
Continuation of technical development with emphasis on performance range and style. Students study with 5-6 guest artists of renown with disparate aesthetics and technical styles.

Dnce 5040-5050-5060. Advanced Ballet I-II-III. (2 cr per qtr [6 cr max each]; prereq audition or ∆ for 5040, # or ∆ or 5040 for 5050, # or ∆ or 5050 for 5060) Mathis
Continuation of intermediate technique with additional emphasis on musicality, performance, and stylistic differences. Practical work is conducted within context of study of choreographic and aesthetic development of ballet.

Dnce 5070-5080-5090. Advanced Jazz I-II-III. (1 cr per qtr [3 cr max each]; prereq audition or ∆ for 5070, # or ∆ or 5070 for 5080, # or ∆ or 5080 for 5090) Buraczeski, Sealy
Continuation of intermediate jazz technique with additional work on syncopation, performance projection and specific jazz styles: swing, bebop, lyrical, funk, Latin.

Dnce 5100. Dance Practicum. (1-6 cr; prereq #, ∆)
Arranged individual creative projects in dance.

Dnce 5312-5313-5314. Composition IV-V-VI. (3 cr per qtr; prereq ∆ or 3313 for 5312, ∆ or 5312 for 5313, ∆ or 5313 for 5314) Smith
Continuation of exploration of movement vocabulary through improvisation, analysis of form and structure, experimentation with tone and performance persona, exploration of effects of lights/costumes/text/props/music, development of larger ensemble works.

Dnce 5487. World Dance Studies. (4 cr) Maddux
Study of dance as art, ritual, social activity and entertainment in selected cultures of Asia, Africa, the Americas and Eastern Europe. Comparative analysis from historical, visual and ethnological perspective.

Dnce 5616. Teaching Modern Dance. (4 cr; prereq # or ∆ and intermediate level competency in modern) Maddux
Study and practice of principles and methods of dance pedagogy.
Dnce 5700. Dance Performance. (3 cr; must be enrolled in a technique class, audition) Shapiro, Smith
Performance of dance technique work constructed by faculty and guest choreographer.

Dnce 5910. Topics in Dance: Choreographic Workshop. (3 cr; prereq #)
Creation of a dance under supervision of faculty member.

Turkish
See Institute of Linguistics and Asian and Slavic Languages and Literatures.

Urban Studies (UrbS)

Staff—Director, Judith Martin, 348 Social Sciences Building

Adjunct Faculty—Professors: J. Adams (Geography and Humphrey Institute), Berman (History), Clemente (Architecture), Galaskiewicz (Sociology), Scott (Political Science), Sheppard (Geography), Wattenberg (Social Work)

Associate Professors: Archer (Cultural Studies and Comparative Literature), Brewer (Afro-American Studies), Goetz (Housing), Leitner (Geography), Miller (Geography)

This cross-disciplinary major involves urban studies coursework, fieldwork experiences, and introductory work in a number of disciplines that offer useful perspectives on contemporary urban and postindustrial society. Two degree options are offered. They focus on the conceptual and analytical frameworks and specialized skills necessary to enter professions focused on urban change or development in public agencies or private business or to undertake graduate study in urban planning, law, social welfare, public affairs, or the social and environmental sciences. The urban studies advising office offers students help in choosing a degree plan and provides current information about courses, research, and fieldwork opportunities.

Overseas and U.S. Off-Campus Study—
Students are encouraged to incorporate field study into the major or minor. Among the relevant options are HECUA-sponsored urban studies programs in Colombia, Norway, and the Twin Cities. In addition, many opportunities exist for internships and independent field research projects. See also Foreign Study.

B.A. and B.S. Degree Programs

You may choose one of two urban studies degree options, depending on your career plans. Both the B.A. and the B.S. require coursework focusing on urban form and society, with additional credits from areas such as cultural analysis and political economy and infrastructure. Both degrees also require an internship and a senior paper. The B.S. requires substantive quantitative skills coursework. Depending on the degree track chosen, the required number of major program credits ranges from 56 to 68.

Although you will develop an individual major program, all students will complete certain courses within the program: an introductory course, two urban studies colloquia, and two workshops. The Urban Studies Program Booklet, available from the department, contains a listing of required and recommended courses for each of the degree options as well as urban-related course offerings in other University departments that can be used to fulfill various urban studies requirements.

Minor Sequence

Minor Requirements—19-21 cr, including 3104, 3500, 3101 or 3102 or 3103, electives

UrbS 3101f, 3102w, 3103s. Urban Studies Colloquia. (2 cr per qtr; prereq A)
Introduction to urban problems and problem-solving techniques.

UrbS 3104. Introduction to Urban Studies. (4 cr; prereq # A-F only) Martin
Introduction to the field for urban studies sophomores and those considering an urban studies major. Lectures and discussions to integrate the diverse aspects of urban studies.

UrbS 3301. American Cities: Settings for Cultural Pluralism. (4 cr; prereq #)
Exploration of the potential that U.S. cities hold for nurturing cultural pluralism. Explores the problems, conflicts, and successes of pluralistic efforts in our cities.
UrbS 3500f,w,s. Workshops. (4 cr per qtr; prereq jr or sr, #)
Project-focused workshops, usually with substantial field experience components.

UrbS 3900f,w,s. Internship. (1-6 cr per qtr [12 cr max]; prereq jr or sr, ∆)
Internships arranged for any quarter or summer term. A weekly seminar to integrate the internship experience with the academic program should be taken during the internship.

UrbS 3970. Directed Studies. (2-6 cr; prereq ∆)
Guided individual reading or study.

Wolof
See Afro-American and African Studies.

Women’s Studies (WoSt)

Staff—Chair, Jacquelyn Zita, 492 Ford Hall; Director of Undergraduate Studies, Naomi Scheman, 483 Ford Hall; Director of Graduate Studies, Helen Longino, 326 Ford Hall

Professors: Faunce (Women’s Studies, Psychology), Kaminsky (Women’s Studies), Longino (Women’s Studies), McNaron (English, Women’s Studies), Scheman (Philosophy, Women’s Studies)

Associate Professors: Geiger (Women’s Studies), Reyes (Women’s Studies), Zita (Women’s Studies)

Adjunct Faculty

Professors: Bridwell-Bowles (English), Campbell (Speech-Communication), S. Evans (History), Fellows (Law School), Garner (English), Joeres (German, Scandinavian, and Dutch), Junghare (South Asian and Middle Eastern Studies), Laslett (Sociology), Loeffler (University Counseling Services), E. May (American Studies), Maynes (History), Miner (English), Noakes (French and Italian), Quam (Social Work), Robinson (Architecture), Wahlstrom (Rhetoric)

Associate Professors: Albrecht (General College), Brewer (Afro-American and African Studies, Women’s Studies), Damon (English), Jones (Social Work), Kane (Kinesiology), Kenney (Humphrey Institute), Messer-Davidow (English), O’Connell (Spanish and Portuguese), Prell (American Studies), Rabinowitz (English), Schiappa (Speech-Communication), Sheldon (Speech-Communication), Sivert (French and Italian), Sullivan (Spanish and Portuguese), Turner (Educational Policy and Administration), Waltner (History)

Assistant Professors: Disch (Political Science), Norling (History), Pierce (Sociology)

Lecturers: Barceló, Katz, Knutson, D. Marquit, Ringdahl, Rubright, Woford

Visiting Professor: Schissler (German, Scandinavian, and Dutch, History)

The Women’s Studies Department addresses the University community’s need to develop feminist perspectives through multidisciplinary and multicultural approaches to the study of women.

The quarterly Class Schedule gives information about topics courses and new courses. A Course Guide describing each year’s courses is available from the director of undergraduate studies, 483 Ford Hall. All Women’s Studies courses except 3901, 3902, and 3960 may be taken through UC.

Honors Program—Qualified majors are encouraged to participate in the department’s honors program. The program is flexible in meeting student needs and offers courses with Honors credit.

Overseas and U.S. Off-Campus Study—Students are encouraged to incorporate field or overseas classroom study into their program. Study in another country can enhance comparative understanding of women’s issues. For information, consult the Director of Undergraduate Studies, 483 Ford Hall; see also Foreign Study.

B.A. Major Sequences

Required Preparatory Courses—1001 and 3002 or 3003

Major Requirements—48 cr in advisor-approved courses, including 3102, 5101, a 3xx or 5xx course that focuses on women and U.S. cultural diversity, a 5xx course from an approved list of theoretically focused courses, 3901, and either 3902 or 3960.

Majors may take a maximum of 12 cr in Topics courses (3100, 5100, 3200, 5200, 3300, 5300, 3400, 5400, 3500, 5500, 3600, 5600).

Prospective majors should consult the Women’s Studies Handbook. The handbook and other useful resources may be obtained from the Women’s Studies office.
Minor Sequence

Required Preparatory Courses—1001

Minor Requirements—Minimum of 20

3xxx–5xxx cr

Course selections must be approved by a Women’s Studies adviser.

Introductions to Women’s Studies

WoSt 1001. Introduction to Women’s Studies. (4 cr)
Introduction to the study and analysis of the current and rapidly changing conditions of women in the world; includes U.S. multicultural and international perspectives, but mostly focused on the experiences and histories of women in the Western world.

WoSt 3002 (formerly 1002). Women and U.S. Multicultural Studies. (4 cr)
Focus on women in one or two (possibly three) U.S. minority and ethnic cultures. Experiences, literatures, artistic productions, and economic, political, and social contributions developed by U.S. women of color.

WoSt 3003 (formerly 1003). Women in World Cultures. (4 cr)
The lives of women in non-Western societies, including their economic, political, and social contributions, familial roles, and status in society.

Feminist Thought, Theory, and Methods

WoSt 3100. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 3102. Feminist Thought and Theory. (4 cr)
Representative feminist theories and their relation to social and political action.

WoSt 3103. Feminist Approaches to History. (4 cr)
A comparative look at issues and problems in the study of women’s history. Theoretical approaches, documents, and sources (written, oral, statistical) for understanding women’s experience.

WoSt 3104. Feminist Expository Writing. (4 cr, §Comp 3051; prereq completion of writing practice requirement, jr)
Stages of composing process; similarities and differences between feminist and traditional expository language and structure; improves skills for analytical and critical thinkers.

WoSt 5100. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 5101. History of Western Feminism. (4 cr; prereq 1001, 3002 or 3003)
Feminist thought and movements; feminist politics since 1790, especially in the United States and Great Britain; other international references.

WoSt 5103. Feminist Pedagogies. (4 cr; prereq 8 cr women’s studies or #)
Theory and practice of feminist teaching and learning as a system of inquiry. Emphasizes challenges raised by the diversity of women’s experiences and perspectives.

WoSt 5106. The Cultural Construction of Sex, Gender, and Sexuality. (4 cr; prereq 12 cr women’s studies for undergrad or CAFS student or #)
Investigation of Euro-American concepts of sex, gender, and sexuality in representative texts and images from the 17th century to the present. Critical and source materials from literary and cultural studies, history, biology, anthropology, psychology, and sociology.

WoSt 5107. Feminist Criticism of Concepts of the Self. (4 cr; prereq 12 cr women’s studies or substantial work in phil or religious studies or soc sci or psych or #)
Traditional views and feminist alternatives concerning the self and related notions, such as human nature, individualism, and transcendence, as expressed in philosophy, religion, morality, politics, art, and psychology.

Women’s Biology, Psychology, and Sexuality

WoSt 3200. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 3202. BIOLOGY OF WOMEN. (4 cr)
Physiology, anatomy, and endocrine aspects of women’s life cycles.

WoSt 3203. Biology, Race, and Gender. (4 cr; prereq 3202 or #)
Critical study of biological methods and theories used to explain and justify the social relations of race and gender.

WoSt 3204. Sexuality and Self-Image. (4 cr; prereq 1001, 3002 or 3003 or #)
Social attitudes toward sexuality and how they influence our sense of self. Focus on art, pornography, sexual violence, psychosexual development, sexual identity, and political economy.
MAJOR REQUIREMENTS AND COURSE DESCRIPTIONS

WoSt 3205. Woman: A Sense of Identity. (4 cr, §5205; UC only)
Sex roles (social expectations, personal values, and personal behaviors). Applications of success analysis, strength identification, communication training, goal setting, and behavior rehearsal to affirm and develop the potential of women.

WoSt 3206. Women and Madness in History and Literature. (4 cr, §5206; prereq 4 cr women's studies or #)
Forum for discussion of prescriptive application of label of “madness” to women since the 19th century. Literature, case studies, and critical and theoretical texts.

WoSt 5200. Topics in Women's Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 5201. The Older Woman: A Feminist Perspective. (4 cr; prereq 12 cr women's studies or substantial work in soc sci or psych or #)
Changing roles of older women in our society and problems unique to them, including societal, health, economic, familial, emotional, sexual, and political concerns.

WoSt 5202. Feminist Therapies. (4 cr)
Sexism in theoretical views of women and therapy; emerging views of alternative therapeutic approaches for women. Resources include feminist behavioral/social sciences research and literature; biographies, essays, and cases regarding women’s lives; community resource persons.

WoSt 5203. Women, Feminism, and Power. (4 cr; prereq 12 cr women's studies or #)
Exploration and development of feminist conceptualizations of power, including personal power, empowerment, spirituality, networking, civil disobedience, holism, and utopias.

WoSt 5205. Woman: A Sense of Identity. (4 cr, §3205; UC only)
For description, see WoSt 3205.

WoSt 5206. Women and Madness in History and Literature. (4 cr, §3206; prereq jr)
For description, see WoSt 3206.

Women in Literature and the Arts

WoSt 3300. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 3303. Women and Literature. (4 cr; prereq intro work in literature)
Women as authors, characters, and readers with focus on “classic” texts. Attention to culturally diverse literary traditions. Introduction to feminist literary criticism.

WoSt 3304. Women and the Arts. (4 cr; prereq intro work in music or art or drama or dance or film or other arts)
Works of art by or about women. Focus may be on one or more of several forms of artistic expression.

WoSt 3305. Women and Language. (4 cr)
Women’s use of language, sexism in language, contrast of usage and patterns of verbal and nonverbal language by women and men, feminist critiques of language, and evaluations of proposals for language reforms or radical linguistic change.

WoSt 3306. U. S. Minority Women Writers. (4 cr; prereq 8 cr women's studies or [4 cr women's studies, 4 cr literature or American studies or Chicano studies or Afro-American studies or American Indian studies])
Analysis of poetry, fiction, and drama written by minority women in the United States.

WoSt 3307. Modern Feminist Novel. (4 cr; prereq intro work in literature)
Analysis of fiction written by women that addresses questions of women’s identity and the diversity of women’s experience.

WoSt 3308/H. Women Writers of Africa and Latin America. (4 cr, §5308; prereq 8 cr women's studies and/or Latin American studies or Afro-American studies or #)
Novels, short stories, poetry, and/or drama by contemporary African and Latin American women in the context of gender analysis and the history of colonialism.

WoSt 3309. Contemporary Women's Short Fiction. (4 cr; prereq intro work in literature)
Short fiction of contemporary women (written in English or in English translation). Authors such as Atwood, Cisneros, Erdrich, Gordimer, Lessing, Walker. Changing forms of the short story, primarily 20th century; popular “genre” fiction; role of independent presses in broadening literary canon.

WoSt 5300. Topics in Women's Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 5301/H. Women's Autobiographical Narratives. (4 cr; prereq 12 cr women’s studies or literature or #)
Women’s autobiographical narratives from various theoretical, cultural, stylistic, and postcolonial feminist perspectives. Texts include autobiographical essays, letters, diaries, journals, formal autobiographies, and life stories.

WoSt 5308/H. Women Writers of Africa and Latin America. (4 cr, §3308; prereq 8 cr women's studies and/or Latin American studies or Afro-American studies or #)
See WoSt 3308 for description.

Comparative Study of Women

WoSt 3400. Topics in Women's Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.
WoSt 3403. Jewish Women in the United States. (4 cr)
Analysis of the cultural, social, economic, and religious conditions of European Jewry and American society in the 19th and 20th centuries that have structured the lives of American Jewish women; documentation of their perspectives on that process.

WoSt 3404. Lesbian Cultures. (4 cr; prereq 8 cr women’s studies)
Theoretical and historical readings combined with literature, music, and art; emphasis placed on diverse contexts within which lesbian cultures exist.

WoSt 3405. Latin American Women’s Lives. (4 cr; prereq 1001, 3002 or 3003 or LA 3131 or #)
Interdisciplinary study of women in a variety of Latin American countries; focuses on issues of race, sexuality, education, class, and ethnicity.

WoSt 3406. Women, Race, and Class in the U.S. (4 cr; prereq 1001, 3002 or 3003 or major or #)
In-depth historical analysis of social constructions of race, class, and gender. Examination of racism, class bias, and sexism as systems of oppression that relate to anti-Semitism and heterosexism.

WoSt 5400. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 5401. Women, Colonialism, and Underdevelopment. (4 cr)
Impact of colonial domination and economic underdevelopment on Third World women’s lives; strategies employed by women to resist, survive, and overcome oppressive conditions.

WoSt 5402. Women and Contemporary American Spirituality. (4 cr; prereq 8 cr women’s studies or grad or #)
Present-day American women’s spiritual consciousness and participation in religious institutions and religious movements. New forms of women’s spiritual/religious knowledge and beliefs, quests, and expressions of them; their history and sources.

WoSt 5501. Women and the Law. (4 cr)
The legal system as it relates to women. Areas of criminal law, welfare law, employment law, corporate law, alternative delivery systems for legal service, and legal education.

WoSt 5502. Women and Public Policy. (4 cr; prereq 1001, 3002 or 3003 or #)
A survey of public policy issues of special concern to women in the United States.

Women and Work
WoSt 3600. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 5600. Topics in Women’s Studies. (4 cr per qtr [12 cr max])
Topics specified in Class Schedule.

WoSt 5601. Gender and Class. (4 cr; prereq 1001, 3002 or 3003 or 12 cr women’s studies)
Interactions between gender roles and social class in a historical and comparative perspective; course topics introduce concepts and methods of gender and class analysis, women’s work and economic systems, domestic work, social reproduction, feminism, and socialism.

WoSt 5602. Working Class Women’s Lives. (4 cr; prereq 12 cr women’s studies or #)
Social, historical, economic, and ideological influences/effects of women’s participation in wage labor. Multidisciplinary study of impact of class, race, ethnicity, and gender on employment issues; protective legislation, job segregation, comparable worth, trade unions; women’s experiences in the workplace, child-rearing, and family life.

Senior Seminars (required for Women’s Studies majors)
WoSt 3901/H. Senior Seminar: Feminist Research Methods. (4 cr; prereq jr or sr WoSt major, , priority given to graduating srs)
Developing library research, critical thinking, and data collection skills for senior project. Internet research skills, oral history and focus group methods, and strategies for reviewing and organizing scientific literature.

WoSt 3902/H. Senior Seminar: Writing the Senior Project. (4 cr; prereq WoSt 3901, jr or sr WoSt major, , priority given to graduating srs)
Writing seminar for senior research projects.
Directed Study, Research, and Internship Courses

WoSt 3960. Field Learning in Women's Studies. (4 cr per qtr [8 cr max]; prereq 1001, 3002 or 3003, one additional 3xxx WoSt course, Δ)
A seminar that includes internship placement with agencies and organizations that serve women or deal with issues of concern to women.

WoSt 3970. Directed Studies. (1-15 cr per qtr; prereq #, Δ)
Individualized reading or study with faculty supervisor.

WoSt 3980. Directed Instruction. (1-5 cr per qtr; prereq #, Δ)
Undergraduates serve as teaching assistants.

WoSt 5970. Directed Studies. (1-5 cr per qtr [12 cr max]; prereq #, Δ)
For description, see WoSt 3970.

Zoology

Courses in zoology may be found in the listings of the Department of Ecology, Evolution, and Behavior and the Department of Genetics and Cell Biology.