LING 830  SYNTAX III
3
In-depth investigation of syntactic universals and recent developments in the
theory of syntax.
PREREQ: LING630.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 831  TOPICS IN SYNTAX
3
Current topics in syntactic theory, problems in the syntactic analysis of
specific languages.
PREREQ: LING830.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 848  SEMINAR IN LANGUAGE DEVELOPMENT
3
See EDUC848 for course description.

LING 850  LINGUISTICS AND WRITING
3
Survey of writing systems. Problems of text structure.

LING 851  LINGUISTIC FIELD METHODS
3
Development of skills and techniques in various kinds of field analysis. Use
of native informants. Discussion of the relationship between data collecting
and grammatical statement.

LING 853  TOPICS IN THE STRUCTURE OF CHINESE
3
Formal analysis of selected aspects of the grammar of Chinese and related
dialects. Topics may include phonology, morphology, syntax and semantics.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 854  TOPICS IN THE STRUCTURE OF FRENCH
3
Formal analysis of selected aspects of the grammar of French and related
dialects. Topics may include phonology, morphology, syntax and semantics.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 855  TOPICS IN THE STRUCTURE OF GERMAN
3
Formal analysis of selected aspects of the grammar of German and related
dialects. Topics may include phonology, morphology, syntax and semantics.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 856  TOPICS IN THE STRUCTURE OF ITALIAN
3
Formal analysis of selected aspects of the grammar of Italian and related
dialects. Topics may include phonology, morphology, syntax and semantics.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 857  TOPICS IN THE STRUCTURE OF JAPANESE
3
Formal analysis of selected aspects of the grammar of Japanese and related
dialects. Topics may include phonology, morphology, syntax and semantics.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 861  TOPICS IN PHONOLOGY
3
Detailed examination of one or more current (controversial) issues in
phonological theory.
PREREQ: LING610.
REQUIREMENTS: May be repeated for credit when topics vary.

LING 862  ACQUISITION OF PHONOLOGY
3
Development of phonology in normal children from babbling stage through
acquisition of phonemes and basic phonological rules of a language.
Examination of data from a variety of languages, focusing on language specific
and universal phenomena.
PREREQ: LING610.

LING 865  PROJECTS IN ACOUSTIC PHONETICS
3
Brief review of the articulatory, acoustic, and perceptual characteristics of
speech and computer-based laboratory instrumentation. Students conduct
research projects in acoustic phonetics, speech analysis, or speech synthesis.
Projects will be suggested by the instructor, however, students may (with
instructor’s approval) choose a project of their own design.

LING 880  SECOND LANGUAGE ACQUISITION
3
A detailed analysis of current issues in second language acquisition based on
extensive readings of research findings. Topics include monitor model,
pidginization process, natural versus formal second language acquisition, and
adult-versus-child acquisition.

LING 890  STUDIES IN LINGUISTICS
3
Varying topics in linguistics, such as grammatical theory, grammatical analysis,
syntax, historical-comparative linguistics, stylistics and grammar testing.
May be cross-listed with COSC890 and/or ENGL890.

LING 964  PRE-CANDIDACY STUDY
3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying
examinations for any candidate students before admission to candidacy but after
completion of all required course work.
REQUIREMENTS: Not open to students who have been admitted to candidacy.

LING 969  DOCTORAL DISSERTATION
1-12 PF

MAJOR STUDIES

MAST 200  THE OCEANS
3
Integrates physical, chemical, geological and biological principles into an
overview that addresses why and how the oceans work. Draws heavily on
current ocean issues to illustrate processes and problems.
REQUIREMENTS: Open only to non-science majors or with permission from
instructor.

MAST 314  COMPARATIVE TERRITORIAL AND MARINE ECOLOGY
3
See ENWC314 for course description.

MAST 366  INDEPENDENT STUDY
1-6

MAST 464  MARINE SCIENCE SUMMER INTERNSHIP
1-3
Students design a research project with an advisor and present it to peers,
advisors and course instructor.

MAST 466  INDEPENDENT STUDY
1-3

MAST 468  UNDERGRADUATE RESEARCH
1-6

MAST 482  INTRODUCTION TO OCEAN SCIENCES
3
A quantitative introduction to the ocean world including geography,
geophysics, chemistry of water and sediments, physics of ocean circulation
and waves and tides, description of oceanic and nearshore environments, and
biology of the sea.
REQUIREMENTS: May be repeated for credit when topics vary.

MAST 601  INTRODUCTION TO OCEANOGRAPHY
3
Topics include the geology and history of the ocean floor, oceanic sediments,
the physics of the marine environment and the oceanic circulation, chemical
processes in the ocean, and biological processes and production in the oceans.
REQUIREMENTS: For non-oceanographers. Requires graduate status.

MAST 602  PHYSICAL OCEANOGRAPHY
3
Geographic and hydrodynamic aspects of oceanography. The geography of
ocean basins, physical properties of seawater, radiation, and observed
distributions of temperature, salinity, oxygen and currents. Scalar and vector fields;
hydrostatics, kinematics, momentum dynamics, vority dynamics, viscous flow
and eddy flux.
REQUIREMENTS: Requires permission of instructor.

MAST 603  INTRODUCTION TO MARINE AND AQUATIC EDUCATION
3
Water environments and associated marine and aquatic curricula are highlighted
through inquiry learning, lecture and field trips. Emphasizes the
integration of science, math, language arts, history and exploratories in
development of thematic curricula. For inservice educators.
REQUIREMENTS: Inservice educators only.

MAST 604  ENVIRONMENTAL DATA MANAGEMENT
1
Emphasizes the use of remotely sensed data for research and
management of coastal resources. Environmental issues and data requirements
are discussed. Case studies illustrate the use of Geographic Information
Systems for integrating remotely sensed imagery with ancillary data to address
coastal environmental problems.
REQUIREMENTS: Requires approval of instructor.

MAST 605  TOPICS: MARINE SCIENCE EDUCATION
1-4
Stimulates Delaware teachers into incorporating integrated marine sciences into
their classroom teaching.

MAST 606  OCEAN AND ATMOSPHERE REMOTE SENSING
3
Fundamentals of ocean and atmosphere remote sensing including space
platforms, their orbits, instruments, data retrieval and image processing
methods. Oceanographic and atmospheric applications of remote sensing and
new developments in sensors and data analyses.

MAST 607  WRITING PAPERS IN THE MARINE SCIENCES
3
The process and mechanics of publishing scientific papers in marine journals.
Covers organizing data in tables and figures; mechanics of drawing up
coherent story; and strategies and techniques used in effective writing.

MAST 615  INTRODUCTION TO MARINE BIOLOGY
3
Involves laboratory, field and lecture study for a broad understanding of
marine biology and biochemistry.
REQUIREMENTS: For non-biologically oriented marine studies graduate students.
MAST 616  METHODS IN MOLECULAR BIOLOGY 3
Conceptual experience in molecular biological techniques with an emphasis on their application to marine related problems. Topics include: nucleic acid extractions, cloning, gene amplification and characterization, and expression methodologies.
PREREQ: MAST634

MAST 617  METHODS IN MOLECULAR BIOLOGY LABORATORY 3
Provides practical experience in molecular biological techniques with emphasis on applications to marine related problems
COREQ: MAST616

MAST 618  MARINE MICROBIAL ECOSYSTEMS 3
Examines the role of microbes in the oceans and their impact on oceanographic processes and biogeochemical cycles in marine environments. Emphasis is on bacteria and their interactions with other marine organisms. Introduces use of molecular tools to examine uncultivated microbes
RESTRICTIONS: Requires permission of instructor

MAST 620  ENERGY POLICY AND ADMINISTRATION 3
See POSC624 for course description.

MAST 621  COASTAL FIELD BIOLOGY 2
Hands-on study of estuarine and coastal communities with emphasis on patchiness in time and space. Instruction in field techniques as well as analysis and presentation of data. Experience in scientific writing
PREREQ: General biology, ecology, genetics, physiology.

MAST 622  CONSERVATION AND RENEWABLE ENERGY POLICY 3
See UAPP626 for course description

MAST 623  PHYSIOLOGY OF MARINE ORGANISMS 3
Processes and mechanisms of adaptation of organisms to marine environments. Examines how environmental factors affect physiological processes in marine organisms. Lectures address physiological processes at cellular, whole organism and habitat levels
PREREQ: MAST634 or equivalent. Requires permission of instructor

MAST 626  TOPICS IN HADROPHYTES BIOLOGY 1
Analysis of current research in the biology of halophytic plants. Emphasis on student seminars and group discussions of the current literature
RESTRICTIONS: May be repeated for credit when topics vary

MAST 627  MARINE BIOLOGY 3
Ecologically oriented study of elementary oceanography, adaptive physiology, aspects of population and community ecology, reproductive and larval biology and marine production systems. Emphasis on coastal and estuarine habitats including soft- and hard-substrate intertidal regions, subtidal regions and coral reefs.
PREREQ: General biology, ecology, genetics, and physiology
RESTRICTIONS: Requires permission of instructor

MAST 628  COMPARATIVE ENVIRONMENTAL POLITICS 3
See UAPP627 for course description

MAST 629  TOPICS IN MARINE ECOLOGY 1-3
Selected topics in marine ecology and physiology. Topics may vary and will be announced in the registration booklet.
RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary

MAST 630  MARINE BIOCHEMISTRY 3
Addresses biochemical processes and enzyme, metabolic and structural adaptations of marine plants and animals. Discussions on topics such as enzyme kinetics, enzyme structure and metabolic pathways to organisms in the marine environment
RESTRICTIONS: Requires sufficient background in chemistry and permission of instructor

MAST 635  TURBULENCE IN THE ENVIRONMENT 3
Fundamentals of turbulence including the dynamics of vorticity, the cascade of energy and the theory of Kolmogorov, turbulent diffusion and turbulence in density stratified flows. Applications to marine engineering disciplines as well as to meteorology and oceanography.

MAST 637  GEOLOGICAL OCEANOGRAPHY 3
Focuses on processes that create the oceanic and continental margin sedimentary record. Topics include marine particle production and composition, transport, seafloor morphology, stratigraphy and paleoceanography. Students will gain a broad understanding of concepts in geological oceanography and marine geology

MAST 645  GENERAL OCEANOGRAPHY 3
Introduction to the science of oceanography for teachers, emphasizing the physical and natural sciences, nature of the subject matter and application to social sciences. Where applicable mid-Atlantic environments are emphasized to demonstrate physical, chemical, geological and biological themes associated with oceanographic sciences
RESTRICTIONS: Offered off-campus, for public school teachers and general public

MAST 646  CHEMICAL OCEANOGRAPHY 3
Composition of seawater: physicochemical properties of seawater distributions of gases, nutrients and trace metals; and effect of biological processes on seawater composition
PREREQ: CHEM103 and CHEM104

MAST 647  PHYSICAL CHEMISTRY OF SEAWATER 3
Introduction to chemical equilibria in seawater. Topics include electrolyte theory, gas solubility, chemical speciation, acid-base equilibria and the carbon dioxide system. Emphasizes use of computer techniques to study oceanic chemical processes
PREREQ: One year of chemistry
RESTRICTIONS: Computer experience not required

MAST 648  WATER WAVE MECHANICS 3
See CIEG672 for course description
PREREQ: CIEG305

MAST 661  DECISION TOOLS 3
Develops quantitative decision-making skills for science and technology policy decisions. Covers decision-making under uncertainty, axioms of decision analysis, decision trees, influence diagrams, sensitivity analysis, confidence intervals, value of information, probabilistic risk assessment, and multi-attribute decision theory
May be cross-listed with POSC663 and/or UAPP663

MAST 664  MARINE TRANSPORTATION POLICY 3
Overview of marine transportation policy and analysis under local, national, and international contexts. Topics include: maritime transportation technology and fleet development; policy frameworks affecting trade, safety, and environment; quantitative analysis of shipping business economics and logistics under policy constraints

MAST 670  UNITED STATES OCEAN AND COASTAL POLICY 3
Provides an overview and assessment of the evolution of U.S. ocean and coastal policies, including such policy areas as coastal management, fisheries management, marine mammal protection, offshore oil development, and marine pollution control

MAST 671  COASTAL PROCESSES AND MANAGEMENT 3
Introduction to key processes operating in the coastal zone and to management techniques appropriate to these processes and environments. Emphasis on policy, regulatory and intergovernmental complexities that characterize coastal zone management in the United States and in other coastal nations

MAST 672  APPLIED POLICY ANALYSIS 3
Empirical analysis of environmental and natural resource policy issues. Topics include valuation of natural resources, decision making under uncertainty, dynamic control and intertemporal issues in resource use and institutional aspects of policy analysis
May be cross-listed with ECON670
PREREQ: ECON401

MAST 673  INTERNATIONAL LAW 3
Origins, sources and applications of law to international relations, including the nature of treaties, the legal powers of states and international organizations, jurisdiction and immunities, and the role of international courts. Special attention given to the law of the sea for navigation, fisheries conservation, mineral exploitation and environmental protection
May be cross-listed with LEST673 and/or POSC604
RESTRICTIONS: Requires permission of instructor

MAST 674  LEGAL ASPECTS OF THE COASTAL ZONE 3
Examines basic legal doctrines and public policy implications relevant to the development and protection of the coastal zone of the United States. Use, ownership and control of water and land beneath and bordering upon water; relationships between the states and the federal government in areas of marine affairs; environmental protection and legal controls of water pollution
RESTRICTIONS: Requires permission of instructor

MAST 675  ECONOMICS OF NATURAL RESOURCES 3
Study of the allocation of natural resources, especially marine and coastal zone resources, in modern economics. Application of economic theory to the problems of misallocations and the means of correction, under both free and planned markets
May be cross-listed with ECON675
RESTRICTIONS: Requires permission of instructor
MAST 850  MARINE INORGANIC CHEMISTRY  3
Principles of inorganic chemistry are used to explain and to understand the speciation and reactivity of the elements in the marine environment. Emphasis on the mechanistic aspects of important marine processes including mineral dissolution and formation, electron transfer reactions and the role of metals in biogeochemical reactions.
May be cross-listed with CHEM 853.
PREREQ: MAST 646, aquatic chemistry or physical chemistry.

MAST 851  MARINE SEDIMENTARY GEOCHEMISTRY  3
Fluxes of major, minor, trace, and nutrient elements and radionuclides from marine waters to sediments deposits with emphasis on deposition rates, sedimentary reaction and transport regimes, return fluxes to the overlying waters, and models that may be used to quantify these processes.
PREREQ: MAST 646 or CIEG 632 or PLSC 608 or GEO 646.

MAST 852  ISOTOPE GEOCHEMISTRY  3
Introduction to the field of isotope geochemistry and the application of isotope systemsatics to the study of geological, geochemical, hydrological, atmospheric and marine cycles. Light stable isotopes, uranium thorium decay series nuclides, and long-lived heavy isotopes will be considered.
PREREQ: MAST 646.

MAST 853  OCEANOGRAPHY SEMINAR  1
A review of current oceanographic literature through student presentations.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 855  COASTAL AND ESTUARINE CHEMISTRY  3
Distributions, behavior, and chemical processes in estuarine and coastal waters are examined in this advanced general chemical oceanography course.
Greater heterogeneity of physical controls and anthropogenic influence give a unique nature to this coastal corridor in the global flux from land to sea.
PREREQ: MAST 646.

MAST 856  BIOGEOCHEMICAL OCEANOGRAPHY  1-4
Modular graduate seminar of individual offerings to aspects of marine biogeochemical cycle. Includes such topics as atmospheric and oceanic fluxes, climatic feed back controls involving the ocean, and the role of the marine environment in global change.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 857  PALEOCEANOGRAPHY  3
Focuses on processes related to climate change from tectonic to millennial timescales based on the marine sedimentary record of the past 65 million years.
Topics include light stable isotopes and biogeochemical cycling of elements. Includes lectures and student-led discussion of current literature.
May be cross-listed with GEO/BYS7:
RESTRICTIONS: Requires permission of instructor.

MAST 868  RESEARCH  1-9

MAST 869  MASTER’S THESIS  1-6

MAST 870  INTEGRATED COASTAL MANAGEMENT  3
Provides a practical guide to the development, implementation, operation, and evaluation of integrated coastal management (ICM) programs. Examines the evolution of international prescriptions on ICM, and compares and contrasts experiences with integrated coastal management in both developed and developing countries.
PREREQ: MAST 670.

MAST 871  ENVIRONMENTAL POLICY AND ADMINISTRATION  3
See POSC 818 for course description.

MAST 873  SEMINAR: MARINE POLICY  1
Current topics in marine policy based on recent journal articles and active research and policy relevant activities of students, faculty and visitors from other universities and government agencies. Emphasis on research design and formats for oral and written presentation of results.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 875  ADVANCED FISHERY ECONOMICS  3
Theoretical and applied study of the optimal utilization and management of commercial and recreational fisheries with emphasis on equity issues and the difficulty of deriving regulations which are biologically effective and which provide incentives for economic efficiency at reasonable costs.
May be cross-listed with ECON 875:
PREREQ: MAST 675 or ECON 675.

MAST 882  PHYSICAL OCEAN SCIENCE AND ENGINEERING SEMINAR  1
A review of the current literature in physical ocean science and engineering through student presentations.

MAST 964  PRE-CANDIDACY STUDY  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
RESTRICTIONS: Requires arithmetic and Algebra I skills.

MAST 969  DOCTORAL DISSERTATION  1-12 PF

MATH

MATH 101  INTERMEDIATE ALGEBRA  3 R
Review skills necessary for pre-calculus and College Mathematics and Statistics courses. Topics include a review of sets, operations with polynomial and rational expressions, solving equations and inequalities, and an introduction to the coordinate plane and functions.
RESTRICTIONS: Requires arithmetic and Algebra I skills.

MATH 102  CONCEPTS OF INTERMEDIATE ALGEBRA  1-3 R
Reviews skills necessary for pre-calculus and College Mathematics and Statistics courses. Topics (when three credits are completed) include a review of sets, operations with polynomial and rational expressions, solving equations and inequalities, and an introduction to the coordinate plane and functions.
RESTRICTIONS: Requires arithmetic and Algebra I skills.

MATH 111  CONTEMPORARY MATHEMATICS  3
Application of scientific methods to investigate phenomena. Solution of various real-world problems using appropriate mathematical methods. Topics include descriptive and inferential statistics, probability, management science, optimization via analysis of models, coding information, social choice and decision making and size and shape.
RESTRICTIONS: Only four credits from any combination of MATH 113, MATH 114, MATH 115, MATH 117, MATH 127, MATH 170 and MATH 171 can count toward graduation.

MATH 114  COLLEGE MATHEMATICS AND STATISTICS  3
Stresses mathematical concepts and algebraic skills with a strong emphasis on applications in the areas of management, life and social sciences. Topics include various function classes and models, linear programming and statistics including descriptive and inferential statistics.
PREREQ: MATH 101 or MATH 102.
RESTRICTIONS: Only four credits from any combination of MATH 113, MATH 114, MATH 115, MATH 117, MATH 127, MATH 170 and MATH 171 can count toward graduation.

MATH 115  PRE-CALCULUS  3
The various classes of functions and their graphs are explored. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for calculus (MATH 221) are emphasized.
PREREQ: MATH 101 or MATH 102.
RESTRICTIONS: Only four credits from any combination of MATH 113, MATH 114, MATH 115, MATH 117, MATH 127, MATH 170 and MATH 171 can count toward graduation.

MATH 117  PRE-CALCULUS FOR SCIENTISTS AND ENGINEERS  4
Designed to prepare students for MATH 241. All topics covered in MATH 115 will be covered as well as additional topics in functions, trigonometry, linear systems, parabolas and sequences.
PREREQ: MATH 101 or MATH 102 or 2 years of high school algebra.
RESTRICTIONS: Only four credits from any combination of MATH 113, MATH 114, MATH 115, MATH 117, MATH 127, MATH 170 and MATH 171 can count toward graduation.

MATH 127  MATHEMATICS AND QUANTITATIVE REASONING  3
Mathematics driven by typical quantitative reasoning needed in everyday life. Combines critical thinking with basic mathematics in contexts encountered in various areas such as finance, social sciences, politics, the environment, etc. Includes probability and statistics, basic logic, and basic finance.
PREREQ: High school algebra.
RESTRICTIONS: Only four credits from any combination of MATH 113, MATH 114, MATH 115, MATH 117, MATH 127, MATH 170 and MATH 171 can count toward graduation.

MATH 170  SELF-PACED COLLEGE MATHEMATICS AND STATISTICS  1-3
Stresses mathematical concepts and algebraic skills with an emphasis on applications in the areas of management, life and social sciences. Topics include various function classes and models, linear programming and statistics. Variable credit allows the student to complete the course at a slower pace.
PREREQ: MATH 101 or MATH 102.
RESTRICTIONS: Only four credits from any combination of MATH 113, MATH 114, MATH 115, MATH 117, MATH 127, MATH 170 and MATH 171 can count toward graduation.
MATH 171 Self-Paced Pre-Calculus 1-3
Explores the various classes of functions and their graphs. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Emphasizes skills needed for calculus (MATH221). Variable credit notation provides an opportunity to change the pace of the course.
PREREQ: MATH101 or MATH12.
RESTRICTIONS: Only four credits from any combination of MATH113, MATH114, MATH115, MATH117, MATH127, MATH170 and MATH171 can count toward graduation.

MATH 201 Introduction to Statistical Methods I 3
Exploratory analysis, basic probability, discrete and continuous distributions, sampling distributions and confidence intervals, and hypothesis tests on means and proportions. Emphasis on applications in business and economics. Statistical computing is an integral part of this course.
PREREQ: College algebra.

MATH 202 Introduction to Statistical Methods II 3
Two-sample tests on means and proportions, chi-square analysis of contingency tables, complete and randomized block designs, analysis of variance, simple linear and multiple regression, model diagnostics, quality control, time series analysis. Emphasis on applications in business and economics. Statistical computing is an integral part of this course.
PREREQ: MATH201.

MATH 205 Statistical Methods 4
Descriptive statistics, graphical displays, sampling, variation, normal distribution, estimation, hypothesis testing, one-way analysis of variance, simple linear regression and goodness of fit. Laboratory covers use of statistical packages on mainframe and microcomputers.
PREREQ: MATH210 or MATH230.

MATH 210 Discrete Mathematics I 3
Sets, logic, induction, number systems, counting, introduction to graph theory, sequences and formal power series. COREQ: MATH221 or MATH241 or MATH242.

MATH 221 Calculus I 3
Topics include functions, graphing functions, limits, derivatives, sequences, series, exponential and logarithmic functions, and integration.
RESTRICTIONS: Requires two years of high school algebra and one year of geometry. Credit cannot be received for both MATH221 and MATH241.

MATH 222 Calculus II 3
Topics include integration, Taylor polynomials, series, multivariable calculus and trigonometric functions.
PREREQ: MATH221.
RESTRICTIONS: For students in the behavioral, management and social sciences. Credit cannot be received for both MATH222 and MATH242.

MATH 230 Finite Mathematics with Applications 3
Set theory, probability, optimization, linear programming and an introduction to matrix methods.
PREREQ: MATH221.
RESTRICTIONS: For students in the behavioral, management and social sciences.

MATH 241 Analytic Geometry and Calculus A 4
Functions, limits, continuity, derivatives and definite integrals.
RESTRICTIONS: Requires two years of high school algebra, one year of geometry and trigonometry. Credit cannot be received for both MATH241 and MATH221.

MATH 242 Analytic Geometry and Calculus B 4
Exponential and log functions; inverse trig functions; integration techniques; parametric curves; polar coordinates; infinite series. Includes use of the computer package, Maple, to perform symbolic, numerical and graphical analysis.
PREREQ: MATH241.
RESTRICTIONS: Credit cannot be received for both MATH242 and MATH222.

MATH 243 Analytic Geometry and Calculus C 4
Vectors, operations on vectors, velocity and acceleration, partial derivatives, directional derivatives, optimization of functions of two or more variables, integration over two- and three-dimensional regions, line integrals, Green's Theorem. Includes use of the computer package, Maple, to perform symbolic, numerical and graphical analysis.
PREREQ: MATH242.

MATH 245 An Introduction to Proof 3
Basic set operations, relations, equivalence relations, functions, inverse functions, cardinality, order properties of real numbers, least upper bound, greatest lower bound, completeness axiom, topology of reals, complex numbers.
PREREQ: MATH210 and MATH243.

MATH 251 Mathematics for the Elementary School I 3
Basic concept development in sets, numeration systems, functions, system of whole numbers and related algorithms, selected topics from number theory, and integers. Emphasis placed on problem solving and general number sense.
RESTRICTIONS: Requires School of Education Mathematics Competency Test.

MATH 252 Mathematics for the Elementary School II 3
Basic concept development in rational numbers expressed as fractions and decimals, proportional reasoning, percent, properties of real numbers, basic statistical topics and probability.
PREREQ: MATH251.

MATH 253 Mathematics for Elementary School III 3
Basic geometric concept development in classifying and analyzing basic two and three-dimensional geometric shapes, the role of definitions, symmetry, congruence, similarity, Euclidean constructions, measurement topics including linear and regional, coordinate geometry and graphing in a plane.
PREREQ: MATH252.

MATH 268 Perspectives on Mathematics 1
Designed for mathematics and other majors to expand students' understanding of contemporary mathematical thought, practice, culture and tools. Features presentations from faculty and invitees on mathematical endeavors and professional activities in an informal atmosphere.
PREREQ: MATH241 or equivalent.

MATH 279 Problem Solving Strategies I 1
Designed to study a multitude of problem solving strategies such as working backwards, looking for a pattern, etc. Emphasizes the use of these strategies with the content that secondary mathematics teachers normally teach.
PREREQ: MATH241.

MATH 300 Statistical Methods and Theory 4
Exploratory data analysis, probability, estimation, classical statistical inference, regression, multiple regression. Laboratory covers use of statistical packages.
PREREQ: MATH210 and MATH243.

MATH 302 Ordinary Differential Equations 3
Solutions and applications of ordinary differential equations as well as systems. Considers initial value problems and boundary value problems. Topics include Laplace transform, the phase plane, series solutions and partial differential equations. Includes use of the computer package Maple. COREQ: MATH243.
RESTRICTIONS: Credit not given for both MATH302 and either MATH341, MATH342, MATH351 or MATH352.

MATH 303 Differential Equations Computing Lab 1
Provides computing experience in differential equations. COREQ: MATH302.

MATH 305 Applied Mathematics for Chemical Engineering 3
A special applied mathematics course designed for chemical engineering majors. Emphasis is given on the interaction between mathematical theory and its engineering applications. May be cross-listed with CHEG305.
PREREQ: A minimum grade of C- in MATH243 and CHEG112.
RESTRICTIONS: For chemical engineering majors only.

MATH 308 Historical Development of Mathematical Concepts and Ideas 3
Illustrates the origins of ideas, processes and topics in the history of mathematics. Biographical sketches of the creators, descriptions of their diverse cultures and a writing project are included.
PREREQ: MATH241.

MATH 315 Discrete Mathematics II 3
Algorithmic graph theory and computational geometry. Topics in graph theory cover shortest path problems, coloring problems, and others. The computational geometry covers Steiner tree, convex hull, design of experiments and selected topics.
PREREQ: MATH210.

MATH 341 Differential Equations with Linear Algebra I 3
Topics include first and second order differential equations, systems of algebraic equations, determinants, vector spaces, eigenvalues and eigenvectors of matrices and systems of differential equations. Emphasis on the interaction between these topics and appropriate physical systems.
PREREQ: MATH242.

MATH 349 or MATH351 Open to majors outside mathematics.
MATH 342 Differential Equations with Linear Algebra II 3
A continuation of MATH341. Topics include series solutions, Laplace transform methods, boundary value problems, orthogonality, higher order equations, difference equations and numerical techniques. Continued emphasis on the interaction between these topics and physical systems.
PREREQ: MATH341
RESTRICTIONS: Credit not given for both MATH342 and either MATH302, MATH349 or MATH352. Open to majors outside mathematics.

MATH 349 Elementary Linear Algebra 3
PREREQ: MATH230 or MATH242
RESTRICTIONS: Credit not given for both MATH349 and either MATH341, MATH342 or MATH351

MATH 350 Probability Theory and Simulation Methods 3
Introduces the basic theory in both discrete and continuous aspects of probability theory.
PREREQ: MATH210 or MATH230
COREQ: MATH243

MATH 351 Engineering Mathematics I 3
Solutions of linear algebraic equations, Gauss elimination, vector spaces, subspaces, linear dependence, linear ordinary differential equations of 2nd order and higher, initial value and boundary value problems, eigenvalues, coupled linear ordinary differential equations, nonlinear differential equations, with engineering applications.
COREQ: MATH243
RESTRICTIONS: Credit not given for MATH351 and either MATH302, MATH341 or MATH349. Open to MEEG and CIEG students only.

MATH 352 Engineering Mathematics II 3
Laplace transform, application to constant coefficient ordinary differential equations, scalar and vector fields, Laplacian, line integrals, divergence theorem, Stokes' theorem, Fourier series, orthogonality, diffusion equation, Laplace's equation, wave equation, separation of variables, with engineering applications.
PREREQ: MATH351
RESTRICTIONS: Open to MEEG and CIEG majors only.

MATH 353 Engineering Mathematics III 3
PREREQ: MATH351
RESTRICTIONS: Open to MEEG and CIEG students.

MATH 366 Independent Study 1-6

MATH 379 Problem Solving Strategies 1
Studies a multitude of problem solving strategies such as looking for a pattern, making a model, working backwards, etc.
COREQ: MATH380
RESTRICTIONS: Requires permission of the Committee on Secondary School Mathematics. Not for major (B.A. or B.S.) or minor credit in mathematical sciences.

MATH 380 Approaches to Teaching Math 3
Aims, course planning, instructional strategies, evaluation and selection of materials for teaching mathematics in secondary schools.
COREQ: MATH379
RESTRICTIONS: Requires permission of the Committee on Secondary School Mathematics. Not for major (B.A. or B.S.) or minor credit in mathematical sciences.

MATH 382 Student Teaching Seminar in Secondary Math 2 PF
Provides student teachers opportunities to reflect upon and discuss classroom teaching experience. Focuses on classroom management and other professional issues.
PREREQ: MATH380
COREQ: EDUC400.

MATH 401 Introduction to Real Analysis 3
A rigorous treatment of one variable calculus. Topics will include sequences of real numbers, limit theorems, monotone sequences, Cauchy sequences, Bolzano-Weierstrass Theorem, continuity, uniform continuity, differentiability and Riemann integral. A historical perspective on the development of these topics will be provided.
PREREQ: MATH245

MATH 426 Introduction to Numerical Analysis and Algorithmic Computation 3
Direct and iterative methods for solution of algebraic equations and systems of linear equations, matrix inversion, pseudo-inverses, algebraic eigenvalue problems, linear least-squares problems and nonlinear equations. Stresses both numerical analysis and applications.
PREREQ: MATH349 or MATH341 or MATH351; and CISC105 or CISC181
RESTRICTIONS: Requires familiarity with computing (e.g. programming language).

MATH 428 Algorithmic and Numerical Solution of Differential Equations 3
Algorithms for numerical integration and differentiation. Initial value problems; boundary value problems in ordinary differential equations; finite difference (explicit and implicit) methods; polynomial and spline approximation; finite elements and collocation; and introduction to numerical methods for partial differential equations.
PREREQ: MATH426 or CISC410

MATH 450 Mathematical Statistics 3
Introduction to mathematical aspects of statistics. Topics include exploratory data analysis, parameter estimation, maximum likelihood method, testing of hypotheses, confidence intervals and others. Includes application of a computer software package to perform data analysis.
PREREQ: MATH350 or an equivalent course in probability.

MATH 451 Abstract Algebra I 3
Basic properties of the integers and the rationals, fields of quotients, polynomial rings, root-finding, introduction to groups, rings and fields. A historical perspective on the development of the notion of number and algebraic structure will be provided.
PREREQ: MATH349 and MATH325

MATH 466 Independent Study 1-6

MATH 503 Advanced Calculus for Applications 3
Change of variables, surface integrals, Stokes' theorem, Divergence Theorem, calculus of variations, Euler's equation, braochistochrone, isoperimetric problem. Fourier series, pointwise and mean square convergence, vibrating string, Fourier transform, inversion formula, heat equation on a half-line.
PREREQ: A 300 or higher level course on differential equations.

MATH 507 Introduction to Complex Variables and Applications 3
Introduction to analytic functions, contour integration, power series, residues and conformal mapping.
PREREQ: MATH243

MATH 512 Contemporary Applications of Mathematics 3
Aimed at providing hands-on learning experiences in contemporary applications of mathematics. Involves work with investigators from industry, national laboratories and other departments. Mathematical topics may include ordinary and partial differential equations, systems of differential equations, transform, asymptotic and numerical methods.
PREREQ: A 300 or higher level course on differential equations.

MATH 518 Mathematical Models and Applications 3
Illustration and analysis of mathematical models for problems in the biological, physical and social sciences.
PREREQ: Either MATH230 or MATH349, and MATH300 or STAT370.

MATH 529 Linear Programming: Methods and Applications 3
Theory of linear programming (linear inequalities, convex polyhedra, duality, related topics (games, integer programming), main algorithms (simplex, dual) and representative applications in agriculture, economics, engineering, operations research and mathematics. Familiarity with computer implementation of LP methods acquired by individual (or small group) projects of applying LP to the students' chosen areas.
PREREQ: MATH349.

MATH 530 Optimization and Game Theory 3
Convex functions and sets, duality, fixed point theorems, elementary game theory and the theory of Nash and Walrasian equilibria; non-linear programming and the Kuhn-Tucker Theorem; dynamic optimization including dynamic programming and Pontryagin's Maximum Principle. Emphasis on applications and interpretation in terms of economic models.
May be cross-listed with ECON330
PREREQ: MATH302, MATH349, ECON301 and ECON303.

MATH 535 Introduction to Partial Differential Equations 3
Theory and applications of parabolic, elliptic and hyperbolic partial differential equations originating from various mathematical physics problems.
PREREQ: MATH302 or MATH342 or MATH352
MATH 540 College Geometry: A Historical Approach

Historical development of the axiomatic systems in geometry, inauguration of deductive reasoning introduced by the Greeks (Euclid) along with the axiomatic developments, extensions, algebraic methods and geometric properties which followed. Plane, analytic, transformational and projective geometries are included.

PREREQ: MATH245
RESTRICTIONS: Graduate credit only for teachers.

MATH 549 Coding Theory and Cryptography

Basic coding theory including correcting and detecting error patterns. Cryptography, including symmetric key encryption, DES, RSA and cryptographic protocols.

PREREQ: MATH349

MATH 581 On the Nature of Proof

Designed for secondary teachers to show how to investigate a problem, develop ideas, test conjectures, and, if appropriate, prove that resulting statements are correct. Problems, including proofs, are chosen from the areas of algebra, pre-calculus, geometry and number theory.

PREREQ: BA/BS Math or Math Ed
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 582 Studies in Discrete Mathematics

Designed to show secondary teachers how discrete mathematics underlies the science and technology specific to the computer age. Using the NCTM Standards as a guide, topics include relations, combinatorics, graph theory, sequences, and linear programming, as well as associated algorithms.

PREREQ: MATH581
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 583 Probability and Statistics for Education

Designed specifically for middle and secondary teachers. Topics emphasized include graphical methods, probability models, statistical inference and study design. Offers an orientation to popular software packages. Applications selected from current literature.

PREREQ: Undergraduate statistics course
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 584 Advanced Secondary Mathematics Methods

Designed to develop perspectives, knowledge, and frameworks which an inservice teacher can use to organize, interpret and critique their own teaching experience and that of others.

RESTRICTIONS: Requires permission of instructor. Credit to be used only in graduate programs in mathematics education.

MATH 585 Technology in Secondary Mathematics

Major emphasis on learning how to use computer software to enhance both the teaching and learning of algebra, geometry, statistics, probability and precalculus. Participants get hands-on experience with a function plotter, spreadsheet, geometry package and a statistic/probability package.

RESTRICTIONS: Working knowledge of graphing calculators.

MATH 586 Mathematical Problem Solving: Theories and Practices

Designed to offer secondary teachers an opportunity to face and solve nonroutine problems. Teachers will become familiar with problem solving strategies that can be used not only with nonroutine problems but also with standard problems in an existing mathematics curriculum.

RESTRICTIONS: Requires permission of instructor. Credit to be used only in graduate programs in mathematics education.

MATH 587 Proportional Reasoning

Introduces and reinforces the underlying concepts of proportional reasoning and their applications in science.

RESTRICTIONS: Restricted to middle school mathematics and science teachers.

MATH 600 Fundamentals of Real Analysis I

Rigorous introduction to classical real analysis. Brief review of real numbers and a thorough discussion of the basic topology of metric spaces. Covers in detail the following topics: the analysis of sequences and series; continuity; differentiation and Taylor's theorem; and the analysis of sequences and series of functions.

PREREQ: MATH401.

MATH 602 Fundamentals of Real Analysis II

Riemann integration, an introduction to Lebesgue integration, multivariable calculus.

PREREQ: MATH600.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 806</td>
<td>Functional Analysis</td>
<td>3</td>
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<tr>
<td>MATH 807</td>
<td>Complex Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 810</td>
<td>Asymptotic and Perturbation Methods</td>
<td>3</td>
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<tr>
<td>MATH 812</td>
<td>Inverse Problems</td>
<td>3</td>
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<tr>
<td>MATH 821</td>
<td>Topics in Applied Analysis</td>
<td>3</td>
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<tr>
<td>MATH 824</td>
<td>Topics in Applied Mathematics</td>
<td>3</td>
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<tr>
<td>MATH 826</td>
<td>Topics in Pure Mathematics</td>
<td>3</td>
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<tr>
<td>MATH 827</td>
<td>Topology</td>
<td>3</td>
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<tr>
<td>MATH 835</td>
<td>Partial Differential Equations I</td>
<td>3</td>
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<tr>
<td>MATH 836</td>
<td>Partial Differential Equations II</td>
<td>3</td>
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<tr>
<td>MATH 838</td>
<td>Numerical Methods for Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 845</td>
<td>Groups and Their Applications</td>
<td>3</td>
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<tr>
<td>MATH 850</td>
<td>Theory of Probability</td>
<td>3</td>
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<tr>
<td>MATH 868</td>
<td>Research</td>
<td>1-6</td>
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<tr>
<td>MATH 869</td>
<td>Master's Thesis</td>
<td>1-6</td>
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<tr>
<td>MATH 870</td>
<td>Reading in Mathematics</td>
<td>1-6</td>
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<tr>
<td>MATH 884</td>
<td>Finite Geometries and Designs</td>
<td>3</td>
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<tr>
<td>MATH 885</td>
<td>Extremal Combinatorics</td>
<td>3</td>
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<tr>
<td>MATH 964</td>
<td>Pre-Candidacy Study</td>
<td>3-12 PF</td>
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<tr>
<td>MATH 969</td>
<td>Doctoral Dissertation</td>
<td>1-12 PF</td>
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</table>

**MEDICAL TECHNOLOGY**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MEDT 100</td>
<td>Introduction to Medical Technology</td>
<td>1</td>
</tr>
<tr>
<td>MEDT 210</td>
<td>Information Technologies and Communication Skills</td>
<td>2</td>
</tr>
<tr>
<td>MEDT 366</td>
<td>Independent Study</td>
<td>1-6</td>
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<tr>
<td>MEDT 370</td>
<td>Phlebotomy Practicum</td>
<td>1</td>
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<tr>
<td>MEDT 372</td>
<td>Diagnostic Parasitology</td>
<td>2</td>
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<tr>
<td>MEDT 375</td>
<td>Clinical Laboratory Principles and Statistics</td>
<td>2</td>
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<tr>
<td>MEDT 380</td>
<td>Clinical Immunology and Medical Virology</td>
<td>4</td>
</tr>
<tr>
<td>MEDT 390</td>
<td>Introduction to Molecular Diagnostics</td>
<td>2</td>
</tr>
<tr>
<td>MEDT 391</td>
<td>Introduction to Molecular Diagnostics Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

RESTRICTIONS: Requires permission of instructor.
**MEDT 400 Urinalysis and Body Fluids**
The study of routine urinalysis examination, renal function and body fluid testing procedures.
RESTRICTIONS: Open to medical technology majors only.

**MEDT 401 Clinical Physiological Chemistry I**
RESTRICTIONS: Open to medical technology majors only.

**MEDT 403 Clinical Physiological Chemistry II**
Application and theory of methodologies in enzymology, endocrinology and toxicology. Relationship of normal and abnormal laboratory findings in organ functional tests.
PREREQ: MEDT401.

**MEDT 404 Hematology I**
Quantitative and qualitative study of the formed elements of the blood with emphasis on the normal state, as well as the study of normal and abnormal coagulation and hemostasis.
RESTRICTIONS: Open to medical technology majors only.

**MEDT 405 Hematology II**
Study of the pathophysiology of erythroid and leukocytic disorders and the laboratory findings of these disorders.
PREREQ: MEDT404.

**MEDT 406 Medical Microbiology**
Study of the occurrence and pathogenesis of human infections and microorganisms associated with humans in health and disease.
RESTRICTIONS: Open to medical technology majors only.

**MEDT 409 Immunohematology I**
Study of antigen and antibody systems of human red cells and compatibility testing of blood for transfusion.
RESTRICTIONS: Open to medical technology majors only.

**MEDT 411 Clinical Physiological Chemistry Laboratory I**
Laboratory exercises that complement the topics covered in MEDT401.
COREQ: MEDT401.

**MEDT 413 Clinical Physiological Chemistry Laboratory II**
Laboratory exercises that complement the topics covered in MEDT403.
COREQ: MEDT403.

**MEDT 414 Hematology I Laboratory**
Study and implementation of laboratory procedures that correlate with the material taught in MEDT404.
COREQ: MEDT404.

**MEDT 415 Hematology II Laboratory**
Study and implementation of laboratory procedures in hematology consistent with the material taught in MEDT405.
COREQ: MEDT405.

**MEDT 416 Medical Microbiology Laboratory**
Laboratory study of microorganisms important in the normal flora and infections diseases of humans.
COREQ: MEDT406.

**MEDT 418 Medical Technology Senior Seminar**
Readings, case studies, career planning and orientation for clinical education.
RESTRICTIONS: Requires senior and major status.

**MEDT 419 Immunohematology I Laboratory**
Laboratory procedures consistent with MEDT409.
COREQ: MEDT409.

**MEDT 420 Immunohematology II**
Study of blood and component transfusions, their risks, complications and quality assurance. Also blood component therapy and testing of the neonate and adult.
PREREQ: MEDT409.

**MEDT 421 Immunohematology II Laboratory**
Laboratory procedures consistent with MEDT420.
COREQ: MEDT420.

**MEDT 430 Diagnostic Bacteriology and Medical Mycology**
Diagnostic bacteriology, emphasizing the correlation of in vitro and in vivo findings in the diagnosis and treatment of infectious disease, including human mycoses. Identification of pathogenic and nonpathogenic bacteria and fungi in clinical specimens.
PREREQ: MEDT406 and MEDT416.
COREQ: MEDT431.

**MEDT 431 Diagnostic Bacteriology and Medical Mycology Laboratory**
Study and implementation of laboratory procedures that correlate with the material taught in MEDT430.
COREQ: MEDT430.

**MEDT 450 Anatomy of Professionalism**
Introduces medical technology majors and those already in the clinical laboratory field to aspects of professional development essential for success in the modern healthcare arena and for life-long learning. Includes a first-hand experience at a national clinical laboratory science annual meeting, accompanied by on-site discussions and student presentations on campus.
RESTRICTIONS: Restricted to MT/MTI majors and MT graduates.

**MEDT 461 Laboratory Practice and Leadership I**
Introduction to clinical laboratory practice and leadership with emphasis on management styles, motivational techniques, communication skills, organizational leadership and administration of personnel.
RESTRICTIONS: Requires permission of instructor.

**MEDT 466 Independent Study**
1-6

**MEDT 471 Laboratory Practice and Leadership II**
Discussion of clinical laboratory practice and leadership. Emphasis on responsibilities relating to daily operation of the laboratory, including human resource management, financial planning, cost analysis, laboratory design, laboratory information systems, marketing, government regulations and accreditation.
PREREQ: MEDT461.

**MEDT 472 Clinical Urinalysis and Serology Practicum**
Clinical experience in the application of laboratory theory and techniques in urinalysis and serology.
PREREQ: MEDT380 and MEDT400.

**MEDT 473 Clinical Chemistry Practicum**
Supervised experience in the application of laboratory theory and techniques in clinical chemistry.
PREREQ: MEDT403 and MEDT413.

**MEDT 475 Clinical Hematology Practicum**
Supervised experience in the application of laboratory procedures in hematology.
PREREQ: MEDT403 and MEDT415.

**MEDT 477 Clinical Microbiology Practicum**
Supervised experience in the application of laboratory procedures in diagnostic microbiology.
PREREQ: MEDT430 and MEDT431.

**MEDT 479 Clinical Immunohematology Practicum**
Supervised experience in the application of laboratory procedures in immunohematology.
PREREQ: MEDT420 and MEDT421.

**MECH 101 Introduction to Mechanical Engineering**
Introduces the mechanical engineering profession. Uses a team design project to illustrate the engineering design process. Introduces computational tools.

**MECH 102 Introduction to Mechanical Engineering Laboratories**
Introduces laboratory techniques and procedures focusing on data acquisition and reporting; also introduces mechanical engineering disciplines.

**MECH 112 Statics**
To recognize, idealize and solve problems involving rigid bodies in static equilibrium using scalar and vector techniques. Introduces free body diagrams, friction, center of gravity, moment of inertia; emphasizes the role of statics in the design process.
COREQ: MATH242 and PHYS207.

**MECH 202 Computer-Aided Engineering Design**
Introduces computer-aided mechanical engineering by developing the student’s ability to 1) think visually, 2) communicate spatial information to an engineering audience through parametric solid modeling drafting standards and 3) begin to recognize the connection between a virtual design and an actual component.
PREREQ: MECHG101.
MEEG 211 Dynamics 3
Intermediate-level development of the kinematics and dynamics of particle systems and rigid bodies. Solution of engineering problems by force, momentum and energy methods with applications to mechanisms, machines, and vehicles. Computer problems. PREREQ: MEEG112 and PHYS207.

MEEG 215 Mechanics of Solids 4
Analytical study of stresses and deformations and their application to the design of machine and structural elements under axial, torsional, bending and lateral loads. Buckling and energy methods will also be discussed. PREREQ: MEEG112.

MEEG 301 Machine Design-Kinematics & Kinetics 3
Kinematic analysis of machines and machines, kinematic synthesis, cam design, gear train analysis and machine dynamics. PREREQ: MEEG211.

MEEG 304 Machine Design-Elements 3
Aspects of machine design: statistical nature, theories of failure and design for strength and design of machine elements. PREREQ: MEEG215, MEEG301 and MEEG321. RESTRICTIONS: Open to majors only.

MEEG 311 Vibration and Control 4

MEEG 321 Materials Engineering 3
Mechanical properties and materials behavior under static and dynamic loading; fatigue, creep, wear and corrosion; properties and applications of metals, ceramics, polymers and composites; forming and joining of materials; practical examples of materials selection in design and the use of materials data bases. PREREQ: MEEG215 and MEEG302.

MEEG 331 Fluid Mechanics I 4
Incompressible fluid mechanics: fluid statics, control volume analysis for mass, momentum and energy; differential analysis of viscous and inviscid flow; dimensional analysis; experiments in fluid mechanics. PREREQ: MEEG112 and MATH351. RESTRICTIONS: Open to majors only.

MEEG 332 Fluid Mechanics II 3
Compressible flows, isentropic flow, shock waves; lift and drag; inviscid flows, potential and stream functions, elementary wing theory; boundary layers; computational fluid dynamics. PREREQ: MEEG331.

MEEG 342 Heat Transfer 3

MEEG 344 Thermodynamics 3

MEEG 366 Thermal Lab 1
Introduction to experimental and measurement techniques related to thermodynamics and heat transfer. Designed to complement MEEG342 and MEEG344. PREREQ: PHYS310. COREQ: MEEG342 and MEEG344.

MEEG 361 Applied Engineering Analysis 3
Linear algebra; vector field theory; Fourier series and partial differential equations. Engineering applications. PREREQ: MATH302.

MEEG 366 Independent Study 1-6
In this capstone engineering practice course, student teams develop real engineering system designs; discover customer requirements; benchmark best practices; develop engineering specifications; generate concepts; and justify a specific concept. They then design, fabricate, assemble, test and improve an actual prototype. PREREQ: MEEG304. RESTRICTIONS: For majors only.

MEEG 401 Senior Design 6
Overview of numerical modeling in continuum mechanics. Case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities and limitations of commercial codes.

MEEG 481 Computer Solution of Engineering Problems 3
Introduction to computer solution of engineering problems. Direct and iterative approaches to element formulation, interpolation functions and isoparametric elements. PREREQ: MEEG215.

MEEG 481 Senior Research I 3
Investigation of an experimental nature to be carried out and reported upon by each student. RESTRICTIONS: Open to seniors only.

MEEG 481 Senior Research II 3
Investigation of an experimental nature to be carried out and reported upon by each student. RESTRICTIONS: Open to seniors only.

MEEG 453 Manufacturing Processes and Systems 3
Seminar: Manufacturing processes and systems. Topics vary each semester. PREREQ: MEEG321 or consent of instructor.

MEEG 456 Independent Study 1-6
Computer solution of engineering problems. Integration of computer solution techniques and methods. PREREQ: MEEG321 or consent of instructor.

MEEG 481 Computer Solution of Engineering Problems 3
MEEG 481 Senior Research III 3
Overview of numerical modeling in continuum mechanics. Case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities and limitations of commercial codes.

MEEG 482 Clinical Biomechanics 3
The biomechanics and patho-mechanics of various human musculoskeletal joint systems. Normal joint anatomy and biomechanics; the mechanical effects of pathology and the goals of surgical repair to cause them to be explored through in vitro, in vivo and mathematical modelling studies of joint system mechanics.
MEEG 483 Orthopedic Biomechanics
Anatomy and physiology including microanatomy and mechanics of bone, cartilage, tendon and muscle. Mechanical modeling of body including joint loads, motion analysis, muscle forces and interaction with orthopedic devices. PREREQ: MEEG 211 and MEEG 215

MEEG 484 Biomaterials and Tissue Engineering
Biomaterials for mechanical replacement of Orthopedic tissues: bone, cartilage, ligament, tendon and whole joint systems. Topics include normal tissue mechanics and biocompatibility, mechanical behavior, degradation and host response to biomaterials. Experimental methods to assess biomaterials along with design and manufacturing considerations for joint and tissue replacements.

MEEG 600 Seminar
1 PF

MEEG 610 Intermediate Solid Mechanics
Indicial notation, tensors, displacement, strain, compatibility; traction and stress, equations of motion; constitutive description of an elastic material; solutions to boundary value problems including torsion, bending, plate problems in elasticity (Airy stress function) and elements of linear elastic fracture mechanics.

MEEG 611 Sandwich Structures
Composite and isotropic sandwich structures are studied for stresses, deformations, buckling loads, natural frequencies and dynamic response under mechanical and environmental loads, involving honeycomb, solid, foam, web and trusscore sandwich comprising beam, plate, ring and shell structures. Design and minimum weight optimization are treated.

MEEG 612 Biomechanics of Human Movement
Mechanics of the musculoskeletal system with an emphasis on the control of human movement. Topics include how the nervous system activates muscles, the mechanical properties of skeletal muscle and mechanisms for controlling limb movement. Applications include gait analysis, sports biomechanics and hand trajectory formation. Involves computer modeling of musculoskeletal systems. PREREQ: MEEG 112 and MEEG 211.

MEEG 615 Mechanical Properties of Materials
See MSEG 615 for course description.

MEEG 616 Composite Materials Structures
Introduction to composite materials; onisotropic elasticity and laminate theory; plates and panels of composite materials; beams, columns and rods; composite materials of structural structures; energy methods; strength and failure theories; adhesive bonding and mechanical fastening; hygrothermal effects; stress analysis, buckling, vibrations and impact.

MEEG 617 Composite Materials
Fiber and matrix materials, fiber-matrix interface, polymer, metal, ceramic and carbon matrix composites, geometric aspects, elastic properties, laminate theory, strength of unidirectional composites, strength of laminates, durability, hybrid composites, flexible composites and textile structural composites.

MEEG 618 Fracture of Solids
Introduction to the field of fracture mechanics, covering both theoretical approaches and practical applications. Examines fundamentals of linear elastic and elastic-plastic fracture mechanics, and offers a short introduction to the basic premises and approaches for the treatment of dynamic fracture mechanics. May be cross-listed with MSEG 618.

MEEG 620 Intermediate Dynamics
Reference frames, angular velocity, linear velocity, angular acceleration, linear acceleration, multibody systems, inertia properties, kinetic energy, equations of motion, generalized d'Alembert's principles, numerical integration, computer simulation.

MEEG 621 Optimization of Dynamic Systems
Static optimization, numerical methods for static optimization, calculus of variations. Dynamic optimization: basic, reduction to direct solution, indirect solution. Linear systems: finite time optimal control, steady state optimal control, multi-degree-of-freedom mechanical systems. RESTRICTIONS: Undergraduates require permission of instructor.

MEEG 623 Nonlinear Dynamics and Chaos
Nonlinear dynamics and chaotic phenomenon as applied to natural and engineering systems. Geometric and computational techniques, analytical methods for the qualitative analysis of dynamical systems modeled by differential equations and iterated maps. Planar and non-planar phase space analysis, local and global bifurcation analysis, catastrophes, resonances. PREREQ: MATH 351 or equivalent.

MEEG 624 Control of Dynamic Systems
Review of modeling and analysis of dynamic systems. Transient and steady-state responses. Introduction to the theory of feedback controls and stability for continuous time systems. Control system design studies via root locus, frequency domain and state space methods. Brief introduction to digital controls. PREREQ: MEEG 211, MEEG 311 and MATH 352.

MEEG 630 Intermediate Fluid Mechanics

MEEG 633 Bioengineering Fluids and Transport
Anatomy and physiology of pulmonary, cardiac, genitourinary, cerebrospinal and synovial systems. Applications of fluid, heat and mass transport fundamentals to analysis of these biological systems.

MEEG 634 Air Pollution Processes
Physical, chemical, and meteorological processes that govern the phenomenon of transport of gas-phase and aerosol-phase air pollutants in the atmosphere. Topics to be covered include air quality, pollutant emissions, gas-phase and liquid-phase chemistry, aerosol dynamics, plumes, turbulent transport in geophysical flows; meteorology, and deposition. RESTRICTIONS: Requires graduate standing in engineering.

MEEG 636 Fluid Mechanics Measurements
Point-wise velocity measurement including differential pressure measurement, hot-wire anemometry, and laser-Doppler anemometry. Global measurement techniques based on particle imaging and digital image processing. Signal processing, statistics and uncertainty analysis.

MEEG 637 Two-Phase Flow and Particle Technology
Modeling mass, momentum, heat transfer, and mixing in particle-laden flows, slurries, and bubbly flows. Issues in particle process industry such as particle separation, dispension, agglomeration, transport and handling. Particle measurements and characterization. PREREQ: MEEG 331.

MEEG 640 Intermediate Heat Transfer
Theory and equations of heat conduction, boundary conditions, steady and transient heat conduction, theory of convection, forced convection in laminar flows, derivation of conservation equations, numerical methods.

MEEG 641 Combustion
Fundamentals and applications of combustion. Topics include thermodynamics, chemical kinetics, explosives and oxidative characteristics of fuels, combustion-generated pollutants; ignition and flammability phenomena; detonation; laminar in premixed flames; gaseous diffusion flames; and droplet combustion. PREREQ: Graduate standing in engineering or science.

MEEG 652 Flow of Viscous Materials
Applied fluid dynamics with an emphasis on flow processes dominated by viscous effects. Flow phenomena in polymeric, ceramic and composite materials Modeling of flows in processing and manufacturing and its application to the design of molds and machinery.

MEEG 653 Manufacturing Processes and Systems
Explains key elements and concepts of basic processes, technologies, process systems and industries, current advances. Processes: packaging, plastic molding, food, pharmaceutical, metal cutting, forming: Technologies: robotics, numerical control. Just-in-time inventory, ergonomics, material handling, quality management. PREREQ: MEEG 212 or consent of instructor.

MEEG 655 Principles of Composites Manufacturing
The fundamental principles involved in composites manufacturing will be introduced. Modeling of such processes will be emphasized with applications of injection molding, compression molding, filament winding, pultrusion and resin transfer molding. PREREQ: MEEG 332 and MEEG 342.

MEEG 658 Metals and Alloys
MEEG 663  COMPUTER-AIDED DESIGN 3
Essentials of computer-aided design for engineers: specific topics include theory and application of computer graphics, introduction to data structures, numerical methods for curve and surface fitting and generation, and solid modeling.
PREREQ: MATH352

MEEG 671  INTRODUCTION TO ROBOTICS 3
Topics include: rigid motions and transformations, forward kinematics, Denavit-Hartenberg representations, inverse kinematics, velocity kinematics, dynamics, independent joint control, multivariable control, force control
PREREQ: Requires familiarity with kinematics and basic dynamics
RESTRCTIONS: Recommended for seniors and graduate students

MEEG 681  COMPUTER SOLUTIONS OF ENGINEERING PROBLEMS 3
Overview of numerical modeling in continuum mechanics. Case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities and limitations of consumer codes.

MEEG 682  CLINICAL BIOMECHANICS 3
The biomechanics and patho-mechanics of various human musculoskeletal joint systems. Normal joint anatomy and biomechanics; the mechanical effects of pathology and the goals of surgical repairs to counteract them are explored through in vivo, in vitro and mathematical modeling studies of joint system mechanics.

MEEG 683  ORTHOPEDIC BIOMECHANICS 3
Anatomy and physiology including microanatomy and mechanics of bone, cartilage, tendon and muscle. Mechanical modeling of body including joint loads, motion analysis, muscle forces and interaction with orthopedic devices.
PREREQ: MEEG211 and MEEG215

MEEG 684  BIOMATERIALS AND TISSUE ENGINEERING 3
Biomaterials for mechanical replacement of Orthopedic tissues: bone, cartilage, ligament, tendon and whole joint systems. Topics include normal tissue mechanics and biocompatibility, mechanical behavior, degradation and host response to biomaterials. Experimental methods to assess biomaterials along with design and manufacturing considerations for joint and tissue replacements.

MEEG 690  INTERMEDIATE ENGINEERING MATHEMATICS 3

MEEG 801  ADVANCED THERMODYNAMICS 3
Critical examination of thermodynamic principles, equations of state for liquids, gases and mixtures. Interpretation of thermodynamic functions and applications to processes, reactions and equilibrium states.

MEEG 803  CONVECTION HEAT TRANSFER 3
Forced convection heat transfer in laminar and turbulent boundary layers including viscous dissipation effects. Forced convection heat transfer in pipes and external boundary layers. Free convection boundary layers.
PREREQ: MATH352

MEEG 805  SPECIAL TOPICS IN THERMODYNAMICS 3
Selection of topics that may include thermodynamics of irreversible processes, statistical mechanics, nonequilibrium statistical mechanics, thermodynamics of materials with memory, etc.

MEEG 811  SANDWICH STRUCTURES 3
Composite and isotropic sandwich structures are studied for stresses, deformations, buckling loads, natural frequencies and dynamic response under mechanical and environmental loads, involving honeycomb, solid, foam, web and truss core sandwich comprising beam, plate, ring and shell structures. Design and minimum weight optimization are treated.

MEEG 813  THEORY OF ELASTICITY 3
Index notation. Concepts of stress and strain. Equations of equilibrium and compatibility and elastic constitutive response. Applications to problems in applied mechanics

MEEG 814  THEORY OF PLASTICITY 3
PREREQ: MEEG410 or MEEG413

MEEG 816  ADVANCED CONTINUUM MECHANICS 3
A rigorous study of kinematics of finite deformation and the field equations of mechanics and thermodynamics of continua. Tensor analysis employed throughout.

MEEG 817  COMPOSITE MATERIALS 3
Introduction, thermoset and thermoplastic behavior of laminated composites, statistical strength theories of continuous-fiber composites, short-fiber composites, hybrid composites, two-dimensional textile structural composites, three-dimensional textile structural composites, flexible composites, and nonlinear elastic finite deformation of flexible composites.
PREREQ: May be cross-listed with MEEG617

MEEG 818  PLATES AND SHELLS IN AEROSPACE STRUCTURES I 3

MEEG 819  PLATES AND SHELLS IN AEROSPACE STRUCTURES II 3
General theory of thin shells from three-dimensional equations of elasticity; shells of revolution under axially symmetric loads; asymmetric loads; thermoeelastic effects; general bending theory, membrane theory, inextensional theory; Donnell equations; edge load solutions; orthotropic shells; laminated shells.

MEEG 821  ADVANCED DYNAMICS 3
General principles of spatial dynamics. Lagrangian and Hamiltonian methods. Application to engineering problems.

MEEG 823  VIBRATION ANALYSIS 3
Engineering analysis of the vibrations of machines and structures. Free, forced and random vibrations with emphasis on linear, multidegree-of-freedom systems by matrix and energy methods. Introduction to the Lagrangian method and normal coordinate analysis of complex systems.

MEEG 824  STRUCTURAL DYNAMICS AND CONTROL 3
Reviews vibration analysis of uniform/composite beams, plates and shells. Introduces analysis of structural sound radiation into enclosures and open field. Structural vibration controls and feedback strategies including modal, natural and optimal controls and uniform damping. Reduction of structural sound radiation by adaptive feed forward structural controls
PREREQ: MEEG211, MEEG311 and MATH352

MEEG 830  SPECIAL TOPICS IN FLUID MECHANICS 3
Offered occasionally and with varying subject matter. Topics may include turbulence, plasma kinetic theory, stability, etc.

MEEG 831  FLUID DYNAMICS 3
Bodies, configurations and motions. Kinematics and basic laws. Constitutive theory, simple fluids, viscometric motion. Differential, rate type and integral models. Newton-Stokes fluids, stability theorems, uniqueness
PREREQ: MATH630, MEEG690, or permission of instructor

MEEG 832  FLUID DYNAMICS II 3
Rotational and irrotational flows, potential theory, airfoils, creeping motion, lubrication theory, wave motion, compressibility, supersonic flow and shock waves, and hydrodynamic stability.

MEEG 840  SPECIAL TOPICS IN CONTINUUM MECHANICS 3
Study of advanced principles of continuum mechanics in one or more special fields. Topics selected by instructor. Special subjects may include the general theory of constitutive equations, hyperelasticity, electroelasticity, hypoelasticity, simple and nonsimple fluids, and solutions of special problems in these areas.

MEEG 855  PRINCIPLES OF COMPOSITES MANUFACTURING 3
Fundamental principles and an application involving composites manufacturing will be introduced. Modeling of such processes will be emphasized and a specific project will be required. Assignments will include open-ended problems. Areas of manufacturing include: injection molding, compression molding, filament winding, pultrusion and resin transfer molding

MEEG 856  NANOCRYSTALLINE AND NANOCOMPOSITE MATERIALS 3
Covers developments in polymer, ceramic and metal nano systems, current applications, major processing routes, and the novel mechanical and physical properties of nanocomposites.

MEEG 862  ADVANCED ENGINEERING ANALYSIS 3
Emphasis on asymptotic and perturbation methods. Topics from among the following: steepest descent and stationary phase; phase plane; asymptotic analysis of ODEs and PDEs using such methods as WKB, matched asymptotic expansions, Pade approximants, strainring, and multiple scales; singularity methods; catastrophe theory; and chaos
Engineering applications
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MLSC 105</td>
<td>INTRODUCTION TO LEADERSHIP I</td>
<td>1</td>
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<tr>
<td>MLSC 106</td>
<td>INTRODUCTION TO LEADERSHIP II</td>
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<tr>
<td>MLSC 205</td>
<td>BASIC LEADERSHIP I</td>
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<tr>
<td>MLSC 206</td>
<td>BASIC LEADERSHIP II</td>
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<tr>
<td>MLSC 215</td>
<td>LEADER DEVELOPMENT</td>
<td>4</td>
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<tr>
<td>MSEG 302</td>
<td>MATERIALS SCIENCE FOR ENGINEERS</td>
<td>3</td>
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<tr>
<td>MSEG 366</td>
<td>INDEPENDENT STUDY</td>
<td>1-3</td>
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<tr>
<td>MSEG 366</td>
<td>MATERIALS SCIENCE FOR ENGINEERS</td>
<td>3</td>
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<tr>
<td>MSEG 406</td>
<td>CORROSION AND PROTECTION</td>
<td>3</td>
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<tr>
<td>MSEG 410</td>
<td>EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS</td>
<td>3</td>
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**MLSC 105 INTRODUCTION TO LEADERSHIP I**

Introduction to leadership principles using case studies, historical perspectives and handson leadership opportunities. Learn to rappell, use map and compass, understand the basics of physical fitness and familiarize with Army traditions and ceremonies. No military obligation associated with this course.

**MLSC 106 INTRODUCTION TO LEADERSHIP II**

Continues to build on the basics of MLSC105. Provides additional leadership opportunities and expands upon leadership theory. Learn basic rifle marksmanship, develop public presentation abilities and continue physical fitness development. No military obligation associated with this course.

**MLSC 205 BASIC LEADERSHIP I**

Enhances understanding of human behavior, leadership techniques and management and planning structures. Builds leadership competencies through leadership opportunities with structured evaluations and feedback. Learn about the various branches and job opportunities in the Army. No military obligation associated with this course.

**MLSC 206 BASIC LEADERSHIP II**

Continues to build on the basics of MLSC205. Learn small unit tactics, how to handle up to ten people in stressful situations with feedback on performance. Further develop skills with map and compass, weapons safety and emergency first aid techniques for basic life saving. No military obligation associated with this course.

**MLSC 215 LEADER DEVELOPMENT**

An introductory six week off-campus, hands-on leadership education and assessment course. Real life individual and collective leadership challenges and opportunities. All expenses paid. Multiple scholarship opportunities. Requires permission of instructor.

**MSEG 302 MATERIALS SCIENCE FOR ENGINEERS**

Crystal binding and structure, energetics and structure of lattice defects; elasticity, plasticity, and fracture; phase equilibrium and transformations; relations of structure and treatment to properties; structures of inorganic and organic polymers; and electronic and magnetic properties.

**MSEG 366 INDEPENDENT STUDY**

1-3 Credits. Selected topics in American military history, current military trends and future military requirements.

**MSEG 406 ADVANCED LEADERSHIP I**

Prepares cadets for commissioning by refining professional skills and leadership ability. Students assigned leadership positions and function as commanders and staff officers in planning and executing cadet battalion activities. Focuses on technical skills needed to accomplish assigned missions and other topics which expand cadet knowledge of Army systems and procedures. Commitment to military service required. Requires permission of instructor.

**MSEG 410 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS**

Study of the micromechanical and thermomechanical response of composite materials. Execution and assessment of experiments conducted to investigate strength and stiffness characteristics of composite materials. May be crosslisted with CIEG410.
MSEG 420 CAREER SURVIVAL OUTSIDE THE UNIVERSITY
Provides mechanisms to overcome cultural barriers existing between university
and industrial cultures. Topics include leadership vs. management, professional
and cultural ethics, individual responsibility vs. teamwork, and networking and
mentorship in accomplishing career goals. Includes guest speakers from local
industries, technical writing and oral communication exercises.

MSEG 446 SENIOR RESEARCH
1-6
Student will research general areas of materials science and/or engineering under the direction of a member of the materials science faculty or other
classified in science or engineering subject to the approval of the materials
science chair.
RESTRICTIONS: Open to seniors only. Science background required.

MSEG 466 INDEPENDENT STUDY
1-6

MSEG 600 INTRODUCTION TO POLYMER SCIENCE AND ENGINEERING I
See CHEG600 for course description

MSEG 601 STRUCTURE AND PROPERTIES OF POLYMERIC MATERIALS
Measurement and control of the microstructure and properties of solid
polymers. Structure generation, structure-property models and effects of
processing on properties.
May be cross-listed with CHEG601
PREREQ: MSEG302

MSEG 602 STRUCTURE OF MATERIALS
Crystal structure analysis by X-ray and electron diffraction.
Characterization of materials by optical microscopy, scanning and transmission
electron microscopy, thermal analysis and spectroscopy.
PREREQ: MSEG302

MSEG 603 ANALYTICAL TECHNIQUES IN MATERIALS SCIENCE
Laboratory course in optical microscopy, X-ray diffraction, scanning and
transmission electron microscopy, electron diffraction, X-ray fluorescence
and optical microscopy. Auger analysis and other spectroscopic techniques.
PREREQ: MSEG302
COREQ: MSEG402

MSEG 604 PHASE TRANSFORMATIONS
Introduction to thermodynamic functions: enthalpy, entropy and free energy.
Fick's first and second laws of diffusion. Liquid/solid and solid/solid phase
equilibria and transformations. Nucleation and growth. Massive and
martensitic transformations. Phase transformations in polymers, ceramics and
electronic materials.
PREREQ: MSEG302.

MSEG 606 CORROSION AND PROTECTION
Degradation of structural materials through interaction with their
environment. Electrochemical attack on alloys and its relation to
metallurgical structure. Forms of corrosion including high temperature
oxidation and biological effects. Corrosion monitoring and deterioration of
polymers, concrete and advanced materials. Emphasis on materials selection
and corrosion control methods.
PREREQ: CHEM102/103 or equivalent, MSEG302 or consent of instructor.
Physical chemistry helpful.

MSEG 607 PHYSICAL PROPERTIES OF MATERIALS I
Basic models of electrical, magnetic optical and thermal properties of solid
materials. Introduction to quantum physics to describe electronic structure
of atoms, atomic bonds and crystals. Electronic, magnetic and optical effects
in metals, semiconductors, ceramics, polymers and amorphous materials.
Operation of basic electronic devices and semiconductor

MSEG 610 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS
Study of the micromechanical and thermomechanical response of composite
materials. Execution and assessment of experiments conducted to investigate
strength and stiffness characteristics of composite materials.
May be cross-listed with CIEG610

MSEG 615 MECHANICAL PROPERTIES OF MATERIALS
Stress, strain, tensor notation and elementary elasticity. Plasticity and
ductility based upon continuum mechanics. Ideal strength of crystalline,
polymer and amorphous materials. Real materials: amorphous, polymers,
ceramics, metals and composites. Dislocations, strengthening of solids.
Mechanisms of fracture, fracture mechanics, fatigue, creep and stress rupture.
May be cross-listed with MSEG615
RESTRICTIONS: Requires graduate status

MSEG 616 CHEMISTRY AND PHYSICS OF SURFACES AND INTERFACES
See CHEG616 for course description

MSEG 618 FRACURE OF SOLIDS
See MSEG618 for course description

MSEG 620 CAREER SURVIVAL OUTSIDE THE UNIVERSITY
Provides mechanisms to overcome cultural barriers existing between university
and industrial cultures. Topics include leadership vs. management, professional
and cultural ethics, individual responsibility vs. teamwork, and networking and
mentorship in accomplishing career goals. Includes guest speakers from local
industries, technical writing and oral communication exercises.

MSEG 630 INTRODUCTION TO SCIENCE AND ENGINEERING OF POLYMER SYSTEMS
Provides an understanding of the science and engineering of macromolecules from
a structure/property perspective. Topics include polymerization, chain
structure and configuration, polymer size and shape, phase separation behavior,
amorphous and crystalline state, glass/semiconductor transition, cross linking/rubber
elasticity, viscoelasticity, rheology polymer processing and mechanical behavior

MSEG 632 POLYMER SYNTHESIS
Basic models and theoretical considerations of polymer synthesis. Topics include theoretical descriptions of molecular weight distributions, step growth polymerizations, chain growth polymerizations, living polymerizations, as well as chemical strategies for the productions of various polymers. Specialized topics in the current polymer chemistry
literature may also be discussed.

MSEG 633 POLYMER SYNTHESIS AND CHARACTERIZATION LAB
Provides direct laboratory experience with the synthesis of a variety of
conventional polymers via step growth, radical, and ionic polymerization
methods. Polymers synthesized are also characterized via common polymer
characterization methods such as IR spectroscopy, gel permeation
chromatography, differential scanning calorimetry, and NMR spectroscopy.
PREREQ: MSEG632

MSEG 635 PRINCIPLES TO POLYMER PHYSICS
Chain statistics, thermodynamics, and kinetics are discussed in the context of
modern polymer physics characterization techniques, such as dynamic and static
light scattering and elastic/inelastic neutron scattering.

MSEG 666 SPECIAL PROBLEM
1-12

MSEG 803 EQUILIBRIA IN MATERIAL SYSTEMS
Classical thermodynamics of condensed systems (macroscopic description)
Fundamental laws. Functions and equations of state. Equilibria and
stability criteria. Single component phase equilibria, multi-component
mixtures. Partial molar properties, non-ideal mixtures. Equilibria in
multi-phase, multi-component systems. Phase Rule
PREREQ: MSEG302

MSEG 804 KINETICS IN MATERIAL SYSTEMS
Theory of reaction kinetics. Transport mechanisms in solids. Nucleation and
spontaneous decomposition. Interfacial attachment and migration. Transition
state theory applied to diffusion and phase transformation. Elementary
non-equilibrium thermodynamics and phenomenological equations in
material transport and phase transformation.
PREREQ: MSEG302

MSEG 806 PHYSICAL PROPERTIES OF SOLIDS
Bonding, structure and growth of crystalline solids, glasses and
properties of solids. Defects in solids and their effects on electrical and
optical properties. Carrier generation, transport and recombination. Solids in
magnetic fields

MSEG 807 PHYSICAL PROPERTIES OF MATERIALS II
Continuation of MSEG607 with emphasis on the electrical transport properties
of material. Topics will include electronic structure and energy band
diagrams of semiconductors, metals and insulators; Fermi surfaces; dynamics of
electrons; Semiconductor materials and devices; band structure and transport
properties of selected semiconductors; band-gap engineering; novel materials
systems; electron emission; particularly field emission.
PREREQ: MSEG607

MSEG 811 ADVANCED TOPICS IN MATERIALS
1-3
Discussion of topic of current interest in the science or engineering of
materials

MSEG 817 COMPOSITE MATERIALS
See MEEG817 for course description

MSEG 821 DIFFRACTION OF RADIATION BY MATTER
Theory and analysis of diffraction from ideal and imperfect crystals, gases
and liquids, and other atomic aggregations.
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<tr>
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<tbody>
<tr>
<td>MSEG 823</td>
<td>Transmission Electron Microscopy in Materials Science</td>
<td>3</td>
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<tr>
<td>MSEG 866</td>
<td>Special Problem</td>
<td>1-12</td>
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<tr>
<td>MSEG 868</td>
<td>Research</td>
<td>1-9</td>
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<tr>
<td>MSEG 964</td>
<td>Pre-Candidacy Study</td>
<td>3-12 PF</td>
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<tr>
<td>MSEG 969</td>
<td>Doctoral Dissertation</td>
<td>1-12 PF</td>
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**MUSEUM STUDIES**

<table>
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<tr>
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<td>MSST 205</td>
<td>Science and the Detection of Art Forgeries</td>
<td>3</td>
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<tr>
<td>MSST 206</td>
<td>Queer Sexual Imagery in the Visual Arts</td>
<td>3</td>
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<tr>
<td>MSST 403</td>
<td>History, Philosophy, Functions and Future of Museums</td>
<td>3</td>
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<tr>
<td>MSST 408</td>
<td>Public History: Resources, Research and Practice</td>
<td>3</td>
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<tr>
<td>MSST 444</td>
<td>Technology of Cultural Materials: Ceramics and Glass</td>
<td>3</td>
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<tr>
<td>MSST 445</td>
<td>Technology of Cultural Materials: Metals</td>
<td>3</td>
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<tr>
<td>MSST 464</td>
<td>Museum Studies Internship</td>
<td>3</td>
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<tr>
<td>MSST 480</td>
<td>Studio in the Materials and Techniques of Drawing in the West</td>
<td>3</td>
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<tr>
<td>MSST 485</td>
<td>Color Mixing and Matching</td>
<td>3</td>
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<tr>
<td>MSST 488</td>
<td>Studio Materials and Techniques of Painting I</td>
<td>3</td>
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<tr>
<td>MSST 489</td>
<td>Studio Materials and Techniques of Painting II</td>
<td>3</td>
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<tr>
<td>MSST 490</td>
<td>Studio in the Materials and Techniques of Printmaking I</td>
<td>3</td>
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<tr>
<td>MSST 491</td>
<td>Issues in American Material Culture</td>
<td>3</td>
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<tr>
<td>MSST 629</td>
<td>Seminar in Historic Preservation</td>
<td>3</td>
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<tr>
<td>MSST 644</td>
<td>Technology of Cultural Materials: Ceramics and Glass</td>
<td>3</td>
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<tr>
<td>MSST 645</td>
<td>Technology of Cultural Materials: Metals</td>
<td>3</td>
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<tr>
<td>MSST 680</td>
<td>Studio in the Materials and Techniques of Drawing in the West</td>
<td>3</td>
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<tr>
<td>MSST 681</td>
<td>Materials and Techniques of the Contemporary Painter and Draftsman</td>
<td>3</td>
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</table>

- **MUSEUM STUDIES**
- **MSST 205 Science and the Detection of Art Forgeries**
- Concepts from many scientific disciplines are useful for interpreting works of art. Analytical techniques based on those concepts often reveal art forgeries. Case studies will use basic scientific principles to investigate a wide variety of known or alleged art forgeries. May be cross-listed with ARTH205.
- **MSST 206 Queer Sexual Imagery in the Visual Arts**
- Introduction to the diversity of representation of the human body in western visual art with an emphasis on coded as well as explicit images of queer sexuality.
- **MSST 403 History, Philosophy, Functions and Future of Museums**
- Introduction to philosophy, purpose, structure, historical development and future of museums, and botanical and zoological gardens. Examines functions of collection, conservation, research, exhibition/interpretation, and social/cultural services; museum field growth. May be cross-listed with ARTH403 and/or HIST403.
- **MSST 408 Public History: Resources, Research and Practice**
- See HIST408 for course description.
- **MSST 444 Technology of Cultural Materials: Ceramics and Glass**
- Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic ceramic and glass objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH444 and/or ARCT444.
- **MSST 445 Technology of Cultural Materials: Metals**
- Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic metal objects from the point of view of technology, aesthetics and functions. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH445 and/or ARCT445.
- **MSST 464 Museum Studies Internship**
- Internship practice supplementing theoretical and methodological background in administration, collections management, exhibition, research, interpretation, and public programming and services of museums. Students intern at the University Museum or other acceptable museums, related institution or organization in the United States. PREREQ: MSST403.
- **MSST 480 Studio in the Materials and Techniques of Drawing in the West**
- Lecture-studio presentation on materials and tools, supports and techniques of wet and dry media drawing in the West from about the year 1400 to the present. Topics include: the development and manufacture of paper, pens, brushes, inks, watercolor paint, charcoal, metal points, graphite pencils, natural and fabricated chalks, crayons, pastels, erasers and fixatives. Studio reconstructions of masterworks, lectures and library research. May be cross-listed with ART424, ARTC480, and/or ARTH480. RESTRICTIONS: Requires permission of instructor.
- **MSST 485 Color Mixing and Matching**
- Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors without instrumentation. Pigments, dyes and the manufacture of paint sticks. Major topics include color interaction and the Munsell system of color description. May be cross-listed with ART426 and/or ARTC485. RESTRICTIONS: Requires permission of instructor.
- **MSST 488 Studio Materials and Techniques of Painting I**
- Major masters and the materials, tools, supports and techniques of architectural painting and panel painting in tempera from about 1500 BC to AD 1500. Topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research. May be cross-listed with ART427, ARTC488, and/or ARTH488. RESTRICTIONS: Requires permission of instructor.
- **MSST 489 Studio Materials and Techniques of Painting II**
- Major masters and the materials, tools and techniques of indirect and direct oil painting. Time frame: 1500 to the present. Major topics include the development of canvas, brushes, oil paint, mediums, varnishes, solvents and the complex relationship between indirect and direct techniques. Includes studio reconstruction of masterworks, lectures and library research. May be cross-listed with ART428, ARTC489, and/or ARTH489. RESTRICTIONS: Requires permission of instructor.
- **MSST 490 Studio in the Materials and Techniques of Printmaking I**
- Major masters and the materials, tools and techniques of relief, planographic and intaglio printmaking. Time frame: ca. 1400-1920. Major topics include woodcut, copperplate engraving, etching, drypoint, aquatint, mezzotint, lithograph and wood engraving. Studio reconstructions, lectures and library research. May be cross-listed with ART429, ARTC490, and/or ARTH490. RESTRICTIONS: Requires permission of instructor.
- **MSST 491 Issues in American Material Culture**
- See EAMC406 for course description. RESTRICTIONS: Requires permission of instructor.
- **MSST 608 Public History: Resources, Research, and Practice**
- See HIST608 for course description.
- **MSST 629 Seminar in Historic Preservation**
- See UAPP629 for course description.
- **MSST 644 Technology of Cultural Materials: Ceramics and Glass**
- Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic ceramic and glass objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH644 and/or ARCT644.
- **MSST 645 Technology of Cultural Materials: Metals**
- Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic metal objects from the point of view of technology, aesthetics and functions. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH645 and/or ARCT645.
- **MSST 680 Studio in the Materials and Techniques of Drawing in the West**
- Lecture-studio presentation on materials and tools, supports and techniques of wet and dry media drawing in the West from about the year 1400 to the present. Topics include: the development and manufacture of paper, pens, brushes, inks, watercolor paint, charcoal, metal points, graphite pencils, natural and fabricated chalks, crayons, pastels, erasers and fixatives. Studio reconstructions of masterworks, lectures and library research. May be cross-listed with ART682, ARTC680, and/or ARTH680. RESTRICTIONS: Requires permission of instructor.
- **MSST 681 Materials and Techniques of the Contemporary Painter and Draftsman**
- Twenty-century artists' materials. Topics: Acrylic emulsion and acrylic solution alkyd resin, PVA paints: collage-assembly; solvent-photo transfer; synthetic fiber canvas, paper, panels, oil pastels, paint sticks, felt-tip markers, colored inks and pencils; airbrush spray gun; and non-art materials. Potential health hazards: Conservation topics: pH, lightfastness, adhesion and storage environments. May be cross-listed with ART681, ARTC681, and/or ARTH681.
MUSEUM STUDIES

MSST 685 COLOR MIXING AND MATCHING 3
Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors with and without instrumentation. Pigments, dyes and the manufacture of paint studied. Major topics include color interaction, and the Munsell system of color description. May be cross-listed with ART685 and/or ARTC685.
RESTRICTIONS: Requires permission of instructor

MSST 688 STUDIO MATERIALS AND TECHNIQUES OF PAINTING I 3
Major masters and the materials, tools, supports and techniques of architectural and panel painting from tempera from about 1450 BC to AD 1500. Topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research. May be cross-listed with ARTH688, ARC688, and/or ART688.
RESTRICTIONS: Requires permission of instructor

MSST 689 STUDIO MATERIALS AND TECHNIQUES OF PAINTING II 3
Major masters and the materials, tools and techniques of direct and indirect oil painting. Time frame: 1500 to the present. Topics include the development of canvas, brushes, oil paint, mediums, varnishes, solvents and the complex relationship between indirect and direct techniques. Includes studio reconstruction of masterworks: lectures and library research. May be cross-listed with ART689, ARC689, and/or ART689.
RESTRICTIONS: Requires permission of instructor

MSST 801 MUSEUM CURATORSHIP: COLLECTIONS MANAGEMENT 3
A course on collections management theory and practices that focus on the administration, handling, physical care, recording and study of museum collections. Combines classroom instruction, demonstrations and field trips with "hands on" projects in the University Gallery and other area museums.
RESTRICTIONS: Open to graduate students only

MSST 802 LEADERSHIP AND MANAGEMENT OF MUSEUMS 3
Treats governance and administrative operations of museums, highlighting planning, legal and organizational structures, trustees and directors, personnel management, finance, development, marketing, merchandising, maintenance and security, libraries and archives, publishing, computer applications, public programming, cultural tourism and professional standards and ethics.
RESTRICTIONS: Open to graduate students only. Includes field trips and team task force project.

MSST 803 MUSEUMS AND MODERN TECHNOLOGY 3
Examines the use of digital technology in museums. Topics include communication strategies, digital image processing, collections databases, geographic information systems, CAD, animation, exhibitions, and web design.
Students will plan and prepare a web site that deals with a museum-related topic.

MSST 804 MUSEUM INTERNSHIP 3
Internship practice in administration, collections management, exhibition and interpretation at museums and related institutions. Students spend ten full weeks, or the equivalent, at the University museum, Winterthur Museum, Hagley Museum, Longwood Gardens or other acceptable institution.
May be cross-listed with HIST804.
RESTRICTIONS: Open to graduate students only. Requires at least one semester in museum studies and permission of instructor.

MSST 805 HISTORICAL PROPERTIES 3
Administration and interpretation of historical properties, including historic site surveys, preservation research, building restoration, conservation techniques and the establishment and attainment of interpretive objectives. Field trips to area historic sites. Combines classroom instruction and work projects at area historic sites.
RESTRICTIONS: Open to graduate students only

MSST 807 MUSEUM CURATORSHIP: TEMPORARY AND ECONOMICAL EXHIBITS 3
Focuses on the planning, designing and fabrication of economical exhibits for small museum exhibits for small exhibition rooms and alternative spaces. Emphasizes time-, money- and labor-saving techniques. Students design and produce a temporary exhibit in the University Gallery or in a local museum.
RESTRICTIONS: Open to graduate students only

MSST 808 MUSEUM EDUCATION AND INTERPRETATION 3
The theory, strategies, practices, evaluation and administration of learning in a museum environment with emphasis on interpretation of collections through a variety of instructional means. Lectures, discussions, field trips, program planning, curriculum development, proposal writing, audience studies, practice teaching and special project work with area museums.
RESTRICTIONS: Open to graduate students only

MSST 810 ENVIRONMENTAL INSTITUTION MANAGEMENT 6
Seminars at Delaware Nature Society headquarters with staff and guest lecturers including attorneys, investment counselors, University faculty and museum lecturers. Experiences at area environmental institutions. Covers goal definition, long-range planning, building/grounds management, programming, fund raising, financial management, personnel policies, ethics, volunteers, publicity and publications, legal considerations and conservation/preservation roles.
RESTRICTIONS: Open to graduate students only. Permission of instructor required

Music Education

MUED 179 FRESHMAN SEMINAR IN MUSIC EDUCATION 1
Introduction to issues and approaches in music education. Helps students examine their own interests and aptitude for teaching while presenting discussion on current trends in the profession and attributes of successful teachers. Provides guidelines for developing student portfolios.
RESTRICTIONS: Offered fall semester only

MUED 279 PRACTICUM IN MUSIC EDUCATION 3
Observation of differing elementary and secondary school music program structures; studies and observations of children's growth and development patterns in terms of music learning; and experience in music instructional methods.
RESTRICTIONS: Requires permission of instructor. Offered fall semester only

MUED 336 CHORAL CONDUCTING 2
Specific problems in conducting choral literature. Comparative analysis of works to be conducted.
PREREQ: MUSC335.
RESTRICTIONS: For vocal music education majors. Offered spring semester only

MUED 337 INSTRUMENTAL CONDUCTING 2
Specific problems in conducting instrumental literature. Practical application of conducting techniques through supervised conducting of instrumental ensembles.
PREREQ: MUSC335.
RESTRICTIONS: For instrumental music education majors. Offered spring semester only

MUED 366 INDEPENDENT STUDY 1-3

MUED 379 MUSIC IN THE ELEMENTARY AND JUNIOR HIGH (OR MIDDLE) SCHOOL 3
Introduction to music materials and approaches through clinical experiences.
PREREQ: MUED279.
COREQ: MUED336 or MUED337.
RESTRICTIONS: For music majors. Offered spring semester only.

MUED 390 MUSIC IN THE ELEMENTARY SCHOOL 3
Introduction to music materials and approaches through clinical experiences.
PREREQ: Must take prior to student teaching.
RESTRICTIONS: For elementary education and child development majors. Offered fall and spring semesters

MUED 391 AESTHETICS AND EDUCATION 3
Exploration of the philosophical basis in the performing and visual arts in education and strategies for their integration into core curriculum subjects.
Satisfies the Fine Arts requirement for Elementary Education majors.
RESTRICTIONS: Offered fall and spring semesters.

MUED 479 SECONDARY MUSIC MATERIALS AND APPROACHES 3
Procedures and materials used for teaching music in the secondary school.
PREREQ: MUED379, and MUED336 or MUED337.
RESTRICTIONS: Requires permission of instructor. Offered fall semester only

MUED 574 MUSIC CONCEPTS IN THE ELEMENTARY SCHOOL 3
Methods and materials for developing children's understanding of music concepts by involvement in listening to, performing and describing musical sound events.
RESTRICTIONS: For experienced teachers.
MUSIC

MUSC 095 Basic Harmony and Ear-Training 3 R
Designed to establish or re-establish basic harmony and ear-training skills.
RESTRICTIONS: For beginning music majors and minors. Requires musicality test.
Credits do not apply toward degree. Offered in fall semester only.

MUSC 100 Recital Attendance 0 PF
A recital experience; see Department of Music Student Handbook for details.
RESTRICTIONS: May be repeated. Offered in fall and spring semesters.

MUSC 101 Appreciation of Music 3
Introduction to Western music literature through a nontechnical presentation of
various musical styles and forms.
RESTRICTIONS: Offered in fall and spring semesters.

MUSC 102 Appreciation of Music 3
Music literature through a nontechnical presentation of various musical styles and
forms. Continuation of MUSC 101 with emphasis on the larger forms -
symphonies, operas, oratorios, concertos - and the 20th century. 
PREREQ: MUSC 101

MUSC 103 Introduction to Italian Opera 3
Explores the world of opera including categories of singers; types of operas,
e.g., opera seria and operetta; and the roles of the chorus. Includes
experience seeing an opera performed live.
RESTRICTIONS: Offered in fall semester only.

MUSC 104 Introduction to Opera 3
Introduction to opera, concentrating on opera comic, singspiel, operetta,
baroque opera, seria, and Wagnerian music drama. Explores philosophies
associated with music in the context of opera. Time span covered is 1607 to
present.
RESTRICTIONS: Offered in spring semester only.

MUSC 105 Fundamentals of Music I 3
Introduction into the elements of music theory including ear training, music
reading and harmony with keyboard application
RESTRICTIONS: Designed for nonmusic majors.

MUSC 106 Fundamentals of Music II 3
Continuation of MUSC 105. Survey and analytical approach to music styles
Composing original works for voice and instruments
PREREQ: MUSC 105

MUSC 107 History of Rock 3
The study of various styles of rock music. Introduction to folk, country,
bubble, doo-wop, and jazz as predecessors to rock. Intended for the non-music major.
No music reading skills required.
May be cross-listed with BAMS 107
RESTRICTIONS: Offered in fall and spring semesters.

MUSC 108 University Singers 1
Members enter by audition. University Singers is a chorus of sopranos and
altos that performs its own concerts and may also perform with other choirs.
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 109 Schola Cantorum 1
Members enter by audition. Schola Cantorum is a chorus of 100+ voices that
rehearse an masses on Monday nights and perform large-scale choral works.
Smaller sections perform independently as well.
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 110 Choirale 1
Members enter by audition. Choirale is the university's most select chorus of
mixed voices.
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 113 Marching Band 1
RESTRICTIONS: Contact the Director for detailed information. All interested
percussionists, colorguard and twirlers must audition. May be repeated for credit
Offered in fall semester only.

MUSC 114 Symphonic Band 1
The ensemble performs standard concert literature as well as new compositions.
During fall semester the ensemble meets one day a week and performs one full
concert. The ensemble participates in the Department of Music's CALLOPE
concert.
RESTRICTIONS: Requires audition. May be repeated for credit. Offered in fall and
spring semesters.

MUSC 115 Wind Ensemble: Orchestral Winds and Percussion 1
The Wind Ensemble is a select 45-member group of woodwind, brass and
percussion players that performs original band music, chamber music and
transcriptions. The Orchestral Winds and Percussion consists of select
players from the Wind Ensemble, who form the wind and percussion sections of
the University Orchestra.
RESTRICTIONS: Requires audition and may be repeated for credit. Offered in fall and
spring semesters.

MUSC 116 Jazz Ensemble 1
Study and performance of the diverse styles characteristic of the medium.
RESTRICTIONS: Requires audition. May be repeated for credit. Offered in fall and
spring semesters.

MUSC 117 University Orchestra 1
Rehearsal and performance of representative works for orchestra.
RESTRICTIONS: Requires audition. May be repeated for credit. Offered in fall and
spring semesters.

MUSC 118 Percussion Ensemble 1
Study and performance of works for percussion instruments
RESTRICTIONS: Requires audition. May be repeated for credit. Offered in fall and
spring semesters.

MUSC 120 Pep Band 1
Attends all home basketball games performing a variety of pop, rock and jazz
selections. Performs at select games during Winter Session. Attendance at
these games is mandatory.
RESTRICTIONS: May be repeated for credit. Offered in spring semester only.

MUSC 121 Gamelan Ensemble 1
Gamelan is the largest instrumental ensemble from Southeast Asia, and is
considered the "orchestra of the Eastern world." This is a performing
ensemble, dealing with traditional and contemporary Japanese and Balinese
literature.
RESTRICTIONS: Open to anyone without prior musical experience. May be
repeated for credit.

MUSC 123 Steel Band 1
Teaches music and theory through role learning, reading, and improvisation to
students with no musical training. Students perform in a traditional Caribbean Steel
Drum Band.
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 124 Steel Band: Advanced Ensemble 1
Traditional Caribbean Steel Drum ensemble. Students rehearse and perform music
of the Caribbean tradition.
PREREQ: Permission of instructor.
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 125 Collegium Musicum 1
Ensemble for the performance of instrumental and vocal music of the Medieval,
Renaissance and Early Baroque periods. Size, instrumentation and repertoire
for the group varies from semester to semester dependent upon resources at
hand, players' skills and other factors.
PREREQ: Audition.
RESTRICTIONS: May be repeated for credit. Offered in fall and spring semesters.

MUSC 150 Freshman Honors Private Study 1
Private study for qualified freshman honors students. The student adds to the
course title the branch of study elected: piano, organ, voice, or an orchestral
instrument. Includes a one-hour studio class.
PREREQ: Requires audition.
RESTRICTIONS: Restricted to Honors students only. May be repeated for credit
Offered in fall and spring semesters.

MUSC 151 Private Study for Bachelor of Music I 2
Private study for freshman bachelor of music students. The student adds to the
course title the branch of study elected: piano, organ, voice, or an orchestral
instrument. Includes a one-hour studio class.
PREREQ: Audition and acceptance into Bachelor of Music Program.
RESTRICTIONS: For bachelor of music students only. Offered in fall and spring
semesters.

MUSC 152 Private Study for Bachelor of Music II 2
Continuing private study for freshman bachelor of music students. The student adds to the
course title the branch of study elected: piano, organ, voice, or an orchestral
instrument. Includes a one-hour studio class.
PREREQ: MUSC 151.
RESTRICTIONS: For bachelor of music students only. Offered in fall and spring
semesters.
MUSC 153 PRIVATE STUDY FOR BACHELOR OF ARTS AND MINORS I 2
Private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC153.
REQUIREMENTS: For bachelor of arts (music) students and music minors only. Offered in fall and spring semesters.

MUSC 154 PRIVATE STUDY FOR MUSIC BACHELOR OF ARTS AND MINORS II 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC153.
REQUIREMENTS: For bachelor of arts (music) students and music minors only. Offered in fall and spring semesters.

MUSC 155 PRIVATE STUDY FOR SECONDARY AND MERIT I 1
Private study for music majors pursuing a secondary area, and qualified students not enrolled in a music degree program. Student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. May be repeated for credit.
PREREQ: Audition.
REQUIREMENTS: Offered in fall and spring semesters.

MUSC 156 DICTION: ENGLISH AND ITALIAN 1
Study of pronunciation rules for singing in English and Italian. Includes practice.
COREQ: Enrollment in applied study.
REQUIREMENTS: Offered in fall semester only.

MUSC 157 CLASS VOICE 1
Fundamentals of singing and techniques of singing.
REQUIREMENTS: For nonmajors.

MUSC 158 CLASS VOICE: BEGINNING 1
Fundamentals of singing for the nonvocal music major. Study of basic technique, repertoire and function of vocal mechanism.
REQUIREMENTS: Requires permission of instructor for nonmajors. Requires one semester of University vocal experience. Offered in fall semester only.

MUSC 159 CLASS PIANO: ELEMENTARY I 1
Beginning piano primarily for the vocal or instrumental music major. Basic techniques, reading, transposition and playing by ear.
PREREQ: Preference for enrollment given to music majors.
REQUIREMENTS: Offered in fall semester only.

MUSC 160 CLASS PIANO: ELEMENTARY II 1
A continuation of MUSC159. Scale and arpeggio playing, keyboard harmony, repertoire of pieces appropriate to technical ability.
PREREQ: MUSC175 and MUSC195.
REQUIREMENTS: Offered in spring semester only.

MUSC 161 CLASS GUITAR I 1
Introduction to the fundamentals of guitar technique and note reading for non-music majors. Topics include guitar history, repertoire, scales and exercises with an emphasis on classical as well as folk music. Music Education majors may also find this course particularly useful for classroom teaching.
REQUIREMENTS: Offered in fall and spring semesters.

MUSC 162 CLASS GUITAR II 1
A continuation of Class Guitar I with a stronger emphasis on ensemble playing and development of a repertoire.
PREREQ: MUSC177.
REQUIREMENTS: Offered in fall and spring semesters.

MUSC 163 ORGAN CLASS 1
Students learn the basic techniques needed to play the organ. Students apply these skills in a class setting, focusing on introductory organ literature and hymn playing.
REQUIREMENTS: Requires permission of instructor.

MUSC 164 PRIVATE STUDY FOR APPLIED JAZZ STYLES AND TECHNIQUES 2
Private studio instruction covering techniques and interpretation used in jazz performance. Examine a cross-section of styles and repertoire.
REQUIREMENTS: Requires audition. Offered in fall and spring semesters.

MUSC 165 EAR TRAINING AND SIGHT SINGING I 2
Techniques of sight singing and music reading skills. Development of ability in the aural recognition of melody, harmony and rhythm.
PREREQ: MUSC195, or passing grade on departmental musicality test.
COREQ: MUSC195.
REQUIREMENTS: Requires permission of instructor. Offered in fall semester only.

MUSC 166 EAR TRAINING AND SIGHT SINGING II 2
Techniques of sight singing and music reading skills. Development of ability in the aural recognition of melody, harmony and rhythm.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC195.
REQUIREMENTS: Offered in spring semester only.

MUSC 167 SIGHT READING AT THE KEYBOARD I 1
Techniques for improving coordination and musical comprehension when playing from sight at the keyboard.
REQUIREMENTS: For keyboard majors. Offered in fall and spring semesters.

MUSC 168 SIGHT READING AT THE KEYBOARD II 1
Continuation of MUSC167.
PREREQ: MUSC167.
REQUIREMENTS: Offered in fall and spring semesters.

MUSC 169 HARMONY I 3
PREREQ: MUSC105, MUSC110, or passing grade on departmental musicality test.
COREQ: MUSC185.
REQUIREMENTS: Offered in fall semester only.

MUSC 170 HARMONY II 3
Continuation of harmony: diatonic through chromatic harmonic with keyboard application. Chord structures and functional relationships. Basic melodic and contrapuntal compositional techniques. Writing, playing and analysis.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC185.
REQUIREMENTS: Offered in spring semester only.

MUSC 171 JAZZ HARMONY 3
An exploration of contemporary classical music and ethnic music, score and part preparation, practical steps towards mounting composition performances, notation, computer software, career opportunities, PR and business-related skills and publishing.
COREQ: MUSC185.
REQUIREMENTS: Offered in odd numbered years, fall semesters only.

MUSC 172 SEMINAR IN MUSIC COMPOSITION 1
An exploration of contemporary classical music and ethnic music, score and part preparation, practical steps towards mounting composition performances, notation, computer software, career opportunities, PR and business-related skills and publishing.
COREQ: MUSC185.
REQUIREMENTS: Offered in fall semester only.

MUSC 173 SEMINAR IN MUSIC COMPOSITION 1
An exploration of contemporary classical music and ethnic music, score and part preparation, practical steps towards mounting composition performances, notation, computer software, career opportunities, PR and business-related skills and publishing.
COREQ: MUSC105.
REQUIREMENTS: Offered in spring semester only.

MUSC 174 SEMINAR IN MUSIC COMPOSITION 1
Survey of non-Western world musical cultures utilizing textbook, reprinted reserve articles, films and in-class performances/performances. Goal is the understanding and appreciation of various world music.
PREREQ: MUSC105.

MUSC 175 SEMINAR IN MUSIC COMPOSITION 1
Systematically examines the origin and historical development of the musical cultures of the Far East. Studies how the musical and cultural influence of Chinese musical culture has had an enormous impact in the development of such cultures in Korea and Japan.

MUSC 176 SEMINAR IN MUSIC COMPOSITION 1
Chronicled study of the style changes in jazz from the late 19th. century to the present. Emphasis on the sociological, economic and technological influences of the period and on the principal personalites who have been primarily responsible for change.
May be cross-listed with BAMS207.
PREREQ: MUSC105.
REQUIREMENTS: Offered in spring semester only.
MUSC 209 Music of the Baroque
Chronological study of the music of the Baroque period with emphasis on the 17th and 18th centuries. Includes major composers and their works.

MUSC 210 Music of the Classical Period
Further study of the music of the Baroque period with emphasis on the 18th and 19th centuries. Includes major composers and their works.

MUSC 211 Introduction to Music History
Survey of selected works in music history with emphasis on selected basic terminology, forms and style changes, through score reading and listening. Prerequisites: Consent of instructor. Offered fall and spring semesters.

MUSC 212 History of Literature and Music
Study of the evolution, structure and content of historic literatures and of the hymnody which developed within them. Includes an examination of Jewish and Eastern elements while focusing on the texts and music of the services and hymns of various traditions within the Western Church.

MUSC 213 French Musical Culture
Explores the contributions of French culture to the history of Western Music. Special focus on major trends in music written and performed in Paris from the Middle Ages through the 20th century, and on the musical institutions that made Paris a world capital of music. Restrictions: Taught abroad only.

MUSC 214 Stringed Instruments Class: Violin, Viola, Cello, Bass
Development of performing and teaching skills. Restrictions: Open to only students whose major requires this course. Offered fall and spring semesters.

MUSC 215 High Brass Instruments Class
Development of performing and teaching skills. Restrictions: MUSC215 and MUSC216 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered fall semester only.

MUSC 216 Low Brass Instruments Class
Development of performing and teaching skills. Restrictions: MUSC215 and MUSC216 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered spring semester only.

MUSC 217 Woodwind Instruments Class I
Development of performing and teaching skills. Restrictions: MUSC217 and MUSC218 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered fall semester only.

MUSC 218 Woodwind Instruments Class II
Development of performing and teaching skills. Restrictions: MUSC217 and MUSC218 to be taken consecutively in one academic year. Open only to students whose major requires this course. Offered spring semester only.

MUSC 219 Percussion Instruments
Development of performing and teaching skills. Restrictions: Open only to students whose major requires this course. Offered spring semester only.

MUSC 220 Marching Band Techniques
Focuses on designing and charting a show of the complete contemporary marching band. Overview of history and development of the marching band, as well as "hands-on" sessions in marching percussion and color guard. Prerequisites: Consent of instructor. Offered spring semester only.

MUSC 221 Marching Percussion Techniques
Focuses on advancing skills on the marching snare drum, multi-tom, bass drum, cymbals or front ensemble. Emphasizes techniques through an opportunity to learn basic arranging skills. Open to students of all skill levels. Restrictions: Offered spring semester only.

MUSC 241 Accompanying Chamber Music: Piano
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard. Prerequisites: Sight-Reading Placement Test. Restrictions: First course of a six-semester sequence. Requires permission of instructor. Offered fall and spring semesters.

MUSC 242 Accompanying Chamber Music: Piano
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard. Prerequisites: Consent of instructor. Offered fall, spring semesters.

MUSC 251 Private Study for Bachelor of Music III
Continuing private study for sophomore bachelor of music students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. Prerequisites: Consent of instructor. Offered fall and spring semesters.

MUSC 252 Private Study for Bachelor of Music IV
Continuing private study for sophomore bachelor of music students. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. Prerequisites: Consent of instructor. Offered fall and spring semesters.

MUSC 253 Private Study for Bachelor of Arts and Minors III
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. Prerequisites: Consent of instructor. Offered fall and spring semesters.

MUSC 254 Private Study for Bachelor of Arts and Minors IV
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. Prerequisites: Consent of instructor. Offered fall and spring semesters.

MUSC 271 Dictation: German
A study of pronunciation rules for singing in German. Includes practical work. Corequisites: Enrollment in applied study. Restrictions: Offered fall semester only.

MUSC 272 Dictation: French
A study of pronunciation rules for singing in French. Includes practical work. Corequisites: Enrollment in applied study. Restrictions: Offered spring semester only.

MUSC 275 Class Piano: Intermediate I
Piano techniques applicable to the levels and needs of the students; a continuation of reading and transposition; and improvisation and repertory of grade two pieces. Prerequisites: MUSC176 and MUSC196. Restrictions: Offered fall semester only.

MUSC 276 Class Piano: Intermediate II
A continuation of MUSC275. Prerequisites: MUSC275. Restrictions: Offered spring semester only.

MUSC 279 Introduction to the Organ
Designed to provide information about the organ: its history, use and literature as well as tonal and mechanical aspects of its design.

MUSC 281 Private Study for Applied Jazz Styles and Techniques
Private studio instruction covering techniques and interpretation used in jazz. Corequisites: Enrollment in applied study. Restrictions: Offered fall and spring semesters.

MUSC 285 Advanced Ear Training and Sight Singing I
Continuation of MUSC183 and MUSC196. Prerequisites: MUSC186 and MUSC195. Corequisites: MUSC295. Restrictions: Offered fall semester only.

MUSC 286 Advanced Ear Training and Sight Singing II
Continuation of MUSC185, MUSC186 and MUSC285. Prerequisites: MUSC285 and MUSC295. Corequisites: MUSC296. Restrictions: Offered spring semester only.

475
MUSC 287 Music Technology I 3
Overview and experience with commercially-available music-related hardware and software. Hardware includes IBM and Macintosh microcomputers, electronic keyboards and tone generators incorporating Musical Instrument Digital Interface (MIDI), digital recording systems, CD-ROM and videotape. Software includes sequencers, notation packages, interactive composers, educational programs and hypermedia applications. PREREQ: MUSC105 or MUSC195
RESTRICTIONS: Offered fall and spring semesters.

MUSC 291 Practice in Church Music 1
Introduces a variety of skills, techniques and information needed in the practice of church music. Students will learn to apply these skills through in-class experience with various instruments and resources.

MUSC 292 Organ Improvisation and Service Playing 2
Student learns and applies skills used in improvising at the organ and playing for church services. A basic conducting component is included. RESTRICTIONS: Offered spring semester only.

MUSC 293 Jazz Improvisation I 3
A comprehensive study of jazz improvisation vocabulary and techniques which will result in the student being able to improvise in a stylistically acceptable manner over a given set of chord progressions. PREREQ: MUSC197.

MUSC 294 Jazz Improvisation II 3
An advanced study of jazz improvisation vocabulary and techniques which will result in the student being able to improvise in a stylistically acceptable manner. PREREQ: MUSC293.

MUSC 295 Advanced Harmony I 3

MUSC 296 Advanced Harmony II 3

MUSC 298 Seminar in Music Composition 1
An exploration of contemporary classical music and ethnic music, score and part preparation, practical steps towards mounting composition performances, notational computer software, career opportunities, PR and business-related skills, and publishing. RESTRICTIONS: Open only to Music Theory/Composition majors. Offered fall semester only.

MUSC 299 Seminar in Music Composition 1
An exploration of contemporary classical music and ethnic music, score and part preparation, practical steps towards mounting composition performances, notational computer software, career opportunities, PR and business-related skills, and publishing. RESTRICTIONS: Open only to Music Theory/Composition majors. Offered spring semester only.

MUSC 301 Junior Recital 0 PF
A 30-minute public recital. RESTRICTIONS: Requires junior status.

MUSC 302 Women in Music: An Alternate Survey 3
Survey of women's contributions to Western art music traditions from 12th century to present day through the study of women as composers, performers, patrons, and as the subject of musical expression. Explores cultural systems that have alternately encouraged and suppressed women's creativity. May be cross-listed with WOMS302.

MUSC 309 Patterns of Patronage 3
Examines the creation, performance and transmission of music within broader context of the economic, political, social and technological environment. Emphasizes interdependency of musical activity and its patrons, including traditional functions of state, church, civic, mercantile, private; also contemporary interaction with public, private, and third sectors. RESTRICTIONS: Open to juniors and seniors.

MUSC 310 Churches and Cathedrals of London 3
A study of ecclesiastical architecture of the 12th-20th centuries, noting structure, architectural style & historical role, as well as the way in which music, liturgy and the visual arts unfold within each building. RESTRICTIONS: Taught in London only.

MUSC 311 Music History: 400 Through 1600 3
The history of musical style and theory in the Middle Ages [5th through 14th centuries] and the Renaissance [13th and 16th centuries]. PREREQ: MUSC211 or permission of instructor. RESTRICTIONS: Offered spring semester only.

MUSC 312 Music History: 1600 Through 1827 3
The history of musical style and theory during the Baroque period (1600-1750), and the Classic period through the death of Beethoven (1827). PREREQ: MUSC211 or MUSC101. RESTRICTIONS: Offered fall semester only.

MUSC 313 Music History: 1827 to the Present 3
The Romantic era, Impressionism and the 20th century. Musical thought and style from 1825 to the present. PREREQ: MUSC211 or MUSC101. RESTRICTIONS: Offered spring semester only.

MUSC 316 Ensembles: Instrumental, Piano, or Vocal 1
Performance of chamber music for instrument, piano or voice. RESTRICTIONS: May be repeated for credit. Offered fall and spring semesters.

MUSC 318 Choral Literature 2
Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1500. PREREQ: MUSC211. RESTRICTIONS: Offered fall semester only.

MUSC 319 Orchestration 2
Orchestral and band arranging; review of instrumental ranges and colors; scoring for small ensembles; special problems in scoring accompaniments. Final arrangement performed by a University ensemble. PREREQ: MUSC296. RESTRICTIONS: Offered fall and spring semesters.

MUSC 335 Basic Conducting 2
The principles of conducting and score reading. PREREQ: MUSC286 and MUSC296. RESTRICTIONS: Offered fall semester only.

MUSC 339 Viennese Composers 3
Selected Viennese composers including Mozart, Beethoven, Schubert and the Strausses. Emphasis on Viennese music. A combination of music history and music appreciation. RESTRICTIONS: Taught in Semester in Vienna program only.

MUSC 341 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard. PREREQ: MUSC242. RESTRICTIONS: Offered fall and spring semesters.

MUSC 342 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard. PREREQ: MUSC341. RESTRICTIONS: Offered fall and spring semesters.

MUSC 345 History of Theatre: American Musical Theatre 3
Musical-dramatic forms of the 18th, 19th and 20th centuries in the United States and their impact on the modern musical theatre. Complete works read and compared to a series of criteria that are found in successful modern shows. Comparison of older and current works. May be cross-listed with THEA345. RESTRICTIONS: Offered fall semester only.

MUSC 351 Private Study for Music Education V 2
Continuing private study for junior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class. PREREQ: MUSC252. RESTRICTIONS: For music education majors only. Offered fall and spring semesters.
MUSC 351 Private Study for Music Education VI 2
Continuing private study for junior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC351
RESTRICTIONS: For music education majors only. Offered fall and spring semesters.

MUSC 352 Private Study for Music Education VII 2
Continuing private study for junior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC351
RESTRICTIONS: For music education majors only. Offered fall and spring semesters.

MUSC 353 Private Study for Bachelor of Arts and Minors V 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC254, permission of instructor
RESTRICTIONS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts degree credit. Offered in fall and spring semesters.

MUSC 354 Private Study for Music Bachelor of Arts and Minors VI 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC255, permission of instructor
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 355 Private Study for Applied Music V 3
Continuing private study for junior music education majors, including preparation for Junior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC252
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 356 Private Study for Applied Music VI 3
Continuing private study for junior music education majors, including preparation for Junior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC357
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 357 Private Study for Applied Music V 3
Continuing private study for junior music education majors, including preparation for Junior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC252
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 358 Private Study for Applied Music VI 3
Continuing private study for junior music education majors, including preparation for Junior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class.
PREREQ: MUSC357
RESTRICTIONS: For applied music majors only. Offered in fall and spring semesters.

MUSC 361 Keyboard Literature I 3
Style, structure and technical performance of keyboard music from the 17th century to the present.
PREREQ: MUSC262

MUSC 362 Keyboard Literature II 3
Intensive study of one composer or style period from the keyboard repertory. Content varies from year to year.
PREREQ: MUSC363

MUSC 363 Independent Study 1-3
1-3 credit hours for independent study under the direction of a faculty member.
PREREQ: MUSC365

MUSC 364 Music Technology II 3
Explores intermediate to advanced applications of music technology including professional level implementation of MIDI hardware and software. Topics include multiprocessor interfaces, synchronization, MIDI sequencing and notation techniques, multimedia, and music related Internet services. Additional topics may be examined depending on student experience.
PREREQ: MUSC287

MUSC 365 Principles of Music Industry Practice 3
Offers an understanding of the fundamental workings of the music industry. Examines theory/practice of core principles, focusing on provisions of copyright law, standard agreements, and the influence of professional organizations. Emphasis on framework for interaction among writers, artists, performers, publishers, record companies, producers.
PREREQ: MUSC351, permission of instructor

MUSC 366 Elements of Music Management 3
Introduces principles involved in planning and management for performing arts organizations. Includes basic concepts of project development and implementation, production issues for public performances, communication skills and marketing techniques, utilization of new technologies, and aspects of resource planning and advocacy.
RESTRICTIONS: Open to juniors and seniors.

MUSC 367 Honors Colloquium 3
See ARSC390 for course description. May be cross-listed with ENGL391.
MUSC 441 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard
PREREQ: MUSC342
REQUIREMENTS: Offered fall and spring semesters

MUSC 442 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard
PREREQ: MUSC441
REQUIREMENTS: Offered fall and spring semesters

MUSC 443 Chamber Music Performance 1
Survey of chamber music literature through performance. Emphasis is placed on the ensemble of instrumental skills while exploring music from the Baroque Period through the present day. Open to both majors and non-majors and open to voice, string, piano, and wind players
REQUIREMENTS: Requires permission of instructor

MUSC 451 Private Study for Music Education VII 2
Continuing private study for senior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC352
REQUIREMENTS: For music education majors only. Offered fall and spring semesters

MUSC 452 Private Study for Music Education VIII 2
Optional continuing private study for senior music education majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC451
REQUIREMENTS: For music education majors only. Offered fall and spring semesters

MUSC 453 Private Study for Bachelor of Arts and Minors VII 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC354, permission of instructor
REQUIREMENTS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts degree credit. Offered fall and spring semesters

MUSC 454 Private Study for Bachelor of Arts and Minors VIII 2
Continuing private study for bachelor of arts (music) students and music minors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC353, permission of instructor
REQUIREMENTS: For bachelor of arts (music) students and music minors only. Does not count for bachelor of arts degree credit. Offered fall and spring semesters

MUSC 457 Private Study for Applied Music VII 4
Continuing private study for senior applied music majors, including preparation for Senior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC358
REQUIREMENTS: For applied music majors only

MUSC 458 Private Study for Applied Music VIII 4
Continuing private study for senior applied music majors, including preparation for Senior Recital. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC457
REQUIREMENTS: For applied music majors only

MUSC 464 Internship 1-3
Field experience with nonprofit performing arts organizations or commercial music businesses relevant to the student's area of interest
REQUIREMENTS: Open to music management studies majors and minors only

MUSC 466 Independent Study 1-3

MUSC 480 Vocal Pedagogy 3
Designed for those who plan to work with the singing voice. Includes vocal research, comparative pedagogy, observation of teaching and practical teaching experience
REQUIREMENTS: Offered fall semester only

MUSC 481 Pedagogy and Literature 3
The study of teaching methods and literature (music scores, books, and other media). Shows teaching skills needed at the secondary level and lower REQUIREMENTS: Requires permission of instructor

MUSC 485 Pedagogy of Theory 3
Materials, organization, techniques and problems of teaching high school and basic college theory courses. Attention to sight singing, ear training, keyboard and form and analysis materials. Observation and teaching of theory courses at the Freshman and Sophomore levels
PREREQ: MUSC286 and MUSC296

MUSC 489 Opera Workshop 1-3
Dramatic and musical preparation of operatic roles through the production of a complete opera/operetta
REQUIREMENTS: Admission by audition, with permission of private instructor, and preference given to vocal performance majors. Offered fall and spring semesters

MUSC 561 Non-Degree Private Study 1-2
Continuing private study for all music majors. The student adds to the course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-hour studio class
PREREQ: MUSC452, MUSC454, or MUSC458, and permission of instructor
REQUIREMENTS: Music majors only. May be repeated for credit

MUSC 600 Master's Performance in Conducting 2 PF
Reflects the culmination of student performances as a conductor with one or more large ensembles in the Department of Music
PREREQ: MUSC662
REQUIREMENTS: For students in the Master of Music degree, Performance Concentration (Conducting)

MUSC 603 Wind Literature 3
Survey of chamber music literature from the 17th century to the present
REQUIREMENTS: Requires permission of instructor

MUSC 604 String Quartet Literature 3
A survey of music for the string quartet from Haydn through the present day
REQUIREMENTS: Requires permission of instructor

MUSC 605 Symphonic Literature 3
Historical and structural analysis of major symphonic works from the 18th century to the present
REQUIREMENTS: Requires permission of instructor

MUSC 606 Wind Literature 3
History of the wind band and its music from the Renaissance to the present, with emphasis on the wind music from the 19th and 20th centuries for wind ensemble and concert band. Examines wind literature suitable for secondary school and college-level performing groups
REQUIREMENTS: Requires permission of instructor

MUSC 607 Contemporary Music Literature 3
Analysis of styles and techniques of contemporary composers beginning with compositions of the late 1950s
REQUIREMENTS: Requires permission of instructor

MUSC 608 Vocal Music Literature 3
A survey of important literature for solo voice. Area of emphasis varies by year and includes German Lieder, French Art Song, and twelfth-century Art Song
REQUIREMENTS: Requires permission of instructor. May be repeated when topics vary

MUSC 609 Choral Music Literature I 3
Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1450. Particular emphasis on current research as related to the use of primary source material as applied to the modern edition
REQUIREMENTS: Requires permission of instructor

MUSC 610 Choral Music Literature II 3
Survey of the development of major choral genres (e.g. mass, motet, requiem) from 1500 to the present. The evolution of musical style and structure is examined through analysis and discussion regarding performance practice
REQUIREMENTS: Requires permission of instructor

MUSC 611 Studies in Music History 3
A survey of representative compositions from various periods of music history. Includes a study of the relationship of music to the socio-cultural background of each epoch and discussions of performance practice problems. Topics of study may change with each time of offering
MUSC 620 LARGE ENSEMBLE
Participation as a performer in a large ensemble
RESTRICTIONS: Entry audition required

MUSC 621 CHAMBER ENSEMBLE
Participation as a performer in a chamber ensemble.
RESTRICTIONS: Entry audition required

MUSC 622 MATERIALS AND METHODS OF RESEARCH
Examines the major materials used in research in the areas of music history, theory, performance and education, as well as the methods of conducting research in these fields.
RESTRICTIONS: Requires permission of instructor.

MUSC 637 ADVANCED INSTRUMENTAL CONDUCTING
Advanced conducting techniques for directors of instrumental performing groups.
RESTRICTIONS: Requires permission of instructor

MUSC 638 LARGE ENSEMBLE PRACTICE
Participation in a large ensemble and seminar with ensemble director.
RESTRICTIONS: Requires permission of instructor

MUSC 640 HISTORY AND PHILOSOPHY OF MUSIC EDUCATION
Topics include philosophical issues concerning the role of arts in education, intrinsic and extrinsic rationales for music in the schools, and arts advocacy at the local, state, and national levels. Also includes the history and philosophy of music education in the United States from the colonial period to the present.
RESTRICTIONS: Requires permission of instructor

MUSC 643 ADVANCED CHAMBER MUSIC PERFORMANCE
In-depth survey of chamber music literature through performance. Emphasis is placed on the development of advanced ensemble skills while exploring music from the Baroque Period through the present day. Open to both majors and non-majors and open to voice, string, piano, and wind players.

MUSC 659 MASTER'S THESIS
Examination of structural, melodic, rhythmic, harmonic and textural aspects of selected music literature and their significance in artistic performance.
RESTRICTIONS: Requires satisfactory score on music theory graduate placement exam.

MUSC 869 MASTER'S THESIS
1-6

NUTRITION AND DIETETICS

NTDT 103 INTRODUCTION TO NUTRITION PROFESSIONS 1 PF
Career opportunities in dietetics and nutrition. Provides information about undergraduate programs and the competencies required of dietitians and registered dietitians. Introduces opportunities for dietetic internships and dietetic practice.

NTDT 168 FRESHMAN SPECIAL TOPICS 1-6
Freshman level independent study.

NTDT 200 NUTRITION CONCEPTS 3
Functions and sciences of nutrients, dietary adequacy, energy balance and metabolism with emphasis on health promotion. Includes weight control, evaluation of popular diets, vegetarianism, eating disorders, alcohol, other current issues and concerns in nutrition.

NTDT 201 FOOD CONCEPTS 3
Food selection and preparation as related to the chemical and physical properties of food. Includes composition of food. Functions of ingredients and methods to achieve desirable sensory and nutritional attributes of foods. 
RESTRICTIONS: Open to APN, DIET, NS, HS and IST majors and minors only.

NTDT 222 NUTRITION CONTROVERSY 1
Explores topical issues in nutrition via discussion format.
COREQ: NTDT200

NTDT 255 MULTICULTURAL FOOD HABITS 3
Food habits of diverse cultural groups. Determinants of traditional and cultural food habits. Historical and cultural context of food. 
RESTRICTIONS: Open to APN, DIET, NS, HS and IST majors and minors only.

NTDT 268 SOPHOMORE SPECIAL TOPICS 1-6
Sophomore level independent study.

NTDT 305 NUTRITION IN THE LIFESPAN 3
Nutrition and health during the different stages of life: pregnancy, lactation, infancy, preschool years, middle childhood, adolescence, adulthood and later maturity.
PREREQ: NTDT200 and a course in biology.

NTDT 310 NUTRITION AND ACTIVITY 3
Energy and nutrient needs for activity with emphasis on particular physical and athletic activities; common myths and fallacies concerning diet and athletic performance; and appropriate dietary approaches for specific activities and active people.
PREREQ: NTDT200 and a food service course.

NTDT 321 QUANTITY FOOD PRODUCTION AND SERVICE 3
Principles of quantity food production and delivery systems; menu planning and purchasing design; safety, sanitation and technical operations in a food service system.
PREREQ: NTDT200 and NTDT201

NTDT 322 MANAGEMENT OF FOOD AND NUTRITION SERVICES 3
Organization and administration of not-for-profit and entrepreneurial services. Functions and responsibilities related to these products including planning, marketing, total quality and human resource management, and food and labor cost accounting.
PREREQ: NTDT200 and NTDT201
NTDT 326  Onsite Food Production  3
Laboratory experience in quantity food production and delivery with emphasis on equipment, production methods, quality standards and controls and environmental issues. Development of food production design considering material flow, functional areas and utility requirements. Food safety certification. COREQ: NTDT321.

NTDT 330  Nutrition Counseling  3
Theories, skills and techniques of nutrition interviewing and counseling applied to changing food behaviors. PREREQ: NTDT200 and NTDT201.

NTDT 350  Nutrition and Older Adults  3
Discussion of the physiology of aging on fundamental nutrition processes, food and nutrient requirements and intakes, assessment of nutritional status, and nutrition related problems of older adults. PREREQ: NTDT200 and BISC106 or BISC276.

NTDT 368  Junior Special Topics  1-6
Junior level independent study.

NTDT 400  Macronutrients  3
Metabolism of carbohydrates, proteins and fats in human nutrition, interdependence and relation to energy metabolism/balance, scientific bases of macronutrient requirement during the life cycle. PREREQ: NTDT200, CHEM214 and CHEM216.

NTDT 401  Micronutrients  3
Mechanisms and interactions of vitamins and minerals in cellular metabolism, scientific bases of nutrient requirements during the life cycle. PREREQ: NTDT400.

NTDT 403  Dietetics Seminar  1 PF
Provides direction for career decisions, including self-assessment, resume development, and interview preparation. Focuses on the post-baccalaureate career pathways of employment, graduate study, and the supervised practice experience. Explores registration, specialty certification and licensure for dietitians. RESTRICTIONS: Open only to senior dietetics majors.

NTDT 420  Maternal and Infant Nutrition  3
Maternal physiological adjustments in pregnancy and their relationship to nutritional needs; effect of maternal nutrition on fetal growth and development; physiology of lactation and maternal nutrient needs; and neonatal nutritional needs and current infant feeding practices. PREREQ: NTDT400 and BISC276.

NTDT 421  Nutritional Assessment Methods  3
Nutritional screening and assessment methods and techniques including evaluation of dietary intake, anthropometric measurements, biochemical tests and clinical assessment. Overview of the methodologies involved in nutrition research. PREREQ: NTDT400 and a course in statistics.

NTDT 430  Nutrition Clinic Practicum  1-3
Experience in on-going activities of the University of Delaware Nutrition Clinic including client counseling, group presentations, nutrition education materials development and research activities. PREREQ: NTDT330. RESTRICTIONS: Requires permission of instructor.

NTDT 435  Peer Nutrition Mentoring  3
Preparation of upper division students to become peer mentors for an introductory nutrition course. Internet discussion forums used to increase interaction in a large classroom setting. Offers pre-professional practice opportunities for nutrition majors. PREREQ: NTDT400.

NTDT 445  Teaching Methods: Nutrition/Foods  3
Needs assessment; writing instructional objectives; selecting appropriate methods, materials and resources for audiences varying in age, literacy and ethnicity; planning, implementing and evaluating education programs related to food and nutrition. PREREQ: NTDT200.

NTDT 450  Medical Nutrition Therapy I  3

NTDT 451  Medical Nutrition Therapy II  3

NTDT 452  Topics in Nutrition and Dietetics  1-3
In-depth analysis of a specific topic in an area of nutrition and dietetics. RESTRICTIONS: Junior-level NTDT course(s) relating to the specific topic required.

NTDT 460  Community Nutrition  3
Nutritional care as a part of health maintenance and health care delivery; the relationship of community resources, structure and dynamics to an individual's ability to be well fed. Nutritional needs and programs. Means of affecting change in nutrition knowledge and practice. PREREQ: NTDT400 and NTDT321.

NTDT 464  Community Nutrition Field Experience  2
Direct client contact through delivery of nutritional services in community health maintenance and health care delivery facilities. First-hand experience with the nutritional management of clients in a community nutrition program. PREREQ: NTDT322 COREQ: NTDT460.

NTDT 468  Senior Special Topics  1-6
Senior level independent study.

NTDT 475  Transcultural Foods and Cuisine  3-5
Travel study of transcultural food habits: attitudes, beliefs, customs and taboos. Visits to major food industries and health organizations and interaction with indigenous population. PREREQ: NTDT200.

NTDT 550  Dietetics Practicum I  4 PF
Introduces supervised practice experiences for incorporation and application of skills, knowledge, and attitudes with special emphasis on current dietary issues facing the health professional in public health nutrition. COREQ: NTDT650. RESTRICTIONS: Open to dietetic internship students only.

NTDT 551  Dietetics Practicum II  4 PF
Continued supervised practice experiences for incorporation and application of skills, knowledge, and attitudes, focusing on entry-level competence with current dietary issues facing the health professional. PREREQ: NTDT550. COREQ: NTDT651. RESTRICTIONS: Open to dietetic internship students only.

NTDT 611  Advanced Nutrition  3
Metabolism and its relation to human nutrition; current literature; methods and techniques of nutrition research. PREREQ: NTDT400 or NTDT610.

NTDT 615  Advanced Nutrition and Physical Activity  3
Critical analysis of current research on effects of nutrition, food and diet on physical activity and optimal athletic performance. Develops specific topics and interests through independent projects. PREREQ: Undergraduate nutrition and physiology courses.

NTDT 620  Maternal and Infant Nutrition  3
Maternal physiological adjustments in pregnancy and their relationship to nutritional needs; effect of maternal nutrition on fetal growth and development; physiology of lactation and maternal nutrient needs; neonatal nutritional needs and current infant feeding practices. PREREQ: NTDT400 and BISC106 or BISC276.

NTDT 621  Nutrition Research Methods  2
Discussion and experience with selected methods and techniques in nutrition research. PREREQ: Upper-division course work in nutrition, biochemistry and physiology.

NTDT 624  Monogastric Nutrition  3
See ANSC624 for course description.

NTDT 630  Trace Minerals and Vitamins  3
Recent advances in knowledge of the nutritional significance of trace minerals and vitamins; their physiological function(s); factors affecting needs and utilization; assessment of requirements; occurrence in food supply; and current issues and concerns. Primary focus on human nutrition with comparative aspects in other living systems utilized to illustrate significant similarities and/or differences. May be cross-listed with ANSC630. PREREQ: Junior-level course work in human or animal nutrition, biochemistry or biological sciences.
NURSING

NURS 100 NEW STUDENT CONNECTIONS
Provides first semester students in CHNS opportunities to explore and become familiar with the college and university. Students acquire information on campus resources and gain practical skills helpful for a successful transition to college.
RESTRICTIONS: Open to nursing majors only.

NURS 101 HUMAN ANATOMY
Introduction to the study of human anatomy which provides a foundation for the future study of human physiology and other related courses. Includes a clinically relevant, fundamental overview of the human body using a "systems" approach.
RESTRICTIONS: Open to nursing and health studies majors only.

NURS 110 NURSING CONNECTIONS
Introduction to the profession of nursing and basic clinical nursing skills. Includes the roles of nursing, historical development and nursing philosophy.
RESTRICTIONS: Open to nursing majors only.

NURS 200 CLINICAL DECISION MAKING
Introduces and explores nurses’ decision making processes including the nursing process. Builds upon basic clinical skills with psychomotor, cognitive, and affective skills used by nurses.
PREREQ: NURS110
RESTRICTIONS: Open to nursing majors only.

NURS 220 CONCEPTS OF NURSING PRACTICE
Introduction to the nursing profession which includes psychomotor, cognitive and affective skills integral to basic nursing practice. The nursing process, professional ethics and basic clinical skills are covered.
PREREQ: ENGL110
COREQ: PSYC100
RESTRICTIONS: Open to nursing majors only.

NURS 222 PHARMACOLOGY
Focuses on the therapeutic and adverse biological, psychological and social reactions to pharmacological agents. Drug use and medication abuse, client teaching, lab data and current research are discussed. Nursing responsibilities and clinical applications are emphasized.
PREREQ: NURS220
COREQ: NURS230, NURS240
RESTRICTIONS: Open to nursing majors only.

NURS 230 FOUNDATIONS OF NURSING
Examines the health continuum with an emphasis on wellness, health promotion across the lifespan, the aging process, and an introduction to community-based nursing. Clients will be discussed as individuals, members of families, and as parts of cultural and global communities. Clinical experiences in the laboratory and healthcare facilities provide opportunities to practice physical and health assessment skills and teaching/health promotion techniques.
PREREQ: BISC207, CHEM105, CHEM106, NURS220 and a course in anatomy.
COREQ: IFST201, NTD200, NURS222
RESTRICTIONS: Open to nursing majors only.

NURS 231 HEALTH PROMOTION ACROSS THE LIFESPAN
Explores the continuum of healthcare with a focus on prevention, wellness initiatives and health promotion across the lifespan. Emphasizes the nurse’s teaching role. Examines types of health promotion for individuals, families and communities.
PREREQ: NURS110
RESTRICTIONS: Open to nursing majors only.

NURS 232 CARE OF VULNERABLE POPULATIONS
Focuses on population-based healthcare. Examines community level nursing care. Explores vulnerability as it relates to pediatric, older adult, rural and disadvantaged, and culturally diverse populations within the American healthcare system.
PREREQ: NURS110
RESTRICTIONS: Open to nursing majors only.

NURS 241 SCIENTIFIC BASIS OF NURSING
Examines pathophysiological concepts as a scientific basis of disease processes. Focuses on major body systems, including immune, endocrine, neurological and psychological. Emphasizes concepts of cancer, pain and infection.
PREREQ: BISC207, CHEM105, CHEM106, NURS110
COREQ: BISC276 or BISC300
RESTRICTIONS: Open to nursing majors only.

NURS 242 SCIENTIFIC BASIS OF NURSING
Examines pathophysiological concepts as a scientific basis of disease processes. Focuses on major body systems, including cardiovascular, respiratory, gastrointestinal and renal. Emphasizes concepts of fluids and electrolytes.
PREREQ: BISC207, CHEM105, CHEM106, NURS110
COREQ: BISC276 or BISC300
RESTRICTIONS: Open to nursing majors only.

NURS 250 HEALTH ASSESSMENT ACROSS THE LIFESPAN
Introduces and develops clinical skills of physical health assessment across the lifespan. Field experiences develop physical assessment skills.
PREREQ: NURS110, NURS200
COREQ: BISC276 or BISC300
RESTRICTIONS: Open to nursing majors only.

NURS 312 PATHOPHYSIOLOGY
Focuses on biological processes leading to alterations of body structure and functions. Emphasis on identification of etiology and pathogenesis of selected diseases.
PREREQ: BISC276, BISC300, IFST201, NTD200, PSYC100 and STAT200
RESTRICTIONS: Open to nursing majors only. Nursing majors must take three credits; BRN majors must take four credits.
NURS 335  BACCALAUREATE FOR THE REGISTERED NURSE ORIENTATION  
Provides an orientation to the on-line BRN major including a hands-on technology component. Includes initial preparation for the BRN Practicum. Emphasizes resources essential for successful program completion. 
RESTRICTIONS: Must be taken prior to any other BRN nursing course. Open to BRN majors only.

NURS 340  CURRENT PERSPECTIVES IN NURSING  
Introduces nursing theory and conceptual foundations for practice within a pluralistic society. Provides overview of principles of nursing education and practice at the baccalaureate level. Focuses on healthcare needs within diverse practice settings, emphasizing emerging legal and ethical responsibilities, economic and sociocultural influences. 
RESTRICTIONS: Admission to BRN program.

NURS 342  NURSING INFORMATICS  
Addresses the current utilization of evolving technologies in nursing/client education, practice, administration and research. 
RESTRICTIONS: Admission to BRN program.

NURS 343  TRANSITION TO BACCALAUREATE NURSING  
Addresses issues related to the socialization and transition to baccalaureate nursing education and practice. Completes content of NURS340 and NURS342. Incorporates the practical application of evolving technologies with emphasis on nursing/client education. Introduces University and BRN program resources. 
PREREQ: NURS340 and NURS342.

NURS 344  WELLNESS AND HEALTH ASSESSMENT  
Explores selected concepts, theories and skills utilized in health promotion and disease prevention of individuals from socioculturally diverse populations within the context of family, community and healthcare system. Includes key elements of a biopsychosocial/cultural health history and health assessment of individuals across the life course. 
PREREQ: NURS343.

NURS 345  CONCEPTUAL FOUNDATIONS FOR NURSING PRACTICE  
Introduces conceptual foundations for practice within a pluralistic society. Provides overview of nursing education, practice, research, informatics and evolving technologies. Focuses on healthcare needs within diverse practice settings, emphasizing emerging legal and ethical responsibilities, and economic and sociocultural influences. 
PREREQ: NURS335. 
RESTRICTIONS: Open to BRN majors only. To be taken immediately following completion of NURS335.

NURS 350  WELLNESS AND HEALTH ASSESSMENT  
Explores selected concepts, theories and skills utilized in health promotion and disease prevention of individuals from socioculturally diverse populations within the context of family, community and healthcare systems. Key elements include a health history, physical, and psychosocial assessment. 
PREREQ: NURS335, NURS345. 
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.

NURS 352  ADULT HEALTH NURSING  
Examines selected concepts and theories related to restoring and maintaining optimal health in adult populations. Focuses on major body systems, including immune, endocrine, and neurological. Selected laboratory and field experiences are included to enhance concepts. 
PREREQ: BISC276, BISC300; all required 200 level nursing courses except NURS222. 
COREQ: NURS222. 
RESTRICTIONS: Open to nursing majors only.

NURS 354  PSYCHOSOCIAL NURSING  
Provides and examines selected concepts and theories related to restoring and maintaining optimal health of patients experiencing psychopathology. Selected laboratory and field experiences are included to enhance concepts. 
PREREQ: All 200 level required nursing courses except NURS222. 
COREQ: NURS222. 
RESTRICTIONS: Open to nursing majors only.

NURS 356  CARE OF CHILDREN AND FAMILIES  
Examines selected concepts and theories related to the nursing care of infants, children and adolescents and their families. Selected laboratory and field experiences are included to enhance concepts. 
PREREQ: All 200 level required nursing courses except NURS222. 
COREQ: NURS222. 
RESTRICTIONS: Open to nursing majors only.

NURS 358  WOMEN'S HEALTH NURSING  
Examines selected concepts and theories related to the nursing care of the childbearing family and major women's health issues. Selected laboratory and field experiences are included to enhance concepts. 
PREREQ: All 200 level required nursing courses except NURS222. 
COREQ: NURS222. 
RESTRICTIONS: Open to nursing majors only.

NURS 362  RESEARCH CONCEPTS IN HEALTHCARE  
Application of the research process and the research utilization process to healthcare practice. 
PREREQ: NURS200. 
COREQ: STAT200. 
RESTRICTIONS: Open to nursing and health studies majors only.

NURS 366  INDEPENDENT STUDY  

takes selected concepts and theories related to restoring and maintaining optimal health in adult populations. Focuses on major body systems, including cardiovascular, respiratory, gastrointestinal and renal. 
PREREQ: All 200 level required nursing courses except NURS222. 
COREQ: NURS222. 
RESTRICTIONS: Open to nursing majors only.

NURS 372  ADULT HEALTH NURSING  
Examines the nurse's role in health policy across the lifespan and in community settings. Major issues affecting healthcare and current political issues are examined. Issues of bioterrorism are included. 
PREREQ: All 200 level required nursing courses except NURS222. 
COREQ: NURS222. 
RESTRICTIONS: Open to nursing majors only.

NURS 390  CLINICAL WORK EXPERIENCES  
Students receive credit for approved healthcare-related work/volunteer experience. Students must work/volunteer in an appropriate healthcare-related position and credit will be given based on hours worked. 
PREREQ: NURS200. 
RESTRICTIONS: Open to nursing majors only.

NURS 411  TOPICS IN HEALTHCARE DELIVERY  
A consideration of selected issues and problems of nursing practice within the healthcare delivery system. Exploration of some topics may include a laboratory or clinical component. Variable topics. 
PREREQ: NURS352. 
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.

NURS 435  LEADERSHIP AND MANAGEMENT IN HEALTH ORGANIZATIONS  
Introduces the principles of leadership and management and their application in health systems where nursing care is delivered. 
PREREQ: All 300-level BRN nursing courses. 
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.

NURS 442  COMMUNITY HEALTH NURSING  
Focuses on conceptual foundations for community health nursing practice with the community, family and individual as clients. Diversity in nursing roles and practice is related to community health promotion and community health problems. 
PREREQ: NURS444.

NURS 443  BRN ROLE PRACTICUM  
A preceptored clinical experience focused on the integration of concepts learned in baccalaureate nursing education. 
PREREQ: NURS441, NURS442. 
RESTRICTIONS: NURS445 and NURS456 required as prerequisites or corequisites.

NURS 446  LEADERSHIP AND ORGANIZATIONAL BEHAVIOR  
Introduces organizational theory and structure, nursing care delivery systems and components of leadership. Focuses on the role of the nurse-leader in organizing, teaching, decision making, evaluating, planning change and managing conflict. 
PREREQ: NURS441.

NURS 450  SYNTHESIS OF PROFESSIONAL NURSING PRACTICE  
Provides opportunities to bring key aspects of professional nursing practice together utilizing a systems framework. Includes student presentation of projects related to NURS443. 
PREREQ: All other courses in BRN program. 
RESTRICTIONS: Open to BRN majors only. Course sequence alteration requires permission of instructor.
NURS 452  ADULT NURSING CARE II  3
Prepares selected concepts and theories for the interdisciplinary management of
adult patients with critical and/or complex healthcare problems.
PREREQ: NURS220, NURS222, NURS230, NURS240, NURS352 and
NURS353.
COREQ: NURS453
RESTRICTIONS: Open to nursing majors only.

NURS 453  CLINICAL APPLICATIONS ADULT HEALTH NURSING I  3
Clinical application of science and nursing theories of care for adult clients
in hospitals.
PREREQ: All 300 level required nursing courses.
RESTRICTIONS: Open to nursing majors only.

NURS 454  NURSING OF POPULATIONS  2
Prepares students for the role of the nurse in the community and laboratory
which facilitate the transition to the professional role of the nurse.
PREREQ: NURS352, NURS353, NURS354, NURS355, NURS356, NURS357,
NURS358, NURS359 and NURS362.
COREQ: NURS455.
RESTRICTIONS: Open to nursing majors only.

NURS 457  CLINICAL APPLICATIONS: MATERNAL CHILD NURSING  3
Clinical application of science and nursing theories of care for infants,
children, adolescents and childbearing families.
PREREQ: All 300 level required nursing courses.
RESTRICTIONS: Open to nursing majors only.

NURS 459  CLINICAL APPLICATIONS: PSYCHOSOCIAL NURSING  3
Clinical application of science and nursing theories of care for clients with
acute and chronic psychiatric healthcare needs.
PREREQ: All 300 level required nursing courses.
RESTRICTIONS: Open to nursing majors only.

NURS 460  CLINICAL INTEGRATION SEMINAR I  2
Using a seminar format, students discuss major issues identified in clinical
nursing care. Assists students in integrating scientific and theoretical
knowledge into clinical practice. Focuses on legal and ethical issues, nursing
roles, leadership, and nursing licensure issues that arise from clinical
experiences.
PREREQ: All 300 level required nursing courses.
COREQ: NURS453, NURS457, NURS459.
RESTRICTIONS: Open to nursing majors only.

NURS 466  INDEPENDENT STUDY  1-6
NURS 473  CLINICAL APPLICATIONS: ADULT HEALTH NURSING II  3
Advanced clinical application of science and nursing theories in acute core
health settings. Builds upon clinical practice skills of NURS453.
PREREQ: NURS453.
RESTRICTIONS: Open to nursing majors only.

NURS 474  PROFESSIONAL PRACTICE IN HEALTHCARE  2
Explores professional issues related to the current and future roles of
healthcare professionals and serves as a capstone course.
PREREQ: NURS452, NURS453, NURS454 and NURS455.
COREQ: NURS475.
RESTRICTIONS: Open to healthcare majors only.

NURS 475  SENIOR PRECEPTORSHIP  6
Comprehensive application of concepts and skills learned throughout the nursing
curriculum which facilitate the transition to the professional role of the nurse.
PREREQ: NURS452, NURS453, NURS454 and NURS455.
COREQ: NURS474.
RESTRICTIONS: Open to nursing majors only.

NURS 477  CLINICAL APPLICATIONS: CARE OF POPULATIONS  3
Clinical application of science and nursing theories in community health
settings. Local, national, and global issues are addressed.
PREREQ: NURS433, NURS459, NURS460.
RESTRICTIONS: Open to nursing majors only.

NURS 479  CLINICAL PRECEPTORSHIP  3
Clinical application of science and nursing theories in student-selected
clinical settings. Provides a transition from student-faculty relationships to
mentor-new graduate relationships. A nurse preceptor mentors students.
PREREQ: NURS453, NURS459, NURS460.
COREQ: NURS473, NURS477.
RESTRICTIONS: Open to nursing majors only.

NURS 480  CLINICAL INTEGRATION SEMINAR II  2
Discussion of major issues identified in clinical nursing care. Assists
students in integrating scientific and theoretical knowledge into clinical
practice. Focuses on legal and ethical issues, nursing roles, leadership, and
nursing licensure issues that arise from clinical experiences. Provides a
transition to new graduate nurse experiences.
PREREQ: NURS460.
COREQ: NURS457, NURS473, NURS477, NURS479.
RESTRICTIONS: Open to nursing majors only.

NURS 604  ADVANCED PRACTICE ROLES FOR HEALTHCARE PROVIDERS  3
Focuses on roles and issues affecting healthcare providers engaged in advanced
practice. Roles are analyzed in relation to current issues and concepts of
advanced practice.
May be cross-listed with HSAD604.
RESTRICTIONS: Permission required from department.

NURS 609  NURSING SCIENCE: THEORY AND RESEARCH  4
Examines the science of nursing from theoretical and research perspectives and
emphasizes theory as the foundation for research and practice.
RESTRICTIONS: Open to majors only. Permission required from department.
First clinical course and EDUC653 required as prerequisites or corequisites.

NURS 610  CROSS-CULTURAL HEALTHCARE  3
An in-depth study of cultural diversity, delineating ethnocultural congruent
healthcare practices in a pluralistic society. Assessment, planning and
interventions for health promotion, illness and disease prevention, health
restoration and health policy legislation are explored.
RESTRICTIONS: Open to only to graduate students or by permission of instructor.

NURS 612  NURSING INFORMATICS  3
Addresses the current utilization of evolving technologies in nursing/client
education, practice, administration and research.
RESTRICTIONS: BSN or bachelor's degree in another discipline, or by permission
of instructor.

NURS 613  DEATH EDUCATION  3
Focuses on the field of death education, its relevance to everyday life
and most specifically to the professional practice of practitioners providing
support to the dying and bereaved.
RESTRICTIONS: Admission to BRN major or BSN degree or bachelor's degree in
another discipline.

NURS 616  PRIMARY CARE IN COMMUNITY HEALTH  3
Focuses on community based primary care issues in relation to the individual,
family, and community health. Clinical component includes health promotion
and disease prevention activities.
RESTRICTIONS: Open to majors only. Permission required from department.
NURS520 required as either a corequisite or prerequisite.

NURS 617  PRECEPTORSHIP I  3
Focuses on clinical topics in primary care relevant to each practitioner
concentration.
PREREQ: All required clinical courses except NURS427.
RESTRICTIONS: Open to nursing majors only. Permission of department required.

NURS 619  FINANCIAL MANAGEMENT IN HEALTH SERVICES
ORGANIZATIONS  3
Provides the basic principles and concepts of effective management of budgets
for healthcare units. Includes analysis of the environment and departmental
organization and their impact on healthcare.
May be cross-listed with HSAD619.
RESTRICTIONS: Permission of department required.

NURS 620  ADVANCED HEALTH ASSESSMENT  3
Assists graduate students in acquiring advanced knowledge and proficiency in
performing health assessments. Includes eliciting a complete health history
and performing a comprehensive examination.
RESTRICTIONS: Permission of department required.

NURS 621  ADVANCED PATHOPHYSIOLOGY  3
Prepares the pathogenesis of common conditions affecting children and adults
as a basis for clinical management.
RESTRICTIONS: Permission of department required.
NURS 622  ADVANCED PHARMACOLOGY  3  Applies principles of pharmacology to the therapeutic management of the client. Emphasizes prescribing, monitoring drug regimens, identifying adverse reactions, and anticipating changes inherent in self medication. RESTRICTIONS: Permission of department required

NURS 623  MANAGEMENT OF WOMEN'S HEALTHCARE  3  Focuses on gynecologic and reproductive primary healthcare. Emphasizes management of gynecologic health needs and the normal reproductive cycle. RESTRICTIONS: NURS604 and NURS622 are required as either corequisites or prerequisites.

NURS 624  MANAGEMENT OF CHILDREN'S HEALTH  3  Focuses on delivery of primary healthcare to children and adolescents. Emphasizes physical and developmental variations and management of acute and episodic illness. PREREQ: NURS620 and NURS621 RESTRICTIONS: NURS604 and NURS622 required as prerequisites or corequisites.

NURS 625  MANAGEMENT OF ADULT EPIDEMIC HEALTH NEEDS AND PROBLEMS  3  Focuses on delivery of primary care to adults and the elderly with acute epidemic health problems. Emphasizes the clinical decision making necessary to serve as a foundation for planning primary healthcare services. PREREQ: NURS620 and NURS621 RESTRICTIONS: NURS604 and NURS622 required as prerequisites or corequisites.

NURS 626  MANAGEMENT OF ADULT CHRONIC HEALTH NEEDS AND PROBLEMS  3  Focuses on delivery of primary care to adults and the elderly with chronic health problems. Emphasizes management of ongoing needs. PREREQ: NURS620 and NURS621 RESTRICTIONS: NURS604 and NURS622 required as prerequisites or corequisites.

NURS 627  PRECEPTORSHIP II  3  Emphasizes clinical decision making in an interdisciplinary environment with the nurse practitioner as the principal provider of primary care. RESTRICTIONS: NURS617 required as either a corequisite or prerequisite.

NURS 628  NURSE PRACTITIONER SEMINAR  1  Emphasizes the role of the nurse practitioner in the current healthcare system. Issues such as marketing, practice acts, reimbursement, and prescriptive privileges are discussed. PREREQ: All required courses except NURS627.

NURS 629  ADVANCED MANAGEMENT OF WOMEN'S HEALTHCARE  3  Focuses on the delivery of primary care to women with acute and chronic obstetric and gynecologic problems. PREREQ: NURS623.

NURS 630  ADVANCED MANAGEMENT OF CHILDREN AND ADOLESCENT HEALTHCARE  3  Focuses on the delivery of primary healthcare to specific populations. Emphasizes special problems of the neonate and high risk children and adolescents. PREREQ: NURS624.

NURS 635  HEALTH ADMINISTRATION THEORIES  3  Theories of administration, organization and management, their interaction with other health discipline theories and their influence on management of healthcare agencies. Includes the interaction of theories with attainment of institutional goals. May be cross-listed with HSAD635. RESTRICTIONS: NURS604 required as prerequisite or corequisite.

NURS 636  ADULT HEALTH I  3  Provides the conceptual foundation and practical knowledge base needed to develop the essential characteristics of the clinical nurse specialist in adult health. Core content is characterized around three spheres of influence: patient, families and communities; nursing and healthcare personnel; and organizations and networks; with a primary focus on patients, families and communities. Areas of emphasis include assessment skills, therapeutic interventions, education, evidence-based practice and issues and trends in healthcare. COREQ: NURS5804; NURS5821. RESTRICTIONS: Open to clinical nurse specialist students only.

NURS 637  HEALTH PLANNING STRATEGIES  3  Analyzes organizational systems and roles of managers and administrators. Students identify organizational needs, formulate goals and objectives appropriate to healthcare agencies and identify strategies appropriate to accomplishing goal attainment with ethical constraints of healthcare. May be cross-listed with HSAD637. RESTRICTIONS: NURS604 required as prerequisite or corequisite

NURS 638  HEALTH SERVICES EVALUATION  3  Emphasizes the role of managers and administrators in personnel development, promotion of research in clinical settings and development and implementation of quality improvement initiatives and their implications for healthcare. May be cross-listed with HSAD638. RESTRICTIONS: NURS604 required as prerequisite or corequisite

NURS 644  ADULT HEALTH II  3  Provides the learner with opportunities to develop advanced skills inherent to the clinical nurse specialist role as determined by the National Association of Clinical Nurse Specialists. Content is organized around the three spheres of influence with emphasis on nursing and healthcare personnel and builds upon CNS content in previous courses. Areas of emphasis include leadership, collaboration, citizenship, cost-effective care, innovations in practice, and mentorship. PREREQ: NURS636. RESTRICTIONS: Open to graduate clinical nurse specialist students only.

NURS 654  NURSING OF CHILDREN I  3-4  Explores the scientific basis for the routine healthcare guidance required by children and their families. Focuses primarily on the acutely ill child. RESTRICTIONS: NURS604 and NURS621 required as prerequisites or corequisites.

NURS 655  NURSING OF CHILDREN II  3-4  Explores the biopsychosocial needs of children with chronic conditions and their families. Emphasizes the interventions of the advanced practice nurse to assist these children to attain, maintain or regain health. PREREQ: NURS654.

NURS 660  CLINICAL NURSE SPECIALIST ADVANCED CLINICAL PRACTICE  2 PF  Provides the opportunity for students in the clinical nurse specialist concentration to enhance proficiency as clinical experts within their chosen specialty area. PREREQ: NURS631, NURS640, NURS650, NURS654 or NURS671. RESTRICTIONS: Open to majors only. Permission required from department.

NURS 664  NURSING PRACTICUM I  1-3  In conjunction with the faculty advisor and based on the student’s individualized long range goals, the student selects a preceptor and healthcare setting in which to apply didactic content in real life settings. Requires 135 hours of on-site experience, which can be taken in one semester or divided over three semesters. RESTRICTIONS: NURS635, NURS637, or NURS638 is required as a corequisite or prerequisite.

NURS 671  PSYCHIATRIC MENTAL HEALTH NURSING I  3  Emphasizes theory and research related to assessment, diagnosis, clinical management and psychopharmacological intervention in mental illness. Didactic and clinical components allow for the development of subspecialization. PREREQ: Graduate psychopathology course.

NURS 672  PSYCHIATRIC MENTAL HEALTH NURSING II  3  Focuses on the development of two modalities of psychiatric skills and treatment. Core concepts of cognitive and group therapy are integrated with specific strategies for behavioral change. PREREQ: NURS671.

NURS 686  CLINICAL NURSE SPECIALIST ROLE INTEGRATION  4  Integration of theories and concepts related to roles of the clinical nurse specialist. Emphasizes advanced practice roles within the broad context of healthcare. PREREQ: All required clinical courses.

NURS 687  NURSING SCIENCE: RESEARCH APPLICATION  3  Focuses on the application of research to nursing practice. Includes critical analysis of research through an organized critique process, examination of data, and examination of facilitators and barriers to research utilization, models of research utilization, and methods of quality management. PREREQ: NURS609. RESTRICTIONS: Open to majors only. Permission required from department.
ORES 834 SEMINAR IN RESOURCE ECONOMICS
See FREC834 for course description
ORES 827 ADVANCED PRODUCTION ECONOMICS
See FREC806 for course description
ORES 806 RESEARCH TECHNIQUES AND PROCEDURES
See FREC806 for course description
ORES 827 ADVANCED PRODUCTION ECONOMICS
See FREC827 for course description
ORES 834 SEMINAR IN RESOURCE ECONOMICS
See FREC834 for course description

OPERATIONS RESEARCH

ORES 401 INTRODUCTION TO OPERATIONS RESEARCH
Introduction to the methodologies of operations research with particular focus on their application in areas such as agriculture, environmental systems, health care, manufacturing and transportation. Case studies and applied problem solving are emphasized.
PREREQ: MATH241 and MATH242

ORES 601 SURVEY OPERATIONS RESEARCH I
Covers various deterministic mathematical programming methods (LP, integer dynamic), network models and basic inventory models.
PREREQ: Linear algebra

ORES 602 SURVEY OPERATIONS RESEARCH II
Covers various stochastic operations research models including decision theory, game theory, project planning, inventory models, simulation, markov decision processes and queueing models.
PREREQ: Linear algebra and MATH630

ORES 603 SIMULATION MODELING AND ANALYSIS
Instructors from hard sciences and social sciences introduce real-world Operations Research case studies based on their expertise. Students implement proposed solution methodologies using a variety of available computer software packages.
PREREQ: ORES601 and permission of director/instructor.
COREQ: ORES602

ORES 615 ADVANCED PRICES AND STATISTICS
See FREC615 for course description
ORES 650 URBAN TRANSPORTATION SYSTEMS
See CIEG650 for course description
ORES 664 OPERATIONS RESEARCH INTERNSHIP
Supervised, on-the-job experience, performing technical work for clients, including OR applications, econometrics and statistical applications.
RESTRICTIONS: Requires permission of instructor.
ORES 690 OPERATIONS RESEARCH SEMINAR
0 PF
Semester to be given by faculty and by visiting academicians, industry and government persons. Graduate students provide topical insights in significant methods and results of current research in operations research.
ORES 801 OPERATIONS RESEARCH PRINCIPLES
Models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queueing theories, maintenance and replacement or equipment and government planning.
Contemporary models from research literature of energy management, urban planning, artificial intelligence and flexible manufacturing systems.
COREQ: MATH529, STAT601 or MATH630
ORES 802 OPERATIONS RESEARCH APPLICATIONS
Applications of models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queueing theories, maintenance and replacement or equipment and government planning.
Contemporary models from research literature of energy management, urban planning, artificial intelligence and flexible manufacturing systems.
COREQ: MATH529, STAT601 or MATH630
ORES 806 RESEARCH TECHNIQUES AND PROCEDURES
See FREC806 for course description
ORES 810 INTERNATIONAL AGRICULTURAL TRADE SPECIAL TOPICS
See FREC810 for course description
ORES 827 ADVANCED PRODUCTION ECONOMICS
See FREC827 for course description
ORES 834 SEMINAR IN RESOURCE ECONOMICS
See FREC834 for course description

PHIL 100 PHILOSOPHIES OF LIFE
Survey of selected past and present philosophies that people strive to live by, typically including individualistic, group-oriented, religious and nonreligious positions

PHIL 101 GREAT WESTERN PHILOSOPHERS
Survey of the key ideas of great Western philosophers concerning the nature of reality and how it is known. Focus on individual philosophers such as Plato, Aristotle, Descartes, Kant, Hegel, James and Wittingen

PHIL 102 INTRODUCTION TO PHILOSOPHY
An examination of such central philosophical problems as ethics, theories of knowledge, the nature of reality, philosophy of religion and political philosophy

PHIL 105 CRITICAL THINKING
Emphasis on developing skill at logical criticism of arguments. Topics include informal fallacies, deceiving with statistics, the role of definitions, in reasoning, the importance of evidence and confirmation

PHIL 109 MODERN RELIGIOUS ISSUES
The biblical world view and modern science, controversies over the nature of Scripture, doctrines of religious authority, the nature of theological language and existentialist interpretations and myth.

PHIL 125 TOPICS: PHILOSOPHY IN POPULAR CULTURE
Philosophical ideas expressed in popular media such as science fiction or fantasy literature, films and music. Topics are variable.
RESTRICTIONS: May be repeated for up to four credit hours.

PHIL 200 BUSINESS ETHICS
Ethical theory applied to moral problems in business. Corporate social responsibility, and ethical issues in advertising, personnel and investment

PHIL 201 SOCIAL AND POLITICAL PHILOSOPHY
Classical and contemporary views on such problems as the proper scope and functions of government, on what is a just distribution of wealth, and on the extent of an individual's rights, liberties and obligation to obey the law

PHIL 202 CONTEMPORARY MORAL PROBLEMS
The application of philosophical techniques to contemporary moral problems such as abortion, punishment, biomedical ethics, reverse discrimination and sexual morality.
May be cross-listed with WOMS5203

PHIL 203 ETHICS
Study of moral value, moral obligation and moral virtue through comparison of notable schools of ethical theory, including utilitarianism, existentialism, Kantianism, classical Greek euthyphobism, pragmatism and Thomism.

PHIL 204 WORLD RELIGIONS
Varieties of religious belief and practice from diverse cultures, including representative Asian and Western traditions, studied mainly in terms of their historical development and importance.

PHIL 205 LOGIC
Concepts and techniques of elementary symbolic logic: truth and consistency of sentences, validity and soundness of arguments; translation of English sentences into a formal language, construction of truth tables and the use of a system of natural deduction to prove the validity of deductive arguments.

PHIL 207 SCIENTIFIC REASONING
Critical survey of basic concepts and forms of inductive reasoning. Applications to the physical, social and biomedical sciences. Topics include: interpretations of probability, probabilistic fallacies, methods of statistical induction, logic of hypothesis testing, judging correlations, criteria of causation, experimental design and definitions of confirmation.
PHIL 208 INTRODUCTION TO JEWISH PHILOSOPHY
Fundamental issues in philosophy of religion reflecting both general theological approaches to resolving the tension between philosophy and religion and the uniquely Jewish attempt to do so. Topics include God, miracles, good and evil, divine commandments and free will.
May be cross-listed with JWST208

PHIL 209 PHILOSOPHY OF RELIGION
Religious experience, proofs for God’s existence, religious language and critiques of religion. Selected special topics such as mysticism, evil, atheism, miracles, immortality and myth

PHIL 210 WOMEN AND RELIGION
See WOMS210 for course description.

PHIL 211 BASIC DECISION THEORY

PHIL 216 INTRODUCTION TO FEMINIST THEORY
The concepts of love, marriage, sexuality, family, work, power and equality of women. Theories of women and their position in society, including classical Marxism, the status politics of the suffragettes, radical feminism and socialist feminism. May be cross-listed with WOMS216

PHIL 226 MIND, ESP AND SURVIVAL
An exploration of major philosophical conceptions of the relation of mind (soul) and brain. Implications for the nature of mind from the literature of psychic research and immortality.

PHIL 229 THE NATURE OF SCIENCE
See CSCC229 for course description

PHIL 241 ETHICAL ISSUES IN HEALTHCARE
See CSCC241 for course description.

PHIL 244 PHILOSOPHY OF ART
An introduction to main philosophic problems concerning art: the nature, evaluation and value of art

PHIL 246 PHILOSOPHICAL PERSPECTIVES OF MEDICINE
See CSCC246 for course description.

PHIL 250 ENGINEERING ETHICS
Concrete ethical problems in engineering practice, both professional/entrepreneurial and in industrial research settings. Other topics include the social responsibilities of engineering societies. May be cross-listed with CSCC250

PHIL 301 ANCIENT PHILOSOPHY
Beginnings of Western science and philosophy. The pre-Socratics, Sophists, Socrates, Plato, Aristotle, the Epicureans, Stoics and Skeptics

PHIL 303 MODERN PHILOSOPHY
Skepticism and the birth of Modernity. Bacon and scientific experimentalism; Hobbes materialism, Descartes, Spinoza and Leibniz; Locke, Berkeley, Hume and Kant; and the Age of Enlightenment and its impact on philosophy, science and religion.

PHIL 304 NINETEENTH-CENTURY PHILOSOPHY
Major philosophies of the 19th century with special emphasis on Hegel and Nietzsche.

PHIL 305 TWENTIETH-CENTURY PHILOSOPHY
Major philosophical movements from the 20th century to the present. Includes logical empiricism and the recent crisis of this movement.

PHIL 306 PHILOSOPHY OF SCIENCE
A survey of central topics in the philosophy of science which may include the distinction between science (astronomy) and pseudo-science (astrology), the role of values in science, scientific realism, scientific reductionism, as well as the nature of scientific theories, explanations, and confirmation.

PHIL 307 BLACK THOUGHT AND PHILOSOPHY
See BAMS307 for course description.

PHIL 308 TOPICS IN JEWISH THEOLOGY
Critical evaluation of the theological views of major branches of Judaism on such topics as: the significance of Israel, the status of Jewish law, the meaning of Jewish ritual and the mission of the Jewish people. May be cross-listed with JWST308
PREREQ: Recommended: PHIL208/JWST208

PHIL 309 INDIAN RELIGION AND PHILOSOPHY
The Vedas, Upanishads, and Bhagavad-Gita; Santhya, Yoga, Nyaya, Vaisheshika and Mimamsa; Jainism and Indian Hinayana and Mahayana Buddhism; Vedanta and modern developments such as Aurobindo.

PHIL 310 CHINESE RELIGION AND PHILOSOPHY

PHIL 311 EARLY MEDIEVAL PHILOSOPHY
Examines the attempt to synthesize Greek philosophy with biblical religion in the late classical and early medieval period. Covers Plotinus, Augustine, Anselm and Abelard among others, on topics including God, skepticism, evil, the happy life, universals and more.

PHIL 312 LATE MEDIEVAL PHILOSOPHY
The rediscovery of Aristotle by the Islamic philosophers (10th-12th centuries) through Ockham (14th century) and includes Avicenna, Alghazzzi, Averroes, Maimonides, Aquinas, and more. Topics include science and religion, divine command theory, talking about God, among others.

PHIL 315 METAPHYSICS
Examination of central issues in metaphysics. Sample topics: universals and particulars, possibility and necessity, identity over time, free will, causality, and the philosophy of time.
PREREQ: One philosophy course.

PHIL 316 TIME TRAVEL
Through philosophy applied to physics and science fiction, explores the connections of time travel to traditional philosophic issues concerning the nature of time, God, free will and personal identity.

PHIL 317 AMERICAN PHILOSOPHY
Classical American philosophers, including Emerson, Thoreau, Peirce, James and Dewey. Includes ethics, epistemology and social and political theory.

PHIL 320 THEORY OF KNOWLEDGE
An examination of some central issues in epistemology: classical and contemporary analyses of empirical knowledge; the nature of justification and rationality; implications for science, religion and metaphysics.

PHIL 321 PHILOSOPHY OF BIOLOGY
Examines philosophical issues raised by the theory of evolution. Topics may include the challenge of scientific creatianism, the units of selection problem, the debate about adaptationism, human sociobiology and evolutionary ethics.

PHIL 322 EXISTENTIALISM
Study of the origins and development of existential philosophy. Emphasis on the fundamental insight into the nature of man that separates the existentialists from the rest of the Western philosophical tradition. Sources include Pascal, Kierkegaard, Nietzsche and Sartre.

PHIL 327 RACE, GENDER, SCIENCE
Critical examination of scientific research on and arguments for and against the biological reality of race, sex and gender. Analyzes social constructivism about such categories as well as constructivist claims about the nature and objectivity of science.
May be cross-listed with BAMS327 and/or WOMS327

PHIL 330 PHILOSOPHY OF MIND
Coverage of central issues in the philosophy of mind including such topics as the relation between mind and body, the nature of thought and consciousness, perception, personal identity and the relation of cognitive psychology, neuroscience and computer science to the philosophy of mind.
May be cross-listed with CGSC330.

PHIL 340 CROSS CULTURAL ENVIRONMENTAL ETHICS
Critical and global study of the ethics of human-environment relations as suggested by the science of ecology, Western philosophy, physical science, the world views of Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism, Native American traditions, African traditions ecofeminism and American law.

PHIL 341 ETHICS OF ENGINEERING PROFESSION
Introduction to cases involving engineers’ moral responsibilities; emphasis on making reasonable ethical choices.
May be cross-listed with CSCC341

PHIL 344 SCIENCE AND RELIGION
Examines the relationship between science and religion and focuses on: whether our current cosmological picture of the Big Bang allows for a Creator; the rationality of miracle reports; whether the scientific image of humanity is compatible with a religious worldview; the biological evolution/creation debate.
May be cross-listed with SCEN344
PHIL 345 PHILOSOPHY OF HISTORY 3
Nature and limits of our knowledge of the past, categories of explanation used by historians and the aim of historical inquiry. Speculation about the "meaning" of history and the structure of historical process.

PHIL 366 INDEPENDENT STUDY 1-6

PHIL 389 TOPICS: WOMEN AND HEALTH ISSUES 3
See WOMS 389 for course description.

PHIL 390 HONORS COLLOQUIUM 3
See ARSC390 for course description.

PHIL 392 HONORS COLLOQUIUM 3
Racism, sexism and speciesism. May be cross-listed with WOMS392.

PHIL 444 MEDICAL ETHICS 3
Seminar focuses on such topics as experimentation with human subjects, genetic engineering and the moral problems of health care. May be cross-listed with CSCS444.

PHIL 448 ENVIRONMENTAL ETHICS 3
Ethical problems associated with environmental protection, local, national, and international. Critical social and political movements. Seminar format.

PHIL 454 PHILOSOPHY OF SOCIAL SCIENCE 3
Critical examination of the central historical and contemporary questions about the concepts, methods, social structure and purposes of social science inquiry. May be cross-listed with ANTH465. PREREQ: A theory of methodology course in a social science, or an epistemology or philosophy of science course.

PHIL 463 ETHICAL THEORY 3
Justification of ethical beliefs, alternative criteria of moral rightness and the meaning of moral concepts. PREREQ: PHIL202 or PHIL203.

PHIL 465 SENIOR SEMINAR 3
Various authors and themes; e.g., Plato, Kant, epistemology, philosophy of mind. RESTRICTIONS: May be repeated once for credit when topics vary.

PHIL 466 INDEPENDENT STUDY 1-6

PHIL 467 PHILOSOPHY OF TECHNOLOGY 3
Philosophical reflections on working with tools in the broadest sense; definitions; studies of processes, products and uses; and ethical, cultural and political critiques. Seminar format.

PHIL 468 ENVIRONMENTAL ETHICS 3
Ethical problems associated with environmental protection, local, national, and international. Relations to social and political movements. Seminar format.

PHIL 868 RESEARCH 1-3
A detailed study of certain philosophical problems with special reference to research problems under way in the department.

PHYSICS AND ASTRONOMY

PHYS 104 ELEMENTARY PHYSICS 3
Overview of the principles of physics and their applications. Course is designed for beginners with no previous exposure to physics. RESTRICTIONS: Requires working knowledge of algebra and the use of scientific notation. Only one course among PHYS104, PHYS201, PHYS207 and SCEN101 can count toward graduation.

PHYS 133 INTRODUCTION TO ASTRONOMY 4
Objects of the universe from the earth to galaxies. How the universal laws that govern them; e.g., gravity and electromagnetic radiation, permit us to learn their nature from quantitative observations. Telescopic observations, visual and electronic, included in the laboratory.

PHYS 139 STAR AND CONSTELLATION IDENTIFICATION 1
Familiarity with the sky, its changing aspects, constellations, mythology, bright stars, and planets. Topics will include use of sky maps and coordinates, how to estimate directions and time from knowledge of the sky, and the use of binoculars and small telescopes.

PHYS 140 GREAT CONCEPTS OF PHYSICS 3
Designed for non-science majors, will concentrate on understanding both the content and impact of five great concepts of physics: the Newtonian Universe, Conservation of Energy, Entropy, Relativity, and Wave-Particle Duality. The influence of these concepts in other areas of human concern, e.g., philosophy, art, history, politics, medicine, etc. will be an important feature.

PHYS 141 LIGHT, LASERS, CAMERAS, PERCEPTION 3
Introduction to the phenomena of light, optics and perception for non-science majors. Topics include: nature of light, sources of light and shadows, rainbows, mirages and other atmospheric phenomena, cameras, telescopes, microscopes, color creation and observation, physics influences in art, the human eye and perception.

PHYS 143 ENERGY TECHNOLOGY AND SOCIETY 3
Basic principles of physics are applied to discuss forms of energy (mechanical, thermal, chemical, electrical and nuclear), and how energy is derived from sources such as coal, petroleum, solar, nuclear fission and fusion. Environmental consequences of energy use are treated. PREREQ: College algebra.

PHYS 144 CONTEXTS OF THE UNIVERSE 3
Survey of astronomy emphasizing early and modern concepts. Stars, planets, galaxies, cosmic evolution and intelligent life are studied in the context of physical principles which describe the dynamics of the universe. Scientific process is used to interpret observations that shape our perceptions of the cosmos.

PHYS 145 BLACK HOLES AND COSMIC EVOLUTION 3
Geared toward a general audience and focuses on topics such as finding black holes in space; the nature of space, time and black holes; the origin of the Universe; and the development of complex life here on Earth.

PHYS 146 QUARKS, GLUONS, AND THE BIG BANG: PARTICLES AND COSMOLOGY 3
Non-mathematical course focusing on the elementary particles and their influence on the early evolution of the universe. Major topics are quarks and the forces they feel, Einsteins theory of relativity, Quantum Mechanics and fairly simple, and the Inflationary Universe.

PHYS 147 ATOMS FOR EVERYONE 3
Elementary but earnest inquiry into the sources of our knowledge that these completely invisible building blocks of ordinary matter exist as discrete entities, and exist to the exclusion of all other possibilities. RESTRICTIONS: Requires high school algebra.

PHYS 149 EXPLORING PHYSICS CONCEPTS I 3
Exploration of physics concepts for first year students with no prior background. Emphasis on physics of light, color, electrical circuits and structure of matter. RESTRICTIONS: Open to first year students only and to undeclared majors.

PHYS 201 INTRODUCTORY PHYSICS I 4
First course in a sequence with PHYS202 that provides an introduction to physics for students in the life and environmental sciences. Emphasis on topics including mechanics, fluid dynamics, optics and thermodynamics. PREREQ: MATH115.

PHYS 202 INTRODUCTORY PHYSICS II 4
Final course in a sequence with PHYS201 that provides an introduction to physics for students in the life and environmental sciences. Topics include rotation and oscillatory motion, waves, electricity and magnetism, structure and properties of nuclei, atoms, molecules and solids. PREREQ: PHYS201.

PHYS 207 FUNDAMENTALS OF PHYSICS I 4
First course in a sequence with PHYS208 and PHYS209 that provides an introduction to physics for those in the physical sciences and engineering. Emphasis is on Newtons laws of motion, force laws, and conservation principles. Integrates conceptual understanding with extensive problem solving and laboratory experience. CORREQ: MATH241.

PHYS 208 FUNDAMENTALS OF PHYSICS II 4
Second part of the sequence. PHYS207. Requires physics 104, PHYS201, PHYS207 and SCEN101 can count toward graduation.

PHYS 209 FUNDAMENTALS OF PHYSICS III 4
Third part of the sequence. PHYS208. Requires physics 104, PHYS201, PHYS207 and SCEN101 can count toward graduation.
PHYS 208  FUNDAMENTALS OF PHYSICS II  4
Second course in a sequence with PHYS207 and PHYS209 that provides an
introduction to physics for those in the physical sciences and engineering.
The emphasis is on electricity and magnetism, force laws, fields and electrical
circuits.
PREREQ: PHYS207.
COREQ: MATH242.

PHYS 245  INTRODUCTION TO ELECTRICITY AND ELECTRONICS  4
Fundamentals of electricity and magnetism specific to DC and AC circuit
analysis transient circuit behavior and rotating machinery. Fundamentals of
analog and digital electronics, with emphasis on applications in engineering,
integrated circuits and operational amplifiers
PREREQ: PHYS207.
COREQ: MATH243
RESTRICTIONS: Not for major credit

PHYS 309  PHYSICS OF THE TWENTIETH AND TWENTY FIRST CENTURIES  3
Fundamentals in physics that help form a modern understanding of science and
technology. Intended for physical science and engineering majors, the emphasis
is on electromagnetic radiation, quantum mechanics, nuclear reactions, Bohr
atom, solid state physics and devices, and relativity.
PREREQ: PHYS208.
COREQ: MATH243 suggested

PHYS 310  INTRODUCTION TO THERMAL PHYSICS  3
Basic concepts of thermodynamics including properties of substance, first and
second law analysis of systems and control volumes, entropy and availability
Power and refrigeration cycles.
PREREQ: MATH302

PHYS 313  PHYSICAL OPTICS  4
A detailed treatment of optics at an intermediate level appropriate for physics,
engineering and other students with a physical science background. Emphasis is
on physical concepts and analysis of geometric optics, wave optics and
applications of optics
COREQ: MATH243

PHYS 366  INDEPENDENT STUDY  1-3

PHYS 419  CLASSICAL MECHANICS I  3
Intermediate course which emphasizes the fundamental principles of classical
mechanics. Treats in detail and with mathematical rigor, particle mechanics,
conservation laws, harmonic oscillation, motion under central force, rigid
body dynamics, and moving coordinate systems.
COREQ: MATH302

PHYS 424  QUANTUM MECHANICS  3
Introduces quantum mechanical concepts by reviewing experiments which cannot
be explained by classical physics. The Schrodinger equation is solved for simple
cases such as free-particle motion, the simple harmonic oscillator and the
hydrogen atom, with a basic treatment of angular momentum.
May be crosslisted with CHEM424 and/or ELEC424
PREREQ: PHYS309, MATH302 and MATH349

PHYS 445  ELECTRONICS FOR SCIENTISTS  3
Fundamentals of analog and digital electronics, with emphasis on applications in
science. Circuit analysis, operational amplifiers, filters, gates, flip-flops,
counters, analog to digital and digital to analog converters.
PREREQ: PHYS208.
COREQ: MATH302 or MATH341

PHYS 446  INSTRUMENTATION FOR SCIENTISTS  3
Electronic measurements and instrumentation with emphasis on applications in
science. Amplification, noise, low-level signal recovery, lock-in amplifiers,
digital signal averaging, frequency and time measurements, transducers,
bridges, interfacing to laboratory computers and automation of experiments.
PREREQ: PHYS208, PHYS313 suggested
COREQ: MATH302 or MATH341

PHYS 449  INTRODUCTION TO RESEARCH  1-6
Undergraduate research on an assigned problem carried out under the
supervision of the staff

PHYS 460  COMPUTATIONAL METHODS OF PHYSICS  3
Introduction to basic computational techniques in science with application to a
number of disciplines of current research interest, such as quantum physics,
biophysics, statistical mechanics and chaos
PREREQ: MATH302 or MATH341, CISC105 or equivalent, PHYS208

PHYS 466  INDEPENDENT STUDY  1-3

PHYS 501  TOPICS IN MIDDLE SCHOOL PHYSICS EDUCATION: FORCE AND MOTION  3
Application of scientific principles to topics related to Newton's first law,
motion, force, electric circuits, magnetism, electromagnets, motors, and
generators.
RESTRICTIONS: Restricted to in-service middle school teachers

PHYS 502  TOPICS IN MIDDLE SCHOOL PHYSICS: PLANETARY SYSTEMS  3
Application of physics principles to topics related to the earth, moon, sun,
planets, and seasons.
RESTRICTIONS: Restricted to in-service middle school science teachers

PHYS 503  TOPICS IN MIDDLE SCHOOL SCIENCE EDUCATION: PROPERTIES OF MATTER  3
Application of scientific principles to topics related to the particle model
and density, phase change, mixtures and solutions, and separation techniques
RESTRICTIONS: Restricted to in-service middle school science teachers

PHYS 504  TOPICS IN MIDDLE SCHOOL SCIENCE EDUCATION: TRANSFORMATION OF ENERGY  3
Application of scientific principles to topics related to energy changes, heat,
light, and topics in other middle school science curriculums such as ecosystems
and weather systems.
RESTRICTIONS: Restricted to in-service middle school science teachers

PHYS 511  TOPICS IN HIGH SCHOOL PHYSICS: FORCE, MOTION AND ENERGY  3
Application of physics principles to topics related to Newton's Three Laws,
work and mechanical energy
RESTRICTIONS: Restricted to in-service high school science teachers

PHYS 600  PHYSICS RESEARCH TALKS  1 PF
Lectures by Physics and Astronomy faculty describing their current research to
aid graduate students in selection of an area of thesis research

PHYS 601  INTRODUCTION TO TEACHING PHYSICS AND ASTRONOMY  1 PF
Introduction to the methods and techniques of teaching and tutoring physics at a
level appropriate for teaching assistants and tutors of undergraduate
courses in Physics and Astronomy. Discussion and workshop formats utilized.

PHYS 603  ELECTRICITY AND MAGNETISM I  3
First course in a two-part sequence with PHYS604 which provides a detailed
treatment of electrostatics and magnetostatics at the intermediate level.
Topics include Maxwell's equations in the static limit, multipole expansions,
capacitors and electrostatic energy, analytical and numerical solutions to
boundary-value problems, dielectric and magnetic media, and steady currents.
PREREQ: PHYS202 or PHYS208; MATH302
COREQ: MATH503 suggested

PHYS 604  ELECTRICITY AND MAGNETISM II  3
Second course in a two-part sequence with PHYS603 which provides a detailed
treatment of electromagnetic theory at the intermediate level. Maxwell's
equations are developed and applied to electromagnetic waves in vacuum,
material media, and wave guides. Includes application to electromagnetic
radiation and special relativity.
PREREQ: PHYS603

PHYS 607  METHODS OF MATHEMATICAL PHYSICS  3
Mathematical subjects commonly employed in physics with examples taken from
physics. Linear vector spaces, Fourier series, orthogonal function
expansions and eigenvalue problems.
PREREQ: PHYS620 and MATH302

PHYS 608  METHODS OF MATHEMATICAL PHYSICS  3
Mathematical subjects commonly employed in physics with examples taken from
physics. Complex variables and asymptotic analysis
PREREQ: PHYS607

PHYS 610  QUANTUM MECHANICS  3
Wave-particle duality. The Schrodinger equation. One-dimensional problems
Spherically symmetric potentials. Orbital angular momentum. Applications
including hydrogenic atoms.
PREREQ: PHYS424

PHYS 616  KINETIC THEORY AND THERMODYNAMICS  3
Postulates of equilibrium thermodynamics; review of relevant mathematics;
entropy maximum principle; energy minimum principle; Legendre
transformations Entropy representation, internal energy representation, Helmholtz
representation and Gibbs representation. Maxwell relations; reduction of
partial derivatives; phase transitions; statistical mechanics via Boltzmann's
elementary method; equipartition of energy; applications
May be crosslisted with ELEC616.
PREREQ: MATH243 and PHYS309.
PHYS 620 Classical Mechanics II 3
Topics covered are Lagrangian and Hamiltonian dynamics, dynamics of systems of particles, rigid bodies and fluids, oscillations of systems of coupled particles, oscillations of waves in continuous systems. Provides a classical introduction to techniques that are used extensively in quantum and statistical mechanics.
PREREQ: MATH302 and PHYS419

PHYS 621 Fundamentals of Modern Physics 3
Comprehensive and critical discussion of the phenomenological bases of atomic, electronic, and nuclear physics and their assimilation into a wave mechanical view of the microscopic world.
PREREQ: MATH302

PHYS 624 Introduction to Solid State Physics 3
X-ray diffraction, structure and properties of metals, insulators and semiconductors, and band theory of solids; includes electrical, optical, magnetic and thermal properties.
PREREQ: PHYS616 and PHYS621

PHYS 631 Acoustics 3
Vibrations of particles, strings and membranes; acoustic waves; radiation of sound; room acoustics; and acoustic measurements.
PREREQ: MATH302.

PHYS 632 Astrophysics 3
Survey of diverse astronomical objects and the physical principles used in modeling them. Emphasis on the observational basis and foundations of astrophysics: Stellar magnitudes, colors and spectra; the HR diagram; solar and stellar activity; binary stars; the phenomena of galactic and extragalactic astronomy.
PREREQ: MATH302 plus 14 credit hours of physics

PHYS 633 Introduction to Stellar Astrophysics 3
Introduction to the physics of stellar interiors and atmospheres. The evolution of stars is explored by studying the changes in internal composition due to nuclear reactions. The physical processes underlying stellar spectra are investigated. Computer simulations of stars and their atmospheres may be used.
PREREQ: PHYS632 and MATH302

PHYS 638 Selected Topics in Physics 3
Treatment of a specialized subject taken from the following list: particle astrophysics, magnetic materials, electron microscopy, elementary particles, cosmology, solar physics and other advanced topics.
RESTRICTIONS: May be repeated for credit when topics vary

PHYS 645 Electronics for Scientists 3
Fundamentals of analog and digital electronics, with emphasis on applications in science. Circuit analysis, operational amplifiers, filters, gates, flip-flops, counters, analog to digital and digital to analog converters.
PREREQ: PHYS608. COREQ: MATH302 or MATH341

PHYS 646 Instrumentation for Scientists 3
Electronic measurements and instrumentation with emphasis on applications in science. Amplification, noise, low-level signal recovery, lock-in amplifiers, digital signal averaging, frequency and time measurements, transducers, bridges, interfacing to laboratory computers and automation of experiments.
PREREQ: PHYS608, PHYS313 suggested. COREQ: MATH302 or MATH341

PHYS 660 Computational Methods of Physics 3
Introduction to basic computational techniques in science with application to a number of disciplines of current research interest, such as quantum physics, biophysics, statistical mechanics and chaos. 
PREREQ: MATH302 or MATH341, CISC1105 or equivalent, PHYS208

PHYS 803 Solid State Physics 3
Crystal structure; mechanical, thermodynamic, electrical, optical and magnetic properties of solids; and imperfections in crystals.
PREREQ: PHYS204

PHYS 809 Electromagnetic Theory 3
Review of statics; Maxwell's equations, physical optics and wave guides. May be crosslisted with ELEG809
PREREQ: PHYS604.

PHYS 810 Electromagnetic Theory 3
PREREQ: PHYS604 and PHYS809.

PHYS 811 Quantum Mechanics 3
PREREQ: PHYS607 and PHYS610. COREQ: PHYS608.

PHYS 812 Quantum Mechanics 3
PREREQ: PHYS811

PHYS 813 Statistical Mechanics and Thermodynamics 3
Review of equilibrium thermodynamics and probability theory. Kinetic theory, including the Boltzmann equation. Statistical ensemble theory in classical and quantum statistical mechanics. Classical ideal gases with internal degrees of freedom. Dissociation equilibrium. The ideal Bose and Fermi gases with elementary applications to fluids and solids. May be crosslisted with ELEG813.
PREREQ: PHYS616

PHYS 815 Theory of Relativity 2-3
Critique of the special theory introductory to the general theory; physical basis of the general theory; Einstein's field equations; and problems of gravitational motion and radiation.
PREREQ: PHYS809.

PHYS 817 Advanced Classical Dynamics 3
Theoretical treatment of classical dynamics. 
PREREQ: PHYS629

PHYS 838 Advanced Treatment of Selected Topics 3
Selected topics taken from the following list: quantum field theory, renormalization group and critical phenomena, nuclear theory, elementary particles and applications of group theory in physics.
RESTRICTIONS: May be repeated for up to six credit hours when topics vary

PHYS 862 Solid State Seminar 1
Lectures and discussions by faculty and students on specialized topics in solid state physics.

PHYS 868 Research 1-9

PHYS 869 Master's Thesis 1-6

PHYS 964 Pre-Candidacy Study 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required coursework.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

PHYS 969 Doctoral Dissertation 1-12 PF

PHYSICAL THERAPY

PHYT 466 Independent Study 1-6

PHYT 600 Physical Therapy as a Profession 1
The ethics, licensure laws and practice of physical therapy will be explored.
The Guide to Physical Therapy Practice will be introduced and the importance to effective practice discussed.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 604 Functional Anatomy and Biomechanics 4
Gives a description of normal and abnormal human movement. Emphasis on joint structure and function and gait using orthokinematic and osteokinematic analysis. Evaluation procedures such as EMG, cinematography and computer simulations utilized.
RESTRICTIONS: Open to physical therapy graduate students only or with permission of instructor.

PHYT 605 Clinical Internship 1-9 PF
Full- or part-time clinical experiences at various health care facilities.
RESTRICTIONS: Open to physical therapy graduate students only

PHYT 606 Research 3
An overview of methodological issues in the conduct of physical therapy research. Topics include scientific method, experimental design, statistical procedures and technical writing. Student expected to critically analyze current physical therapy literature.
RESTRICTIONS: Open to physical therapy graduate students only

489
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYT 608</td>
<td>Musculoskeletal Evaluation and Treatment</td>
<td>4</td>
</tr>
<tr>
<td>PHYT 610</td>
<td>Psychosocial Aspects of Disabilities</td>
<td>2</td>
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<tr>
<td>PHYT 611</td>
<td>Advanced Orthopedics</td>
<td>3 PF</td>
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<tr>
<td>PHYT 613</td>
<td>Sports Physical Therapy</td>
<td>3 PF</td>
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<tr>
<td>PHYT 614</td>
<td>Advanced Neurotherapeutics</td>
<td>3</td>
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<tr>
<td>PHYT 615</td>
<td>Pediatrics Seminar</td>
<td>3 PF</td>
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<tr>
<td>PHYT 616</td>
<td>Patient Management II</td>
<td>3</td>
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<tr>
<td>PHYT 617</td>
<td>Life Span Development</td>
<td>3</td>
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<td>PHYT 618</td>
<td>Educational Process in Community Health</td>
<td>1</td>
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<tr>
<td>PHYT 619</td>
<td>Practice Clinic</td>
<td>3 PF</td>
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<tr>
<td>PHYT 620</td>
<td>Clinical Gross Anatomy</td>
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<tr>
<td>PHYT 621</td>
<td>Clinical Neurosciences</td>
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<tr>
<td>PHYT 622</td>
<td>Basic Evaluation Techniques</td>
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<tr>
<td>PHYT 623</td>
<td>Advanced Regional Anatomy</td>
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<tr>
<td>PHYT 624</td>
<td>Human Movement Control</td>
<td>3</td>
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<tr>
<td>PHYT 625</td>
<td>Physical Therapy in the Acute Care Environment</td>
<td>4</td>
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<tr>
<td>PHYT 626</td>
<td>Applied Physiology I</td>
<td>3</td>
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<tr>
<td>PHYT 627</td>
<td>Physical Therapy II</td>
<td>3</td>
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<tr>
<td>PHYT 628</td>
<td>Applied Physiology II</td>
<td>4</td>
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<tr>
<td>PHYT 629</td>
<td>Electrotherapy</td>
<td>4</td>
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<tr>
<td>PHYT 630</td>
<td>Thermal Agents and Soft Tissue Techniques</td>
<td>2</td>
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<tr>
<td>PHYT 631</td>
<td>Life Span Development</td>
<td>3</td>
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<tr>
<td>PHYT 632</td>
<td>Rounds I</td>
<td>1 PF</td>
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<tr>
<td>PHYT 633</td>
<td>Rounds II</td>
<td>1 PF</td>
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<td>PHYT 634</td>
<td>Rounds III</td>
<td>1 PF</td>
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<td>PHYT 635</td>
<td>Rounds IV</td>
<td>1 PF</td>
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<tr>
<td>PHYT 636</td>
<td>Medical Science I: General Medicine</td>
<td>3</td>
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<tr>
<td>PHYT 637</td>
<td>Medical Science II: Orthopedics</td>
<td>3</td>
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<tr>
<td>PHYT 638</td>
<td>Medical Science III: Neurology</td>
<td>3</td>
</tr>
<tr>
<td>PHYT 639</td>
<td>Neurophysiologic Evaluation and Treatment</td>
<td>4</td>
</tr>
</tbody>
</table>

RESTRICTIONS: Open to physical therapy graduate students only.
PHYT 803 REHABILITATION
Advanced instruction in the theory, research and clinical skills necessary for the comprehensive management of patients in a rehabilitation setting with an emphasis on building evidence-based program plans.
RESTRICTIONS: Open to DPT Program students only.

PHYT 806 GERiatrics
The personal-social, biological, socioeconomic and physiological factors accompanying the aging process will be examined and their impact on physical therapy intervention explored.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 807 ADVANCED SEMINAR
Lectures pursue various topics in greater depth and develop advanced clinical skills. Topics include wound care, hand therapy, women's health issues, vestibular rehabilitation and aquatic therapy.
RESTRICTIONS: Open to DPT Program students only.

PHYT 808 SPINE MANAGEMENT
Discusses the biomechanics, pathophysiology and disability associated with spine pain and dysfunction. Includes an understanding of the role of physical therapy evaluation in the determination and implementation of physical therapy interventions.
RESTRICTIONS: Open to DPT Program students only.

PHYT 809 PSYCHOSOCIAL ASPECTS OF HEALTH AND DISEASE
Discusses the psychosocial characteristics of patient populations and therapists that impact on the rehabilitation process. Death and dying, social implications of illness diagnosis and other topics are discussed.
RESTRICTIONS: Open to DPT Program students only.

PHYT 810 CLINICAL MANAGEMENT
Discusses concepts of administration and issues in the management of hospital clinics, private practice and consultative ventures. Students introduced to current trends in billing and reimbursement strategies being used by clinicians.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 811 PEDIATRICS
Instruction in the theory, research and clinical skills necessary for the comprehensive management of pediatric clients and their families. Emphasis on the incorporation of modern developmental science into evidenced-based program plans.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 812 PEDIATRIC INTEGRATED CLINICAL EXPERIENCE
Mentored clinical experience in pediatric healthcare facilities.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 821 ORTHOPEDIC INTEGRATED CLINICAL EXPERIENCE
Mentored clinical experience in University of Delaware Physical Therapy Clinic. Emphasis is orthopedic with some exposure to outpatients with other diagnoses. All students participate in this experience for one semester.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 822 GERIATRIC INTEGRATED CLINICAL EXPERIENCE
Student participation in local physical therapy settings evaluating and treating geriatric clients under the supervision of a licensed physical therapist. All students participate in this experience for one semester.
PREREQ: All previous physical therapy graduate courses.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 831 CLINICAL INTERNSHIP I: ACUTE CARE
A six-week, full-time clinical experience in an acute care hospital setting. Students directly participate in all aspects of patient care under the supervision of a licensed physical therapist. Students involved in all aspects of patient care including, but not limited to, evaluation, treatment, patient and family education, charting, billing, and discharge planning.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 832 CLINICAL INTERNSHIP II: REHABILITATION
An eight-week, full-time clinical experience in a rehabilitation setting. Students participate in direct patient care under the supervision of a licensed physical therapist. Students involved in all aspects of patient care including, but not limited to, evaluation, treatment, patient and family education, charting, billing, team conferences with related disciplines, and discharge planning.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 833 CLINICAL INTERNSHIP III: ELECTIVE
An eight-week, full-time clinical experience under the supervision of a licensed physical therapist. Students may choose the type of experience they desire. Types available include acute care, orthopedics, rehabilitation or a specialty area.
RESTRICTIONS: Open to physical therapy graduate students only.

PHYT 868 RESEARCH
RESTRICTIONS: Requires permission of instructor.

PLANT AND SOIL SCIENCES

PLSC 100 PLANTS AND HUMAN CULTURE
3
Historical survey of interrelationships between plants and diverse human cultures. Examines Asian, African, Mediterranean, North/South American peoples (ancient and modern) to provide a broad multicultural perspective and commentary on modern American values about plants and their environment.

PLSC 101 BOTANY I
4
Introductory botany stressing fundamental concepts and processes in plants. Topics include cell structure and function, anatomy, genetics, reproduction, physiology, taxonomy, phytology and ecology.

PLSC 105 INTRODUCTORY FORESTRY
3
Distribution, ecology, value, measurement and management of forest systems.

PLSC 133 ORNAMENTAL HORTICULTURE
3
Use of ornamental plants. Emphasis on a basic knowledge of plant materials useful in maintaining an aesthetically and functionally pleasing environment in and around the home.

PLSC 140 PEOPLE AND PLANTS: FEAST OR FAMINE
3
Exploration of plant pathology as a biological science with its important ties to human welfare. Topics include food production systems, famine caused by plant diseases and their impact on human culture.

PLSC 151 INTRODUCTION TO CROP SCIENCE
3
Plant structure and plant processes with practical application to the production and management of commercial crops.
RESTRICTIONS: Credit not allowed if preceded by PLSC401.

PLSC 154 TOPICS IN PRODUCTION AND MANAGEMENT OF ORNAMENTAL PLANTS
1-6
Topics combine theory and practice in the areas of turf and ornamental horticulture.
RESTRICTIONS: Not for major credit except as elective.

PLSC 170 SOILS AND ENVIRONMENTAL QUALITY
3
Role of soils in contemporary environmental problems, including the nature and causes of soil, air and water pollution; soil management practices to minimize environmental impacts of nutrients, pesticides, agricultural and industrial wastes, and contaminated soils; risk management strategies needed to develop environmental management programs.

PLSC 171 NEW STUDENT COLLOQUIUM
1 PF
Focuses on academics, careers and resources as important components in achieving success in the plant and soil sciences. Practical skills, helpful in mastering the first year in the plant and soil sciences majors.
RESTRICTIONS: Open to first year majors only.

PLSC 201 BOTANY II
4
Sexual and vegetative characters of algae, bacteria, fungi, liverworts, mosses, ferns, horsetails, club mosses, quillworts, gymnosperms and angiosperms. Selected genera within these divisions considered in detail.
PREREQ: PLSC101 or BISC207.

PLSC 204 INTRODUCTION TO SOIL SCIENCE
3
Fundamentals of soil including origin, composition and classification; physical, chemical and biological properties; significance of soil properties to use and management, and to soil-plant relationships.
PREREQ: CHEM101

PLSC 205 INTRODUCTION TO SOIL SCIENCE LABORATORY
1
Laboratory exercises in soil science.
COREQ: PLSC204.

PLSC 211 HERBACEOUS LANDSCAPE PLANTS
3
Survey of herbaceous plants including annuals, perennials and bulbs; plant identification, culture, selection, design and maintenance in the landscape.
PREREQ: PLSC133.

PLSC 212 WOODY LANDSCAPE PLANTS
4
The study of woody plants for landscape use in the mid-Atlantic coastal region, including plant identification, selection and culture.
PREREQ: PLSC133.

PLSC 270 BIOTECHNOLOGY: SCIENCE AND SOCIOECONOMIC ISSUES
3
See ANSC270 for course description.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSC 300</td>
<td>Principles of Animal and Plant Genetics</td>
<td>3</td>
<td>See ANSC300 for course description</td>
</tr>
<tr>
<td>PLSC 302</td>
<td>Vegetable Science</td>
<td>4</td>
<td>Basic factors affecting productivity and marketability of vegetable crops.</td>
</tr>
<tr>
<td>PLSC 303</td>
<td>Introductory Plant Pathology</td>
<td>4</td>
<td>Introduction to the nature, causes, development, effects and control of plant disease. Laboratory involves microscope use for examining plant disease specimens and fungal structures, and experience in isolation and culture of pathogenic fungi. PREREQ: PLSC201 or BISC207.</td>
</tr>
<tr>
<td>PLSC 305</td>
<td>Soil Fertility and Plant Nutrition</td>
<td>4</td>
<td>Practical application of the basic principles of soil chemistry, physics and microbiology to modern land use programs. Covers basic principles of nutrient management (availability and cycling in soils, roles in plant nutrition), soil acidity and liming, soil testing, environmental fate of non-essential elements and organic chemicals, and role of risk assessment in soil management. PREREQ: CHEM102 and PLSC204.</td>
</tr>
<tr>
<td>PLSC 306</td>
<td>Introduction to Plant Molecular Biology</td>
<td>3</td>
<td>The molecular biology of higher plants, including organization of plant genes, genomes, gene expression, gene transfer and genetic engineering. PREREQ: BISC207, CHEM213.</td>
</tr>
<tr>
<td>PLSC 308</td>
<td>Fruit Science</td>
<td>3</td>
<td>Major temperate zone fruit crops, climatic requirements, growth and fruiting habits, and principles involved in production, harvesting and marketing.</td>
</tr>
<tr>
<td>PLSC 310</td>
<td>Animal and Plant Genetics Laboratory</td>
<td>1</td>
<td>See ANSC310 for course description.</td>
</tr>
<tr>
<td>PLSC 313</td>
<td>Turf Establishment and Maintenance</td>
<td>4</td>
<td>Factors affecting the establishment and maintenance of fine and utility turf; emphasis on the management of golf courses, athletic fields and sod farms. PREREQ: PLSC204.</td>
</tr>
<tr>
<td>PLSC 319</td>
<td>Environmental Soil Microbiology</td>
<td>4</td>
<td>Introduction to soil microbiology and biochemistry as related to environmental issues: microbial diversity and ecology in soil/plant systems, transformations of natural and synthetic organic compounds, biocycling of nutrients and metals, bioremediation. Introduction to laboratory methods for studying soil microorganisms and associated processes. PREREQ: PLSC204 and CHEM213.</td>
</tr>
<tr>
<td>PLSC 325</td>
<td>Nursery Production I</td>
<td>2</td>
<td>The planning, production, management and marketing of field grown nursery stock. Student selects crops, propagates them and is responsible for all aspects of production, including cost accounting.</td>
</tr>
<tr>
<td>PLSC 326</td>
<td>Nursery Production II</td>
<td>2</td>
<td>The planning, production, management and marketing of container-grown nursery stock. Student selects crops, propagates them and is responsible for all aspects of production, including cost accounting.</td>
</tr>
<tr>
<td>PLSC 330</td>
<td>Landscape Construction Details</td>
<td>4</td>
<td>Introduction to principles involved in the design and installation of landscape elements: stone, brick, concrete, wood and metal.</td>
</tr>
<tr>
<td>PLSC 331</td>
<td>Landscape Construction Systems</td>
<td>4</td>
<td>Introduction to principles involved in contour grading, site drainage, lighting and irrigation design related to landscaping.</td>
</tr>
<tr>
<td>PLSC 332</td>
<td>Basic Landscape Design</td>
<td>4</td>
<td>Application of design principles to actual field problems, drafting and presenting techniques. PREREQ: PLSC212.</td>
</tr>
<tr>
<td>PLSC 344</td>
<td>Forest Ecology</td>
<td>2</td>
<td>See ENWC344 for course description. PREREQ: BISC208.</td>
</tr>
<tr>
<td>PLSC 364</td>
<td>Landscape Horticulture Internship</td>
<td>1-6</td>
<td>Supervised, faculty-monitored, career-related experience in one or more aspects of the ornamental horticulture industry. PREREQ: PLSC133.</td>
</tr>
<tr>
<td>PLSC 366</td>
<td>Independent Study</td>
<td>1-6</td>
<td>The use of chocolate and its origin, horticulture, chemistry, nutrition and sensory evaluation. PREREQ: PLSC201.</td>
</tr>
<tr>
<td>PLSC 399</td>
<td>Teaching Experience</td>
<td>1-2 PF</td>
<td>Practical teaching experience assisting in instruction of an undergraduate course. RESTRICTIONS: Requires overall GPA of 2.75 and 3.0 in major. Must have taken the course in which assisting or have equivalent experience.</td>
</tr>
<tr>
<td>PLSC 401</td>
<td>Agronomic Crop Science</td>
<td>3</td>
<td>Production and management of the major grain and forage crops, with emphasis on diagnosis of production problems and decision making. PREREQ: PLSC151.</td>
</tr>
<tr>
<td>PLSC 402</td>
<td>Plant Taxonomy</td>
<td>3</td>
<td>Identification, classification and nomenclature of vascular plants, including sight recognition as well as use of alternative-statement keys. Emphasis on economic plant families of eastern U.S. PREREQ: PLSC201.</td>
</tr>
<tr>
<td>PLSC 403</td>
<td>Nursery and Garden Center Management</td>
<td>4</td>
<td>Production, maintenance and marketing of plants relative to the establishment and management of a nursery or garden center. PREREQ: PLSC101 or PLSC151.</td>
</tr>
<tr>
<td>PLSC 404</td>
<td>Plant Taxonomy</td>
<td>3</td>
<td>Identification, classification and nomenclature of vascular plants, including sight recognition as well as use of alternative-statement keys. Emphasis on economic plant families of eastern U.S. PREREQ: PLSC201.</td>
</tr>
<tr>
<td>PLSC 410</td>
<td>Introduction to Plant Physiology</td>
<td>3</td>
<td>The physiology of green plants: light and energy conversion, carbon fixation, nitrogen metabolism, amino acid synthesis, protein synthesis mechanisms and regulation, water and solute utilization, nutrient translocation, photomorphogenesis and photoperiodism and growth hormones, considered at the fundamental level of operation. PREREQ: PLSC201 or BISC206, and CHEM213.</td>
</tr>
<tr>
<td>PLSC 411</td>
<td>Diagnostic Plant Pathology</td>
<td>3</td>
<td>Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epiphytology, symptoms and control. PREREQ: PLSC303.</td>
</tr>
<tr>
<td>PLSC 413</td>
<td>Principles of Plant Disease Control</td>
<td>3</td>
<td>Principles of plant disease control by exclusion, eradication and resistance. Plant protection with emphasis on fungicides, bactericides, and nematocides and their use. PREREQ: PLSC303.</td>
</tr>
<tr>
<td>PLSC 414</td>
<td>Plant Cell and Tissue Culture</td>
<td>4</td>
<td>Principles of culturing plants in vitro. Topics for both lecture and laboratory include cell suspensions, anther culture, embryo rescue, micropropagation and regeneration via organogenesis and embryogenesis. PREREQ: PLSC101.</td>
</tr>
<tr>
<td>PLSC 415</td>
<td>Vascular Plant Anatomy</td>
<td>3</td>
<td>A developmental and comparative study of the cells, tissues and organs of vascular plants. Readings in the current anatomical literature.</td>
</tr>
<tr>
<td>PLSC 416</td>
<td>Plant Virology</td>
<td>4</td>
<td>Epidemiology, detection, identification and control of plant viruses and virus-like agents. PREREQ: PLSC303.</td>
</tr>
<tr>
<td>PLSC 417</td>
<td>Greenhouse Management</td>
<td>4</td>
<td>Greenhouse structures, environmental control, cultural techniques and general management practices in greenhouse operations. Laboratory exercises supplement lecture material. PREREQ: PLSC201 and PLSC204.</td>
</tr>
<tr>
<td>PLSC 419</td>
<td>Soil Microbiology</td>
<td>4</td>
<td>Characterization of microorganisms and microbial habitats in soil environments. Processes and interactions involving soil microorganisms with respect to agricultural productivity and environmental quality. Introduction to laboratory techniques for the observation, enumeration and isolation of soil microorganisms and measurement of associated activities.</td>
</tr>
<tr>
<td>PLSC 420</td>
<td>Plant Physiology Laboratory</td>
<td>2</td>
<td>The extraction from higher plants of enzymes and other macromolecules, and assay by chemical tests. Pigment extraction, organelle separation, ion uptake, protein manipulation using centrifuge, spectrophotometer, chromatography and electrophoresis. COREQ: PLSC410.</td>
</tr>
<tr>
<td>PLSC 422</td>
<td>Plant Propagation</td>
<td>3</td>
<td>Practical and physiological aspects of the propagation of economic plants including both sexual and asexual methods. PREREQ: PLSC201.</td>
</tr>
</tbody>
</table>
PLSC 429 INTRODUCTORY MYCOLOGY
A survey of the structure, classification and possible relationship of major groups of fungi with stress on representative organisms and a working knowledge of terminology. Practical laboratory experience in the culture and identification of fungi.
RESTRICTIONS: Requires permission of instructor.

PLSC 435 PLANT DEVELOPMENTAL BIOLOGY
An anatomical and molecular analysis of plant growth and development with a focus on how genes regulate pattern formation and cellular differentiation.
PREREQ: PLSC300, PLSC306.

PLSC 438 FATT/TRANSPORT SOIL CONTAMINANTS
Fundamental concepts and mechanisms of contaminant fate and transport in porous media. Includes an overview of soil and groundwater as resources; types of soil and groundwater contaminants; transformation and attenuation of contaminants; solute transport in saturated and unsaturated systems.
PREREQ: MATH221.

PLSC 440 INTEGRATED PEST AND DISEASE MANAGEMENT
See ENVC440 for course description.

PLSC 444 PHYSIOLOGY OF PLANT STRESS
Angiosperms’ response to biotic and abiotic environmental stresses; mineral nutrients, salt, drought, cold, heat, light, pathogens and herbicides at the physiological and molecular levels.
PREREQ: PLSC410.

PLSC 446 PLANT CELL BIOLOGY
See BISC446 for course description.
PREREQ: Introductory organic chemistry.

PLSC 450 PLANTING DESIGN
Comprehensive solution of landscape problems. Field application of principles of construction and design.
PREREQ: PLSC211, PLSC212 and PLSC332.

PLSC 454 MANAGEMENT OF LANDSCAPE ENTERPRISES
How to establish and finance a landscape management business; how to hire, supervise, evaluate, discipline and terminate personnel; how to manage time, select equipment, construct bids and contracts and maintain landscaped areas.
PREREQ: PLSC211 and PLSC212.

PLSC 455 ISSUES IN HORTICULTURE
An introduction to current and emerging issues facing the horticultural professions. Ethics, professionalism, environment, politics, horticultural technology and practices will be the foci of discussion groups, student oral and written presentations, case studies, guest lecturers and field trips.
RESTRICTIONS: Open to junior and senior majors only.

PLSC 461 SOILS AND WETLAND DELENAITON
Soil taxonomy, use of a soil survey, properties of hydric soils and wetland delineation using soil characteristics, hydrology and plant ecological principles.
PREREQ: PLSC101, PLSC204 and PLSC205.

PLSC 465 SEMINAR
Oral and written reports in one of the fields of plant science.

PLSC 466 INDEPENDENT STUDY
1-6
Introduction to weed science: weed biology and identification, survival strategies, competition, and impact of weeds. Weed management principles and practices including cultural, biological, and chemical control methods.
PREREQ: PLSC101 or PLSC151 or PLSC204.

PLSC 467 AGRONOMIC CROP SCIENCE
Production and management of the major grain and forage crops, with emphasis on diagnosis of production problems and decision making.
PREREQ: PLSC151.

PLSC 602 PHYSIOLOGICAL PLANT PRODUCTIVITY
PREREQ: PLSC410.

PLSC 603 SOIL PHYSICS
See BREG603 for course description.

PLSC 604 PLANT TAXONOMY
Identification, classification and nomenclature of vascular plants, including sight recognition as well as use of alternative-statement keys. Emphasis on economic plant families of eastern U.S.
PREREQ: PLSC201.

PLSC 605 PLANT BREEDING
Improvement of crops through the application of genetic principles to breeding methods.
PREREQ: ANSC300 or PLSC300 or introductory genetics course.
RESTRICTIONS: Includes at least two mandatory Saturday field trips.

PLSC 606 SOIL GENESIS AND CLASSIFICATION
Soil forming factors and processes; chemical, physical and mineralogical parameters useful in characterizing soil; geologic and geographic settings in Delaware and their influence on soil formation and classification; soil taxonomy and soil limitations and interpretations.
PREREQ: PLSC204.

PLSC 607 PLANT AND SOIL WATER RELATIONS
Environmental aspects, measurement and control of water flux and storage in the soil-plant-atmosphere continuum; and development and significance of plant water deficits.
PREREQ: PLSC305 and PLSC410.

PLSC 608 ENVIRONMENTAL SOIL CHEMISTRY
Principles of soil chemical reactions and their application to the environment including: inorganic and organic soil components, soil solution-solid phase equilibria, sorption phenomena, ion exchange reactions, kinetics of soil chemical processes; redox chemistry, soil acidity and salinity.
PREREQ: CHEM102 or CHEM104 and PLSC204.

PLSC 609 PLANT MICROTECHNIQUE
Introduction to techniques useful in microscopically examining diseased and malnourished plant structures: Emphasis on fixation, embedding, sectioning, staining and interpretation of prepared materials.

PLSC 611 DIAGNOSTIC PLANT PATHOLOGY
Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epiphytology, symptoms and control.
PREREQ: PLSC303.

PLSC 613 PRINCIPLES OF PLANT DISEASE CONTROL
Exclusion, eradication, resistance and protection with emphasis on fungicides, bactericides and nematocides and their use.
PREREQ: PLSC303.

PLSC 614 PLANT CELL AND TISSUE CULTURE
Principles of culturing plants in vitro. Topics for both lecture and laboratory include cell suspensions, anther culture, embryo rescue, micropropagation and regeneration via organogenesis and embryogenesis.
PREREQ: PLSC101.

PLSC 615 VASCULAR PLANT ANATOMY
A developmental and comparative study of the cells, tissues and organs of vascular plants. Readings in the current anatomical literature.

PLSC 616 PLANT VIRIOLOGY
The epidemiology, detection, identification and control of plant viruses and virus-like agents.
PREREQ: PLSC303.

PLSC 619 SOIL MICROBIOLOGY
Characterization of microorganisms and microbial habitats in soil environments. Processes and interactions involving soil microorganisms with respect to agricultural productivity and environmental quality. Introduction to laboratory techniques for the observation, enumeration and isolation of soil microorganisms, and measurement of associated activities.

PLSC 620 PLANT PHYSIOLOGY LABORATORY
The extraction from higher plants of enzymes and other macromolecules, and assay by chemical tests. Pigment extraction, organelle separation, ion uptake, protein manipulation using centrifuge, spectrophotometer, chromatography and electrophoresis.
COREQ: PLSC410.

PLSC 629 INTRODUCTORY MYCOLOGY
Survey of the structure, classification and possible relationship of major groups of fungi with emphasis on representative organisms and a working knowledge of terminology. Practical laboratory experience in the culture and identification of fungi.
RESTRICTIONS: Requires permission of instructor.
PLSC 630  **COLLECTIONS MANAGEMENT AND CURATION**  3
Organization and maintenance of curatorial records including: plant records and labeling, organization of seed plants (phylogeny), nomenclature, policy statements and management concerns.
COREQ: PLSC402

PLSC 633  **PLANT DEVELOPMENTAL BIOLOGY**  3
An anatomical and molecular analysis of plant growth and development with a focus on how genes regulate pattern formation and cellular differentiation.
PREREQ: PLSC300, PLSC306

PLSC 640  **INTEGRATED PEST AND DISEASE MANAGEMENT**  3
See ENWC640 for course description.

PLSC 644  **PHYSIOLOGY OF PLANT STRESS**  3
Angiosperms' response to biotic and abiotic environmental stresses; mineral nutrients, salt, drought, cold, heat, light, pathogens and herbivores at the physiological and molecular levels.
PREREQ: PLSC410.

PLSC 646  **PLANT CELL BIOLOGY**  3
See BISC646 for course description.
PREREQ: Introductory organic chemistry.

PLSC 650  **CLAY MINERALOGY**  3
See MAST650 for course description.

PLSC 655  **POLLUTION MICROBIOLOGY**  3
Integration of basic chemical, physical and biological processes that affect biotransformation of organic and inorganic pollutants in soils and subsurface sediments. Organization is based on a progression from molecular to field scale processes.
PREREQ: PLSC204, CHEM213, PLSC101 or BISC207

PLSC 660  **PESTICIDES IN THE ENVIRONMENT**  3
Role of pesticides in agriculture and public health. Classification and environmental fate in soil, water and atmosphere. Management practices, non-target effect, detoxification and regulation, impact of pesticide alternatives.
PREREQ: CHEM102.

PLSC 670  **WEED BIOLOGY AND CONTROL**  4
Introduction to weed science: weed biology and identification, survival strategies, competition, and impact of weeds. Weed management principles and practices including cultural, biological, and chemical control methods.
PREREQ: PLSC101 or PLSC151 or PLSC204.

PLSC 800  **CURRENT TOPICS IN PLANT SCIENCE**  1-3
Discussion of selected topics and recent literature in plant science.

PLSC 801  **PLANT SCIENCE TECHNIQUES**  3
Theories, principles and applications of laboratory techniques used in planning and conducting plant science research.
RESTRICTIONS: Requires permission of instructor.

PLSC 802  **PROFESSIONAL DEVELOPMENT**  1
Professional development including grantmanship, manuscript writing and reviewing, resume preparation, job interviewing and presentation of research at professional meetings.

PLSC 803  **ADVANCED SOIL FERTILITY AND PLANT NUTRITION**  3
Analysis of chemical and biochemical factors involved in nutrient availability and transport in the soil. Evaluation of current theories of ion uptake, translocation and assimilation.
PREREQ: PLSC305 and PLSC410.

PLSC 804  **PLANT MOLECULAR BIOLOGY**  3
Fundamental and applied aspects of plant molecular biology, including organization of plant genes, genomes, gene expression, gene transfer and genetic engineering.
PREREQ: ANSC670 or BISC653.

PLSC 805  **INSECT-PLANT CHEMICAL ECOLOGY**  2
See ENWC805 for course description.

PLSC 810  **KINETICS AND SURFACE CHEMISTRY OF SOILS**  3
Kinetics and mechanisms of soil chemical reactions, including application of chemical kinetics to natural systems, rates of sorption/desorption, redox, precipitation/dissolution, and ion exchange processes and application of surface spectroscopic and microscopic techniques to elucidate reactions at the soil mineral/water interface.
May be cross-listed with CHEM410
PREREQ: PLSC608, and either CHEM418 or CHEM443

PLSC 819  **ECOLOGICAL SOIL MICROBIOLOGY**  3
Ecological principles of microbial activities and processes in soil-plant systems: dynamics of soil and rhizosphere populations, symbiotic interactions with plants, and selected topics in environmental quality
PREREQ: PLSC619

PLSC 823  **SEMINAR: PRINCIPLES OF PLANT INFECTION**  2
The basic factors governing the development of plant infection by phytopathogenic organisms: invasion, parasitism, colonization, dissemination, epidemiology and host-pathosis relationships.
RESTRICTIONS: Requires permission of instructor.

PLSC 831  **TAXONOMY OF ORNAMENTAL PLANTS**  3
Identification, considering the plant families that include the majority of the ornamental plants grown in botanic gardens, arboreta and horticultural institutions.

PLSC 832  **BOTANIC GARDEN MANAGEMENT**  1-10
A lecture and laboratory course conducted at Longwood Gardens to familiarize Longwood Fellows with the operations and purposes of all areas of Longwood Gardens and other botanic gardens.
RESTRICTIONS: May be repeated for up to ten credits.

PLSC 833  **SEMINAR: SOIL SCIENCE**  1
Current topics in soil science will be discussed from the literature.

PLSC 834  **CURRENT TOPICS IN AGRONOMY**  1
Seminars to review current agronomic literature.

PLSC 835  **ENVIRONMENTAL SOIL PHYSICS**  4
PREREQ: PLSC204 and MATH221

PLSC 864  **SEMINAR PLANNING AND DEVELOPMENT**  1 PF
Planning, developing and hosting a major seminar series: topic and speaker selection, format and schedule development, marketing, local arrangements and hosting.

PLSC 865  **SEMINAR**  1

PLSC 868  **RESEARCH**  1-9

PLSC 869  **MASTER'S THESIS**  1-6

PLSC 874  **TOPICS IN MOLECULAR BIOLOGY**  1
Provides a forum for the discussion of current topics in molecular biology, with critical reading of relevant primary literature.
RESTRICTIONS: Requires permission of instructor.

PLSC 964  **PRE-CANDIDACY STUDY**  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

PLSC 969  **DOCTORAL DISSERTATION**  1-12 PF

**Portuguese**

PORT 105  **BRAZILIAN PORTUGUESE I - ELEMENTARY**  4
Introduction to Brazilian Portuguese language and development of speaking, listening, reading and writing skills through the use of basic texts.

PORT 106  **BRAZILIAN PORTUGUESE II - ELEMENTARY/INTERMEDIATE**  4
Completion of basic Brazilian Portuguese. Increasing mastery of the basic skills of speaking, listening, reading and writing.
PREREQ: PORT105.
RESTRICTIONS: Two or three years of high school Brazilian Portuguese acceptable in lieu of Prerequisite.

PORT 315  **INTENSIVE PORTUGUESE FOR SPANISH SPEAKERS**  3
Students with advanced knowledge of Spanish (300-level) will learn the basic structures and vocabulary of Portuguese in a concentrated course covering material of PORT105 and PORT106
PREREQ: Any 300-level Spanish course, or graduate status in Spanish, or being a Heritage speaker of Spanish.
POLITICAL SCIENCE

POSC 100  INTRODUCTION TO POLITICAL SCIENCE  3
Introduction to the study of central concepts of the discipline, such as political power, authority, decision making, conflict management, representation and institutions of government

POSC 150  AMERICAN POLITICAL SYSTEM  3
Constitutional principles, structure and functions of the political process in the United States

POSC 202  INTRODUCTION TO SCIENTIFIC INQUIRY  3
Introduces students to the foundations of scientific social research, with emphasis on political phenomena. Prepares students in the skills needed to conduct scientific research

REstrictions: Students cannot take both POSC202 and POSC300 for credit

POSC 211  INTRODUCTION TO POLITICS IN DEVELOPING COUNTRIES  3
Forces affecting politics in emerging nations. Impact of colonialism, economic development, military rule, instability and environment. Discussion of how developing nations affect the world political system.

REstrictions: Only one of either POSC211 or POSC311 can count for degree credit

POSC 220  INTRODUCTION TO PUBLIC POLICY  3
Emphasis on what government does, with a focus on substantive policy areas as well as the mechanisms of policy making. Case studies of policy areas (e.g., health policy, environmental policy, social welfare policy, etc.) used to illustrate processes of agenda setting, decision making and policy implementation

POSC 240  INTRODUCTION TO INTERNATIONAL RELATIONS  3
The development of international systems, their structure and political economic dynamics. Fundamental analytical concepts and approaches

POSC 260  HUMANITIES COLLOQUIUM  3
See ASCR260 for course description

POSC 266  SPECIAL PROBLEM  1-3

POSC 270  COMPARATIVE POLITICS  3
Introduction to comparison of politics "within nations." Covers Europe, Africa, Asia and Latin America

POSC 285  CURRENTS IN POLITICAL THEORY  3
Basic introduction to political philosophy, organized not around particular historical periods or specific philosophers, but around some of the most important, enduring questions of political theory. What is the nature of the state? What are the obligations and responsibilities of citizens?

POSC 300  DATA ANALYSIS FOR POLITICAL SCIENCE  3
Applied statistical analysis, including regression, analysis of variance, descriptive statistics and exploratory data analysis, statistical inference, and measurement

POSC 301  STATE AND LOCAL GOVERNMENT  3
American federalism with emphasis on government and politics, with special attention to Delaware

POSC 303  PUBLIC ADMINISTRATION  3
Introduction to management in the public sector; personnel, budgeting, leadership, ethics, and the role of civil service in government

POSC 306  ECONOMIC THEORY OF POLITICS  3
See ECON306 for course description

POSC 309  POLITICAL CULTURE BY COUNTRY  3
Introduction to the political and civic cultures underpinning and supporting different political systems. Topics may vary depending on host country

May be cross-listed with FLIT309

REstrictions: Offered only in conjunction with travel abroad programs. May be repeated for credit when topics vary

POSC 310  EUROPEAN GOVERNMENTS  3
Structure and process of British, French, West German and Russian governments

POSC 311  POLITICS OF DEVELOPING NATIONS  3
Forces determining public policy among the emerging nations. Cross-national comparative analysis

REstrictions: Only one of either POSC211, or POSC311 can count for degree credit

POSC 312  POLITICS OF EAST ASIAN DEVELOPMENT  3
Examines contemporary issues and questions of political legitimacy and economic development in East and Southeast Asia. Traditional patterns of authority, impact of Western colonialism, emergence of new Southeast Asian states and the political and economic development of selected countries are covered

POSC 313  AMERICAN FOREIGN POLICY  3
The theory, policies and administration of U.S. foreign policy

POSC 315  THIRD WORLD WOMEN IN POLITICS  3
Introduction to the role of women in politics and society in Africa, Asia, Latin America and the Middle East.

May be cross-listed with WOMS315

POSC 316  INTERNATIONAL POLITICAL ECONOMY  3
Interaction of international political and economic phenomena. Considers history and development of political economy, and the political underpinnings and effects of global monetary, trade, financial and investment systems. Both relations among advanced countries, and between the advanced and poor countries will be considered

POSC 319  TOPICS IN POLITICS AND BROADCAST JOURNALISM  3
See COMM319 for course description

POSC 320  PARTIES AND INTEREST GROUPS  3
Organization and behavior of political parties and interest groups, including structure, leadership, recruitment and decision making

POSC 321  CLASS, ETHNICITY AND POLITICS  3
Examines the history, strategic positions and political tactics of ethnic minorities in the U.S. Where appropriate, the politics of cultural and ethnic minorities will be compared to that of racial minorities. Attention also given to social class as a factor influencing politics in the U.S.

POSC 322  RACE AND POLITICS  3
Provides an insight and understanding of race as an intricate part of the political process in the U.S. The role of race in U.S. politics is explored primarily through the political experiences of black Americans and how the political system has responded

May be cross-listed with SAMS322

POSC 323  INTRODUCTION TO WOMEN AND POLITICS  3
Political-legal status of American women since the Revolution, and their participation in the political process. Women's present political-legal status, as illustrated through current issues such as reproductive rights, pay equity and the feminization of poverty

May be cross-listed with WOMS323

POSC 324  VOTING AND ELECTIONS  3
Examines various aspects of political behavior including political socialization, the formation of political attitudes and opinion, electoral behavior and political participation. Attention also given to the relationship of political behavior and public policy

POSC 329  INTERNATIONAL MIGRATION  3
This interdisciplinary course introduces alternative/complementary disciplinary approaches to the study of human movement between states. It is offered on a rotational basis by faculty involved in the University of Delaware migration group.

May be cross-listed with GEOG329, HIST329, and/or SOCI329

POSC 330  POLITICAL TERRORISM  3
Selectively examines cases, trends and organizations which have made the violence termed terrorism so salient. Also examines whether governments, including the U.S., are responding appropriately to the challenge

REstrictions: Not open to freshmen except with consent of instructor

POSC 331  PLANETARY MANAGEMENT SEMINAR AND LABORATORY  3
See GEOG331 for course description

POSC 333  COMMUNISM, FASCISM AND DEMOCRACY  3
Considers the theoretical development of liberal democracy and significant theoretical and ideological challenges to its dominance including Marxist, Islamic, postcolonial and postmodernist political theories. Students read the original sources of these positions while considering their historical development and application to contemporary politics

POSC 334  LIBERALISM AND CONSERVATISM  3
Introduces capitalism, socialism, liberalism, conservatism and democratic forms of Marxism. Accents problems of economic growth, equality, freedom and self-realization, bureaucracy, representation, justice, brotherhood, the profit motive, social cohesion, nationalism and the international order
### Political Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSC 339</td>
<td>Britain and Europe</td>
<td>3</td>
</tr>
<tr>
<td>POSC 340</td>
<td>Politics and the Media</td>
<td>3</td>
</tr>
<tr>
<td>POSC 341</td>
<td>Environment of Multinational Corporations</td>
<td>3</td>
</tr>
<tr>
<td>POSC 343</td>
<td>Society, Politics and Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>POSC 350</td>
<td>Politics and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>POSC 355</td>
<td>Urban Politics and Community Development</td>
<td>3</td>
</tr>
<tr>
<td>POSC 360</td>
<td>Humanities Colloquium</td>
<td>3</td>
</tr>
<tr>
<td>POSC 362</td>
<td>Diplomacy</td>
<td>3</td>
</tr>
<tr>
<td>POSC 365</td>
<td>International Law and Organization</td>
<td>3</td>
</tr>
<tr>
<td>POSC 366</td>
<td>Independent Study</td>
<td>1-6</td>
</tr>
<tr>
<td>POSC 372</td>
<td>East Central European Politics</td>
<td>3</td>
</tr>
<tr>
<td>POSC 377</td>
<td>Arab-Israeli Politics</td>
<td>3</td>
</tr>
<tr>
<td>POSC 380</td>
<td>Introduction to Law</td>
<td>3</td>
</tr>
<tr>
<td>POSC 387</td>
<td>American Political Thought</td>
<td>3</td>
</tr>
<tr>
<td>POSC 390</td>
<td>Honors Colloquium</td>
<td>3</td>
</tr>
<tr>
<td>POSC 400</td>
<td>Practicum in Teaching Political Science</td>
<td>3</td>
</tr>
<tr>
<td>POSC 401</td>
<td>Topics in Constitutional Law</td>
<td>3</td>
</tr>
<tr>
<td>POSC 402</td>
<td>Civil Liberties: Individual Freedoms</td>
<td>3</td>
</tr>
<tr>
<td>POSC 403</td>
<td>Civil Liberties: Equal Protection Clause</td>
<td>3</td>
</tr>
<tr>
<td>POSC 404</td>
<td>The Judicial Process</td>
<td>3</td>
</tr>
<tr>
<td>POSC 405</td>
<td>Constitutional Law of the United States</td>
<td>3</td>
</tr>
<tr>
<td>POSC 407</td>
<td>American Presidency</td>
<td>3</td>
</tr>
<tr>
<td>POSC 408</td>
<td>International Organization</td>
<td>3</td>
</tr>
<tr>
<td>POSC 409</td>
<td>Contemporary Problems of World Politics</td>
<td>3</td>
</tr>
<tr>
<td>POSC 410</td>
<td>Political and Poverty</td>
<td>3</td>
</tr>
<tr>
<td>POSC 411</td>
<td>Foreign Policy of the Post-Soviet Union</td>
<td>3</td>
</tr>
<tr>
<td>POSC 412</td>
<td>Problems in American Government</td>
<td>3</td>
</tr>
<tr>
<td>POSC 413</td>
<td>Problems in American Foreign Policy</td>
<td>3</td>
</tr>
<tr>
<td>POSC 414</td>
<td>Problems in American Foreign Policy</td>
<td>3</td>
</tr>
<tr>
<td>POSC 415</td>
<td>Force and World Politics</td>
<td>3</td>
</tr>
<tr>
<td>POSC 416</td>
<td>Constitutional Issues in American Public Schools</td>
<td>3</td>
</tr>
<tr>
<td>POSC 417</td>
<td>Human Role in Environmental Change</td>
<td>3</td>
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<tr>
<td>POSC 418</td>
<td>Introduction to Political Economy</td>
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<tr>
<td>POSC 419</td>
<td>Political Leadership</td>
<td>3</td>
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<td>POSC 420</td>
<td>Congress and Public Policy</td>
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<td>POSC 424</td>
<td>Energy Policy and Administration</td>
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<tr>
<td>POSC 425</td>
<td>Advanced Topics in Politics and Broadcast Journalism</td>
<td>3</td>
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<td>POSC 426</td>
<td>Latin American Political Systems</td>
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<td>POSC 427</td>
<td>Politics in China</td>
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<td>POSC 428</td>
<td>Politics in Japan</td>
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<td>POSC 429</td>
<td>Southeast Asia and the World</td>
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<td>POSC 431</td>
<td>Latin American Politics Countries</td>
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<td>POSC 432</td>
<td>Political System of the Post-Soviet Union</td>
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<td>POSC 433</td>
<td>African Politics</td>
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<td>POSC 434</td>
<td>Political Thought I</td>
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<tr>
<td>POSC 435</td>
<td>Political Thought II</td>
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<td>POSC 436</td>
<td>Politics and Literature</td>
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<td>POSC 437</td>
<td>Who Governs: Perspectives on Political Power</td>
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<td>POSC 438</td>
<td>Problems in African Politics</td>
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<td>POSC 439</td>
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<td>Problems of Western Europe by Country</td>
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<td>POSC 443</td>
<td>China and the World</td>
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<td>POSC 444</td>
<td>Global Agenda</td>
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<td>POSC 445</td>
<td>Human Rights and World Politics</td>
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<td>POSC 446</td>
<td>International Human Rights on Film</td>
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<td>POSC 448</td>
<td>Theories of International Relations</td>
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<td>POSC 450</td>
<td>Problems of Latin American Politics</td>
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<td>POSC 451</td>
<td>Problems in Urban Politics</td>
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<td>POSC 452</td>
<td>Public Sector Human Resource Management</td>
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<td>POSC 453</td>
<td>Management and Nonprofit Organizations</td>
<td>3</td>
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<td>POSC 454</td>
<td>Public Budgeting and Financial Management</td>
<td>3</td>
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<td>POSC 455</td>
<td>Disaster and Politics</td>
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<tr>
<td>POSC 456</td>
<td>Public Administration</td>
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<td>POSC 457</td>
<td>Management and Nonprofit Organizations</td>
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<td>POSC 458</td>
<td>Community Service Fieldwork</td>
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<tr>
<td>POSC 459</td>
<td>Problems of Western European Politics</td>
<td>3</td>
</tr>
<tr>
<td>POSC 463</td>
<td>The United Nations and World Affairs</td>
<td>3</td>
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<tr>
<td>POSC 464</td>
<td>Internship in Political Science</td>
<td>1-6</td>
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<tr>
<td>POSC 465</td>
<td>Model Organization of American States</td>
<td>3</td>
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<tr>
<td>POSC 466</td>
<td>Independent Study</td>
<td>1-6</td>
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</table>
POLITICAL SCIENCE

POSC 468 Undergraduate Research 1-6
Research conducted under the direction of or in conjunction with a faculty member. May result in a major research paper or be incorporated into a faculty project.

POSC 470 Senior Honors Seminar 3

POSC 475 Model United Nations 3
Intensive preparation for effective participation in the National Model United Nations held in New York City each spring.

RESTRICTIONS: May be repeated once for credit when topics vary. May only count toward political science or international relations major one time.

POSC 499 Capstone in Political Science 1
Designed to integrate students’ acquired knowledge and skills in political science. Emphasizes analytical, written and oral communication skills.

RESTRICTIONS: Offered in conjunction with a 400-level POSC course.

POSC 604 International Law 3
See MAST673 for course description.

POSC 605 Topics in Law and Courts 3
Content of this research seminar will vary from year to year. Possible topics may be comparative public law, jurisprudence, constitutionalism. A major research paper is required.

POSC 612 Foreign Policy of the Post-Soviet Union 3
Principles, foreign policies and administration of the former Soviet government and its most important successor states.

POSC 614 Judicial Process 3
Examines the structure, personnel, and process of the American judiciary, including factors that influence judicial decisions and the scope and nature of judicial policy making.

POSC 615 Force and World Politics 3
Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.

POSC 624 Energy Policy and Administration 3
World and U.S. energy policies with emphasis on nuclear power, solar energy and fossil fuels. Examines progress and design of U.S. science and technology policy in energy domain. May be cross-listed with MAST620 and/or UAPP625.

POSC 626 Conservation and Renewable Energy Policy 3
See UAPP626 for course description.

POSC 627 Latin American Political Systems 3
Impact of social and economic change on the political processes.

POSC 628 Comparative Environmental Politics 3
See UAPP627 for course description.

POSC 629 Southeast Asia and the World 3
Examines patterns of international relations within Southeast Asia and between the region and greater powers, Southeast Asia’s insecurity and patterns of relations at the domestic, regional and global levels. Discussion of contemporary issues including the emergence of economic blocs, the rise of China and the future of the Association of Southeast Asian Nations.

POSC 632 Political System of the Post-Soviet Union 3
Structure and process of the political system of the USSR and its most important successor states (Russia, Ukraine, Byelororus, Kazakhstan and others).

POSC 633 African Politics 3
Overview of politics and society in sub-Saharan Africa including colonialism, the rise of nationalism, decolonization, single-party and military rule, the role of social movements and religious, class, gender and ethnic identities and the move toward economic and political liberalization.

POSC 634 Political Thought I 3
An in-depth study of major political philosophers of the Western tradition from Plato to Machiavelli.

POSC 635 Political Thought II 3
An in-depth study of major political philosophers of the Western tradition from Machiavelli to the present.

POSC 639 Problems in African Politics 3
Examination of selected topics in contemporary African politics. Will focus in-depth on aspects of politics and society in a specific region of Africa or will investigate in greater detail issues confronting Africa today such as economic structural adjustment, democratization and state-society relations.

POSC 640 International Development Policy and Administration 3
Poverty and inequality in developing countries and the economic development policies employed to alleviate them. Emphasis on policy reform, trade strategies, sustainable development, and the role of the state. The approaches used by the World Bank, the IMF and USAID. May be cross-listed with UAPP640.

POSC 642 Problems of Western European Politics 3
Examination of current political trends in Western European politics, including changes in party systems and problems of European integration.

POSC 650 Problems of Latin American Politics 3
Current political issues in selected Latin American countries.

POSC 652 Topics in Political Theory 3
Focuses on selected topics in political theory, including Marxism, liberalism and contemporary political theory.

POSC 653 Politics and Healthcare 3
Prepares students to understand and assess the American healthcare delivery system. Examines the political dynamics involved in developing healthcare policies in both the public and private sectors. May be cross-listed with UAPP653.

POSC 656 Politics and Disaster 3
The politics and public administration of governmental preparedness for, and response to, natural and human-caused disasters and emergency incidents. May be cross-listed with UAPP656.

POSC 659 Topics in Public Administration 1-3
See UAPP659 for course description.

POSC 663 Decision Tools for Policy Analysis 3
See MAST653 for course description.

POSC 678 Admiralty and Maritime Law 3
See MAST678 for course description.

POSC 679 Shipping and Port Management 3
See MAST679 for course description.

POSC 681 Metropolitan Infrastructure and Transportation 3
See UAPP681 for course description.

POSC 683 Regional Policy Analysis 3
See UAPP683 for course description.

POSC 685 Personnel and Human Resource Issues: Current Topics 3
See UAPP685 for course description.

POSC 686 State and Local Government 3
See UAPP686 for course description.

POSC 687 State Government Management and Policy 3
See UAPP687 for course description.

POSC 688 Topics in State and Local Management 3
See UAPP688 for course description.

POSC 800 Seminar: Theories of Political Inquiry 3
Introduces basic topics of political inquiry including philosophies of science, epistemologies and theory building, and research design. Conceptual and normative issues are explored.

POSC 801 Research Design for Political Science 3
Seminar helps students understand and evaluate alternative research methods and research design. Each participant has an opportunity to write a research proposal that is then critiqued by members of the class and the instructor.

POSC 802 Seminar: Developing and Transitional Systems 3
Issues, concepts, and scholarship regarding the politics of the developing and transitional countries of Africa, Asia, Eastern Europe and Latin America in a global governance context. Topics may include democratic transition and consolidation, comparative democracy, political economy of liberal economic reform, religion and political culture, new nationalisms and ethnic conflict, and international systemic influences on all the above.

POSC 803 Seminar: Public Administration 3
See UAPP803 for course description.
POSC 804 Seminar: Post-Industrial Systems 3
Issues, concepts, and scholarship regarding the politics of advanced industrial nations of Europe, North America, and East Asia in a global governance context. Topics may include state theory and the new institutionalism, political culture and nationalism, the welfare state and reform, party systems, civil society and new social movements, regional integration and transnational dimensions of policy processes.

POSC 805 Seminar: Public Law 3
Core seminar for the field of law and courts. Provides a broad overview of the range, depth and variety of approaches of current research within this field.
Restrictions: Graduate students only.

POSC 806 Normative Issues in Global Governance 3
Examines normative issues in contemporary global governance from perspective of diverse ethical traditions and/or political philosophy.

POSC 808 American Political Institutions 3
Explores major themes, viewpoints, issues and topics pertaining to the American political system. Themes include stability, change, conflict, American exceptionalism, American political thought, alternative perspectives on democracy, analysis of political parties, interest groups, Congress, the presidency and the courts.

POSC 810 Seminar: Comparative Government 3
Focuses on the evolution of the study of politics within national states, the principal theoretical approaches in studying politics cross-nationally and major scholarly controversies. Students review a broad spectrum of comparative research and writing.

POSC 811 Topics in Comparative Government 3
Focuses on selected topics in Comparative Government and Politics.

POSC 813 Seminar: American Foreign Policy 3
Overview of contemporary American foreign policy and policy making, as well as the analytical, conceptual and methodological problems associated with foreign policy analysis.

POSC 814 Political Economy of the Environment 3
See UAPP810 for course description.

POSC 815 Introduction to Statistical Analysis for Political Science 3
Training in the basics of statistical analysis and quantitative approaches to politics and society. Topics include elementary statistics, probability theory, hypothesis testing and regression analysis. Provides foundation for further quantitative methods.

POSC 816 Advanced Social Research for Political Science 3
Provides advanced training in applied social research methods. Topics may include econometrics, qualitative methods, game theory, and agent-based modeling. Includes lectures and discussion supplemented by laboratory work involving computer statistical packages and simulations.

POSC 817 Financing Alternatives in the Public Sector 3
See UAPP817 for course description.

POSC 818 Environmental Policy and Administration 3
U.S. environmental policy and administration of air and water pollution control programs. Secondary consideration given to population control, energy and natural resource development and conservation, as well as intergovernmental relations in environmental program implementation. May be cross-listed with MAST871 and/or UAPP818.

POSC 819 Management Decision Making in Public and Nonprofit Sectors 3
See UAPP819 for course description.

POSC 820 International Perspectives on Energy and Environment 3
Policy analysis and political economy at international energy and environmental issues and problems. Encompasses international and multinational government and private sector organizations, as well as non-governmental, non-profit organizations. May be cross-listed with UAPP820.

POSC 821 Proseminar: Technology, Environment and Society 3
See UAPP821 for course description.

POSC 825 Comparative Public Administration 3
A reading and discussion seminar concentrating on the development of administration and bureaucratic elites in developed and developing countries. Attention given to French, British and German bureaucracies and the problems of ethics, decentralization, planning, political influences and external controls. May be cross-listed with UAPP825.

POSC 829 Taxation and Fiscal Policies 3
See UAPP829 for course description.

POSC 830 Seminar: International Relations 3
Surveys broad range of international relations theory including realism, neorealism, interdependence, unil level analysis, regime theory, world system theories, poststructuralism, feminism and normative theory. Epistemological and conceptual problems associated with international relations research are explored.

POSC 833 Seminar: Normative Political Theory 3
Department's core seminar in political philosophy which attempts to acquaint the student with major themes in political thought from "Plato to the present." Within that framework there is normally emphasis placed on the thought of one or two individuals.

POSC 835 Organization and Management in the Public and Nonprofit Sectors 3
See UAPP835 for course description.

POSC 837 Human Resources Management in Public and Nonprofit Sectors 3
See UAPP837 for course description.

POSC 838 Public Policy Analysis 3
Seminar covers an overview of the policy process and considers all topics central to an understanding of policy making in the United States. May be cross-listed with MAST838 and/or UAPP838.

POSC 839 Financial Management in Public and Nonprofit Sectors 3
See UAPP839 for course description.

POSC 840 International Political Economy 3
Considers the political underpinnings and effects of the interaction of political and economic processes at the global level. Reviews schools of thought and various topics including long cycles, foreign investment, monetary and trade regimes, and the political dilemmas of growth and stagnation.

POSC 843 Global Governance: Theory and Cases 3
Exploration of international organization, regime and global governance theory. Analysis of global governance arrangements in various issue areas, such as the environment, ocean issues, human rights, development, world health, telecommunications, trade and finance. May be cross-listed with MAST843 and/or UAPP843.

POSC 868 Research 3
To be taken by M.A. students seeking to satisfy the program's research requirement through the research paper option.

POSC 869 Master's Thesis 1-6

POSC 964 Pre-Candidacy Study 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
Restrictions: Not open to students who have been admitted to candidacy.

POSC 969 Doctoral Dissertation 1-12 PF

PSYCHOLOGY

PSYC 100 General Psychology 3
Provides foundation in the application of the scientific method to problems of human behavior and experience.

PSYC 207 Research Methods 3
Reviews the major issues involved in the design of psychological experiments. Includes measurement issues, internal and external validity of experiments, research with single subjects, and research ethics. Discusses both laboratory and field research.
Prereq: PSYC100.
Restrictions: Majors and minors only.

PSYC 209 Measurement and Statistics 3
Theory and the application of statistical techniques to psychological data.
Prereq: PSYC100 and one course in basic college mathematics.
Restrictions: Majors and minors only.

PSYC 270 Families and Developmental Disabilities 3
See IFST270 for course description.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tr>
<td>PSYC 301</td>
<td>Personality</td>
<td>3</td>
<td>A survey of data and theories of human personality and affect.</td>
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<tr>
<td>PSYC 303</td>
<td>Introduction to Social Psychology</td>
<td>3</td>
<td>Analysis of interpersonal behavior with special emphasis on problems of conformity and influence; the organization and dynamics of social groups; and the development of opinions and attitudes.</td>
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<tr>
<td>PSYC 310</td>
<td>Sensation and Perception</td>
<td>3</td>
<td>Theories and experimental study of sensation and perception.</td>
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<tr>
<td>PSYC 312</td>
<td>Learning and Motivation</td>
<td>3</td>
<td>Experimental study of contemporary theories of learning and motivation.</td>
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<td>PREREQ: PSYC209</td>
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<tr>
<td>PSYC 314</td>
<td>Brain and Behavior</td>
<td>3</td>
<td>Study of the brain mechanisms underlying hunger, sex, aggression, learning, memory, perception, sleep and waking.</td>
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<td>May be cross-listed with CGSC314.</td>
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<tr>
<td>PSYC 325</td>
<td>Child Psychology</td>
<td>3</td>
<td>Survey of the interactions of physiological, psychological, and environmental factors determining psychological development. Consideration of major theories of child development.</td>
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<td>PREREQ: PSYC100</td>
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<tr>
<td>PSYC 333</td>
<td>Psychology of Women</td>
<td>3</td>
<td>Psychological analysis of the meaning and implications of being a woman and cause and consequences of the female experience. Biological sex vs psychological sex-role identity, stereotyping, discrimination, self-concept and the feminist perspective.</td>
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<td>May be cross-listed with WOMS333.</td>
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<tr>
<td>PSYC 334</td>
<td>Abnormal Psychology</td>
<td>3</td>
<td>Disorders of behavior and consciousness including the various psychoses, psychoneuroses, mental deficiency, and other conditions.</td>
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<tr>
<td>PSYC 340</td>
<td>Cognition</td>
<td>3</td>
<td>Survey of major themes in human thought processes, concept formation, problem solving, creativity, language use and cognitive development.</td>
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<td>May be cross-listed with CGSC340.</td>
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<tr>
<td>PSYC 346</td>
<td>Psychology and the Law</td>
<td>3</td>
<td>See CRJU346 for course description.</td>
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<tr>
<td>PSYC 350</td>
<td>Developmental Psychology</td>
<td>3</td>
<td>An analysis of theory and research in developmental psychology including the topics of developmental processes, developmental risk, systems theory and contemporary social issues.</td>
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<tr>
<td>PSYC 356</td>
<td>Psychology Field Placement</td>
<td>3</td>
<td>Student contracts with any psychology instructor. Requirements include a minimum of four hours per week working in an agency, institution or business. Readings assignments and writing a term paper. Placement will be made with assistance from Career Planning and Placement. Inquiries should be made several months in advance.</td>
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<td>PSYC 366</td>
<td>Independent Study</td>
<td>1-6</td>
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<tr>
<td>PSYC 370</td>
<td>Research in Personality</td>
<td>3</td>
<td>An analysis of contemporary issues and research in personality including the assessment of personality traits, the personality situation interaction and the social and biological bases of individual differences.</td>
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<tr>
<td>PSYC 380</td>
<td>Psychopathology</td>
<td>3</td>
<td>Exploration of research on diagnosis, etiology and treatment of major pathological disorders. Emphasis on original research articles, class discussion and assessment instruments, in addition to analysis of video-taped interviews with patients used to illustrate the disorders.</td>
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<tr>
<td>PSYC 390</td>
<td>Social Psychology</td>
<td>3</td>
<td>An analysis of theory and research in social psychology including the topics of social cognition, attitudes, interpersonal and intergroup relations. Student-designed research projects including data analysis.</td>
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<tr>
<td>PSYC 394</td>
<td>Cultural Psychology</td>
<td>3</td>
<td>Introduction to the study of how culture shapes psychological experience, including social behavior, cognition, motivation, and the experience of the self. Covers psychological theory and research on human cultural variation and focuses on different national populations (especially North Americans and East Asians), with some attention to the psychological experience of multicultural populations within the United States.</td>
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<tr>
<td>PSYC 403</td>
<td>Psychology of Nonverbal Behavior</td>
<td>3</td>
<td>A seminar on the social psychological implications of the research literature on nonverbal behavior in social interaction. Focuses on interpersonal attraction, leadership, impression formation, causal attribution, deception, social attitudes and cross-cultural factors, with practical applications.</td>
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<tr>
<td>PSYC 406</td>
<td>Reduction of Intergroup Conflict</td>
<td>3</td>
<td>The reduction of intergroup conflict in business, educational and experimental laboratory settings, with special attention given to organizational mergers and strategies for reducing intergroup conflict.</td>
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<tr>
<td>PSYC 407</td>
<td>Emotions and Preventive Intervention</td>
<td>3</td>
<td>The emotions: their neural, expressive, and experiential components and their relation to adaptive and maladaptive behavior. Translating emotion theory and research into therapeutic and preventive interventions. Requirements include doing emotion tutoring with children.</td>
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<tr>
<td>PSYC 410</td>
<td>Biological Basis of Motivation and Emotion</td>
<td>3</td>
<td>An evolutionary approach towards three major modern theories of motivation: ethologists' instinct theory, Freud's psychoanalytic theory and psychologists' drive theory. Covers current work on circadian rhythms, obesity and anorexia, sleep, fever, phobias, learned helplessness, voodoo death, fear, love and aggression.</td>
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<tr>
<td>PSYC 411</td>
<td>Ideas in Biopsychology</td>
<td>3</td>
<td>Focuses on important ideas in biopsychology as communicated in seminal books. Students examine at least six influential books in psychology, biology, or philosophy. Studies the general trends, which will be “problem-based” and focused on the personal and social context, theoretical importance, and social impact of the book. Reading list includes books by Darwin, Dawkins, Sacks, Goleman, Gould, and Lorenz.</td>
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<td>PREREQ: PSYC314</td>
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<tr>
<td>PSYC 415</td>
<td>History and Systems of Psychology</td>
<td>3</td>
<td>Psychology from the early Greeks through the more important “schools” of the 20th century.</td>
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</table>
PSYC 416 Psychological Perspectives on the Black American 3
The experience of Black Americans as viewed from a psychological perspective. Psychological theory and research pertaining to Black Americans; reactions to oppression, collective behavior, personality development, and life styles. May be cross-listed with BAMS432.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 418 Human Emotions 3
Emotions, cognition and behavior. Role of emotions in personality and social relationships. Includes laboratory/tutorial session with analysis and presentation of scenes from dramatic literature to illustrate integration of emotion, cognition, and action.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 420 Mental Illness: Historical and Critical Perspectives 3
Explores historical and current issues in understanding mental illness from biomedical and social constructionist perspectives. Focuses on recent advances and problems in conceptions of cause, diagnosis, and intervention.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 424 Applied Social Psychology 3
The application of basic principles of interpersonal behavior to everyday life. Topics covered include persuasion, reciprocation, employee motivation, organizational development, liking and authority.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 425 Family Conflict and the Child 3
Analysis of specific topic areas in child psychology, such as infancy and cognitive and social development. Topics may vary from year to year.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 433 Cognitive Neuroscience 3
Examines the brain mechanisms responsible for cognitive functions such as perception, memory, and language. Surveys the neural mechanisms underlying cognition and the current methods for relating mind and brain, including studies of brain-damaged patients and brain imaging techniques.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 441 Computers and Cognition 3
Introduction to computer models of cognitive processes. Computer models gave rise to the interdisciplinary area of cognitive science. Course covers basic types of models that have been used and a discussion of their psychological plausibility. May be cross-listed with CGSC441.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 443 Topics in Organizational Communication 3
See COMM442 for course description

PSYC 444 The Psychology of Aesthetics 3
Psychological and psychobiological theories and empirical investigations of aesthetic experience
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 445 Topics in Adolescent Psychology 3
Analysis of the physiological, psychological, and social factors influencing psychological development from late childhood through adolescence
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 460 Assessment of Young Children 3
See IFST452 for course description

PSYC 462 Language Acquisition 4
See EDUC462 for course description

PSYC 466 Independent Study 1-6

PSYC 468 Research 3-6

PSYC 481 Clinical Psychology 3
Introduction to clinical theories, research and practices. Diagnosis, classification and treatment of behavior disorders
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 484 Social Motivation 3
Analysis of theory and research in the social psychology of motivation. Students may choose to study either leisure behavior or work motivation.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 490 Social Interdependence 3
Presents theoretical and empirical approaches of social psychology to the study of conflict versus cooperation between mutually dependent people. Cooperation/conflict is analyzed in terms of the effects of environmental influence, the reward structure of the relationship, and the interpersonal values of participants.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 491 Psychology of Temporal Orientation 3
The scientific study of how temporal frames of reference regarding the past, present and future affect a variety of basic human processes, especially human behavior.
RESTRICTIONS: Open to junior and senior psychology majors and minors only

PSYC 606 Animal Behavior 3
Seminar on naturalistic and experimental investigations of species-typical behavior.
RESTRICTIONS: Requires permission of instructor

PSYC 612 Human Psychophysiology 3
Introduction to psychophysiological recording techniques. Elementary anatomy and physiology of the human nervous system. Application of psychophysiological techniques to the investigation of psychopathology, information processing and social psychology. Laboratory demonstration of polygraphic measurement of autonomic and CNS variables with small computer analysis.
RESTRICTIONS: Requires permission of instructor

PSYC 626 Neuroscience I 4
Structure and function of the sense organs, nervous system and motor systems in relation to integrated behavior. May be cross-listed with BISC626.
PREQ: BISC306, PSYC314, and PSYC310 or PSYC312.

PSYC 627 Neuroscience II 3
See BISC627 for course description

PSYC 630 Neurons and Networks 3
See CPEG630 for course description

PSYC 642 Mental Representation and Memory 3
Human memory can be conceptualized in terms of representation and information storage within various interrelated mental systems. Critically evaluates research on human memory and representation within the context of major cognitive models. May be cross-listed with CGSC642.
RESTRICTIONS: Requires permission of instructor

PSYC 668 Research 1-6

PSYC 675 Language Acquisition 4
See EDUC675 for course description

PSYC 692 Social Skills Training for Children 3
See EDUC692 for course description

PSYC 804 Seminar: Human Development 3
Selected research literature in developmental psychology. May be cross-listed with EDUC837.
RESTRICTIONS: Requires permission of instructor

PSYC 807 Group and Interpersonal Processes 3
Addresses basic theoretical and empirical knowledge of group processes, structures and interactions.
RESTRICTIONS: Requires permission of instructor

PSYC 809 Research Design 3
An overview of methodological issues in the conduct of psychological research, including correlational, experimental, and quasi-experimental studies. Special emphasis on clinical and personality research.
RESTRICTIONS: Requires permission of instructor

PSYC 813 Seminar in Intergroup Relations 3
Cognitive, motivational and cultural factors involved in the creation of and reduction of intergroup bias and conflict. Emphasis on theoretical and applied perspectives.
RESTRICTIONS: Requires permission of instructor

PSYC 817 Individual Intelligence Testing 3
See EDUC817 for course description

PSYC 819 Psychotherapy I 3
Survey of theories, schools and techniques of psychotherapy and critical review of relevant research.
RESTRICTIONS: Requires permission of instructor

PSYC 820 Psychodiagnostics: Objective Trait and Behavioral Assessment 3
RESTRICTIONS: Requires permission of instructor
PSYC 823  LEARNING AND DEVELOPMENT  3
See EDUC 283 for course description.

PSYC 827  ADVANCED PSYCHOTHERAPY II  3
Schools, theories and techniques of psychotherapy including research on
psychotherapy and review of evaluative studies. Supervised practice
PREREQ: PSYC 319
RESTRICTIONS: Requires permission of instructor.

PSYC 829  ADVANCED PSYCHOPATHOLOGY  3
Theories of psychopathology, including various modes of conceptualizing
psychopathology, i.e., medical vs. behavioral and psychosocial models
Reliability and validity of psychodiagnosis; and relevant research and
problems of experimental clinical research with institutionalized populations.
RESTRICTIONS: Requires permission of instructor.

PSYC 834  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY I  1-3 PF
Limited diagnostic and therapeutic practice in clinical setting under
professional supervision
RESTRICTIONS: Requires permission of instructor.

PSYC 835  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY II  1-3 PF
Continuation of PSYC 834
RESTRICTIONS: Requires permission of instructor.

PSYC 836  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY III  1-3 PF
Continuation of PSYC 834 and PSYC 835
PREREQ: PSYC 834 and PSYC 835
RESTRICTIONS: Requires permission of instructor.

PSYC 837  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY IV  1-3 PF
Continuation of PSYC 834, PSYC 835 and PSYC 836
PREREQ: PSYC 836
RESTRICTIONS: Requires permission of instructor.

PSYC 845  CHILDHOOD PSYCHOPATHOLOGY  3
See EDUC 283 for course description.

PSYC 860  PSYCHOLOGICAL STATISTICS  3
Applications to behavior measurement of probability, regression and analysis
of variance and covariance; psychometrics and scaling techniques; and design
of experiments.
RESTRICTIONS: Requires permission of instructor.

PSYC 861  PSYCHOLOGICAL STATISTICS  3
Further applications to behavior measurement of probability, regression and
analysis of variance and covariance; psychometrics and scaling techniques; and design
of experiments.
RESTRICTIONS: Requires permission of instructor.

PSYC 868  RESEARCH  1-6

PSYC 869  MASTER'S THESIS  1-6
RESTRICTIONS: Requires department permission.

PSYC 964  PRE-CANDIDACY STUDY  3-12 PF
Research and readings in preparation of dissertation and/or qualifying
examinations for doctoral students before admission to candidacy but after
completion of all required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

PSYC 969  DOCTORAL DISSERTATION  1-12 PF

RUSS 105  RUSSIAN - ELEMENTARY  4
Introduction to the Russian language and development of speaking, listening,
reading and writing skills through the use of basic texts.

RUSS 106  RUSSIAN II - ELEMENTARY/INTERMEDIATE  4
Completion of basic Russian. Increasing mastery of the basic skills of
speaking, listening, reading and writing
PREREQ: RUSS 105
RESTRICTIONS: Two to three years of high school Russian acceptable in lieu of
prerequisite.

RUSS 107  RUSSIAN III - INTERMEDIATE  4
Review of grammar, continued practice in speaking and writing, and reading
texts of average difficulty.
PREREQ: RUSS 106
RESTRICTIONS: Four years of high school Russian acceptable in lieu of
prerequisite. Satisfies College of Arts and Science language requirement.

RUSS 200  RUSSIAN GRAMMAR REVIEW  3
Systematic review of elementary and intermediate Russian grammar, study of
complex sentence structure and idioms. Some conversational practice
PREREQ: RUSS 107.

RUSS 205  RUSSIAN CONVERSATION  3
Practical use of the language. Emphasis on topics drawn from contemporary
Russian life and literature.
PREREQ: RUSS 107.

RUSS 211  RUSSIAN READING AND COMPOSITIONS: SHORT FICTION  3
Reading and discussion of 20th century Russian short stories and novellas.
Several short compositions. Grammar review where appropriate.
PREREQ: RUSS 107.

RUSS 305  RUSSIAN CONVERSATION AND COMPOSITION  3
Discussion of current cultural, social and political topics in Russia and the
former republics. Vocabulary building, grammar exercises and frequent
compositions.
PREREQ: Any 200-level course conducted in Russian.

RUSS 310  INTRODUCTION TO RUSSIAN LITERATURE I  3
Masterpieces of poetry, narrative prose and drama from the 19th century
PREREQ: RUSS 211 or RUSS 305.

RUSS 312  INTRODUCTION TO RUSSIAN LITERATURE II  3
Masterpieces of poetry, narrative prose and drama from the 20th century
PREREQ: RUSS 211 or RUSS 305.

RUSS 325  RUSSIAN CIVILIZATION AND CULTURE  3
Survey of the major cultural, social and political developments in Russia from
its inception to the present.
PREREQ: RUSS 211 or RUSS 305.

RUSS 366  INDEPENDENT STUDY  1-3

RUSS 401  ADVANCED RUSSIAN GRAMMAR AND COMPOSITION  3
Selected topics in advanced Russian grammar, with special attention to
participial constructions, verbs of motion, aspect and problems of syntax and
word order. Exercises in writing correct and idiomatic Russian.
PREREQ: One 300-level Russian course.

RUSS 440  SPECIAL TOPICS: RUSSIAN DRAMA, PROSE OR POETRY  3
Explores one of the three major genres by examining a specific theme. Subject
matter varies and will be announced in registration booklet.
PREREQ: Any two 300-level Russian courses.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 455  SELECTED AUTHORS, WORKS AND THEMES  3
Works of one or more outstanding authors or on a special theme.
PREREQ: Two 300-level Russian literature courses.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 465  SEMINAR  3
Various authors and themes. 
PREREQ: One 400-level Russian literature course.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 466  INDEPENDENT STUDY  1-3

RUSS 665  SEMINAR  3
Various authors and themes.
RESTRICTIONS: May be repeated for credit when topics vary.

SCIENCE

SCEN 101  PHYSICAL SCIENCE  3-4
The structure, processes and concepts of the physical world.
RESTRICTIONS: Requires high school algebra. For non-science students with no
physics or chemistry background. Not for physics or chemistry major credit. Only
one course from among SCEN 101, PHYS 104, PHYS 201 or PHYS 207 can count
toward graduation.

SCEN 102  PHYSICAL SCIENCE  3-4
The structure, processes and concepts of the physical world.
RESTRICTIONS: Requires high school algebra. For non-science students with no
physics or chemistry background. Not for physics or chemistry major credit. Only
one course from among SCEN 102, PHYS 202 or PHYS 208 can count toward
graduation.
SCEN 103  CONCEPTS OF SCIENCE AND TECHNOLOGY  3
Introduction to some of the fundamental science concepts underpinning high
technology, emphasizing everyday devices and practical experience, for the
development of scientific and computer literacy of non-science majors.
Restrictions: Requires high school algebra.

SCEN 340  ADVANCED SCIENCE FOR TEACHERS  4
Provides advanced background study for students in the Elementary Teacher
Education Millford Program. Topics are drawn from physical, earth and
biological sciences and build on science courses previously taken in the
program. The areas of science outlined in the State Science Performance
Indicators are covered. Along with lecture/discussion, students have hands-on
laboratories (including the Smithsonian kits used by the District).
Restrictions: Offered to students in the Millford ETE program.

SCEN 344  SCIENCE AND RELIGION  3
See PHIL344 for course description.

SCEN 491  TEACHING SCIENCE IN SECONDARY SCHOOLS  4
Techniques, approaches, and preparation for teaching science in high school and
middle school. Laboratory meets one full morning per week in local high
schools and middle schools for observation and initial teaching.
Coreq: EDUC420 for chemistry education and biology education majors.

SCEN 492  STUDENT TEACHING SEMINAR: SECONDARY SCIENCE  3 PF
Methods, techniques and problems in student teaching in secondary schools and
their solutions. Assesstivity, authority, management, strategies and
teaching for understanding.
Coreq: EDUC400.

SOCI 201  INTRODUCTION TO SOCIOLOGY  3
An overview of the sociological perspective of the study of society, social
organization and social institutions with special emphasis on the social
causes and consequences of human behavior.

SOCI 203  INDIVIDUAL AND SOCIETY  3
Analysis of the social formation of the individual. Particular emphasis on
socialization and personality development. The contribution of individual
patterns of behavior to the functioning of social systems.

SOCI 204  URBAN COMMUNITIES  3
Urbanization, rural-urban social differences and the organization of urban
communities by race, class, ethnicity and stage in the life cycle.
May be cross-listed with BAMS204.

SOCI 206  WOMEN AND WORK  3
See WOMS206 for course description.

SOCI 209  SOCIAL PROBLEMS  3
Topics may include poverty, intergroup conflicts, war, mental illness, aging,
adolescence and environmental pollution.

SOCI 211  MEN, CONFLICT AND SOCIAL CHANGE  3
See WOMS211 for course description.

SOCI 213  MEN AND WOMEN IN AMERICAN SOCIETY  3
Designed to provide students with a sociological framework for analyzing sex
and gender relations in contemporary American society. Topics include the
social construction of gender, patterns of sex-role socialization, gender
stereotyping in the paid work force, gender relations in the family and
other social institutions.
May be cross-listed with WOMS213.

SOCI 215  RACE IN SOCIETY  3
Social definitions of race, how race is incorporated into social institutions
and how race structures relationships among diverse groups in society. Includes
analysis of rights and privileges denied or extended to groups and how
disadvantaged groups work towards racial equality.
May be cross-listed with BAMS215.

SOCI 266  SPECIAL PROBLEM  1-3

SOCI 270  FAMILIES AND DEVELOPMENTAL DISABILITIES  3
See IFST270 for course description.

SOCI 301  INTRODUCTION TO SOCIOLOGICAL RESEARCH  4
Survey of research methods and data analysis employed in sociology.
Coreq: SOC201 and completion of the College of Arts and Science math
requirement.
Restrictions: Strongly recommended - junior status and 12 social science
credits.

SOCI 302  SOCIAL DEVIANCE  3
Defining deviance, research on deviance and explaining deviance.
May be cross-listed with CRJU302.

SOCI 303  JUVENILE DELINQUENCY  3
Historical definition of delinquency, abuse and neglect, research in delinquency,
auses and treatment of delinquents.
May be cross-listed with CRJU303.
Coreq: SOC201 or SOC209.

SOCI 304  CRIMINOLOGY  3
The nature, kinds and causes of crime. Criminal liability, criminal careers
and organized racketeering.
May be cross-listed with CRJU304.
Coreq: SOC201 or SOC209.

SOCI 305  SOCIAL CLASS AND INEQUALITY  3
Internal differentiation as a basis for inequality and differential life
chances of human societies.

SOCI 306  PERSONALITY AND SOCIETY  3
Interaction of personality and society, including such segments as complex
organizations and small groups. Particular emphasis on the social formation
of personality, and its role in the production of various modes of social
behavior and the dynamics of social change.
Coreq: SOC201, SOC203 or PSYC100.

SOCI 308  THE FAMILY  3
The comparative study of the family in various societies provides a background
for the analysis of family organization in modern America.
Coreq: SOC201 or SOC203 or SOC209.

SOCI 311  SOCIOLOGY OF HEALTH  3
Professionalization of health occupations, hospitals as social systems,
medical education and practice organizations, healthcare organizations and
their interrelationships (politics of health), and health service patterns.
May be cross-listed with CSCC311.

SOCI 312  THEORIES OF SOCIETY  3
Covers writings of Karl Marx, Emile Durkheim, Max Weber and related current
approaches. Focuses on theoretical perspectives concerned with social
development, social conflict, solidarity, social class and gender.
Coreq: SOC201.

SOCI 320  PERSONALITY AND POLITICS  3
The role of personality in political behavior. Considerations include the
social and psychological motivations for political activity and the
differential relationship of personality to variations in political systems,
rules, ideologies and dynamics, such as political consensus and cleavage.
Attention given to particular methods of research in this specific area of
social behavior.
Coreq: SOC201 or SOC203 or PSYC100 or POSC150.

SOCI 322  CROWDS, CULTS AND REVOLUTIONS  3
Analysis of forms of behavior in relatively unstructured situations such as
crowds, panics, riots and demonstrations; and processes of interaction:
susceptibility, contagion, polarization and communication.
May be cross-listed with CRJU322.
Coreq: SOC201.

SOCI 323  SOCIOLOGY OF RISK  3
Focuses on how individuals, organizations, and government agencies assess
various types of risk and act with respect to those assessments. Topics
include: risk perception, risk assessment, risk management under conditions of
scientific uncertainty, and public debates about safety.
Coreq: SOC201.

SOCI 325  DISASTERS AND SOCIETY  3
Sociological introduction to the field of disaster studies, including the ways in
which societies attempt to prepare for, respond to, and recover from their impacts.
Coreq: SOC201.

SOCI 326  EMERGENCY AND ENVIRONMENTAL MANAGEMENT  4 PF
Internship experience in an organization or agency responsible for emergency
or environmental management. With approval of the area coordinator, the
student is assigned to an organization to become familiar with issues,
policies and practices pertaining to disasters. Student is under direct supervision of
agency personnel while in the placement position. In addition to the hours spent in
the organization, students are expected to meet weekly in a seminar with the area
coordinator and other students to discuss issues and experiences.
Coreq: SOC201 or SOC203 or SOC470.
Restrictions: Approval of the area coordinator.
SOCI 327  SOCIOLOGY OF ORGANIZATIONS  3
Business enterprises, the military, governmental bureaus and other large-scale
anizations. Bureaucratic structure, internal systems of status and authority,
division of labor, social control, and the individual in the organization.
PREREQ: SOCI201.

SOCI 328  WORK IN A GLOBAL ECONOMY  3
The role of work in contemporary society. Social, institutional and cultural
influences on work. Special emphasis on problem areas such as job satisfaction,
professionalism, career patterns, leisure and occupational choice.

SOCI 329  INTERNATIONAL MIGRATION  3
See POSC329 for course description

SOCI 330  POPULATION, LAW AND SOCIETY  3
Interrelationships among population, law and social structure with an emphasis
on analyzing strategies of adaptation to change. Introduction to demographic
techniques; contemporary issues such as family planning, population policies,
migration, marriage and divorce

SOCI 331  WORLD POPULATION: PROFILES AND TRENDS  3
Study of the size, composition and distribution of world populations. An
examination of the structure and dynamics of selected countries and the
specific problems-causes, consequences and possible solutions. Population
problems are examined in relationship to social organization, environment and
technology.

SOCI 336  THE DETECTIVE IN FILM AND FICTION  3
See CRJU336 for course description

SOCI 341  WELFARE AND SOCIETY  3
Institutional apparatus created to deal with the welfare problems of an
industrial society, development of welfare institutions, their structure and
functioning
PREREQ: Eighteen credit hours in sociology, psychology, political science or

economics.

SOCI 343  SOCIETY, POLITICS AND HEALTHCARE  3
See POSC343 for course description

SOCI 345  SOCIOLOGY OF LAW  3
Analysis of law as a social process in both historical and comparative
perspective. Focuses on various theories of law and society and relevant
empirical research.
May be cross-listed with CRJU345.

SOCI 346  GENDER AND AGING  3
Empirical and theoretical investigation of the aging process
PREREQ: SOCI201 or SOCI202 or PSYC100

SOCI 348  THEORIES OF SOCIAL WORK PRACTICE  3
Methods of social work practice; casework, group work, community organization;
sociological and psychological foundations underlying social services
PREREQ: SOCI201.

SOCI 350  SOCIAL INEQUALITY AND FILM  3
Using a sociological framework for understanding equality, major films are
used to explore the depictions and representations of race, gender,
sexuality and social class issues. Examines the ideologies presented in films,
the contexts that create them and how they contrast with social realities.
PREREQ: SOCI201.

SOCI 356  RACE, CLASS AND CRIME  3
See CRJU355 for course description

SOCI 360  SOCIOLOGY OF RELIGION  3
Sociological analysis of major religions and the societies with which they have
been associated; social settings of particular systems of belief; the relation
of status; religious affiliation and personal behavior in modern societies.
May be cross-listed with JWST360

SOCI 361  RACIAL INEQUALITY  3
A detailed examination of racial inequality, including the social construction
of race, the nature of oppression and advantage, government policies and
resistance strategies. There will be attention to the status of men and women
and social class diversity within racial-ethnic communities
May be cross-listed with BAMS361.
PREREQ: SOCI201

SOCI 366  INDEPENDENT STUDY  1-3

SOCI 368  INDEPENDENT RESEARCH  1-6
Independent research under the supervision of a faculty member. Requirements
include preparation of a research report consistent with the professional
literature in the field. Student and faculty member will file a learning
contract describing the research and a report with the department chair
RESTRICTIONS: Requires permission of instructor.

SOCI 399  PRACTICUM: TEACHING SOCIOLOGY  3 PF
Practical experience in undergraduate education is gained by serving as a
discussion leader in a course taught by a regular member of the faculty.
RESTRICTIONS: Requires permission of instructor Not for major credit.

SOCI 401  ADVANCED SOCIOLOGICAL METHODS  3
Conceptualization, design, data collection and data analysis in sociological
research.

SOCI 402  URBAN STUDIES PRACTICUM AND SEMINAR  4 PF
Field experience and related seminar. Placement in urban planning and service
agencies where students work for approximately 160 hours under professionally
trained supervisors. Students meet in a weekly seminar with coordinator.
PREREQ: SOCI204.

SOCI 407  SOCIOLOGY OF SEX AND GENDER  3
Seminar on sex and gender relations from a sociological perspective. Surveys
current research on gender stratification in the paid work force, the
feminization of poverty, gender relations in the family, sexual violence, and
feminism as a social movement. Special attention given to current theoretical
debates on the origins and persistence of sexual inequality and the
intersection of gender with race and class in patterns of social stratification.
May be cross-listed with WOMS407.
PREREQ: SOCI201, and either SOCI213 or WOMS201.
RESTRICTIONS: Restricted to junior and senior sociology and women's studies
majors.

SOCI 410  HEALTH SERVICES PRACTICUM AND SEMINAR  4 PF
Field experience and related seminar. Placement in health service settings
where student works for about 160 hours under supervision of health service
administrators. Students meet in a weekly seminar with coordinator.
RESTRICTIONS: Requires permission of instructor

SOCI 411  TECHNIQUES OF DEMOGRAPHIC ANALYSIS  3
Study of demographic equation (fertility, mortality and migration), population
processes (composition and distribution) and the use of computers to analyze
demographic data
PREREQ: SOCI301.

SOCI 412  RESEARCH PRACTICUM  4 PF
Field experience and related seminar. Placement in research, planning and service
agencies where students work for approximately 160 hours under professionally
trained supervisors. Students meet in a weekly seminar with coordinator.
PREREQ: SOCI301.
RESTRICTIONS: Requires permission of instructor

SOCI 415  RACE, CLASS AND GENDER  3
Analysis of current American social issues that show interrelationship of race,
class and gender. Readings from sociology, Afro-American studies, feminist
studies, history and literature.
May be cross-listed with BAMS415 and/or WOMS415.

SOCI 416  SOCIAL THOUGHT AND CONTEMPORARY SOCIETY  3
Seminar focuses on ways in which social thought defines and analyzes
contemporary society. Explores how alternative theories and methods serve to
create knowledge about contemporary concerns with everyday life, democracy,
equality, social structure and power
PREREQ: SOC1312

SOCI 418  RACE, GENDER AND POVERTY  3
An examination of contemporary American poverty with attention to race and
gender as fundamental dimensions of inequality. Social policy, employment and
family composition are key topics.
May be cross-listed with BAMS418 and/or WOMS418.
PREREQ: SOCI201.

SOCI 422  FADS AND FASHIONS  3
Examination of the dynamics of short-term enthusiasms. Emphasis will be on
fads and fashions in education, science, medicine, and other institutions,
rather than on fashions in clothing

SOCI 428  CORPORATE CRIME  3
Nature and causes of the deviant behaviors and crimes of large organizations.
How organizations act, are accused of deviance and defend themselves in cases
such as price-fixing, sale of unsafe drugs and illegal spying.
May be cross-listed with CRJU428
SOCI 430 COMPARATIVE SOCIOLOGY 3
Exposes sociological similarities and differences between the United States and a selected country on a number of critical sociological topics. Topics include ethnic and religious diversity, culture, demographic structure, social institutions, social stratification, and urbanization. May be cross-listed with JWST430. Restrictions: Requires permission of instructor. Only three credits may apply toward departmental requirement of six 400-level credits. Offered only in the study abroad program and subject to acceptance by the Office of International Programs.

SOCI 435 SOCIOLOGY OF AMERICAN JEWRY 3
Examines the demographic, socioeconomic, cultural and institutional dimensions of the US Jewish population in the context of models of social integration and in comparison to other immigrant groups in the population. These dimensions are used to discuss current issues facing this population subgroup. May be cross-listed with CRJU435. Prereq: SOCI201.

SOCI 441 SOCIAL WELFARE PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in social service agencies where students work for approximately 160 hours under professionally trained supervisors; students meet in a weekly seminar with coordinator. Prereq: SOCI341. Restrictions: Requires permission of instructor.

SOCI 442 LAW AND SOCIETY PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in court, law firm, or other law-related location where students work for approximately 160 hours under professionally trained supervisors; weekly seminar with program coordinator. Prereq: SOCI345. Restrictions: Requires permission of instructor.

SOCI 448 COMMUNITY-BASED TREATMENT 3
Explores issues related to the appropriateness and design of community-based programs for the mentally disabled, substance abusers, the homeless, dependent children, etc. Emphasis on analyzing client needs and community resources, and on understanding the perspectives of clients, staff and neighbors about these programs. May be cross-listed with CRJU448.

SOCI 450 POLITICAL SOCIOLOGY 3
Analysis of political organization and action, including evaluation of major approaches. Case studies of political structures and behavior. Prereq: SOCI201.

SOCI 456 LAWYERS AND SOCIETY 3
Seminar focusing upon the social organization and dynamics of the legal profession. Topics include professional association, law school socialization, professional ethics, and law practice. May be cross-listed with CRJU456. Prereq: SOCI201 and three additional sociology courses.

SOCI 460 WOMEN IN INTERNATIONAL DEVELOPMENT 3
Understanding of international development process in third world countries by examination of the roles of men and women. Analyzes processes of development with emphasis on women's participation and/or exclusion. Examines development at the project proposal or program implementation level. Hands-on experience in practical project development and proposal presentation skills. May be cross-listed with GEOG460, PSY 460, and/or WMS460.

SOCI 464 INTERNSHIP 1-4 PF
Provides students an opportunity to apply sociological theory and research while working in an agency or other organizational setting under supervision of department faculty. Must complete an internship agreement and secure approval from faculty member to sponsor internship.

SOCI 466 INDEPENDENT STUDY 1-3

SOCI 470 ENVIRONMENTAL SOCIOLOGY 3
A substantive and theoretical introduction to the major issues in environmental sociology: the emergence and development of the environmental movement; the development of environmental issues; and how environmental issues are related to structural, contextual and perceptual factors. Prereq: SOCI201 and SOCI312. Restrictions: Requires upper division status.

SOCI 495 FIELD EXPERIENCE IN CRIMINAL JUSTICE 4 PF
See CRJU495 for course description.

SOCI 496 PRACTICUM IN TEACHING 1-3 PF
Practical exposure to undergraduate education gained by assisting a member of the faculty in carefully supervised experiences such as discussion leader, crafting questions, consulting with students. Students may not be involved in the grading of student work or the assignment of grades. May be repeated for up to three credit hours. Restrictions: Requires permission of instructor. Not for major credit.

SOCI 605 DATA COLLECTION AND ANALYSIS 3
A survey of methods and techniques for defining research problems and for gathering and analyzing data in sociological research. Restrictions: Requires permission of instructor.

SOCI 606 QUALITATIVE METHODOLOGY 3
Focuses on research design, the logic of inquiry and an elaboration of selected issues introduced in SOCI605. Special emphasis on epistemological issues, methodological concerns central to the social sciences and non-positivist research strategies and techniques.

SOCI 607 SOCIOLOGY OF GENDER 3
Reviews current research and theory in the sociology of gender with particular attention to issues arising from the gender division of labor, feminism and social change, gender and the structure of social institutions, and the interaction of gender, race, class and sexuality. Introduces sociological theory and methodology as used and revised by scholars working on gender issues.

SOCI 608 GENDER, WORK AND FAMILIES 3
Brings together studies of the workplace and of the family with special focus on areas of overlap. Analysis of gender roles and the work/family overlap as well as focused discussion on issues of family policy. Restrictions: Requires permission of instructor.

SOCI 611 TECHNIQUES OF DEMOGRAPHIC ANALYSIS 3
Study of demographic equation (fertility, mortality and migration), population processes (composition and distribution) and the use of computers to analyze demographic data.

SOCI 612 DEVELOPMENT OF SOCIOLOGICAL THEORY 3
Historical survey of the development of sociology and sociological theory beginning with the period of the Social Contract theorists through the classic European theorists of the 19th century.

SOCI 614 ADVANCED DATA ANALYSIS 3
Methods of analyzing data in sociological research focusing on multivariate approaches. Prereq: SOCI605.

SOCI 621 THEORIES AND APPROACHES IN SOCIAL Deviance 3
General and specific theoretical orientations in the analysis of social deviance.

SOCI 622 COLLECTIVE BEHAVIOR 3
Process and mechanisms operating in panics, riots, demonstrations and other disruptions of social order.

SOCI 628 CORPORATE AND GOVERNMENTAL Deviance 3
Analyses and cases of internal organizational behavior when external efforts are made to have these behaviors treated as deviant. Also defenses used by the accused organizations, and preconditions for, and consequences of, successfully labeling and sanctioning an organization as deviant.

SOCI 637 LAW AND SOCIETY IN HISTORICAL PERSPECTIVE 3
Examination of the social history of law, crime and legal institutions in the United States from colonial times to present. Focus is on the role that law has historically played in allocating resources, structuring social relationships, and distributing political power. May be cross-listed with HIST637.

SOCI 653 LAW AND SOCIETY 3
Historical and structural development of legal systems. Emphasis on comparing legal systems in various cultures from Roman and Oriental law to Anglo-American legal systems.

SOCI 658 SOCIAL SCIENCE, LAW AND THE LEGAL PROCESS 3
Examines the relationship between social science and law. Reviews the use of social science research to understand the operation and impact of law and the legal system. Critically examines the growing use of social science testimony by the courts.

SOCI 661 RACIAL STRATIFICATION 3
Reviews the concept of race as a social historical category and examines the relationship of racial stratification to other systems of inequality. Also evaluates sociological theories of racial discrimination and institutionalized racism.
### Spanish

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 101</td>
<td>Elementary Spanish I</td>
<td>3</td>
<td>Introduction to the Spanish language and a development of speaking, listening, reading, and writing skills through the use of basic texts.</td>
</tr>
<tr>
<td>SPAN 102</td>
<td>Elementary Spanish II</td>
<td>3</td>
<td>Completion of basic Spanish. PREREQ: SPAN 101 or SPAN 105.</td>
</tr>
<tr>
<td>SPAN 105</td>
<td>Spanish I - Elementary</td>
<td>4</td>
<td>Introduction to the Spanish language and a development of speaking, listening, and writing skills through the use of basic texts.</td>
</tr>
<tr>
<td>SPAN 106</td>
<td>Spanish II - Elementary/Intermediate</td>
<td>4</td>
<td>Completion of basic Spanish. Increasing mastery of the basic skills of speaking, listening, reading, and writing. PREREQ: SPAN 105. RESTRICTIONS: Two to three years of high school Spanish acceptable in lieu of prerequisite.</td>
</tr>
<tr>
<td>SPAN 107</td>
<td>Spanish III - Intermediate</td>
<td>4</td>
<td>Review of grammar, continued practice in speaking and writing, and reading texts of average difficulty. PREREQ: SPAN 106. RESTRICTIONS: Four years of high school Spanish acceptable in lieu of prerequisite. Satisfies College of Arts and Sciences language requirement.</td>
</tr>
<tr>
<td>SPAN 111</td>
<td>Intermediate Spanish I</td>
<td>3</td>
<td>Review of grammar. Increasing mastery of the basic skills of speaking, listening, reading, and writing. PREREQ: SPAN 102 or SPAN 106. RESTRICTIONS: Three years of high school Spanish acceptable in lieu of prerequisite.</td>
</tr>
<tr>
<td>SPAN 112</td>
<td>Intermediate Spanish II</td>
<td>3</td>
<td>Continued practice in speaking and writing, reading texts of average difficulty, grammar review as needed. PREREQ: SPAN 111. RESTRICTIONS: Four years of high school Spanish acceptable in lieu of prerequisite. Satisfies College of Arts and Sciences language requirement.</td>
</tr>
<tr>
<td>SPAN 200</td>
<td>Spanish Composition and Grammar</td>
<td>3</td>
<td>First part of a thorough grammar review and intensive practice, targeting structure, essential vocabulary, speaking, listening, and extensive writing. PREREQ: SPAN 107 or SPAN 112.</td>
</tr>
<tr>
<td>SPAN 201</td>
<td>Spanish Reading and Composition</td>
<td>3</td>
<td>Major emphasis on reading development, composition and literary analysis. PREREQ: SPAN 200.</td>
</tr>
<tr>
<td>SPAN 205</td>
<td>Spanish Conversation</td>
<td>3</td>
<td>Practical use of Spanish by means of oral reports and discussions. Emphasis on improvement of basic conversational skills. Grammar review where appropriate, and/or same written work. PREREQ: SPAN 107 or SPAN 112. RESTRICTIONS: Prerequisites require a minimum grade of B. Not intended for native speakers.</td>
</tr>
<tr>
<td>SPAN 206</td>
<td>Culture through Conversation</td>
<td>3</td>
<td>Discussion of topics drawn from contemporary Spanish or Latin American life. For students who wish to broaden their knowledge of Hispanic culture while improving their oral and aural language skills. PREREQ: SPAN 107 or SPAN 112. RESTRICTIONS: Taught abroad only.</td>
</tr>
<tr>
<td>SPAN 207</td>
<td>Contemporary Latin America I</td>
<td>3</td>
<td>Introduction to contemporary Latin American culture, its people, their way of life, and the issues confronting them. RESTRICTIONS: Taught abroad, in both English and Spanish. Not for major credit. Does not satisfy College of Arts and Sciences language requirement. May be repeated for credit when taken on different study abroad programs.</td>
</tr>
<tr>
<td>SPAN 208</td>
<td>Contemporary Spain I</td>
<td>3</td>
<td>Introduction to contemporary Spain, its culture, its people, their way of life, and the issues confronting them. RESTRICTIONS: Taught abroad, in both English and Spanish. Not for major credit. Does not satisfy College of Arts and Sciences language requirement.</td>
</tr>
<tr>
<td>SPAN 254</td>
<td>Latin America in the News</td>
<td>3</td>
<td>Explores topics in contemporary Latin American society, culture and politics as expressed in the news media. Emphasis on current events and issues of Latin America. Focus of study is the Latin American press: newspapers and magazines printed in the Latin American language. PREREQ: SPAN 110 or SPAN 112 SPAN 200 highly recommended.</td>
</tr>
<tr>
<td>SPAN 255</td>
<td>Spain in the News</td>
<td>3</td>
<td>Explores topics in contemporary Spanish society, culture and politics as expressed in the news media. Emphasis on current events and issues of Spain. Focus of study is the Spanish press: newspapers and magazines printed in the Spanish language. PREREQ: SPAN 110 or SPAN 112. SPAN 200 highly recommended.</td>
</tr>
<tr>
<td>SPAN 256</td>
<td>Advanced Spanish Composition and Grammar I</td>
<td>3</td>
<td>Second part of a thorough review and intensive practice, targeting structure, essential vocabulary, speaking, listening, and extensive writing. PREREQ: SPAN 200.</td>
</tr>
<tr>
<td>SPAN 301</td>
<td>Survey of Spanish Literature</td>
<td>3</td>
<td>Development of Spanish literature from its origins through the 17th century. Study of representative works, discussions and collateral readings. PREREQ: SPAN 201.</td>
</tr>
<tr>
<td>SPAN 302</td>
<td>Survey of Spanish Literature</td>
<td>3</td>
<td>Spanish literature from the 18th century to the present. Selection of representative works, discussions and collateral readings. PREREQ: SPAN 201.</td>
</tr>
<tr>
<td>SPAN 303</td>
<td>Survey of Spanish-American Literature</td>
<td>3</td>
<td>Representative works in all genres of Latin American literature from pre-Columbian to Modernism. PREREQ: SPAN 201.</td>
</tr>
<tr>
<td>SPAN 304</td>
<td>Survey of Spanish-American Literature</td>
<td>3</td>
<td>Representative works in all genres of Latin American literature in the 20th century. PREREQ: SPAN 201.</td>
</tr>
<tr>
<td>SPAN 305</td>
<td>Oral Communication</td>
<td>3</td>
<td>For individuals with a comprehensive knowledge of Spanish grammar and vocabulary. Emphasis on refinement of expression of abstract ideas as well as mastery of practical communication. PREREQ: SPAN 200. RESTRICTIONS: Not intended for native speakers.</td>
</tr>
<tr>
<td>SPAN 306</td>
<td>Practical Oral/Written Expression</td>
<td>3</td>
<td>Strengths skills in grammar and vocabulary in preparation for advanced courses. Includes oral exposes, discussion of articles and videos, textual analysis and compositions. PREREQ: SPAN 200. RESTRICTIONS: Taught abroad only.</td>
</tr>
<tr>
<td>SPAN 308</td>
<td>Contemporary Spain II</td>
<td>3</td>
<td>Discussion and study of issues related to contemporary cultural, political and social developments in Spain, including its place in today's European community. PREREQ: Any two 200-level Spanish courses taught in the Spanish language. RESTRICTIONS: Taught abroad and in Spanish.</td>
</tr>
</tbody>
</table>
SPAN 314 SPANISH PHONETICS AND PHONOLOGY 3
PREREQ: SPAN200
RESTRICTIONS: Recommended for prospective teachers.

SPAN 325 SPANISH CIVILIZATION AND CULTURE 3
Survey of geography, history, art and society of Spain.
PREREQ: SPAN200.

SPAN 326 LATIN AMERICAN CIVILIZATION AND CULTURE 3
Survey of geography, history, art and society of Latin American lands
PREREQ: SPAN200.

SPAN 352 INTRODUCTION TO BUSINESS SPANISH 3
Introduction of essential business/commercial terminology in common business context, reinforcing strategies for understanding, interpreting, and responding to new information, and providing opportunities for interactive practice.
Familiarizes student with basic policies and practices of the Hispanic business community. Includes writing, conversation, grammar and culture
PREREQ: SPAN200 and SPAN201.

SPAN 355 SPECIAL TOPICS 3
Explores an area of special interest in Spanish literature or culture studies. Subject matter varies and will be announced in the registration booklet
PREREQ: SPAN201
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 366 INDEPENDENT STUDY 1-3

SPAN 370 STUDIES IN SPANISH LITERATURE TAUGHT IN SPAIN 3
Presents an historical overview of an area of special interest in Spanish literature or culture studies with emphasis on its cultural and/or cross-cultural context. Topics may include a general survey of Spanish literature from its medieval roots in Latin, Arabic, and Hebrew texts to the multiple influences impacting Spanish literature of the 20th century.
PREREQ: SPAN201
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 401 ADVANCED SPANISH GRAMMAR II 3
Study and practice of selected problems of written and oral Spanish syntax and vocabulary as well as textual analysis.
PREREQ: SPAN300.

SPAN 403 HISTORY OF THE SPANISH LANGUAGE 3
History of the language from Latin to the present. Historical phonology and morphology.
PREREQ: Any 300-level Spanish course.

SPAN 406 ADVANCED SPANISH LANGUAGE 3
Advanced aural-rhetorical structure and stylistics with special attention given to technical vocabulary and discourse (e.g., business, law, science, agriculture)
PREREQ: Any 300-level Spanish course.
RESTRICTIONS: Taught abroad only.

SPAN 415 LATIN AMERICAN LITERATURE AND ITS POLITICAL CONTEXT 3
Analysis of selected works by contemporary Latin American authors, focusing on the techniques used by these writers to reveal the political upheaval that has affected Latin America in recent years.
PREREQ: One SPAN300-level survey of literature.

SPAN 416 CERVANTES: DON QUIXOTE 3
The reading of Don Quixote in Spanish; major themes of the book. The life and times of Cervantes. Antecedents to Don Quixote in Spanish literature. The purpose of Don Quixote. Introduction to the language of Cervantes
PREREQ: One SPAN300-level survey of literature.

SPAN 417 HISPANIC NOBEL PRIZE AUTHORS 3
Covers the works of Spanish and Latin American Nobel Prize authors - Cervantes, Benavente, Mistral, Jimenez, Austurias, Alejandro, Neruda, Garcia Marquez, Paz and Celaa - in relation to their cultural milieu on the regional, national and international levels and in relation to their authors' biographies.
PREREQ: One SPAN300-level survey of literature.

SPAN 418 GOD, MAN AND WOMAN 3
Analysis of the presentation of God, man and woman in a selection of narrative poems, dramas and novels from the 15th to the 17th centuries. Authors studied include Santillana, Diego de la Torre, L6pez de Leon, Zayas and others.
PREREQ: One SPAN300-level survey of literature.

SPAN 420 TOPICS: MEDIEVAL LITERATURE 3
Works of one or more authors or of a special theme or genre within Spanish medieval literature. Example: Love and Passion in the Middle Ages on the Iberian Peninsula
PREREQ: One SPAN300-level survey of literature.

SPAN 421 SPANISH MEDIEVAL LITERATURE 3
Survey of the major authors and genres of Spanish medieval literature from the early lyric poetry through narrative poetry, short story, drama, novel to the 15th century.
PREREQ: One SPAN300-level survey of literature course.

SPAN 430 LATIN AMERICAN NOVEL AND CINEMA 3
Study of a selection of novels of the 20th century which brought international recognition to Latin American writers. These novelists depict the social, economic, political and cultural traits of their respective countries. Film versions of some of the novels illustrate artistic interpretations of the subject matter.
PREREQ: One SPAN300-level survey of literature.

SPAN 436 TOPICS: LITERATURE OF THE SPANISH GOLDEN AGE 3
Works of one or more authors or of a special theme or genre within Spanish literature of the Golden Age (16th and 17th centuries)
PREREQ: One SPAN300-level survey of literature course.

SPAN 439 POSTWAR SPANISH NARRATIVE 3
The Spanish novel from 1962 to the present. Focuses on novels by leading authors such as Luis Martin-Santos, Juan Goytisolo, Jesus Benet, Carmen Martin Gaite, Ana Maria Alba and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism.
PREREQ: One SPAN300-level survey of literature.

SPAN 440 TOPICS: EIGHTEENTH AND NINETEENTH CENTURY HISPANIC LITERATURE 3
Works of one or more authors or of a special theme or genre within Hispanic literature of the 18th and 19th centuries.
PREREQ: One SPAN300-level survey of literature course.

SPAN 447 CONTEMPORARY HISPANIC FICTION BY WOMEN 3
Explores current fiction by women in Spain and Spanish America. Analyzes selected works as individual literary creations, and also situates them in their cultural, historical and aesthetic contexts, using appropriate critical methodologies.
PREREQ: One 300-level survey of Spanish literature course.

SPAN 450 TOPICS: MODERN HISPANIC LITERATURE 1898-1936 3
Works of one or more authors or of a special theme, genre, or topic within Hispanic literature from 1898 to 1936.
PREREQ: One SPAN300-level survey of literature course.

SPAN 451 CONTEMPORARY SPANISH POETRY 3
Analysis of Spanish poetry from Beccar to the present day
PREREQ: One SPAN300-level survey of literature.

SPAN 452 ADVANCED BUSINESS SPANISH 3
Refines basic knowledge of Spanish business/commercial terminology by helping student realize the importance of cultural awareness in doing business in Hispanic countries or with Hispanics in the United States.
PREREQ: SPAN200 and SPAN201
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 454 INTRODUCTION TO SPANISH CINEMA 3
Study of modern Spanish cultural history through the films of such masters as Barden, Sauro, Bunuel, Almodovar, Berlanga, Miro, Amenabar, Medem, Paris, Dejerano, etc. Relation of these films to Spanish culture, politics, history, and to European film theory and analysis.
PREREQ: Any 300-level survey of Spanish literature. SPAN325 is strongly recommended.

SPAN 455 SELECTED AUTHORS, WORKS AND THEMES 3
Works of one or more outstanding authors or on a special theme
PREREQ: One 300-level Spanish literature course.
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 460 TOPICS: CONTEMPORARY HISPANIC LITERATURE 1936-PRESENT 3
Works of one or more authors or of a special theme, genre, or topic within Hispanic literature from 1936 to the present.
PREREQ: One SPAN300-level survey of literature course.

SPAN 462 TOPICS: HISPANIC SHORT FICTION 3
Explores short stories and novellas by major writers of the Hispanic world
Each narrative is analyzed as an individual work of literature and is situated in its literary, historical and cultural contexts.
PREREQ: One SPAN300-level survey of literature course.

SPAN 464 CONTEMPORARY SPANISH AMERICAN LITERATURE BY WOMEN 3
Explores twentieth-century fiction by women authors from diverse regions of Spanish America. Analyzes selected works as individual literary creations and situates each author in her specific socio-cultural, historical and literary contexts.
PREREQ: One SPAN300-level survey of literature course.

507
SPAN 466 INDEPENDENT STUDY 1-3

SPAN 475 TOPICS: HISPANIC CULTURE AND CIVILIZATION 3
Study of topics in Hispanic culture and civilization, ranging through the geography, history, art and society of Spain and Latin American countries. PRE/REQ: Either SPAN325 or SPAN326.

SPAN 484 CONTEMPORARY SPANISH THEATRE 3
Twentieth-century Spanish theatre as a reflection of and commentary on society. Principal authors: Garcia Lorca, Buero Vallejo and Sastre. PRE/REQ: One SPAN400-level survey of literature.

SPAN 601 ADVANCED SPANISH GRAMMAR 3
Study and practice of selected problems of written and oral Spanish syntax and vocabulary as well as textual analysis.

SPAN 603 HISTORY OF THE SPANISH LANGUAGE 3
History of the language from Latin to the present. Historical phonology and morphology.

SPAN 615 LATIN AMERICAN LITERATURE AND ITS POLITICAL CONTEXT 3
In-depth analysis of selected works by contemporary Latin American authors, focusing on techniques used by these writers to reveal the political upheaval that has affected Latin America in recent years.

SPAN 616 CERVANTES: DON QUIXOTE 3
The reading of Don Quijote in Spanish; major themes of the book. The life and times of Cervantes. Antecedents to Don Quijote in Spanish literature. The purpose of Don Quijote. Introduction to the language of Cervantes.

SPAN 617 HISPANIC NOBEL PRIZE AUTHORS 3
Studies the works of Spanish and Latin American Nobel Prize authors - Echegaray, Benavente, Mihual, Jimenez, Aristurin, Alejandro, Neruda, Garcia Marquez, Paz and Cela - in relation to their cultural milieu on the regional, national and international levels and in relation to their authors' biographies.

SPAN 618 GOD, MAN AND WOMAN 3
Analysis of the presentation of God, man and woman in a selection of narrative poems, dramas and novels from the 15th to the 17th centuries. Authors studied include Santillana, Diego de San Pedro, Luis de Leon, Zayas and others.

SPAN 620 TOPICS: MEDIEVAL LITERATURE 3
Works of one or more authors or of a special theme or genre within Spanish medieval literature. Example: Love and Passion in the Middle Ages on the Iberian Peninsula.

SPAN 621 SPANISH MEDIEVAL LITERATURE 3
Survey of the major authors and genres of Spanish medieval literature from the early lyric poetry through narrative poetry, short story, drama, novel to the 15th century.

SPAN 630 LATIN AMERICAN NOVEL AND CINEMA 3
Study of a selection of novels of the 20th century which brought international recognition to Latin American writers. These novels depict the social, economic, political and cultural traits of their respective countries. Film versions of some of the novels illustrate artistic interpretations of the subject matter.

SPAN 632 TOPICS: LITERATURE OF THE SPANISH GOLDEN AGE 3
Works of one or more authors or of a special theme or genre within Spanish literature of the Golden Age (16th and 17th centuries).

SPAN 639 POSTWAR SPANISH NARRATIVE 3
Covers the Spanish novel from 1962 to the present. Focuses on novels by leading authors such as Luis Martin-Santos, Juan Goytisolo, Carmen Martín Gaite, and Esther Tusquets. Analysis of these works is grounded in international literary theory and criticism.

SPAN 640 TOPICS: EIGHTEENTH AND NINETEENTH CENTURY HISPANIC LITERATURE 3
Works of one or more authors or of a special theme or genre within Hispanic literature of the 18th and 19th centuries.

SPAN 647 CONTEMPORARY HISPANIC FICTION BY WOMEN 3
Explores current fiction by women in Spain and Spanish America. Analyzes selected works as individual literary creations, and also to situate them in their cultural, historical and aesthetic contexts, using appropriate critical methodologies.

SPAN 650 TOPICS: MODERN HISPANIC LITERATURE 1898-1936 3
Works of one or more authors or of a special theme, genre, or topic within Hispanic literature from 1898 to 1936.

SPAN 651 CONTEMPORARY SPANISH POETRY 3
Analysis of Spanish poetry from Becquer to the present day. Special emphasis on stylics.

SPAN 655 SELECTED AUTHORS, WORKS AND THEMES 3
Works of one or more outstanding authors or on a special theme. RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 660 TOPICS: CONTEMPORARY HISPANIC LITERATURE 1936-PRESENT 3
Works of one or more authors or of a special theme, genre, or topic within Hispanic literature from 1936 to the present.

SPAN 662 TOPICS: HISPANIC SHORT FICTION 3
Explores short stories and novellas by major writers of the Hispanic world. Each narrative is analyzed as an individual work of literature and is situated in its literary, historical and critical contexts.

SPAN 664 CONTEMPORARY SPANISH-AMERICAN LITERATURE BY WOMEN 3
Explores 20th century fiction by major women authors from diverse regions of Spanish America. Analyzes works as individual literary creations, and situates each author in her specific socio-cultural, historical and literary contexts. Examines the international criticism elicited by each work.

SPAN 665 TOPICS: HISPANIC CULTURE AND CIVILIZATION 3
Study of topics in Hispanic culture and civilization, ranging through the geography, history, art and society of Spain and Latin American countries. PRE/REQ: Either SPAN325 or SPAN326.

SPAN 666 CONTEMPORARY SPANISH THEATRE 3
Twentieth-century Spanish theatre as a reflection of and commentary on society. Principal authors: Garcia Lorca, Buero Vallejo and Sastre.

SPAN 869 MASTER'S THESIS 1-6

SPAN 875 SEMINAR: TOPICS IN SPANISH LITERATURE 3
Study of selected topics, authors and works in the various fields of Spanish literature. Variable content. Emphasizes preparation of seminar presentations and term papers. RESTRICTIONS: May be repeated for credit when topics vary.

STATISTICS

STAT 200 BASIC STATISTICAL PRACTICE 3
Uses real data from a variety of disciplines to explore topics in data analysis, estimation and inference such as graphical displays, estimation of and hypothesis tests on means and proportions, sampling distributions, chi-square tests for independence.
PREREQ: College algebra.

STAT 266 SPECIAL PROBLEM 1-3

STAT 366 INDEPENDENT STUDY 1-6

STAT 370 INTRODUCTION TO STATISTICAL ANALYSIS I 3
Basic probability; continuous, discrete and joint distributions; distribution of functions of random variables; order statistics; expected value and central limit theorem.
PREREQ: MATH222 or MATH243

STAT 371 INTRODUCTION TO STATISTICAL ANALYSIS II 3
Distributions of common statistics, sampling techniques, estimation, confidence intervals, hypothesis testing and selected topics.
PREREQ: STAT370.

STAT 418 SAMPLING METHODS 3
Types of sampling, census vs. survey, methods of sample selection, sampling and non-sampling errors. Planning and execution of surveys, and data collection in selected fields of application.
PREREQ: STAT371.

STAT 420 DATA ANALYSIS AND NONPARAMETRIC STATISTICS 3
Techniques of exploratory and graphical data analysis for univariate and multivariate data sets, and numerical and categorical variables. Emphasis on selection of proper procedure. Non-parametric techniques of estimation testing and curve smoothing.
PREREQ: STAT371.

STAT 466 INDEPENDENT STUDY 1-6
STAT 475 STATISTICS FOR ENVIRONMENTAL SCIENCE 3
Introduction to statistical methods for analyzing environmental data. Relevant probability and sampling theory is introduced, as well as procedures for summarizing, modeling and estimating environmental data. A computer-based statistical package is used to explore behavior of different statistical techniques with a variety of environmental data sets. May be cross-listed with ENSC475. PREREQ: MATH243 and GEOG250. RESTRICTIONS: If STAT475 is taken, degree credit cannot be given for any of the following courses: MATH300, STAT370, STAT371 or MATH450.

STAT 601 PROBABILITY THEORY FOR OPERATIONS RESEARCH AND STATISTICS 3
Provides the basic background in probability theory for further work in statistics and operations research. Basic topics: sample spaces and axioms of probability; conditional probability and independence; Bayes theorem; random variables; moments and moment generating functions; transformations of random variables; common families of distributions; multivariate distributions, covariance and correlation; probability inequalities and limit theorems. PREREQ: MATH243.

STAT 602 MATHEMATICAL STATISTICS 3
Derived sampling distributions; decision theory; estimation theory; multivariate normal; hypothesis testing; special topics. PREREQ: STAT601.

STAT 603 VECTOR SPACES AND OPTIMIZATION 3
Bases, linear transformations, subspaces, projection theorem, least squares, eigenvalues, eigenvectors, matrix factorizations. Quadratic programming, convexity, duality; Karush-Kuhn-Tucker conditions, constraints, sequential quadratic programming; linear programming, simplex method, interior point methods. Examples taken from maximum likelihood estimation, robust and ridge regression, resource allocation, transportation problems. PREREQ: MATH243 and MATH349.

STAT 608 STATISTICAL RESEARCH METHODS 3
See FREC608 for course description.

STAT 611 REGRESSION ANALYSIS 3
Simple linear and nonlinear regression; subset regression; principal component and ridge regression. Introduction to experimental design and design models. PREREQ: MATH420 or STAT371.

STAT 615 DESIGN AND ANALYSIS OF EXPERIMENTS 3
Fundamental principles of design, randomized designs, Latin squares, sources of error, components of error; Factorial designs, response surfaces, models for design. PREREQ: STAT371.

STAT 616 DESIGN AND ANALYSIS OF EXPERIMENTS 3
Planning of experiments, designs for specific problems, fractional factorials, confounding, estimation of error 2-group and confounding designs; interaction to linear estimation. PREREQ: STAT615.

STAT 617 MULTIVARIATE METHODS 3
Multivariate analysis of variance and covariance; classification and discrimination; canonical correlation; principal components; factor analysis. PREREQ: STAT371.

STAT 618 SAMPLING TECHNIQUES 3
Simple random sampling; stratified random sampling; ratio estimates; regression estimates; systematic sampling; cluster sampling; double sampling. PREREQ: STAT371.

STAT 620 NONPARAMETRIC STATISTICS 3
Statistical procedures valid under restrictive assumptions; scales of measurement; efficiency comparisons; signed rank procedures; two-sample rank tests; zeros, ties, and other problems of discrete data; order statistics; k-sample procedures; nonparametric measures of correlation. PREREQ: STAT371, STAT601.

STAT 635 STATISTICAL QUALITY CONTROL 3
Process variation, sequence plotting, control charts, cumulative sum process control procedures; process capability studies, acceptance sampling, quality management and organization, and trouble shooting using graphical techniques. PREREQ: STAT371.

STAT 640 STATISTICAL CONSULTING 3
Topics include the client/consultant relationship; effective communication; identifying the question, developing a plan and presenting the results; following up; actual consulting experience.

STAT 641 STATISTICAL LABORATORY 1
Requires attendance at the weekly statistical laboratory meetings.

STAT 656 BIOSTATISTICS 3
An introduction to statistics focused toward applications in biological, medical and other life sciences. Topics include graphical and numerical techniques, random variables and their distribution, estimation and inference. PREREQ: MATH201.

STAT 657 STATISTICS FOR EARTH SCIENCES 3
Spatial distributions; directional data; statistical graphics, regression and time series analysis; model validation; sampling; principal components; cluster analysis; discriminant analysis; and statistical software routines. May be cross-listed with GEOG657. PREREQ: MATH201.

STAT 664 STATISTICS INTERNSHIP 1-6 PF
Supervised on the job experience, performing statistical analysis of problems for clients. RESTRICTIONS: Requires permission of instructor.

STAT 674 APPLIED DATA BASE MANAGEMENT 3
See FREC674 for course description.

STAT 675 LOGISTIC REGRESSION 3
Practical and computational introduction to logistic regression and related topics. Applications include financial, marketing and biomedical research. The use of SAS and other statistical packages will be emphasized. RESTRICTIONS: Requires permission of instructor.

STAT 800 ESTIMATION AND STATISTICAL INFERENCE I 3
Selected topics in estimation and inference such as uniformly most powerful tests, uniformly most powerful unbiased tests, similarity and completeness, sufficiency, likelihood ratio tests, invariant tests, permutation test. PREREQ: STAT602, MATH602.

STAT 801 ESTIMATION AND STATISTICAL INFERENCE II 3
Further topics in estimation and inference will be covered. PREREQ: STAT800.

STAT 815 LINEAR STATISTICAL INFERENCE I 3
Vector random variables, matrix operations, multivariate normal distributions, distribution of functions of vector random variables, topics from multivariate analysis and specific linear models. PREREQ: STAT602, STAT615.

STAT 816 LINEAR STATISTICAL INFERENCE II 3
Topics from general linear hypotheses of full rank and not full rank. PREREQ: STAT815.

STAT 818 MULTIVARIATE ANALYSIS 3
Likelihood estimation, vector random variables, Hotelling's T-squared distribution of correlation coefficients, classification and discrimination, distribution of sample covariance matrix and generalized variance, and testing multiple hypotheses. PREREQ: STAT800.

STAT 824 ADVANCED TOPICS IN STATISTICS I 3
A presentation of a current area of statistical application or research. Examples of topics which may be covered include: biomeaty, bootstrapping, data analysis, response surfaces, survival analysis and time series. PREREQ: STAT816.

STAT 831 TIME SERIES ANALYSIS 3
Introduction to fundamental topics in time series analysis featuring analysis in both time and frequency domains. The Box and Jenkins technique of fitting autoregressive moving average models will be used in time domain. Emphasis on model building, evaluation and forecasting. Analysis in frequency domain includes such topics as digital filtering and models of estimating and interpreting the spectrum. PREREQ: STAT602.

STAT 832 TOPICS IN DATA ANALYSIS 3
Topics: graphical analysis, model evaluation, robust procedures; influence functions; multivariate data plots, residual analysis; Bayesian concepts in data analysis.

STAT 836 RESPONSE SURFACE METHODOLOGY 3
Derivation of nonlinear relationships between variables. Techniques for characterization and interpreting multidimensional systems through canonical and ridge analysis. Correlation analysis through eigenvalues and eigenvectors for linear systems. PREREQ: STAT602 and either STAT611 or STAT617.
Jazz Dance as an art form and vehicle for individual and group expression. Emphasis on rhythm and style. RESTRICTIONS: Previous dance experience recommended.

THEA 300 FUNDAMENTALS OF STAGECRAFT
Concentrates on traditional techniques used in the construction and rigging of scenery and properties for the stage. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. PREREQ: THEA200 or THEA202.

THEA 301 FUNDAMENTALS OF PROPERTIES CONSTRUCTION
Introduces basic organization and management of properties for a theatrical production in addition to basic techniques of property construction. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. PREREQ: THEA200 or THEA202.

THEA 302 FUNDAMENTALS OF STAGE LIGHTING
Introduces basic techniques and processes used in the lighting of theatrical productions. Emphasis on the use and manipulation of lighting equipment. Demonstrates equipment and basic techniques and processes through a combination of classroom lecture and laboratory experience. PREREQ: THEA200 or THEA202.

THEA 303 FUNDAMENTALS OF SCENE PAINTING
Introduction to the tools, materials, and techniques of painting scenery for the stage. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. PREREQ: THEA200 or THEA202.

THEA 304 FUNDAMENTALS OF AUDIO FOR THE THEATRE
Introduces the physical phenomenon of sound and the techniques of controlling and manipulating it for theatrical productions. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience. PREREQ: THEA200 or THEA202.

THEA 305 FUNDAMENTALS OF COSTUME CONSTRUCTION FOR THE STAGE
Introduces basic costume construction techniques through lectures, demonstrations, and laboratory experience. Culminates in the construction of a finished costume. PREREQ: THEA203.

THEA 306 FUNDAMENTALS OF PATTERN MAKING FOR THE STAGE
Teaches basic pattern-making techniques required in constructing through lectures, demonstrations, and laboratory experience. Includes how to recreate historical details used for period theatrical garments. PREREQ: THEA203.

THEA 307 FUNDAMENTALS OF DRAPING FOR THE STAGE
Introduces basic draping skills and applies them to period costumes. Examines several historical periods commonly used in theatrical productions. Students create muslins or finished garments from at least four historical periods. PREREQ: THEA203.

THEA 308 FUNDAMENTALS OF COSTUME CRAFTS
Provides basic experience in several crafts-related areas commonly utilized in costume-making, including mask making, surface design, hat making, leather work and thermoplastics. PREREQ: THEA203.

THEA 309 FUNDAMENTALS OF STAGE MANAGEMENT
Study of the techniques and procedures used in managing theatrical productions from conception through performance. PREREQ: THEA200 or THEA202.

THEA 310 FUNDAMENTALS OF MASK MAKING
Class will include casting, sculpting human and animal features, and will explore various methods and materials for constructing theatrical masks. Students will construct three to four masks. PREREQ: THEA203.

THEA 311 FUNDAMENTALS OF SCENE DESIGN
Introduction to the exploration of conceptual principles underlying the practice of scenic design. Explores elements of visual thinking through the manipulation of drafting and drawing with emphasis on line, form, color, and spatial relationships as they relate to the play. Some artistic ability is helpful. PREREQ: THEA200, or THEA202, or permission of instructor.

THEA 341 THEATRE/DRAMA: CLASSIC/MEDIEVAL
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMIT341.
THEA 342 THEATRE/DRAMA: RENAISSANCE TO 1700 3
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT342.

THEA 343 THEATRE/DRAMA: 1700 TO 1900 3
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT343.

THEA 344 THEATRE/DRAMA: 1900 TO PRESENT 3
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT344.

THEA 345 HISTORY OF THEATRE: AMERICAN MUSICAL THEATRE 3
See MUSC345 for course description.

THEA 347 SPECIAL TOPICS IN THEATRE HISTORY 3
A series of changing topics in history and theory. Topics range from studies of significant movements in theatre to the study of theoretical issues and individual playwrights and genres.

THEA 360 FUNDAMENTALS OF ORAL INTERPRETATION 3
Basic course in interpretation of text for the stage. Concentrates on texts from plays; explores prose and poetry. Emphasis on diction, meaning and presentation. Studio format.

THEA 366 INDEPENDENT STUDY 1-6

THEA 407 THEATRE PRACTICUM FOR MAJORS 1-4
Students assigned production responsibilities on departmental productions in the areas of lighting, sound, scenery, properties, costuming, stage management, painting and theatre management. RESTRICTIONS: Open to majors only. Requires permission of instructor.

THEA 410 FUNDAMENTALS OF DRAMATURGY 3
Topics covered include various methods of dramatic and entertainment analysis, scene analysis, development of dramaturgical plot, fable and practice. Survey of function and role of the dramaturgy in contemporary theatre. Readings in primary and secondary materials.

THEA 420 FUNDAMENTALS OF STAGE DIRECTING 3
Exploration of the director's part in the creative process of theatre. Philosophy, techniques and problems of directing plays. PREREQ: THEA104.

THEA 466 INDEPENDENT STUDY 1-6

THEA 490 SEMINAR IN THEATRE AND DRAMA 3
Seminar in theatre and drama. Topics will be announced. RESTRICTIONS: Requires permission of instructor.

THEA 600 DISTINCTIONS OF PROFESSIONAL THEATRE PRACTICE 1-3
Inquiry into the nature of the theatre as an art form; techniques and issues of communication, organization, management, leadership, team participation and creativity necessary to the pursuit and accomplishment of fulfilling careers in institutional and commercial theatres. Explores how the nature and purpose of the theatre as an art infuses the day-to-day practices, values and behavior of the individual artist. RESTRICTIONS: Requires enrollment in Professional Theatre Training Program. May be repeated up to 12 credit hours.

THEA 601 DYNAMICS 1
A vocal/physical warmup. Exercises designed to prepare student for the day's work. RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated up to six credit hours.

THEA 602 VOICE DEVELOPMENT I 1
Basic breath control and tone production to develop strength, control, flexibility and awareness. RESTRICTIONS: Requires enrollment in the Professional Theatre Program/Acting or Directing.

THEA 603 VOICE DEVELOPMENT II 1
Continuation of THEA602. PREREQ: THEA602.

THEA 604 VOICE DEVELOPMENT IIIA 1
Continuation of THEA603, with an emphasis on range extension and the development of greater variety in expressiveness. PREREQ: THEA603.

THEA 605 VOICE DEVELOPMENT IIIB 1
Continuation of THEA604. PREREQ: THEA604.

THEA 606 VOICE DEVELOPMENT IIIC 1
Individual instruction to identify habitual vocal patterns and to strengthen individual weaknesses in voice. PREREQ: THEA605.

THEA 607 VOICE DEVELOPMENT IIID 1
Continuation of THEA606. PREREQ: THEA606.

THEA 608 STAGE MOVEMENT I 1
Exercises and assignments to develop alignment, strength, flexibility, control, awareness, endurance, rhythmic sensitivity, balance and expressiveness. RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting or Directing.

THEA 609 STAGE MOVEMENT II 1
Continuation of THEA608. PREREQ: THEA608.

THEA 610 STAGE MOVEMENT III 1
Continuation of THEA609, with an emphasis on stage combat, tumbling, circus and other advanced movement techniques. PREREQ: THEA609.

THEA 611 STAGE MOVEMENT IV 1
Continuation of THEA610. PREREQ: THEA610.

THEA 612 STAGE MOVEMENT V 1
Individual instruction to identify habitual movement patterns and to strengthen individual weaknesses in stage movement. PREREQ: THEA611.

THEA 613 STAGE MOVEMENT VI 1
Continuation of THEA612. PREREQ: THEA612.

THEA 614 STAGE SPEECH IA 2
Ear training and phonetics. Corrective work on regional speech habits. RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting or Directing.

THEA 615 STAGE SPEECH IB 2
Continuation of THEA614. Beginning work on verse scansion. PREREQ: THEA614.

THEA 616 STAGE SPEECH IIA 1
Continuation of THEA615 with an emphasis on phrasing and verse scansion. PREREQ: THEA615.

THEA 617 STAGE SPEECH IIIB 1
Continuation of THEA616. PREREQ: THEA616.

THEA 618 STAGE SPEECH IIIC 1
Stage dialects and advanced work in phrasing and verse scansion. Individual tutoring in problem areas. PREREQ: THEA617.

THEA 619 STAGE SPEECH IIID 1
Continuation of THEA618. PREREQ: THEA618.

THEA 620 REHEARSAL AND PERFORMANCE/ACTING 1-6
Practical instruction and assignments in the preparation, rehearsal and performance of theatrical productions. RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting. May be repeated up to 24 credit hours.

THEA 633 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES I 1-2
Development of organizational structuring and communication techniques for the administration of stage managerial projects. RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management.
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<th>Restrictions</th>
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<td>THEA 634</td>
<td>Stage Management Organizational and Managerial Techniques IB</td>
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<td>THEA 635</td>
<td>Stage Management Organizational and Managerial Techniques II</td>
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<td>Stage Management Production Skills IA</td>
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<td>Rehearsal and Performance/Stage Management</td>
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<td>THEA 648</td>
<td>Costume Construction</td>
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<td>THEA 664</td>
<td>Internship in Professional Theatre</td>
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<td>THEA 665</td>
<td>Theatre Literacy</td>
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<td>THEA 668</td>
<td>Research</td>
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<td>Scenery Production</td>
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<td>Properties Production</td>
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<td>Lighting Production</td>
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<td>Audio Production</td>
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<td>THEA 682</td>
<td>Lighting Design</td>
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<td>Production Project Management</td>
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<td>Scenery Painting</td>
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<td>THEA 688</td>
<td>Computer Aided Drafting and Scenery Construction</td>
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<td>Production and Performance/Technical</td>
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<td>Production Seminar</td>
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Additional notes:
- May be repeated for up to 12 credit hours.
- Materials, tools, and hardware used for scenery construction.
- Materials, tools, and methods used for scenery construction.
- Further study of standard and specialized scenery construction methods.
- May be repeated to 6 credit hours.
- Electrical theory and practice as applied to theatre production.
- Technical problems and issues encountered in productions.
- Introduction to the mechanics and technology of the art of costume.
- Investigation and discussion of technical problems.
- Practical instruction and assignments in the technical preparation.
- Investigation and discussion of technical problems.
- Continued work on CAD techniques for theatre production.
- May be repeated up to 12 credit hours.
- May be repeated up to 18 credit hours.
- May be repeated up to 12 credit hours.
- May be repeated up to 10 credit hours.
- May be repeated up to 20 credit hours.
- May be repeated up to 6 credit hours.
- May be repeated up to 24 credit hours.
- May be repeated up to 18 credit hours.
- May be repeated up to 18 credit hours.
- May be repeated up to 12 credit hours.
- May be repeated up to 6 credit hours.
- May be repeated up to 6 credit hours.
- May be repeated up to 20 credit hours.
- May be repeated up to 6 credit hours.
- May be repeated up to 20 credit hours.
THEA 694 SPECIA L TOPICS IN THEATRE PRODUCTION 1-3
Multiple units on advanced topics in theatre production and management. Students select topics from a list offered by the Professional Theater Training Program. May be repeated up to nine credit hours.

UAPP AND PUBLIC POLICY

UAPP 601 MEASURING AND DEFINING PLANNING PROBLEMS 1
Methods for identifying and measuring planning-related problems, including analyses of land use patterns, population dynamics, economic trends, social indicators, and ecological characteristics as predictors and determinants of future development.

UAPP 602 INTRODUCTION TO COMPREHENSIVE PLANNING 1
Overview of the comprehensive planning process. Description of goals, objectives, and components behind the development of a comprehensive plan and methods for preparing and understanding the value of a comprehensive plan to the community.

UAPP 603 INTRODUCTION TO ZONING AND LAND USE CONTROLS 1
Survey of the theories underlying land use patterns and description of the legal structure and methods surrounding public sector control and management of land use including police power, eminent domain, zoning, subdivision control, and master plans.

UAPP 604 LEADERSHIP IN ORGANIZATIONS 3
Understanding the process of change and positively affecting change in organizations through the exercise of leadership skills and knowledge.

UAPP 605 TOPICS IN URBAN AFFAIRS 3
Focuses on selected topics in urban affairs such as urban politics and government, urban education and neighborhood analysis. RESTRICTIONS: May be repeated up to nine credits when topics vary.

UAPP 606 LOCAL ECONOMIC DEVELOPMENT: POLICY AND PRACTICE 3
Examines theory and contemporary practice for promoting the economic development of local communities. Reviews alternative ways of understanding the dynamics of local economic development and devising strategies that will benefit community residents.

UAPP 607 SEMINAR IN COMMUNITY DEVELOPMENT AND NONPROFIT LEADERSHIP 1
Examines the complex ways in which the concepts of community analysis and development are used and understood. May be cross-listed with IFST607.

UAPP 608 POVERTY, NEIGHBORHOODS AND COMMUNITY DEVELOPMENT 3
Examines social science literature through which multidisciplinary analysts have described and explained poverty, analyzed neighborhoods, and categorized community development efforts. Focusing on the United States, particular attention is paid to analyses from 1960 to the present. May be cross-listed with IFST608.

UAPP 609 FINANCIAL STATEMENT ANALYSIS FOR NONPROFITS 1
Geared toward graduate students with little or no background in accounting or reading financial statements. Intent is to give basic understanding of financial statement analysis. Will cover basic accounting concepts with an emphasis on understanding the financial statements of nonprofit organizations.

UAPP 610 URBAN LAND USE PLANNING AND ADMINISTRATION 3
Interaction of political, economic and social forces in the planning and land use control process. Emphasis on planning agency administration and current policies impacting the planning process, including recently enacted environmental and community development legislation. Concern for the role of the planner, the planning agency and the planning function as it relates to economic and community development.

UAPP 611 REGIONAL WATERSHED MANAGEMENT 3
Reviews the practical applications of watershed planning as a tool to manage land, water and ecosystem resources. Explores public policies and practices of watershed planning by examining case studies. Uses a multidisciplinary approach involving the fields of geography, environmental science, geology, public policy, land planning, geographic information systems (GIS) and engineering. May be cross-listed with FREC611.

UAPP 612 URBAN HOUSING POLICY AND ADMINISTRATION 3
Examines problems associated with providing adequate and affordable housing in the United States. Covers the structure and dynamics of the housing market; supply and demand factors; market failure; financing methods; federal, state and local public policy affecting housing, including taxation, regulation, subsidy programs, and land use controls.

UAPP 613 PLANNING THEORY AND URBAN POLICY 3
Provides an overview of the development and current conceptual normative and methodological issues in planning theory as applied to urban regions.

UAPP 614 THE AMERICAN SUBURB 3
An examination of the historical and geographical origins of the American suburb and its role in metropolitan development and larger society. Includes the evolution of the streetcar and automobile suburbs with special emphasis on the post World War II suburban boom and contemporary post-suburban trends. May be cross-listed with GEOG614 and/or HIST614.

UAPP 615 URBAN, REGIONAL AND ENVIRONMENTAL PLANNING 3
Provides an introduction to urban planning. Focuses mainly on U.S., but some comparisons made with Britain and Canada. Issues covered include zoning, urban growth management, land policies, regional policies, and urban policy. May be cross-listed with GEOG615.

UAPP 616 EFFECTIVELY MANAGING VOLUNTEERS 1
Provides an introduction and overview of the field of volunteer administration, explores the components of the effective management of volunteers and builds students' problem solving skills. Comparisons to the management of paid staff and the role of volunteerism in the larger organizational structure.

UAPP 617 CONTEMPORARY ISSUES IN ENVIRONMENTAL AND ENERGY POLICY 1
Links students with leading energy and environmental policy scholars on a bi-weekly basis to debate key issues such as global warming, ozone layer deterioration, environmental justice, sustainable development and ecological democracy. International, national and community dimensions of these and other policy issues are explored through seminar discussion.

UAPP 618 HUMAN SERVICE SYSTEMS: POLICY, PRACTICES, ADMINISTRATION 3
Centers on operational practices and administration of human service systems. Includes an analysis of human service systems concepts and policies, delivery practices and administration. Human service systems dimensions reviewed in relation to the rising influence of organized human service professional (practitioner) groups and organized human service consumer groups.

UAPP 619 CONTEMPORARY ISSUES IN URBAN AFFAIRS AND PUBLIC POLICY 2
Overview of the origins of urban affairs and public policy and its current academic role and status as a profession. Students meet with and engage in discussions with leading scholars and policy makers invited to the campus to talk about their current research and interests.

UAPP 620 CRIMINAL JUSTICE ADMINISTRATION 3
Focuses on issues of concern to students planning careers as administrators in the criminal justice system. Covers administrative policy, organizational dynamics, budgetary matters, and the role of the computer in criminal justice. Explores the complexities, conflicts and ambiguities of criminal justice management.

UAPP 621 CONFLICT RESOLUTION 1
Introduction to conflict resolution skills. Provides communication and problem solving skills designed to de-escalate conflicts and create win-win solutions. Students learn new ways of approaching conflict while gaining an understanding of their own conflict management style. Examines how these skills transfer to the workplace. RESTRICTIONS: Requires permission of instructor.

UAPP 622 RESOURCES, DEVELOPMENT AND THE ENVIRONMENT 3
See GEOG622 for course description.

UAPP 623 INDEPENDENT STUDY IN GEOF RAPHICAL INFORMATION SYSTEMS (GIS) 1
Students complete self-paced individualized tutorials and apply knowledge in a project of their choice. Material addressed includes creation and display of digital maps and data bases, preparation of data sets, sources of data and GIS standards.

UAPP 624 SEMINAR IN CRIMINAL JUSTICE 3
Discussion and evaluation of institutional components of criminal justice systems. Topics include police, judicial and correctional systems.

513
UAPP 659  TOPICS IN PUBLIC ADMINISTRATION  1-3
Focuses on micro and macro public administration issues, i.e., privatization, health care cost containment, flexible benefits packages, ethics, organizational productivity, concession and productivity bargaining.
May be cross-listed with POSC659.

UAPP 660  SEMINAR IN URBAN MANAGEMENT  3
Provides a theoretical and conceptual orientation to urban management, perspectives on the development of urban management as a profession, a description of the intergovernmental, sociopolitical and economic environment of urban management, and analyses of current issues in the area.

UAPP 661  COMPARATIVE PUBLIC ADMINISTRATION AND POLICY  1
Examines contemporary experience in public administration and policy in other cultures and systems.

UAPP 662  MUNICIPAL MANAGEMENT  3
Surveys the major operational functions of local government with emphasis on the practical elements and problems in the management of these functions. Functions include solid waste disposal; economic development; planning and land use control; water supply; police and emergency services; and cultural, social and recreational services. Emphasis on innovative approaches to the provision of services.

UAPP 663  DECISION TOOLS FOR POLICY ANALYSIS  3
See MAST663 for course description.

UAPP 664  CASE STUDIES IN STATE AND LOCAL MANAGEMENT  3
Uses analyses of cases in state and local decision making to enable students to improve their communication, decision making and management skills. Cases deal with a broad range of subject areas (e.g., health and recreation) and problems (e.g., facility location and personnel).

UAPP 666  SPECIAL PROBLEM  1-12
Introduction to the principles of fund development, a guide to organizing for fund development, and an overview of the fundamentals of annual, major and planned fundraising from individuals.

UAPP 670  FUND DEVELOPMENT: FUNDRAISING FROM INDIVIDUALS  1
Focuses on the role of individuals in the fund development process. Topics include donor research and cultivation, strategy development, and the development of effective fundraising programs.

UAPP 671  FUND DEVELOPMENT: FUNDRAISING FROM INSTITUTIONS  1
Focuses on the role of institutions in the fund development process. Topics include corporate giving, foundation giving, and other institutional giving strategies.

UAPP 678  ADMIRALTY AND MARITIME LAW  3
See MAST678 for course description.

UAPP 679  VIRTUAL GOVERNMENT  1
Explores the evolving field of e-government and evaluates opportunities to enhance the delivery of government services. Reviews developments throughout the world and strategies for implementation in Delaware.

UAPP 681  METROPOLITAN INFRASTRUCTURE AND TRANSPORTATION  3
Movement is essential for metropolitan area performance. Roads and water systems are infrastructure components that impact on where houses, stores, and jobs are located; which in turn links into movement, pollution and congestion. This course treats infrastructure decision making using approaches from public economics. May be cross-listed with POSC681. PREREQ: UAPP834 or microeconomics.

UAPP 683  REGIONAL POLICY ANALYSIS  3
Why do some regions/cities grow and change? Course presents theories of regional development, methods of inter-regional analysis, as well as internal-regional topics such as land use, migration, city-suburban shifts, and neighborhoods. Various kinds of regional policies are analyzed. May be cross-listed with POSC683. PREREQ: UAPP834 or microeconomics.

UAPP 684  PERFORMANCE MANAGEMENT  3
Increases the knowledge of techniques and definitions used in the managing-for-results movement; introduces the indicators used by government and their use for accountability and improved effectiveness; further competence in the areas of strategic planning, benchmark indicators, performance-based budgeting, and performance measurement; and explores linkages and alignments of systems for improved efficiency and effectiveness.

UAPP 685  PERSONNEL AND HUMAN RESOURCE ISSUES: CURRENT TOPICS  3
Analysis of selected policies, practices, and issues currently important in the field of public personnel/human resources. Topics vary depending on instructor (illustrations: EEO developments, “Glass Ceiling” issues, ADA, benefits/cost containment, labor negotiation trends, the changing workforce and workplace). Seminar with individually-tailored projects. May be cross-listed with POSC685. PREREQ: UAPP837. RESTRICTIONS: Based on prior coursework and professional experience, may be waived with instructor approval.

UAPP 686  STATE AND LOCAL GOVERNMENT: CONCEPT AND ISSUES  3
Explores the state and local government context in which public managers work. Examines the organizational, administrative, and economic forces shaping state and local public action, as well as the political decision making apparatus used by subnational governments. Assesses their contemporary role in the federal system. May be cross-listed with POSC686.

UAPP 687  STATE GOVERNMENT POLICY AND MANAGEMENT  3
Focuses on roles and functions of United States state government. Topics include legislative policy making and operations, executive branch organization and functions, structure and role of state courts, and the role of the governor and the states in intergovernmental policy making. State government in the mid-Atlantic region will receive special attention. May be cross-listed with POSC687.

UAPP 688  TOPICS IN STATE AND LOCAL MANAGEMENT  3
Focuses on selected topics in state and local management and policymaking. May include in-depth exploration of management processes/instruments (e.g., budgeting) and/or contemporary policy issues (e.g., educational reform, environmental crises) within state and local government with which public managers must contend. May be cross-listed with POSC688.

UAPP 692  ENVIRONMENTAL ISSUES, MOVEMENTS AND POLICY  3
See MAST692 for course description.

UAPP 800  RESEARCH METHODS AND DATA ANALYSIS  4
Focuses on concepts, issues and techniques related to research design, data acquisition and data analysis in the fields of urban affairs and public policy.

UAPP 801  PROCESSES OF SOCIAL INQUIRY  3
Explores the philosophical underpinnings of social inquiry and epistemological and methodological issues surrounding the development and use of social research. Encourages students to consider the role of critical analysis in social change. Students prepare research designs on topics of their choosing and are assisted by the instructors in developing them into thesis and dissertation proposals.

UAPP 802  ELECTRICITY POLICY AND PLANNING  3
Analyzes the technological and regulatory policy evolution of the electricity industry. Considers how technology innovations and policy/regulatory actions have guided the planning of the industry from its early days.

UAPP 803  SEMINAR: PUBLIC ADMINISTRATION  3
Reading and discussion of theories and problems of public administration, including organization, coordination, field administration, contracts, personnel, policy making, participation, adjudication, budgeting and administrative behavior. May be cross-listed with POSC803.

UAPP 804  PROGRAM EVALUATION FOR HEALTH AND SOCIAL SERVICES  3
Introduces quantitative and qualitative methods for evaluating health and social service programs. Emphasizes program design evaluation, process evaluation, experimental and quasi-experimental design, and clinical trials.

UAPP 806  SURVEY RESEARCH  3
Methods and procedures for the design, administration and analysis of sample surveys.

UAPP 808  QUALITATIVE METHODS FOR PROGRAM EVALUATION  3
Provides skills and examines issues in the use of qualitative methods in the context of program evaluation. Qualitative design, sampling approaches, data collection, and analysis are included. PREREQ: UAPP800, IFST615 or comparable research methods course. RESTRICTIONS: Enrollment limited to 15.
UAPP 810  POLITICAL ECONOMY OF THE ENVIRONMENT  3
Reviews major theories developed over the last half century to explain nature-society relations. Policy case studies on environmental justice, trade and environment, global climate change, and sustainable development are used to evaluate the current range of political-economic explanations of nature-society relations. International, national and local responses to these problems are analyzed. May be cross-listed with MAST814 and/or POSC814.

UAPP 815  PUBLIC MANAGEMENT STATISTICS  3
Emphasis on the practical knowledge of statistical techniques and their use in the management of data (or data systems) in the public sector. Discussion and appraisal of various types of statistical tools from a theoretical standpoint, and application of statistical methods and procedures in a laboratory situation for the collection, organization and analysis of statistical information in public management research.

UAPP 816  ADVANCED SOCIAL STATISTICS  3
Provides advanced training in applied social research. Topics include analysis of variance, regression analysis, analysis of covariance, multidimensional cross-classifications and future analysis. Lectures supplemented by laboratory work involving computer statistical packages and simulations.

UAPP 817  PUBLIC INVESTMENT POLICY  3
Focuses on the means by which governmental activities can be financed. Topics are tax vs. debt financing; use of appropriate instruments and policies, e.g., types of bonds; and forces that influence implementation, e.g., the design of instruments, fiscal capacity, rating system and market behavior. May be cross-listed with POSC817.

UAPP 818  ENVIRONMENTAL POLICY AND ADMINISTRATION  3
See POSC818 for course description.

UAPP 819  MANAGEMENT DECISION MAKING IN PUBLIC AND NONPROFIT SECTORS  3
Focuses on analytical decision making within public and nonprofit organizations. Examines processes by which decisions can be made and evaluated. Emphasis on conceptual factors that provide a guide to decisions and evaluations of decision methodologies, e.g., systems analysis, cost-benefit analysis, PERT/critical path method, decision trees, performance measurement and time series. May be cross-listed with POSC819. PREREQ: Excel.

UAPP 820  INTERNATIONAL PERSPECTIVES ON ENERGY AND ENVIRONMENT  3
See POSC820 for course description.

UAPP 821  PROSEMINAR: TECHNOLOGY, ENVIRONMENT AND SOCIETY  3
Over the last two centuries, forces of industrialization and urbanization have transformed economic, social and political life and the natural environment. Examines theories that explain and assess these transformations, with the goal of fostering critical analysis of social and environmental transformation in international, national and local contexts. May be cross-listed with POSC821.

UAPP 822  PROSEMINAR IN GOVERNANCE, PLANNING AND MANAGEMENT  3
Deals with policy and research issues concerning the making, administering and outcomes of public policies affecting urban populations and with how urban governance, planning and management processes are influenced by the interaction of the public, private and third sectors at the local, national and international scales.

UAPP 823  PROSEMINAR: SOCIAL AND URBAN POLICY  3
Social policy attempts to promote the well-being of individuals, families and communities through public action. Explores efforts to address social and economic problems in urban society. Considers differential policy impacts by social class, race/ethnicity, gender and age. Topics: welfare, housing, social security, health, education, criminal justice and employment. May be cross-listed with EDUC825 and/or FIST823.

UAPP 825  COMPARATIVE PUBLIC ADMINISTRATION  3
See POSC825 for course description.

UAPP 826  MULTIVARIATE STATISTICAL ANALYSIS  3
Provides an in-depth understanding of advanced statistical methods with an applied focus on estimation, inference, and prediction of models. Major topics are: multiple regression, functional forms, types of data, regression diagnostics (collinearity, serial correlation, heteroscedacity, and simultaneity), different estimators, comparison of models, dummy dependent variables, dynamic models and tests, and non-orthogonal models. PREREQ: UAPP815. RESTRICTIONS: A statistics course that introduces regression analysis.

UAPP 827  PROGRAM AND PROJECT ANALYSIS  3
Explores the ways in which decision-makers in the public sector evaluate the feasibility of government programs and projects through the application of Cost-Benefit Analysis (CBA), Cost Utility Analysis (CUA), and Cost Effectiveness Analysis (CEA). Focuses on the determination of social costs and social benefits of public policies. PREREQ: UAPP834 or comparable course in public economics and permission of instructor.

UAPP 828  URBAN SOCIETY AND URBAN POLICY  3
Traces the evolution of the major social, economic and physical dimensions of U.S. cities in order to understand the nature of current challenges facing American society. Compares the "American" model of urban society with societal found in other parts of the world. Examines the role of public policy as a major determinant of the nature of urban communities.

UAPP 829  TAXATION AND FISCAL POLICY  3
Advanced course in theory and application of financing, spending and regulatory policy instruments of state and local governments. Topics include efficiency, equity and impacts of different types of taxation, user charges, expenditure approaches transfers/subsidies and regulation alternatives. May be cross-listed with POSC829.

UAPP 830  PUBLIC INVESTMENT POLICY  3
Focuses on the linkages between the public and private sectors, the effects of public policy on the private sector, and the role of the public sector in managing social and economic change. May be cross-listed with POSC830.

UAPP 831  MANAGEMENT DECISION MAKING IN PUBLIC AND NONPROFIT SECTORS  3
Develops microeconomic concepts and applies them to public issues, policies, and programs. Applications deal with a wide range of topics, including health care, education, transportation, housing, community development, energy, and the environment. Emphasizes how microeconomic analysis can enhance decision-making.

UAPP 832  ORGANIZATION AND MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
Explores (1) theories and concepts of organizational phenomena, (2) current challenges and implications for the public and nonprofit sectors, and (3) issues for individuals who work in these organizations. Behavioral competencies are developed. May be cross-listed with POSC832.

UAPP 833  FINANCIAL MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
Principles of public finance and public sector economics are used to examine issues of demand for and delivery of public goods by state and local governments and nonprofit organizations. Topics include revenues, expenditures, intergovernmental and cross-sectoral relationships, budgeting, debt management and asset allocation. May be cross-listed with POSC833. PREREQ: UAPP834.

UAPP 834  ECONOMICS IN PUBLIC AND NONPROFIT SECTORS  3
Develops microeconomic concepts and applies them to public issues, policies, and programs. Applications deal with a wide range of topics, including health care, education, transportation, housing, community development, energy, and the environment. Emphasizes how microeconomic analysis can enhance decision-making.

UAPP 835  ORGANIZATION AND MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
Explores (1) theories and concepts of organizational phenomena, (2) current challenges and implications for the public and nonprofit sectors, and (3) issues for individuals who work in these organizations. Behavioral competencies are developed. May be cross-listed with POSC832.

UAPP 836  REAL WORLD ETHICS  1
Examines real world situations requiring ethical considerations. Variety of topics to be covered including public policy issues, managerial responsibility and demonstrating ethical integrity in leadership.

UAPP 837  HUMAN RESOURCES MANAGEMENT IN PUBLIC AND NONPROFIT SECTORS  3
Examines the human resources function from three perspectives: (1) basic technical competencies (recruitment, selection, compensation, benefits), (2) legal and constitutional issues in HR, and (3) leadership and organizational change. May be cross-listed with POSC837.

UAPP 838  PUBLIC POLICY ANALYSIS  3
See POSC838 for course description.

UAPP 839  LAW FOR ADMINISTRATORS  1
Introduces basic concepts and rules of administrative law and an understanding of the legal issues affecting public and nonprofit organizations in dealing with governmental agencies. Special attention placed on the impact politics has on efforts by administrators to comply with administrative law rules and regulations. No prior legal training or command of legal language necessary.

UAPP 840  HISTORY AND DEVELOPMENT OF THE NONPROFIT SECTOR  3
Traces history and development of the nonprofit sector in the United States with a focus on social, economic, political and legal factors. Volunteerism and philanthropy are emphasized. The role of nonprofit organizations in furthering the goals of community development is explored.

UAPP 841  MANAGEMENT AND GOVERNANCE OF NONPROFIT ORGANIZATIONS  3
Provides an introduction to the leadership and management issues facing nonprofit executives and governing boards. Topics include board relationships and voluntary leadership, financial management and budgeting, human resource management, organizational marketing and strategic planning, records management and the use of information technology in management and governance.
**UNIVERSITY COURSE**

**UNIV 101 FIRST YEAR EXPERIENCE I** 1 PF  
Provides an integrated, content-based, co-curricular experience for LIFE cluster students. Fosters academic and social competencies necessary for university success and provides structured, regular time for LIFE cluster students to meet with peer mentors and faculty.

**UNIV 102 FIRST YEAR EXPERIENCE II** 1 PF  
Continuation of UNIV101. PREREQ: UNIV101

**UNIV 103 FIRST YEAR EXPERIENCE III** 1 PF  
Continuation of UNIV102. PREREQ: UNIV102

**UNIV 112 SKILMOD: ACADEMIC SELF MANAGEMENT** 1 PF  
Focuses on self-organization and growth in a college environment. Students investigate the nature of a university, learn how to maximize their productivity through time-management and care decision-making and examine what a liberal arts education can mean to them.

**UNIV 113 SKILMOD: STUDY SKILLS** 1 PF  
Teaches strategies for understanding and remembering college lectures and test materials. Strategies include identifying the underlying discourse structure of the field, summarizing, comprehension monitoring, and transforming notes into test formats. Students practice on their own course materials.

**UNIV 114 SKILMOD: CRITICAL THINKING** 1 PF  
Teaches strategies of good reasoning in humanities, social sciences, and other liberal arts areas. Students learn how to become independent, well-informed thinkers and how to make persuasive arguments, using their own course materials.

**UNIV 115 SKILMOD: PROBLEM SOLVING** 1 PF  
Teaches problem-solving strategies for college courses in chemistry, physics, economics, engineering, etc. Students learn methods for breaking problems into manageable components and for using example problems strategically. Students apply these techniques to courses they are currently taking.

**UNIV 260 EXPERIENTIAL TEACHING** 1-3  
Teaching experience as group tutor, peer facilitator/instructor, workshop guide, or undergraduate teaching assistant. Leadership skills developed and applied in laboratory, problem-based learning (PBL), or peer-led team learning mode of instruction in an undergraduate course. Evaluation based on preparation and engagement in teaching and leadership process.  
RESTRICTIONS: Requires permission of instructor. May not substitute for major courses required in department curriculum.

**UNIV 262 EXPERIENTIAL LEARNING** 1-3  
Learning experience on or off campus, other types of learning out of class and beyond existing department courses. Such experiences as non-major required discovery learning, service learning, fieldwork, co-op, apprenticeship, and internship.  
RESTRICTIONS: Requires permission of instructor. May not substitute for major courses required in department curriculum.

**UNIV 268 UNDERGRADUATE RESEARCH** 1-6  
Undergraduate research conducted on or off campus, out of class, and under the supervision of a faculty member.  
RESTRICTIONS: Requires permission of instructor. May not fulfill course requirements in a major curriculum except by departmental permission.

**UNIV 301 PEER MENTOR PRACTICUM I** 1 PF  
Seminar for peer mentors working in the LIFE program. Covers issues in peer mentor activities and LIFE clusters.

**UNIV 302 PEER MENTOR PRACTICUM II** 1 PF  
Continuation of UNIV301. PREREQ: UNIV301

**UNIV 303 PEER MENTOR PRACTICUM III** 1 PF  
Continuation of UNIV302. PREREQ: UNIV302

**UNIV 320 CONTEMPORARY ISSUES FOR RESIDENT ASSISTANTS** 1  
Introduces new resident assistants to issues affecting college students. All topics covered focus on the needs of the new resident assistant in the Office of Housing and Residence Life.  
RESTRICTIONS: Must be a resident assistant.

**UNIV 359 SEMESTER AT BIOSPHERE 2 CENTER** 0 NR

**UNIV 360 EXPERENTIAL TEACHING** 1-3  
Teaching experience as group tutor, peer facilitator/instructor, workshop guide, or undergraduate teaching assistant. Leadership skills developed and applied in laboratory, problem-based learning (PBL), or peer-led team learning mode of instruction in an undergraduate course. Evaluation based on preparation and engagement in teaching and leadership process.  
RESTRICTIONS: Requires permission of instructor. May not substitute for major courses required in department curriculum.

**UNIV 362 EXPERENTIAL LEARNING** 1-3  
Learning experience on or off campus, other types of learning out of class and beyond existing department courses. Such experiences as non-major required discovery learning, service learning, fieldwork, co-op, apprenticeship, and internship.  
RESTRICTIONS: Requires permission of instructor. May not substitute for major courses required in department curriculum.

**UNIV 364 EXPERENTIAL INTERNSHIP** 3  
Internship experience of fifty hours combined with a seminar emphasizing career development, reflection, and personal learning skills. Internship must be arranged and Learning Contract signed prior to first class meeting. Open to major and non-major related internships, paid or volunteer.  
RESTRICTIONS: Requires permission of instructor. May not substitute for major courses required in department curriculum.

**UNIV 368 UNDERGRADUATE RESEARCH** 1-6  
Undergraduate research conducted on or off campus, out of class, and under the supervision of a faculty member.  
RESTRICTIONS: Requires permission of instructor. May not fulfill course requirements in a major curriculum except by departmental permission.

**UNIV 369 HONORS: UNDERGRADUATE RESEARCH SUSTAINING** 0 PF  
Research apprenticeship with faculty mentor.  
RESTRICTIONS: Limited to those appointed as Undergraduate Research Scholars in the Undergraduate Research Program. Must have approval of the Coordinator of Undergraduate Research, University Honors Program.

**UNIV 401 SENIOR THESIS** 2-4  
Senior thesis for students working toward a degree with distinction.  
RESTRICTIONS: Total credits for UNIV401 and UNIV402 not to exceed six.
UNIV 402 SENIOR THESIS
Continuation of UNIV 401. Restrictions: Total credits for UNIV 401 and UNIV 402 not to exceed six.

UNIV 460 EXPERIENTIAL TEACHING
1-3
Teaching experience as group tutor, peer facilitator/instructor, workshop guide, or undergraduate teaching assistant. Leadership skills developed and applied in laboratory, problem-based learning (PBL), or peer-led team learning. Mode of instruction in an undergraduate course. Evaluation based on preparation and engagement in teaching and leadership process. Restrictions: Requires permission of instructor. May not substitute for major courses required in department curriculum.

UNIV 462 EXPERIENTIAL LEARNING
1-3
Learning experience on or off campus. Other types of learning out of class and beyond existing department courses. Such experiences as non-major required discovery learning, service learning, fieldwork, co-op, apprenticeship, and internship. Restrictions: Requires permission of instructor. May not substitute for major courses required in department curriculum.

UNIV 468 UNDERGRADUATE RESEARCH
1-6
Undergraduate research conducted on or off campus, out of class, and under the supervision of a faculty member. Restrictions: Requires permission of instructor. May not fulfill course requirements in a major curriculum except by departmental permission.

UNIV 490 HONORS TUTORIAL: HUMANITIES
3
Designated faculty direct the studies of up to four students per semester. Readings of classical works in the humanities described. Group as well as individual discussions. Restrictions: Requires 3.4 GPA, junior standing or above, and permission of the Honors Program.

UNIV 491 HONORS TUTORIAL: NATURAL/SOCIAL SCIENCE
3
Designated faculty direct the studies of up to four students per semester. Reading of classical works in the social and natural sciences described. Group as well as independent discussions. Restrictions: Requires 3.4 GPA, junior standing or above and permission of the Honors Program.

UNIV 495 HONORS SEMINAR
3
Topics vary; usually interdisciplinary. Restrictions: Requires 3.4 GPA, junior status or above, and permission of the Honors Program. May be repeated for credit with a different topic and instructor.

UNIV 500 LEAVE OF ABSENCE
0 NR

UNIV 600 LEARNING
0 PF
Explores cognitive, affective and social aspects of the learning process through research and reflection on learning and teaching literature in higher education. Students develop skills to facilitate learning in their respective disciplines. Modern information technologies and library research access essential. Restrictions: May be repeated with different Learning Module.

UNIV 601 PEDAGOGY
0 PF
Presents research-based teaching principles and innovative teaching methodologies. Offers practical orientation to enhance pedagogical effectiveness in respective disciplines. Opportunity to observe and reflect on outstanding UD faculty's instructional practices. Modern information technologies and library resources access essential. Restrictions: May be repeated with different Pedagogy Module.

UNIV 602 FACULTY ROLES
0 PF
Introduces the range of faculty roles and responsibilities at different types of institutions. Assists with identifying ideal academic settings and understanding the possibilities and responsibilities concomitant to such appointments. Modern information technologies and library resources access essential.

UNIV 603 ACADEMIC JOB SEARCH
0 PF
Prepares for insertion into the academic workplace by focusing on CV construction, teaching portfolio preparation, and refining interviewing skills. Modern information technologies and library resources access essential.

UNIV 899 MASTER'S SUSTAINING
0 FT

UNIV 999 PH.D. SUSTAINING
0 FT

WOMEN’S STUDIES

WOMS 201 INTRODUCTION TO WOMEN’S STUDIES
3
Study of the causes and conditions determining women’s status in society, as evidenced in institutional structures and personal relations between men and women. Taught from multidisciplinary perspectives.

WOMS 202 INTRODUCTION TO INTERNATIONAL WOMEN’S STUDIES
3
Examines how public policies and traditional customs affect women’s lives around the world. Focuses on the effects of political and economic status, social norms and institutional structures on women’s conditions in family life, education and employment.

WOMS 203 CONTEMPORARY MORAL PROBLEMS
3
See PHIL202 for course description.

WOMS 205 WOMEN IN THE ARTS AND HUMANITIES
3
Interdisciplinary survey of women’s contributions to the arts and humanities, also including literary/artistic images of women, contributions of minority and non-Western women, and study of the relationship between women’s social-economic roles and cultural expressions.

WOMS 206 WOMEN AND WORK
3
Covers a variety of topics including women in traditional and non-traditional occupations, gender-based discrimination (wage inequities, sexual harassment, exclusionary policies), the contributions of women to the economy and the role of law in shaping conditions for women in the workplace. May be cross-listed with SOC206.

WOMS 207 WOMEN, POWER AND SUCCESS
3
Research, theory and possible strategies related to expanding the horizons in achieving “power” and “success” in women’s lives. Topics include socializing girls to be successful, evaluating personal strengths and goals, and a new model of women and power.

WOMS 210 WOMEN AND RELIGION
3
Examines the impact of Near Eastern and Judeo-Christian scriptures on women in the family and society, especially focusing on women’s roles as mystics and leaders within and outside of institutional religion. Also covers recent feminist approaches to religion. May be cross-listed with PHIL210.

WOMS 211 MEN, CONFLICT AND SOCIAL CHANGE
3
Examination of male roles and images in society, utilizing an interdisciplinary social science perspective. Topics include the family, work, military, violence and the implications of feminism for men. Issue-oriented. May be cross-listed with SOC211.

WOMS 212 MOTHERHOOD IN CULTURE AND POLITICS
3
Examines contemporary cultural and political issues related to motherhood and mothering experience, including definitions and cultural significance of motherhood, experiences of childbirth, effects of new reproductive technologies, surrogate mothering and "maternal thinking," also, efforts to avoid motherhood through contraception and abortion and related legal controversies. See SOC213 for course description.

WOMS 213 MEN AND WOMEN IN AMERICAN SOCIETY
3
See SOC213 for course description.

WOMS 216 INTRODUCTION TO FEMINIST THEORY
3
See PHIL216 for course description.

WOMS 222 LANGUAGE AND GENDER
3
See LING222 for course description.

WOMS 233 WOMEN, BIOLOGY AND MEDICINE
3
Considers societal theories and medical practices concerning women and discusses their biological basis, their biological effects, sources of information with which to evaluate them, etc. Emphasis on preparing the student to make own medical and obstetrical decisions and to critically evaluate claims concerning male/female differences. May be cross-listed with CSC233.

WOMS 240 WOMEN AND VIOLENCE
3
Analyzes a variety of issues and topics relating to women and violence, including rape, domestic violence, images of women in popular culture, incest and child abuse, pornography, sexual harassment and women who use violence. Presents descriptive materials, sociological analysis and strategies for change.

WOMS 242 WOMAN AS IMAGE AND IMAGEMAKER
3
See ARTH242 for course description.
**WOMS 250 Topics in International Women's Studies**  
Explores topics related to women's lives in various parts of the world and may include women's history, women's creativity, and social movements in Africa, Asia, Europe, Australia or Latin America.  
**REstrictions:** May be repeated for credit when topics vary.

**WOMS 260 Women: Cultural Representations**  
Examines issues of representation across time and cultures. Offers critical analysis of how women have presented and represented themselves, as well as how their cultural productions and creative labors in a variety of media have been represented by others.

**WOMS 291 Women's History Through Film**  
Explores women's historical experiences through the medium of film. Students will view and discuss a variety of documentary films on women and read materials related to topics covered in the films. Films will deal with historical and contemporary issues in the United States and internationally.  
**May be cross-listed with HIST 291.**  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 298 Research on Race, Ethnicity and Culture**  
Lecture series in which faculty and guest speakers discuss their research on contemporary and historical perspectives on race, ethnicity and culture. Research presented from several disciplines, including sociology, history, literature, anthropology and psychology, among others.  
**May be cross-listed with ANTH 298.**  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 299 Research on Women**  
Interdisciplinary lectures in which faculty and advanced students share results of their research on women. Lectures cover issues in anthropology, sociology, political theory, psychology, philosophy, literature, history, theology, ethnic studies, music, art, math education, health, etc.  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 300 Women in American History**  
See HIST 300 for course description.

**WOMS 302 Women in Music: An Alternate Survey**  
See MUSC 302 for course description.

**WOMS 305 The Evolution of Human Sex Roles and Reproduction**  
See ANTH 305 for course description.

**WOMS 311 Renaissance Women, Society and Art**  
See ARTH 311 for course description.

**WOMS 315 Third World Women in Politics**  
See POSC 315 for course description.

**WOMS 318 Studies in Film**  
See ENGL 318 for course description.  
**Prereq:** ENGL 110.  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 320 Varying Authors and Genres**  
See FLIT 320 for course description.

**WOMS 321 Topics: Chinese Literature in Translation**  
See FLIT 321 for course description.  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 322 Topics: Classical Literature in Translation**  
See FLIT 322 for course description.

**WOMS 323 Introduction to Women and Politics**  
See POSC 323 for course description.

**WOMS 326 Topics: Hispanic Literature in Translation**  
See FLIT 326 for course description.

**WOMS 327 Race, Gender, Science**  
See PHIL 327 for course description.

**WOMS 328 Topics: Japanese Literature in Translation**  
See FLIT 328 for course description.

**WOMS 329 Topics: Italian Literature in Translation**  
See FLIT 329 for course description.

**WOMS 330 Varying Authors, Themes and Movements**  
See FLIT 330 for course description.

**WOMS 333 Psychology of Women**  
See PSYC 333 for course description.

**WOMS 334 African American Women's History**  
See HIST 334 for course description.

**WOMS 350 Gender and Criminal Justice**  
See CRJU 350 for course description.

**WOMS 352 Studies in Nineteenth-Century Literature**  
**Prereq:** ENGL 352 for course description.  
**Restrictions:** May be repeated once for credit when topics vary.

**WOMS 353 Twentieth Century British Literature**  
See ENGL 353 for course description.

**WOMS 363 Women in Cross-Cultural Perspective**  
Social realities of women within the cultures of Asia, Africa and Latin American societies. How institutions such as motherhood, the family, sexuality and work structure women's lives within the dominant social ideologies.  
**May be cross-listed with ANTH 363.**

**WOMS 366 Independent Study**  
1-6

**WOMS 372 Popular Culture in Urban Japan**  
See HIST 372 for course description.

**WOMS 375 Topics: Russian and Soviet Culture in Translation**  
See FLIT 375 for course description.

**WOMS 378 Women Writers**  
See ENGL 378 for course description.

**WOMS 381 Women in Literature**  
See ENGL 381 for course description.

**WOMS 382 Studies in Multicultural Literature in English**  
See ENGL 382 for course description.

**WOMS 383 Topics: Chinese Culture in Translation**  
See FLIT 383 for course description.  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 385 Women and the Economy**  
See ECON 385 for course description.  
**Prereq:** ECON 151.

**WOMS 389 Topics: Women and Health Issues**  
Varying special topics related to women's health. Topics may include, but are not limited to: the relationship between women, health and development; theoretical contributions of feminism to thinking about relationship between gender and health; women's health conditions in various parts of the world.  
**May be cross-listed with CSCI 389 and/or PHIL 389.**  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 390 Honors Colloquium**  
See ARSC 390 for description.  
**May be cross-listed with IFST 390.**

**WOMS 392 Honors Colloquium**  
See PHIL 392 for course description.

**WOMS 401 Foundations of Human Sexuality**  
See IFST 401 for course description.

**WOMS 402 Topics in Constitutional Law**  
See POSC 402 for course description.  
**Restrictions:** May be repeated for credit when topics vary.

**WOMS 407 Sociology of Sex and Gender**  
See SOCIO 407 for course description and restrictions.

**WOMS 410 Critical Issues in Feminist Scholarship**  
Capstone course for majors. Culminates in a senior conference. One of the following options must be completed: 400-level seminar course cross-listed with WOMS, a women's studies internship (WOMS 498), study abroad program with a WOMS component in the senior year, or a WOMS thesis (WOMS 411) or equivalent such as an art portfolio or performance piece.  
**Restrictions:** Senior majors and minors. Requires approval of women's studies advisor and course instructor. Students who select the cross-listed seminar option, study abroad option, thesis option or equivalent, or internship option must register for the appropriate courses.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOMS 411</td>
<td>Seminar in American History</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 413</td>
<td>Problems in American Government</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 415</td>
<td>Race, Class and Gender</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 418</td>
<td>Race, Gender and Poverty</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 420</td>
<td>Women's Studies Senior Thesis</td>
<td>3-6</td>
</tr>
<tr>
<td>WOMS 420</td>
<td>Women's Studies Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 436</td>
<td>Politics and Literature</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 439</td>
<td>Women and Revolution in Africa</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 440</td>
<td>Topics in Interpersonal and Organizational Communication</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 442</td>
<td>Topics in Organizational Communication</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 444</td>
<td>Seminar: Women in the Islamic Middle East</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 460</td>
<td>Women in International Development</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 465</td>
<td>Studies in Literature Genres, Types and Movements</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 466</td>
<td>Independent Study</td>
<td>1-6</td>
</tr>
<tr>
<td>WOMS 472</td>
<td>Seminar in Medieval History</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 475</td>
<td>Seminar in Modern European History</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 480</td>
<td>Seminar</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 484</td>
<td>Women in Sports</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 498</td>
<td>Internship in Women's Studies</td>
<td>3</td>
</tr>
<tr>
<td>WOMS 610</td>
<td>Critical Issues in Feminist Scholarship</td>
<td>3</td>
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**PREREQ: SOC210**

**RESTRICTIONS:** Women's studies majors or minors and permission of the WOMS program.

**PREREQ: SOC210**

**RESTRICTIONS:** Requires permission of instructor.

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**PREREQ: SOC210**

**RESTRICTIONS:** Requires permission of instructor.

**Note:** Students work 115 hours per semester in an agency or program associated with women's issues. Academic knowledge applied to actual working situations. Seminar discussions focus on internship experience in light of academic research and theory. RESTRICTIONS: Requires permission of instructor.

**Note:** Provides a survey introduction to women's studies for graduate students.