MAST 300 THE OCEANS 3
Geared to the non-science major. 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.

MAST 314 COMPARATIVE TERRESTRIAL AND MARINE ECOLOGY 3
See ENTO314 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 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 seas.
PREREQ: MATH241 or MATH221; CHEM103 or CHEM111; PHYS201 or PHYS207.

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.
RESTRICTIONS: For non-oceanographers. Requires graduate status.

MAST 603 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; vorticity dynamics; viscous flow and eddy flux.
RESTRICTIONS: Requires permission of instructor.

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

MAST 615 INTRODUCTION TO MARINE BIOLOGY 3
Involves laboratory, field and lecture study for a broad understanding of marine biology and biochemistry.
RESTRICTIONS: 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: MAST534.

MAST 617 METHODS IN MOLECULAR BIOLOGY LABORATORY 3
Provides practical experience in molecular biological techniques with emphasis on applications to marine related problems.
COREQ: MAST516.

MAST 618 MARINE MICROBIAL ECOLOGY 3
Examines 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: MAST534 or equivalent. Requires permission of instructor.

MAST 624 BIOLOGICAL OCEANOGRAPHY 3
Broad, multidisciplinary approach to marine life and biological processes in the oceans and estuaries. Species composition and biogeography discussed in relation to physical, chemical and geological processes. Examines and quantifies organisms' physiological responses to the abiotic and biotic environment.

MAST 626 TOPICS IN HALOPHYTE 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 habitats 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 booklets.
RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary.

MAST 631 MARINE GEOLOGY 3
See GEOG631 for course description.

MAST 633 IMAGE PROCESSING 3
See ELEG633 for course description.

MAST 634 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 structures 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 many engineering disciplines as well as to meteorology and oceanography.

MAST 636 APPLIED OCEAN SCIENCE SEMINAR 1
Invited speakers from university, industry and government research laboratories will discuss the latest advances in modeling and measurement of physical and biological properties of the oceans and coastal regions. Use of satellite remote sensing data and acoustic data in studies of ocean currents, waves, air-sea interaction turbulence, pollutant dispersion and coastal productivity will be emphasized.

MAST 637 GEOLOGICAL OCEANOGRAPHY 3
Focuses on processes that create the ocean 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 640 OPTOELECTRONICS 3
See ELEG640 for course description.

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 schemes. 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 CHEM110A.

MAST 647 PHYSICAL CHEMISTRY OF SEA WATER 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 650 CLAY MINERALOGY 3
Crystallography, chemistry, physical properties, occurrence, origin and alterations of the clay and related minerals; theory and techniques of identification, characterization and quantitative analysis using x-ray diffraction and electron microscopy; and cation exchange and size characteristics of clay minerals. Discussion of related topics, colloidal chemistry, thixotropic behavior, etc. May be cross-listed with GEOG650 and/or PLSC650.

MAST 670 U.S. 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 complexes 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, and the analysis of private and public 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 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 676 ENVIRONMENTAL ECONOMICS 3
Study of the choice of policies to protect the environment, including land, air and water resources. Theory of market failure and externalities, use of economic incentives in policy design, valuation of environmental resources and examination of inefficiencies in existing U.S. environmental policies. May be cross-listed with ECON676.
PREREQ: ECON300.

MAST 677 INTERNATIONAL OCEAN AND ENVIRONMENTAL POLICY 3
Focuses on understanding the strengths and weaknesses of the legal framework which governs ocean resources, ocean space and the environment beyond the limits of national jurisdiction. Evaluates international conventions which pertain to the ocean and environment as to impact and effectiveness.

MAST 678 COASTAL AND MARITIME LAW 3
Introduction to U.S. coastal and maritime law including legal issues of coastal title and boundaries, beach access, public trust doctrine, and carriage of goods by sea, torts against seamen, collisions, salvage, and marine pollution. May be cross-listed with POSC678 and/or UAPP678.
RESTRICTIONS: Open to Juniors, Seniors and graduate students.

MAST 679 SHIPPING AND PORT MANAGEMENT 3
A seminar to study the structure and management of the shipping industry and ports, policies for ocean commerce, international trade, and merchant marine. May be cross-listed with POSC679.

MAST 681 REMOTE SENSING OF ENVIRONMENT 3
Detection and mapping of land and ocean resources with optical, infrared and microwave sensors. Digital analysis of satellite images using multispectral and spatial analysis techniques and correlation with ground/ship data. Application to oceanography, coastal processes, geology, land use, geography, agriculture, climate and pollution studies. May be cross-listed with ELEEG681 and/or GEOG681.
RESTRICTIONS: Requires permission of instructor.

MAST 682 CURRENT TOPICS IN APPLIED OCEAN SCIENCE 1-3
Advanced treatment of selected areas of the applied ocean sciences, including acoustic wave propagation; remote sensing of physical biological properties of the oceans; experimental fluid dynamics; coagulation of suspended materials; and marine corrosion/biofouling.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 683 STRUCTURAL MATERIALS IN SEA WATER 3
Electrochemical, physical and biological interactions of metals, polymers, concrete, wood and composites with seawater. Emphasis on materials selection and deterioration prevention measures.
PREREQ: CHEM101.
RESTRICTIONS: For students with little or no background in material science. Not for credit for students that passed MAEC302.

MAST 684 PARTICLES IN THE AQUEOUS SYSTEM 3
Deals with all aspects of particle fluctuation that occur within the bounds of the natural environment. Brings together a number of fields (physics, engineering, chemistry and biochemistry) the theories, equations and principles that bear on the natural aqueous environment.
RESTRICTIONS: Requires permission of instructor.

MAST 685 FUNDAMENTALS OF ACOUSTICS 3
Fundamentals of sound and vibration, including equations governing vibrating string, vibration of bars, two-dimensional wave equation in plates, acoustic wave equation, transmission phenomena and acoustic radiation and reception. Other topics include absorption and attenuation of sound, resonators and ducts and filters, in the context of environmental and underwater acoustics.
PREREQ: Calculus. Introduction to differential equations.

MAST 686 REMOTE SENSING SEMINAR 1
Basic and applied research topics in remote sensing of earth resources, coastal processes, estuarine productivity, ocean dynamics and climatic effects presented by University students, faculty and guest speakers. Stresses advanced data acquisition and spectral and spatial image analysis techniques.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 687 COASTAL SCIENCE SEMINAR 1
Basic scientific and applied research topics in coastal science presented by University students, faculty and guest speakers. Stresses the processes related to fine particles in the marine environment.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 691 OCEAN FLUID DYNAMICS 4
See CIEE659 for course description.

MAST 692 ENVIRONMENTAL VALUES, MOVEMENTS AND POLICY 3
Examines citizens' beliefs and values, voluntary environmental groups and the ways in which individuals and groups affect environmental policy. Shows how research in areas such as environmental sociology and ecological anthropology can inform policy. May be cross-listed with UAPP692.

MAST 693 WAVES IN THE MARINE ENVIRONMENT 3
General principles of wave mechanics, kinematics and dynamics. Applications to surface gravity waves, acoustical waves, electromagnetic waves and large scale geophysical waves. May be cross-listed with CIEE693.
PREREQ: MEEG690.

MAST 800 DYNAMICAL PHYSICAL OCEANOGRAPHY 3
Topics include basic definitions, conservation of mass, conservation of momentum, conservation of vorticity, horizontal frictionless flow, wind-driven circulation, stability and double diffusion, thermocline circulation and tides.
RESTRICTIONS: Requires permission of instructor.

MAST 806 GEOPHYSICAL FLUID DYNAMICS I 3
Development of the fundamental fluid dynamics used in analyzing flows in physical oceanography and meteorology. Fundamentals of vorticity dynamics and geostrophy, inviscid theory of Rossby waves, and Ekman boundary layers.
PREREQ: MEEG683 and MEEG684.

MAST 808 COASTAL/ESTUARINE PHYSICAL DYNAMICS 3
Coastal and estuarine dynamics covering continental shelf wind-forced circulation; continental shelf waves; modes of estuarine circulation; shelf-estuary interaction; shelf break front dynamics; and estuarine and river plume fronts.
PREREQ: MAST602.
MAST 809 The Ocean and Climate Variation 3
Study of the ocean-atmosphere system; the fluxes of heat, water and energy in the ocean and interchanges with the atmosphere; budgets and mechanisms of exchange; and interannual and long-term climate variations as related to the ocean.
PREREQ: MAST602.

MAST 811 Oceanographic Time Series Analysis 3
Quantitative techniques for data processing and time series analysis. Topics include basic definitions, linear systems, digital filters, statistical techniques, auto-spectrum estimation, cross-spectrum estimation, Monte Carlo technique, empirical orthogonal function analysis and rotary spectrum estimation.
RESTRICTIONS: Requires permission of instructor.

MAST 814 Political Economy of the Environment 3
See UAPP810 for course description.

MAST 815 Deep-Sea Sedimentation 3
Students will examine the formation of deep-sea sediments. Emphasis will be placed on the geographic distribution of sediments, the processes that developed these sediments, and how they relate to global paleoceanographic and paleoclimatic changes.
PREREQ: MAST631.
RESTRICTIONS: Requires permission of instructor.

MAST 816 Biological Oceanographic Process 1-4
Multidisciplinary approach to the abundance and distribution of organisms in the oceans; the physiological and behavioral responses of organisms to the abiotic and biotic environment and the role of organisms in modifying the environment. Taught as six modules: algae, bacteria, protozoa, zooplankton, benthos, fish and fisheries.
PREREQ: General biology, ecology, microbiology, and invertebrate biology.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 817 Research Design and Methods 3
Covers the logic, design, and practice of public policy research, and should be helpful for planning thesis or dissertation research, regardless of topic or methods used. Methods covered draw from social and political sciences, and process evaluation of policy.

MAST 820 Experimental Design Seminar 1
Forum for presentation of research plans or results with emphasis on experimental design and data analysis. Enabling discussion of preparation of research proposals and sharpens critical assessment of own and colleagues' work.

MAST 821 Marine Biology/Biochemistry Seminar 1
With each offering, addresses a different specific topic, e.g., tropical marine biology, larval dispersal, estuarine productivity, etc.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 823 Phytoplankton Biology 3
Comprehensive treatment of the structure, biochemistry, physiology and ecology of phytoplankton to understand its distribution and growth in the sea. Aspects include spatial and temporal variations of phytoplankton biomass and production, mathematical descriptions of growth, photosynthesis and nutrient uptake; mechanisms of biological adaptation to environmental variables; and structural and biochemical bases of phytoplankton taxonomy and biogeography.
PREREQ: MAST624.

MAST 827 Current Topics in Marine Biology 1-4
Subject areas change each term and will be announced in the registration booklet. Topics include aspects of plant biology, fish and invertebrate ecology and other aspects of marine ecology. May include lectures, tutorials and demonstration of techniques.
RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary.

MAST 828 Current Topics in Marine Biochemistry 1-4
Subject areas change each term and will be announced in the registration booklet. Topics include marine chemical ecology, marine natural products chemistry, marine biochemistry of marine plants and animals. May include lectures, tutorials and demonstration of techniques.
PREREQ: Graduate course in biochemistry.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 831 Coastal and Estuarine Geology 3
Sedimentation processes and products in coastal, estuarine, and shelf environments. Topics include: sediment production, transport and physical/chemical properties; shoreline and seabed morphodynamics; strata formation and sea level variability. Emphasis is on the character and distribution of sedimentary deposits in relation to coastal ocean processes.
PREREQ: MAST637 or GEO631 or permission of instructor.

MAST 834 Global Governance: Theory and Cases 3
See POSC838 for course description.

MAST 843 Global Governance: Theory and Cases 3
See POSC838 for course description.

MAST 847 Current Topics in Chemical Methods in Oceanography 1-3
Principles, capabilities and limitations of analytical methods to the chemistry of marine waters and sediments. Analytical methods include electrochemical, spectroscopic, chromatographic, electron microscopy and surface techniques. Emphasis on the analysis of trace components (biochemical, inorganic and organic) in the marine environment. Laboratory experiments. Topics vary and will be announced in the registration booklet.
PREREQ: MAST546 or analytical chemistry.
RESTRICTIONS: May be repeated for credit when topics vary.

MAST 848 Geochemical Oceanography 3
Chemical origin and formation of the ocean; chemistry of marine sediments; transfer of chemicals to and within the sea (weathering and global cycles); marine precipitates; chemical principles of marine geologic reactions (solubility and radio); sediment genesis and pore water chemistry; and use of stable and radioactive isotopes in the oceans.
PREREQ: Aquatic chemistry and physical chemistry.

MAST 849 Organic Chemical Oceanography 3
Covers descriptive organic chemical studies of seawater and processes that influence organic reactions in seawater. Laboratory devoted to methodology for analysis of organic compounds in seawater and marine organisms.
PREREQ: Organic chemistry.

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 biochemical reactions. May be cross-listed with CHEM55.
PREREQ: MAST646, aquatic chemistry or physical chemistry.

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

MAST 854 Marine Sedimentary Geochemistry 3
Fluxes of major, minor, trace and nutrient elements from ocean waters to marine sedimentary deposits, with emphasis on the deposition of material on the ocean floor, the transport and reaction regimes in sediments that redistribute this material, and return fluxes from sediments to the overlying water.
PREREQ: MAST646.

MAST 855 Coastal and Estuarine Chemistry 3
Distributions, behavior, and chemical processes in estuarine and coastal waters are examined in this advanced general ocean chemistry course. Greater heterogeneity of physical controls and anthropogenic influences give a unique nature to this coastal corridor in the global flux from land to sea.
PREREQ: MAST646.

MAST 856 Biogeochemical Oceanography 1-4
Modular graduate seminar of individual offerings inspects aspects of marine biogeochemical cycle. Includes such topics as atmospheric and oceanic fluxes, climatic feedback 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 methods of reconstruction of ocean history and the interpretation of the marine sedimentary record of the past 60 million years. Specific topics include concepts and application of light stable isotope mass spectrometry, biogeochemical cycling of elements and marine stratigraphy. May be cross-listed with GEO585.
PREREQ: Algebra, Precalculus, CHEM101 through CHEM112, PHYS201-202, BISC103, Geological Oceanography (MAST537) and Quaternary Geology and Geochronology (GEO648), or equivalent.
RESTRICTIONS: Open to Seniors and graduate students only.

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: MAST670.

MAST 871 Environmental Policy and Administration 3
See POSC818 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.
MATH 875 ADVANCED FISHERY ECONOMICS 3
Theoretical and applied study of the optimal utilization and management of commercial and recreational fisheries. 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 crosslisted with ECON 875.
PREREQ: MAST675 or ECON675

MATH 880 PRINCIPLES OF APPLIED OCEAN SCIENCE 3
Principles of ocean energy conversion, remote sensing, materials and corrosion, soil mechanics, foundations, structures, intensive aquatic production, coastal erosion and sedimentation are studied in the context of creative interdisciplinary research and applied in the analysis of a single major marine problem or opportunity using a “case study” approach. Normally involves a practicum.

MATH 881 SATELLITE OCEANOGRAPHY 3
Fundamentals of remote sensing in oceanography, including space platforms, their orbits, instruments, data retrieval and image processing. Oceanographic applications of remote sensing, including visible, infrared and microwave techniques for sensing ocean color, temperature, salinity, currents and waves. Recent developments of remote sensing models for oceanic and new developments in data analysis.

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

MATH 884 BIOLOGICAL EFFECTS AT SURFACES 3
Fundamentals of bioattachment for micro and macroorganisms: Conditioning films and fallout mechanisms. Influence of chemical and electrical surface properties. Applications to marine fouling and its control, mariculture, degradation of heat transfer surfaces, dental plaque formation, biomedical implants and others.

MATH 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.

MATH 969 DOCTORAL DISSERTATION 1-12 PF

MATHEMATICS

MATH 010 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.

MATH 012 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.

MATH 113 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.

MATH 114 COLLEGE MATHEMATICS AND STATISTICS 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 including descriptive and inferential statistics.

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 and MATH 241) are emphasized.

MATH 117 PRECALCULUS 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. Includes a lab/workshop.
PREREQ: MATH 101 or MATH 102 or 2 years of high school algebra.

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.

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 (MATH 221 and MATH 241). Variable credit option provides an opportunity to change the pace of the course.

MATH 172 ALGEBRA AND PRECALCULUS 2
Mastery-based algebra review followed by concepts required for MATH 221 developed around functions and their graphs (polynomial, rational, exponential and exponential).

MATH 179 PROBLEM SOLVING STRATEGIES I 1
Designed to study a multitude of problem solving strategies such as working backwards, look for a pattern, etc. In particular, will emphasize the use of these strategies with the content that secondary mathematics teachers normally teach.

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.

MATH 202 INTRODUCTION TO STATISTICAL METHODS II 3
Descriptive statistics, graphical displays, sampling, variation, normal distribution, estimation, hypothesis testing, one-way 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.

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.

MATH 210 DISCRETE MATHEMATICS I 3
Sets, logic, induction, number systems, counting, introduction to graph theory, sequences and formal power series.

MATH 221 CALCULUS I 3
Topics include functions, graphing functions, limits, derivatives, sequences, series, exponential and logarithmic functions, and integration.

MATH 222 CALCULUS II 3
Topics include integration, Taylor polynomials, series, multivariable calculus and trigonometric functions.

MATH 230 FINITE MATHEMATICS WITH APPLICATIONS 3
Set theory, probability, optimization, linear programming and an introduction to matrix methods.

MATH 241 CALCULUS III 3
Topics include vector and multivariable calculus and vector analysis.

MATH 242 HONORS CALCULUS III 3
Topics include vector and multivariable calculus and vector analysis.

MATH 243 HONORS CALCULUS IV 3
Topics include vector and multivariable calculus and vector analysis.

MATH 244 HONORS CALCULUS V 3
Topics include vector and multivariable calculus and vector analysis.

MATH 245 HONORS CALCULUS VI 3
Topics include vector and multivariable calculus and vector analysis.
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 MATH 241 and MATH 221.

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.
Prerequisite: MATH 241.
Restrictions: Credit cannot be received for both MATH 242 and MATH 222.

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.
Prerequisite: MATH 242.

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.
Prerequisite: MATH 210 and MATH 243.

MATH 250 ENGINEERING PROBABILITY AND STATISTICS  3
Prerequisite: MATH 243.

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.
Prerequisite: MATH 251.

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.
Prerequisite: MATH 252.

MATH 280 INSIGHTS INTO MATHEMATICS  3
A basic course. Mathematics presented as a human endeavor. Topics include problem solving, reasoning and modeling.
Prerequisite: MATH 114 or MATH 115.
Restrictions: For liberal arts students not necessarily planning further study in mathematics.

MATH 300 STATISTICAL METHODS AND THEORY  4
Exploratory data analysis, probability, estimation, classical statistical inference, regression, multiple regression. Laboratory covers use of statistical packages.
Prerequisite: MATH 210 and MATH 243.

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.
Prerequisite: MATH 243.
Restrictions: Credit not given for both MATH 302 and either MATH 341, MATH 342, MATH 351 or MATH 352.

MATH 303 DIFFERENTIAL EQUATIONS COMPUTING LAB  1
Provides computing experience in differential equations.
Corequisite: MATH 302.

MATH 305 APPLIED MATHEMATICS FOR CHEMICAL ENGINEERING  3
A specially designed mathematics course designed for chemical engineering majors. Emphasis is given on the interaction between mathematical theory and its applications. May be cross-registered with CHE 305.
Prerequisite: MATH 302.
Restrictions: For chemical engineering majors only.

MATH 315 DISCRETE MATHEMATICS II  3
Algorithmic graph theory, correctness and complexity of algorithms, recurrence relations, numerical algorithms, algorithms for polynomials (such as Horner's method).
Prerequisite: MATH 210 and MATH 241.

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.
Prerequisite: MATH 242.
Restrictions: Credit not given for both MATH 341 and either MATH 302, MATH 349 or MATH 351. Open to ELEG and CPEG students only.

MATH 342 DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA II  3
A continuation of MATH 341. 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.
Prerequisite: MATH 341.
Restrictions: Credit not given for both MATH 342 and either MATH 302, MATH 349 or MATH 352. Open to ELEG and CPEG students only.

MATH 349 ELEMENTARY LINEAR ALGEBRA  3
Prerequisite: MATH 230 or MATH 242.
Restrictions: Credit not given for both MATH 349 and either MATH 341, MATH 342 or MATH 351.

MATH 351 ENGINEERING MATHEMATICS I  3
Prerequisite: MATH 243.

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.
Prerequisite: MATH 243.
Restrictions: Credit not given for both MATH 351 and either MATH 302, MATH 341 or MATH 349. Open to ELEG students only.

MATH 353 ENGINEERING MATHEMATICS III  3
Prerequisite: MATH 351.
Corequisite: MATH 352.
Restrictions: Open to ELEG students only.

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.
Corequisite: MATH 380.
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.
Corequisite: MATH 379.
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.
Prerequisite: MATH 380.
Corequisite: EDUC 400.

MATH 389 GRAPH THEORY  3
Basic graph theory (paths and circuits, trees and forests, connectivity and coloring theorems) and network flow theory. Applications to areas such as economics, engineering, chemistry and sociology.
Prerequisite: MATH 210.
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: MATH345

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 algorithmic aspects. May be cross-listed with CISC410.
PREREQ: MATH349 and CISC106.
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. May be cross-listed with CISC411.
PREREQ: MATH426 or CISC410.

MATH 450 STATISTICS FOR ENGINEERING AND PHYSICAL SCIENCES 3
Continuum mechanics: probability; distribution theory, estimation and hypothesis testing. Experimental design, analysis of variance and regression theory.
PREREQ: MATH243.

MATH 451 ABSTRACT ALGEBRA I 3
Basic properties of the integers and the rationals, fields of quotients, polynomial rings, rootfinding, 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 MATH245.

MATH 466 INDEPENDENT STUDY 1-6
Introduction to analytic functions, contour integration, power series, residues and conformal mapping.
PREREQ: MATH243.

MATH 510 MODELING AND ANALYSIS OF ENVIRONMENTAL SYSTEMS 3
An elementary course to introduce basic analytical and numerical methods for studying mathematical problems arising in environmental sciences.
PREREQ: MATH242 or equivalent.
RESTRICTIONS: Open to environmental science graduate students or by consent of instructor.

MATH 512 CONTEMPORARY APPLICATIONS OF MATHEMATICS 3
Rigorous 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: MATH425.
RESTRICTIONS: Graduate credit only for teachers.

MATH 581 ON THE NATURE OF PROOF 3
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 3
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 3
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 3
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 3
Designed to provide hands-on learning experience in contemporary applications of mathematics. Topics include discrete mathematics, statistics, and the analysis of sequences and series. Software is used in such activities.
PREREQ: MATH586.
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 586 PROBLEM SOLVING I 3
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 PROBLEM SOLVING II 2
Continuation of MATH586. Emphasis on "introspection" of participants into how they themselves solve problems. Provides teachers an opportunity to engage in and explore techniques for generating problems, solving problems, and reflecting on the processes used in such activities.
PREREQ: MATH586.
RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 600 FUNDAMENTALS OF REAL ANALYSIS I 3
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 3
Continuation of MATH600.
PREREQ: MATH600.

MATH 611 INTRODUCTION TO NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING 3
Introduction to numerical computing, analysis and solution of systems of linear equations, linear least-squares, eigenvalue problems, methods for unconstrained optimization, solution of systems of nonlinear equations. Experience with standard computer packages, code development and simulations of applied problems.
PREREQ: MATH503 or MEEG863 or PHYS267.
MATH 612 INTRODUCTION TO NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS 3
Basic finite difference schemes for standard model problems. Schemes for integrating time-dependent problems (including ordinary differential equations). Curved boundaries. Dispersion and Von Neumann analysis. Lac equivalence theorem and the CFL condition. PREREQ: MATH503 or MEEG83 or PHYS207.

MATH 613 APPLIED SYMBOLIC COMPUTATION 3
See CSC232 for course description.

MATH 616 INTRODUCTION TO APPLIED MATHEMATICS I 3
Introduction to ideas and techniques used in solving problems arising in a variety of physical settings. Stability of nonlinear systems of ODE's, Sturm-Liouville problems and Green's functions. The wave, heat, and Laplace equations. Elementary analysis of some nonlinear PDE's. Special functions. Asymptotic expansions and perturbation theory. PREREQ: One semester of advanced calculus.

MATH 617 INTRODUCTION TO APPLIED MATHEMATICS II 3
Continuation of MATH 616. PREREQ: MATH 616.

MATH 630 PROBABILITY THEORY AND APPLICATIONS 3
Introduction to probability theory as background for further work in statistics or stochastic processes. Sample spaces and axioms of probability; discrete and continuous spaces having equally likely events; conditional probability and independence; random variables and their distributions; classical discrete and continuous random variables; mathematical expectation and moments of a distribution; the distribution of a function of a random variable; Chebyshev's inequality; and law of large numbers and central limit theorem.

MATH 631 INTRODUCTION TO STOCHASTIC PROCESSES 3
Classical stochastic processes with emphasis on their properties which do not involve measure theory. Markov chains in discrete and continuous time with examples from random walk, birth and death processes, branching processes and queueing theory. Renewal and Markov renewal processes. Basic notions of Brownian motion and second-order processes. PREREQ: MATH 630.

MATH 650 ABSTRACT ALGEBRA 3
Elementary number theory, polynomial and abstract rings, PID's and Euclidean rings, groups, cyclic and Abelian groups, direct products, algebraic field extensions, splitting fields, field automorphisms, finite fields. PREREQ: Undergraduate abstract algebra.

MATH 672 VECTOR SPACES 3
Vector spaces, linear transformations, decomposition theorems and bilinear forms. PREREQ: MATH 349.

MATH 688 COMBINATORICS AND GRAPH THEORY I 3
Combinatorial enumeration, designs and geometries, graphs, set systems, partially ordered sets, existence and construction of various combinatorial objects, Ramsey theory. PREREQ: MATH 650 or consent of instructor.

MATH 689 COMBINATORICS AND GRAPH THEORY II 3

MATH 694 METHODS OF OPTIMIZATION 3
Review of linear programming, unconstrained and constrained non-linear programs, numerical methods, Kuhn-Tucker theory, duality and Lagrange multipliers. PREREQ: MATH 602.

MATH 805 REAL ANALYSIS 3
Topics include Lebesgue measure and integration, differentiation and absolute continuity, lp-spaces, distributions and Sobolev spaces. PREREQ: MATH 602.

MATH 806 FUNCTIONAL ANALYSIS 3
Fundamental results for normed linear spaces with special emphasis on the theory of Hilbert space, spectral theory and applications to integral and differential equations. PREREQ: MATH 602.

MATH 807 COMPLEX ANALYSIS 3
Complex numbers; analytic functions; geometry of elementary functions; integrals; power series; residues and poles. PREREQ: MATH 602.

MATH 810 ASYMPTOTIC AND PERTURBATION METHODS 3
Asymptotic expansions of real and complex integrals; singular perturbation theory for ODEs and PDEs. WKBI and multiple-scale expansion techniques. Selected applications. PREREQ: MATH 617 and knowledge of analytic function theory or consent of instructor.

MATH 812 INVERSE PROBLEMS 3
Ill-posed problems, regularization methods, Tikhonov regularization, the discrepancy principle, regularization by discretization. Selected topics from non-linear inverse problems. PREREQ: MATH 617 and MATH 602.

MATH 821 TOPICS IN APPLIED ANALYSIS 3
Topics chosen from ordinary differential equations, harmonic analysis, optimization theory and integral equations. RESTRICTIONS: Requires permission of instructor.

MATH 824 TOPICS IN APPLIED MATHEMATICS 3
Topics chosen from numerical analysis, elasticity, electromagnetic theory, fluid dynamics and other areas. RESTRICTIONS: Requires permission of instructor.

MATH 826 TOPICS IN PURE MATHEMATICS 3
Topics vary from year to year and will be chosen from a variety of areas in pure mathematics. RESTRICTIONS: Requires permission of instructor.

MATH 827 TOPOLOGY 3
Generation and properties of topological spaces including connectedness and compactness. Continuity, separation and countability properties, convergence of nets and filters.

MATH 835 PARTIAL DIFFERENTIAL EQUATIONS I 3
Existence and uniqueness for elliptic, parabolic and hyperbolic equations. Boundary and initial value problems for equations of hyperbolic and parabolic type in two independent variables. Classical approaches employed. PREREQ: MATH 617.

MATH 836 PARTIAL DIFFERENTIAL EQUATIONS II 3
Cauchy's problem and initial boundary value problems for hyperbolic and parabolic equations and systems. Boundary value problems for elliptic equations and systems. Modern approaches will be emphasized. PREREQ: MATH 635 and MATH 606.

MATH 838 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS 3
Introduces concepts of consistency, stability and convergence of numerical schemes. Finite element and finite difference schemes and their applications to fundamental partial differential equations will be emphasized. PREREQ: MATH 612 or equivalent.

MATH 843 GROUPS AND THEIR APPLICATIONS 3
Review of elementary group theory, permutation groups, group action, Sylow theorems, semi-direct and wreath products, classical matrix groups, automorphism groups of combinatorial structures, Polyas enumeration. May also include representation theory, free groups, finite groups of isometries of Euclidean spaces. PREREQ: MATH 650 or consent of instructor.

MATH 850 THEORY OF PROBABILITY 3
Mathematically rigorous treatment of probability theory with emphasis on methods and tools for applications. Axioms of probability and independence. An introduction to large deviation theory and Martingale theory. Probabilistic methods in combinatorics and analysis. PREREQ: MATH 602 or consent of instructor.

MATH 868 RESEARCH 1-6

MATH 869 MASTER'S THESIS 1-6

MATH 870 READING IN MATHEMATICS 1-6

MATH 884 FINITE GEOMETRIES AND DESIGNS 3
Classical projective and affine spaces, non-desarguesian planes, coordinate systems, spreads and packings, collineations and units, collinear generation groups and Singer cycles. Further topics chosen from related geometrical designs, associated codes and algebraic surfaces/varieties. PREREQ: MATH 688 and MATH 645.

MATH 885 EXTREMAL COMBINATORICS 3
Topics from extremal graph theory, extremal set theory and combinatorial geometry. Methods used will be algebraic, geometric and probabilistic. PREREQ: MATH 688 and MATH 689.

MATH 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.

MATH 969 DOCTORAL DISSERTATION 1-12 PF

MEDICAL TECHNOLOGY

MEDT 100 INTRODUCTION TO MEDICAL TECHNOLOGY 1
Orientation to the profession of Medical Technology with overview of clinical laboratory science areas. Discussion of the laboratory's critical role in healthcare delivery and the diversity of employment and career opportunities.
MEDICAL TECHNOLOGY

MEDT 210 INFORMATION TECHNOLOGIES AND COMMUNICATION SKILLS 2
Focuses on the use of computer and education technology such as PowerPoint, Word, Excel, WWW browsers and email as tools to achieve effective communication necessity for success in the biomedical sciences.
RESTRICTIONS: Open to Sophomores, Juniors and Seniors Requires permission of instructor.

MEDT 366 INDEPENDENT STUDY 1-6

MEDT 370 PHLEBOTOMY PRACTICUM 1
Introduction to the theory and performance of phlebotomy. Supervised clinical experience in the application of laboratory theory and techniques in phlebotomy.
RESTRICTIONS: Open to medical technology majors only.

MEDT 372 DIAGNOSTIC PARASITOLOGY 2
Study of human parasites, emphasizing detection and identification of diagnostic forms.
RESTRICTIONS: Open to medical technology majors only.

MEDT 375 CLINICAL LABORATORY PRINCIPLES AND STATISTICS 2
Basic laboratory principles including solution preparation, mathematics, safety, quality assurance and spectrophotometry. Introductory statistics including applications to laboratory information systems and research.
RESTRICTIONS: Requires permission of instructor.

MEDT 380 CLINICAL IMMUNOLOGY AND MEDICAL VIROLOGY 4
Introductory immunology concepts and the use of immunological assays, such as complement fixation, enzyme immunoassays, and fluorescent antibody assays, for the diagnosis of infectious diseases and immunological disorders. Study of viruses, diseases they cause, and the methods used to diagnose viral infections.
PREREQ: BISC206, BISC300, and CHEM213 or CHEM321.
RESTRICTIONS: Requires permission of instructor.

MEDT 390 INTRODUCTION TO MOLECULAR DIAGNOSTICS 2
Introduction to molecular biology principles and techniques used in the clinical laboratory for diagnosis, prognosis and treatment of disease. Topics include isolation of DNA, RNA, and proteins from biological fluids, electrophoresis, PCR, viral load testing and DNA sequencing.
PREREQ: BISC206, and CHEM213 or CHEM321.
RESTRICTIONS: Requires permission of instructor.

MEDT 391 INTRODUCTION TO MOLECULAR DIAGNOSTICS LABORATORY 1
Laboratory exercises that correlate with MEDT390. Techniques include isolation of nucleic acids from biological fluids, electrophoresis, PCR, viral load testing and DNA sequencing.
PREREQ: BISC208, and CHEM213 or CHEM321.
RESTRICTIONS: Requires permission of instructor.

MEDT 400 URINALYSIS AND BODY FLUIDS 2
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 3
Application and theory of manual and automated techniques used in diagnostic and therapeutic medicine. Focus on clinical procedures for carbohydrates, proteins, lipids, nonprotein nitrogenous compounds, blood gases and pH, and electrolytes.
RESTRICTIONS: Open to medical technology majors only.

MEDT 403 CLINICAL PHYSIOLOGICAL CHEMISTRY II 4
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 2
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 2
Study of the pathophysiology of erythrocytic and leukocytic disorders and the laboratory findings of these disorders.
PREREQ: MEDT404.

MEDT 406 MEDICAL MICROBIOLOGY 3
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 1
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 2
Laboratory exercises that complement the topics covered in MEDT401.
COREQ: MEDT401.

MEDT 413 CLINICAL PHYSIOLOGICAL CHEMISTRY LABORATORY II 2
Laboratory exercises that complement the topics covered in MEDT403.
COREQ: MEDT403.

MEDT 414 HEMATOLOGY I LABORATORY 1
Study and implementation of laboratory procedures that correlate with the material taught in MEDT404.
COREQ: MEDT404.

MEDT 415 HEMATOLOGY II LABORATORY 2
Study and implementation of laboratory procedures in hematology consistent with the material taught in MEDT405.
COREQ: MEDT405.

MEDT 416 MEDICAL MICROBIOLOGY LABORATORY 2
Laboratory study of microorganisms important in the normal flora and infectious diseases of humans.
COREQ: MEDT406.

MEDT 418 MEDICAL TECHNOLOGY SENIOR SEMINAR 0 PF
Readings, case studies, career planning and orientation for clinical education.
RESTRICTIONS: Requires Senior and major status.

MEDT 419 IMMUNOHEMATOLOGY I LABORATORY 1
Laboratory procedures consistent with MEDT409.
COREQ: MEDT409.

MEDT 420 IMMUNOHEMATOLOGY II 1
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 1
Laboratory procedures consistent with MEDT420.
COREQ: MEDT420.

MEDT 430 DIAGNOSTIC BACTERIOLOGY AND MEDICAL MYCOLOGY 2
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 non-pathogenic bacteria and fungi in clinical specimens.
PREREQ: MEDT406 and MEDT416.

MEDT 431 DIAGNOSTIC BACTERIOLOGY AND MEDICAL MYCOLOGY LABORATORY 2
Study and implementation of laboratory procedures that correlate with the material taught in MEDT430.
COREQ: MEDT430.

MEDT 461 LABORATORY PRACTICE AND LEADERSHIP I 1
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 1
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 1 PF
Clinical experience in the application of laboratory theory and techniques in urinalysis and serology.
PREREQ: MEDT380 and MEDT400.

MEDT 473 CLINICAL CHEMISTRY PRACTICUM 3 PF
Supervised experience in the application of laboratory theory and techniques in clinical chemistry.
PREREQ: MEDT403 and MEDT413.

MEDT 475 CLINICAL HEMATOLOGY PRACTICUM 3 PF
Supervised experience in the application of laboratory procedures in hematology.
PREREQ: MEDT405 and MEDT415.
MECH 101 Introduction to Mechanical Engineering 3
Introduces the mechanical engineering profession. Uses a team design project to illustrate the engineering design process. Introduces computational tools.

MECH 112 Statics 3
To recognize, idealize and solve problems involving rigid bodies in static equilibrium using scalar and vector techniques. Introduces free body diagrams, theory of stress, and work-energy principles. Emphasizes the role of statics in the design process.
Coreq: MATH242 and PHYS207.

MECH 202 Computer-Aided Engineering Design 3
Introduces computer-aided engineering design by teaching the student's ability to 1) think visually, 2) control the design audience through parametric solid modeling and drafting standards, and 3) begin to recognize the connection between a virtual design and an actual component.
Prereq: MECH112 and PHYS207.

MECH 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: MECH112.

MECH 301 Machine Design: Kinematics and Kinetics 3
Kinematic analysis of mechanisms and machines, kinematic synthesis, cam design, gear train analysis, and machine dynamics.

MECH 304 Machine Design: Elements 3
Aspects of machine design: statistical nature, theories of failure and design for strength and design of machine elements.
Prereq: MECH215.
Restrictions: Open to majors only.

MECH 311 Vibration and Control 4

MECH 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; joining and joining of materials; practical examples of materials selection in design and the use of material test methods.
Prereq: MEEG302.

MECH 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: MECH112 and MATH351.
Restrictions: Open to majors only.

MECH 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: MECH331.

MECH 342 Heat Transfer 3
Prereq: PHYS210.

MECH 344 Thermodynamics 3
Prereq: PHYS210.

MECH 346 Thermal Lab 1
Introduction to experimental and measurement techniques related to thermodynamics and heat transfer. Designed to complement MECH342 and MECH344.
Prereq: PHYS210 and PHYS345.
Coreq: MECH342 and MECH344.

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

MECH 366 Independent Study 1-6

MECH 401 Senior Design 6
In this capstone engineering practice course, student teams develop real engineering systems; 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: MECH344.
Restrictions: For majors only.

MECH 411 Structural Mechanics for Mechanical and Aerospace Engineering 3
Introduction to theory of plates and shells, including analysis of stresses and deformations, vibrations, stability, and thermal response of structures. Topics include modern aerospace and advanced structural systems. Designed to complement MEEG342 and MEEG344.
Prereq: MECH211 and MECH215.

MECH 415 Finite Element Analysis 3
Introduction to the finite element method with applications to structural engineering problems. Direct and variational approaches to element formulation; interpolation functions and isoparametric elements.
Prereq: MECH215.

MECH 423 Vibrations 3
Introduction to mechanical vibrations and structural dynamics. Analysis and synthesis by matrix and energy methods. Applications to machine design, vehicle dynamics and shock and vibration isolation.
Prereq: MECH211.

MECH 432 Aerodynamics 3
Prereq: MECH331.

MECH 433 Bioengineering Fluids and Transport 3
Anatomy and physiology of pulmonary, cardiac, genitourinary, cerebrospinal, and synovial systems. Application of fluid, heat, and mass transport fundamentals to analysis of these biological systems.
Prereq: MECH332 and MECH342.

MECH 434 Air Pollution Processes 3
Physical, chemical, and meteorological processes that govern the photochemistry and 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, and turbulent transport in geophysical and urban environments, meteorology, and deposition.
Restrictions: Requires upper division status in engineering.

MECH 441 Combustion 3
Fundamentals and application of combustion. Topics include thermodynamics; chemical kinetics; explosives and oxidative characteristics of fuels; combustion-generated pollutants; ignition and flame stability; detonation; laminar flow; diffusion flames; and droplet combustion.
Prereq: MECH334.

MECH 445 Senior Research I 3
Investigation of an experimental nature to be carried out and reported upon by each student.
Restrictions: Open to Seniors only.

MECH 446 Senior Research II 3
Investigation of an experimental nature to be carried out and reported upon by each student.
Restrictions: Open to Seniors only.

MECH 466 Independent Study 1-6
MEEG 481 COMPUTER SOLUTION OF ENGINEERING PROBLEMS 3
Overview of numerical methodologies 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 483 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 600 SEMINAR PF

MEEG 610 INTERMEDIATE SOLID MECHANICS 3
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 3
Composite and isotropic sandwich structures are studied for stresses, deformations, buckling loads, natural frequencies and dynamic response under mechanical and environmental loadings, involving 2D, solid, foam and trusscore sandwich comprising beam, plate, ring and shell structures. Design and minimum weight optimization are treated.

MEEG 612 BIOMECHANICS OF HUMAN MOVEMENT 3
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. Some coursework involves computer modeling of musculoskeletal systems.
PREREQ: MEEG112 and MEEG211

MEEG 614 FRACTURE OF MATERIALS 3
See MEEG614 for course description.

MEEG 615 MECHANICAL PROPERTIES OF MATERIALS 3
See MEEG615 for course description.

MEEG 616 COMPOSITE MATERIALS STRUCTURES 3
Introduction to composite materials; anisotropic elasticity and laminate theory; plates and panels of composite materials; beams, columns and rods; composite material shell structures; energy methods; strength and failure theories; adhesive bonding and mechanical fastening; hygrothermal effects; stress analysis, buckling, vibrations and impact.

MEEG 617 COMPOSITE MATERIALS 3
Fiber and matrix materials, fiber-matrix interface, polymer, metal, ceramic and carbon matrix composites, geometric aspects, elastic properties, laminate theory, strength of anisotropic composites, strength of laminates, durability, hybrid composites, flexible composites and textile structural composites.

MEEG 620 INTERMEDIATE DYNAMICS 3
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 3
Static optimization, numerical methods for static optimization, calculus of variations. Dynamic optimization: basic results, 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 3
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 nonplanar phase space analysis, local and global bifurcation analysis, catastrophe theories, resonances.
PREREQ: MATH351.

MEEG 624 CONTROL OF DYNAMIC SYSTEMS 3
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: MEEG211, MEEG311 and MATH352.

MEEG 630 INTERMEDIATE FLUID MECHANICS 3

MEEG 633 BIOENGINEERING FLUIDS AND TRANSPORT 3
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 3
Physical, chemical, and meteorological processes that govern the photochemistry and 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 3
Pointwise velocity measurement including differential pressure measurement, hot-wire anemometry, and laser-Doppler anemometry. Global measurement techniques based on particle imaging and image processing. Signal processing, statistics and uncertainty analysis.

MEEG 637 TWO-PHASE FLOW AND PARTICLE TECHNOLOGY 3
Modeling mass, momentum, heat transfer, and mixing in particle laden flows, slurries, and bubbly flows. Issues in particle process industry such as particle separation, dispersion, agglomeration, transport and handling. Particle measurements and characterization.
PREREQ: MEEG331

MEEG 640 INTERMEDIATE HEAT TRANSFER 3
Theory and equations of heat conduction, boundary conditions, steady and transient heat conduction, theory of convection, forced convection in laminar flows, derivation of convection equations, numerical methods.

MEEG 641 COMBUSTION 3
Fundamentals and application of combustion. Topics include thermodynamics, chemical kinetics, explosions and oxidative characteristics of fuels; combustion-generated pollutants, ignition and flammability phenomena; detonation; laminar in premixed flames; gaseous diffusion flames; and droplet combustion.
PREREQ: Graduating standing in engineering or science.

MEEG 652 FLOW OF VISCOUS MATERIALS 3
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 3
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: MEEG321 or consent of instructor.

MEEG 655 PRINCIPLES OF COMPOSITES MANUFACTURING 3
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: MEEG322 and MEEG342.

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.
RESTRICTIONS: Recommended for seniors and graduate students.

MEEG 681 COMPUTER SOLUTIONS OF ENGINEERING PROBLEMS 3
Overview of numerical methodologies 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 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 690 INTERMEDIATE ENGINEERING MATHEMATICS 3
Linear algebra; generalized vector space, eigenvalue problem, diagonalization, quadratic forms: field theory; divergence theorem, Stokes' theorem, irrotational fields. Sturm-Liouville theory; Bessel functions, introduction to data structures, partial differential equations: diffusion and Laplace equations by separation of variables and Sturm-Liouville theory, wave equation Engineering applications.
MEEG 691 ADVANCED ENGINEERING MATHEMATICS 3
Integral transform and Green’s Function Solution of Partial Differential Equations, complex variables, variational calculus and introduction to perturbation methods
PREREQ: EEEG690

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 to fluids flowing through channels. Free convection, condensation and evaporation in 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 812 ADVANCED CONTINUUM FRACTURE MECHANICS 3
PREREQ: MEEG610 or MEEG813

MEEG 813 THEORY OF ELASTICITY 3

MEEG 814 THEORY OF PLASTICITY 3
PREREQ: MEEG813

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.
PREREQ: MEEG813

MEEG 817 COMPOSITE MATERIALS 3
Introduction, thermoelastic 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, fiber reinforced composites, and nonlinear elastic finite deformation of fiber-reinforced composites. May be cross-listed with MEEG617.
PREREQ: MEEG813

MEEG 818 PLATES AND SHELS IN AEROSPACE STRUCTURES I 3
PREREQ: MEEG813

MEEG 819 PLATES AND SHELS IN AEROSPACE STRUCTURES II 3
General theory of thin shells from three-dimensional equations of elasticity; shells of revolution under axially symmetric loads; symmetric loads; thermoelastic effects; general bending theory, membrane theory, inextensional theory; Donnell equations; edge load solutions, orthotropic shells; laminated shells.
PREREQ: MEEG813

MEEG 821 ADVANCED DYNAMICS 3
General principles of spatial dynamics Lagrange 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 feedforward structural controls.
PREREQ: EEEG211, MEEG311 and MATH352

MEEG 825 DYNAMIC BEHAVIOR OF MATERIALS 3
Importance and historical development of stress waves in solids; 1D stress waves, Hugoniot elastic limit; longitudinal and shear waves, reflection and refraction; Rayleigh, Love, and Stoneley waves; wave guides; spherical waves; Lame's problem, elastic unload- ing; realistic waves and shock waves; dynamic fracture and shear banding of solids; wave propagation in anisotropic media; high speed experimental techniques.
PREREQ: MEEG610 or MEEG813

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
Physical properties of fluids, description of motion, vector and tensor algebra, Navier-Stokes equations, kinetic theory of gases, incompressible viscous flows, boundary-layer theory and turbulence.
PREREQ: MATH352.

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 hydrodynamically 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, hypoplasticity, 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. Modelling of such processes will be emphasized and a specific project will be required. Assignments will include: injection molding, compression molding, filament winding, pultrusion and resin transfer molding.

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, Padé approximants, steepest descent and stationary phase; phase plane; asymptotic analysis of ODEs and PDEs using such methods as WKB, matched asymptotic expansions, Padé approximants, and solutions of special problems in these areas.

MEEG 868 RESEARCH 1-9

MEEG 869 MASTER’S THESIS 1-6
Experimental investigation conducted for the purpose of contributing new useful data and theory in some field of mechanical engineering. Although supervised, investigation will be independent in character to encourage development of initiative.

MEEG 871 RANDOM VIBRATIONS 3
PREREQ: CIEG311 (for CIEG students), MEEG311 (for MEEG students). Knowledge of EEEG24 is desirable but not required.

MEEG 872 PLANNING AND OPTIMIZATION OF DYNAMIC SYSTEMS 3
Overview of cutting edge research methods in planning, control and optimization of dynamic systems that integrate tools from nonlinear systems theory, motion planning and functional optimization.

MEEG 873 APPLIED NONLINEAR CONTROL 3
PREREQ: EEEG824 or equivalent, EEEG690 and MEEG691, and permission of instructor.

MEEG 881 ADVANCED MUSCULOSKELETAL BIOMECHANICS 3
Examines current topics in biomechanics research including musculoskeletal modeling, muscle physiology, anthropometric analysis, biomedical imaging techniques, neural control of movement and/or clinical biomechanics.
PREREQ: MEEG612 and MEEG683
MILITARY SCIENCE

MLSC 105 INTRODUCTION TO LEADERSHIP I
Introduction to leadership principles using case studies, historical perspectives and hands-on leadership opportunities. Learn to rappel, use a 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 skills. 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.

MLSC 305 APPLIED LEADERSHIP I
Advanced training in military leadership. One of two courses designed to prepare cadets for the ROTC Advanced Camp/Nurse Summer Training Program. Focuses on leadership development through multiple, small unit leadership opportunities and counseling. Fine tunes skills learned in the previous two years of Military Science, ROTC Basic Camp or prior military service, especially marksmanship, land navigation, drill and ceremonies and physical fitness. Commitment to military service required.

MLSC 306 APPLIED LEADERSHIP II
Continues to build on the basics of MLSC305. Completes preparation for Advanced Camp/Nurse Summer Training Program and focuses on leadership at the platoon and company level. Small unit tactics and training are emphasized. Information is provided to help the student make wise decisions about military service options. Commitment to military service required.

MLSC 315 LEADER EVALUATION
An advanced six-week off-campus, hands-on leadership education and assessment course. Real-life individual and collective leadership challenges and opportunities. All expenses paid.

MLSC 365 MILITARY HISTORY STUDIES
Selected topics in American military history, current military trends and future military requirements.

MLSC 466 INDEPENDENT STUDY
1-3

MATERIALS SCIENCE

MSEG 302 MATERIALS SCIENCE FOR ENGINEERS
Crystal bonding and structure, energetics and structure of lattice defects; elasticity, plasticity, and fracture; phase equilibria and transformations; relation between structure and treatment to properties; structures of inorganic and organic polymers; and electronic and magnetic properties.

MSEG 410 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS
Study of the microstructural 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 CHEG410.

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 faculty in science or engineering subject to the approval of the materials science chair.

MSEG 466 INDEPENDENT STUDY
1-6

MSEG 600 INTRODUCTION TO POLYMER SCIENCE AND ENGINEERING I
1-3
See CHEG600 for course description.

MSEG 601 STRUCTURE AND PROPERTIES OF POLYMERIC MATERIALS
3
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.

MSEG 602 STRUCTURE OF MATERIALS
3
Crystal structure analysis by X-ray and electron diffraction. Characterization of materials by optical microscopy, scanning and transmission electron microscopy, thermal analysis and spectroscopy.

MSEG 603 ANALYTICAL TECHNIQUES IN MATERIALS SCIENCE
3
Laboratory course in optical microscopy, X-ray diffraction, scanning and transmission electron microscopy, electron diffraction, X-ray fluorescence and microanalysis. Auger analysis and other spectroscopic techniques.

MSEG 604 PHASE TRANSFORMATIONS
3

MSEG 606 CORROSION AND PROTECTION
3

MSEG 607 PHYSICAL PROPERTIES OF MATERIALS I
3
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 devices.

MSEG 610 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS
3
Study of the microstructural 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 CHEG610.

MSEG 614 FRACURE OF MATERIALS
3
Fracture mechanics, micromechanisms, nucleation and propagation of cracks, fracture toughness, ductile-brittle transitions, fatigue, stress, corrosion, irradiation effects and non-metallic materials. May be cross-listed with MEEG614.

MSEG 615 MECHANICAL PROPERTIES OF MATERIALS
3

MSEG 666 INDEPENDENT STUDY
1-3
Restrictions: Requires graduate status.
MUSEUM STUDIES

MSST 616 CHEMISTRY AND PHYSICS OF SURFACES AND INTERFACES 3
See CHEG 616 for course description

MSST 666 SPECIAL PROBLEM 1-12

MSST 803 EQUILIBRIA IN MATERIAL SYSTEMS 3
PREREQ: MSEG 602

MSST 804 KINETICS IN MATERIAL SYSTEMS 3
PREREQ: MSEG 602

MSST 808 PHYSICAL PROPERTIES OF SOLIDS 3

MSST 807 PHYSICAL PROPERTIES OF MATERIALS II 3
Continuation of MSEG 607 with emphasis on the electrical transport properties of materials. Topics 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; electron emission; particularly field emission.
PREREQ: MSEG 607

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

MSST 817 COMPOSITE MATERIALS 3
See MEGS 617 for course description.

MSST 821 DIFFRACTION OF RADIATION BY MATTER 3
Theory and analysis of diffraction from ideal and imperfect crystals, gases and liquids, and other atomic aggregations.

MSST 823 TRANSMISSION ELECTRON MICROSCOPY IN MATERIALS SCIENCE 3

MSST 866 SPECIAL PROBLEM 1-12

MSST 868 RESEARCH 1-9

MSST 964 PRE-CANDIDACY STUDY 3 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.

MSST 969 DOCTORAL DISSERTATION 1-12 PF

MUSEUM STUDIES

MSST 205 SCIENCE AND THE DETECTION OF ART FORGERIES 3
Concepts from many scientific disciplines are useful for interpreting works of art. Analytical techniques based on these 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 ARTH 205.

MSST 403 HISTORY, PHILOSOPHY, FUNCTIONS AND FUTURE OF MUSEUMS 3
Introduction to philosophy, purposes, 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 ARTH 403 and/or HIST 403

MSST 408 PUBLIC HISTORY: RESOURCES, RESEARCH AND PRACTICE 3
See HIST 608 for course description.

MSST 444 TECHNOLOGY OF CULTURAL MATERIALS: CERAMICS AND GLASS 3
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. Course studies from a wide variety of cultural traditions. May be cross-listed with ANTH 444 and/or ARTH 444.

MSST 445 TECHNOLOGY OF CULTURAL MATERIALS: METALS 3
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 function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH 445 and/or ARTH 445.

MSST 464 MUSEUM STUDIES INTERNSHIP 3
Internship practicum supplementing theoretical and methodological background in administration, collections management, exhibition, research, interpretation, and public programming and services of museums. Students intern at the University Gallery or other acceptable museum, related institution or organization in the United States. May be cross-listed with AMCS 464.
PREREQ: MSST 403.

MSST 480 STUDY IN THE MATERIALS AND TECHNIQUES OF DRAWING IN THE WEST 3
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 ART 424, ARTC 480, and/or ARTH 480.
RESTRICTIONS: Requires permission of instructor.

MSST 485 COLOR MIXING AND MATCHING 3
Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors 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 ART 426 and/or ARTC 485.
RESTRICTIONS: Requires permission of instructor.

MSST 488 STUDY MATERIALS AND TECHNIQUES OF PAINTING I 3
Major materials including tools, supports and techniques of architectural painting, manuscript illumination and panel painting in encaustic, watercolor, and egg tempera from about 1500 BC to AD 1500. Major topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research. May be cross-listed with ART 427, ARTC 488, and/or ARTH 488.
RESTRICTIONS: Requires permission of instructor.

MSST 489 STUDY MATERIALS AND TECHNIQUES OF PAINTING II 3
Major masters and the materials, tools and techniques of indirect and direct oil and tempera painting. Time frame: ca. 1400-1920. Major topics include woodcut, copperplate etching, mezzotint, aquatint, lithography, and engraving. Studio reconstructions, lectures and library research. May be cross-listed with ART 429, ARTC 489, and/or ARTH 490.
RESTRICTIONS: Requires permission of instructor.

MSST 490 STUDY IN THE MATERIALS AND TECHNIQUES OF PRINTMAKING 3
Major masters and the materials, tools and techniques of relief, planographic and intaglio printing. Time frame: ca. 1400-1920. Major topics include woodcut, copperplate etching, mezzotint, aquatint, lithography, and engraving. Studio reconstructions, lectures and library research. May be cross-listed with ART 429, ARTC 490, and/or ARTH 490.
RESTRICTIONS: Requires permission of instructor.

MSST 605 HISTORY OF THEORIES IN MATERIAL CULTURE 3
See EAMC 605 for course description.

MSST 606 ISSUES IN AMERICAN MATERIAL CULTURE 3
See EAMC 606 for course description.
RESTRICTIONS: Requires permission of instructor.

MSST 608 PUBLIC HISTORY: RESOURCES, RESEARCH, AND PRACTICE 3
See HIST 608 for course description.

MSST 629 SEMINAR IN HISTORIC PRESERVATION 3
See UAPP 629 for course description.

MSST 644 TECHNOLOGY OF CULTURAL MATERIALS: CERAMICS AND GLASS 3
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. Course studies from a wide variety of cultural traditions. May be cross-listed with ANTH 644 and/or ARTH 644.

MSST 645 TECHNOLOGY OF CULTURAL MATERIALS: METALS 3
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 function. Course studies from a wide variety of cultural traditions. May be cross-listed with ANTH 645 and/or ARTH 645.
**MUSEUM STUDIES**

**MSST 680  **STUDIO IN THE MATERIALS AND TECHNIQUES OF DRAWING IN THE WEST  **3  
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, pastel, graphite pencils, natural and fabricated chalks, crayons, pastels, erasers and fixatives. Studio reconstructions of masterworks, lectures and library research. May be crosslisted with ART682, ARTC680, and/or ARTH680.  
**RESTRICTIONS:** Requires permission of instructor.

**MSST 681  **MATERIALS AND TECHNIQUES OF THE CONTEMPORARY PAINTER AND DRAFTSMAN  **3  
Twentieth-century artists' materials: topics: acrylic emulsion and acrylic solution, oil paint, PVA paints; collage-assemblage; solvent/paint transfer; synthetic fiber canvas, paper, panels, oil paints, paint sticks, felt-tip markers, colored inks and panels; airbrush spray gun; and non-art materials. Potential health hazards, Conservation topics: pH, light-fastness, adhesion and storage environments. May be crosslisted with ART681, ARTC681, and/or ARTH681.  
**RESTRICTIONS:** Requires permission of instructor.

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

**MSST 688  **STUDIO MATERIALS AND TECHNIQUES OF PAINTING I  **3  
Major materials including tools, supports and techniques of architectural painting, manuscript illumination and panel painting in encaustic, watercolor, and egg tempera from about 1500 BC to AD 1500. Major topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research may be crosslisted with ART688, ARTC688, and/or ARTH688.  
**RESTRICTIONS:** Requires permission of instructor.

**MSST 689  **STUDIO MATERIALS AND TECHNIQUES OF PAINTING II  **3  
Major masters and the materials, tools and techniques of indirect and direct oil and tempera 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 crosslisted with ART689, ARTC689, and/or ARTH689.  
**RESTRICTIONS:** Requires permission of instructor.

**MSST 690  **STUDIO IN THE MATERIALS AND TECHNIQUES OF PRINTMAKING I  **3  
Major masters and the materials, tools and techniques of relief, planographic and intaglio printmaking. Time frame: 1400-1920. Major topics include woodcut, copperplate engraving, etching, drypoint, aquatint, mezzotint, lithograph and wood engraving. Studio reconstructions, lectures and library research may be crosslisted with ART690, ARTC690, and/or ARTH690.  
**RESTRICTIONS:** Requires permission of instructor.

**MSST 801  **MUSEUM CURATORSHIP: COLLECTIONS MANAGEMENT  **3  
A course on collections management theory and practice that focuses 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 or in a local museum.  
**RESTRICTIONS:** Open to graduate students only

**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 Gallery, Winterthur Museum, Hagley Museum, Longwood Gardens or other acceptable institution. May be crosslisted with HIST804.  
**RESTRICTIONS:** Open to graduate students only. Requires at least one semester course 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, design and fabrication of economical exhibits for changing 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.  
**PREREQ:** MUSC335  
**RESTRICTIONS:** For vocal music education majors

**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

**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

**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.

**MUED 366  **INDEPENDENT STUDY  **1-3  
**PREREQ:** MUED337  
**RESTRICTIONS:** For music majors

**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:** MUED337  
**RESTRICTIONS:** For music majors

**MUED 390  **MUSIC IN THE ELEMENTARY SCHOOL  **3  
Introduction to music materials and approaches through clinical experiences.  
**RESTRICTIONS:** For elementary education and child development majors.

**MUED 479  **SECONDARY MUSIC MATERIALS AND APPROACHES  **3  
Procedures and materials used for teaching music in the secondary school.  
**PREREQ:** MUED379 and MUED337.  
**RESTRICTIONS:** Requires permission of instructor

**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 061  **PRIVATE STUDY  **1-8 R  
**RESTRICTIONS:** Requires audition and departmental placement tests. Credits do not apply toward bachelor's degree

**MUSC 062  **PRIVATE STUDY  **1-8 R  
**PREREQ:** MUSC061  
**RESTRICTIONS:** Credits do not apply toward bachelor's degree
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

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

MUSC 101 Appreciation of Music 3
Introduction to Western music literature through a non-technical presentation of various musical styles and forms

MUSC 102 Appreciation of Music 3
Music literature through a non-technical 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 Opera 3
Explores the world of opera including categories of singers; types of operas, e.g., opera seria, opera buffa, singspiel; and the roles of the chorus. Includes experience seeing an opera performed live

MUSC 104 Introduction to Opera II 3
Introduction to opera, concentrating on opera comique, singspiel, opera seria, and Wagnerian music drama. Explores philosophies associated with music in the context of opera. Time span covered is 1607 to present

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 non-music 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, blues, and jazz as predecessors to rock. Intended for the non-music major. No music reading skills required

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

MUSC 109 Choral Union 1
Members enter by audition. Choral Union is a chorus of 100+ voices that rehearses on Monday nights. The Union performs large-scale choral works. Smaller sections perform independently as well.
RESTRICTIONS: May be repeated for credit

MUSC 110 Chorale 1
Members enter by audition. Chorale is the university’s most select chorus of mixed voices.
RESTRICTIONS: May be repeated for credit

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

MUSC 114 Symphonic Band 1
The ensemble performs standard concert literature as well as new compositions. During full semester the ensemble meets one day a week and performs one full concert. The ensemble participates in the Department of Music’s CALLIOPE concert.
RESTRICTIONS: Audition. May be repeated for credit

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: The Wind Ensemble requires audition and may be repeated for credit

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

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

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

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 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. Designed for non-music majors and transfer students with no previous experience.
RESTRICTIONS: May be repeated for credit

MUSC 161 Private Study 1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument.
RESTRICTIONS: Contact department to register for correct number of credit hours

MUSC 162 Private Study 1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument.
PREREQ: MUSC 161
RESTRICTIONS: Contact department to register for correct number of credit hours

MUSC 171 Diction: English and Italian 1
Study of pronunciation rules for singing in English and Italian. Includes practice and private instruction.
COREQ: Enrollment in applied study

MUSC 173 Class Voice 1
Fundamentals and techniques of singing
RESTRICTIONS: For non-majors

MUSC 174 Class Voice: Beginning 1
Fundamentals of singing for the non-vocal music major. Study of basic techniques, repertoire and function of vocal mechanism.
RESTRICTIONS: Requires permission of instructor for non-majors, requires one semester of University vocal experience.

MUSC 175 Class Piano: Elementary I 1
Beginning piano primarily for the vocal or instrumental music major. Basic techniques, reading, transposition and playing by ear.
PREREQ: MUSC 105 or Corequisite of MUSC 195. Preference for enrollment will be given to music majors.
RESTRICTIONS: None

MUSC 176 Class Piano: Elementary II 1
A continuation of MUSC 175. Scale and arpeggio playing, keyboard harmony, repertoire of pieces appropriate to technical ability.
PREREQ: MUSC 175 and MUSC 195

MUSC 177 Class Guitar I 1
Introduction to the fundamentals of guitar technique and notation reading for non-music majors. Topics include guitar history, repertoire, scales and exercises with emphasis on classical as well as folk music. Music Education majors may also find this course particularly useful for classroom teaching.

MUSC 178 Class Guitar II 1
A continuation of Class Guitar I with a stronger emphasis on ensemble playing and development of a repertoire.
PREREQ: MUSC 177

MUSC 179 Organ Class 1
Students learn the basic techniques needed to play the organ. Students apply these skills in a class setting, focusing on an introductory organ literature and hymn playing.
RESTRICTIONS: Requires permission of instructor.

MUSC 181 Applied Jazz Styles/Techniques I 2
Private studio instruction covering techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
RESTRICTIONS: Requires audition

MUSC 185 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.
COREQ: MUSC 195
RESTRICTIONS: Requires permission of instructor
MUSC 186 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: MUSC196.

MUSC 193 Sight Reading at the Keyboard I 1
Techniques for improving coordination and musical comprehension when playing from sight at the keyboard.
RESTRICTIONS: For keyboard majors.

MUSC 194 Sight Reading at the Keyboard II 1
Continuation of MUSC193.
PREREQ: MUSC193.

MUSC 195 Harmony I 3
Review of music fundamentals: Chord structure and functional relationships. Basic modal and contrapuntal compositional techniques. Writing, playing and analysis.
COREQ: MUSC185.

MUSC 196 Harmony II 3
Continuation of harmony: Diatonic through chromatic harmony with keyboard application. Chord structures and functional relationships. Basic modal and contrapuntal compositional techniques. Writing, playing and analysis.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC186.

MUSC 197 Jazz Harmony 3
Study of elementary aspects of melody, harmony, texture, dynamics, rhythm and form in selected jazz and American popular literature; development of elementary aural perceptive and compositional skills related to jazz and American popular music.
PREREQ: MUSC105.

MUSC 205 Music of the Non-Western World 3
Survey of non-Western musical cultures utilizing textbook, reprinted reserve articles, films and in-class performance/demonstrations. Goal is the understanding and appreciation of various world music.
PREREQ: MUSC105.

MUSC 206 Music of China, Korea and Japan 3
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 on the development of such cultures in Korea and Japan.
PREREQ: MUSC105.

MUSC 207 History of Jazz 3
Chronological 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 personalities who have been primarily responsible for change.
PREREQ: MUSC105.

MUSC 208 History of the American Musical Theatre 3
The musical-dramatic forms of the 19th, 20th and 21st centuries in the United States and their impact on the modern musical theatre. Complete works read in class and compared to a series of criteria found in successful modern shows. Comparison of older and current works. May be cross-listed with THEA208.

MUSC 209 History of Spanish Music 3
Covers the most outstanding traditions of Spanish music, including Arab influenced Andalusian music, 13th century music, schools of the "Renacimiento", 17th century court music, the "Zarzuela", 19th century Nationalism, and the most modern tendencies of the 20th century.
RESTRICTIONS: Taken abroad only.

MUSC 210 Music of Britain 3
Chronological study of music of Britain with emphasis on English music from 1085 to present. Explores music for various media (including choral, instrumental, oratorio, and principal British composers, relating the development of musical styles to events in British history. When taught as part of UD London Semester, will include attendance at variety of London performances.
RESTRICTIONS: Requires permission of instructor.

MUSC 211 Introduction to Music History 3
Survey of selected works in music history with emphasis on selected basic terminology, forms and style changes, through score reading and listening.
PREREQ: MUSC195.

MUSC 212 History of Liturgy and Hymns 3
Study of the evolution, structure and content of historic liturgies 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 214 Stringed Instruments Class: Violin, Viola, Cello, Bass 1
Development of performing and teaching skills.
RESTRICTIONS: Open only to students whose major requires this course.

MUSC 215 High Brass Instruments Class 1
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.

MUSC 216 Low Brass Instruments Class 1
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.

MUSC 217 Woodwind Instruments Class I 1
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.

MUSC 218 Woodwind Instruments Class II 1
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.

MUSC 219 Percussion Instruments 1
Development of performing and teaching skills.
RESTRICTIONS: Open only to students whose major requires this course.

MUSC 241 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: Sight-Reading Placement Test.
RESTRICTIONS: First course of a six-semester sequence. Requires permission of instructor.

MUSC 242 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: MUSC241.
RESTRICTIONS: Requires permission of instructor.

MUSC 261 Private Study 1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC162.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 262 Private Study 1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC261.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 271 Diction: German 1
A study of pronunciation rules for singing in German. Includes practical work.
COREQ: Enrollment in applied study.

MUSC 272 Diction: French 1
A study of pronunciation rules for singing in French. Includes practical work.
COREQ: Enrollment in applied study.

MUSC 275 Class Piano: Intermediate I 1
Piano techniques applicable to the levels and needs of the students; a continuation of reading and transcription; and improvisation and repertoire of grade two pieces.
PREREQ: MUSC176 and MUSC196.

MUSC 276 Class Piano: Intermediate II 1
A continuation of MUSC275.
PREREQ: MUSC275.

MUSC 279 Introduction to the Organ 2
Designed to provide information about the organ: its history, use and literature as well as tonal and mechanical aspects of its design.

MUSC 281 Applied Jazz Styles/Techniques II 2
Private studio instruction covering techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertory.
PREREQ: MUSC181.
RESTRICTIONS: Requires audition.

MUSC 285 Advanced Ear Training and Sight Singing I 2
Continuation of MUSC185 and MUSC186.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC295.
MUSC 286  Advanced Ear Training and Sight Singing II  2
Continuation of MUSC185, MUSC186 and MUSC285
PREREQ: MUSC285 and MUSC295
COREQ: MUSC296

MUSC 287  Music Technology I  3
Overview and experience with commercially-available music-related hardware and soft-
ware. Hardware includes IBM and Macintosh microcomputers, electronic keyboards and
how generators incorporating Musical Instrument Digital Interface (MIDI), digital record-
ing systems, CD-ROM and videodisc. Software includes sequencers, notation packages,
interactive composers, educational programs and hypermedia applications.
PREREQ: MUSC105 or MUSC195

MUSC 291  Practicum in Church Music  1
Introduction to 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.

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 improvis in a stylistically acceptable manner.
PREREQ: MUSC293.

MUSC 295  Advanced Harmony I  3
Review of chromatic harmony. Study, writing and analysis of 18th century counterpoint.
Introduction to instrumentation. Introduction to form and analysis. Eighteenth and nine-
teenth century harmony, techniques and styles. Original compositions.
PREREQ: MUSC186 and MUSC196.
COREQ: MUSC286

MUSC 296  Advanced Harmony II  3
Continuation of MUSC295. Study of late 19th and 20th century harmony, techniques and
styles. Continuation of instrumentation. Original compositions.
PREREQ: MUSC285 and MUSC295
COREQ: MUSC286

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 pre-
sent day through the study of women as composers, performers, patrons, and as the sub-
ject of musical expression. Explores cultural systems that have alternately encouraged and
suppressed women's creativity. May be cross-listed with WOMS302
PREREQ: MUSC101 or permission of instructor

MUSC 303  Chamber Music Literature  3
Chamber music written for various combinations from the Baroque period to the present
PREREQ: MUSC211, or MUSC302 and MUSC102

MUSC 305  The Symphony  3
The development of the symphony from the early 18th century to the present
PREREQ: MUSC211 or MUSC101

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 interdepen-
dency 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 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 (15th and 16th centuries)
PREREQ: MUSC211 or MUSC101

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

MUSC 313  Music History: 1825 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

MUSC 321  Ensemble Instrumental, Piano, or Vocal  1
Performance of chamber literature for instrument, piano or voice.
RESTRICTIONS: May be repeated for credit

MUSC 327  German Lieder  2
Literature survey of the standard vocal repertoire of the German tradition. Includes exam-
oples of the works of such composers as Schubert, Brahms, Schumann, Wolf and Strauss.
RESTRICTIONS: Open to Juniors and Seniors.

MUSC 328  Choral Literature  2
Study of style, structure and interpretations of representative choral works, including large
and small forms composed since 1500
PREREQ: MUSC211

MUSC 331  Orchestration  2
Orchestral and band arranging; review of instrumental ranges and colors; scoring for small
ensembles; special problems in scoring accompaniments. Final arrangement per-
formed by a University ensemble.
PREREQ: MUSC296

MUSC 335  Basic Conducting  2
The principles of conducting and score reading
PREREQ: MUSC286 and MUSC296.

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 in the performance of chamber music
with keyboard.
PREREQ: MUSC242

MUSC 342  Accompanying Chamber Music: Piano  1
Accompanying vocalists and instrumentalists in the performance of chamber music
with keyboard.
PREREQ: MUSC101 or permission of instructor

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

MUSC 361  Private Study  1-8
The student adds to course title the branch of study elected: piano, organ, voice or an
orchestral instrument. Includes a one-credit studio class.
PREREQ: MUSC262
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 362  Private Study  1-8
The student adds to course title the branch of study elected: piano, organ, voice or an
orchestral instrument. Includes a one-credit studio class.
PREREQ: MUSC361
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 366  Independent Study  1-3

MUSC 387  Music Technology II  3
Explores intermediate to advanced applications of music technology including profes-
sional level implementation of MIDI hardware and software. Topics include multiport in-
faces, synchronization, MIDI sequencing and notation techniques, multimedia, and music
related Internet services. Additional topics may be examined depending on student expe-
rience.
PREREQ: MUSC287

MUSC 388  Principles of Music Industry Practice  3
Offers an understanding of the fundamental workings of the music industry. Examines the-
ory/practice of core principles, focusing on provisions of copyright law, standard agree-
ments, and the influence of professional organizations. Emphasis on framework for inter-
action among writers, artists, performers, publishers, record companies, producers,

MUSC 389  Elements of Music Management  3
Introduces principles involved in planning and management for performing arts orga-
nizations. 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 390  **HONORS COLLOQUIUM**  3
See ARSC390 for course description. May be cross-listed with ENGL391.

MUSC 392  **CONTRAPUNTAL WRITING**  2
Contrapuntal techniques with emphasis on 16th- and 18th-century styles and forms.
PREREQ: MUSC295

MUSC 393  **KEYBOARD HARMONY II**  2
A practical course for the development of facility in applying knowledge of harmony to the keyboard. Emphasis on melody harmonization and improvisation.
PREREQ: MUSC296.
RESTRICTIONS: Requires two years of class or private piano.

MUSC 394  **KEYBOARD HARMONY III**  2
An advanced practical course for the development of facility in applying knowledge of harmony to the keyboard.
PREREQ: MUSC393.

MUSC 395  **FORM ANALYSIS**  3
Structure of homophonic and polyphonic music representing different periods of musical history.
PREREQ: MUSC296.

MUSC 397  **CONTEMPORARY HARMONY**  3
Styles, harmonic principles and techniques in 20th-century music.
PREREQ: MUSC296.

MUSC 400  **INTERNSHIP IN CHURCH MUSIC**  1-3
Capstone course for Church Music minor providing students with opportunities to gain skills and knowledge through practical application while working under the supervision of professional musicians.
PREREQ: MUSC179, MUSC212, MUSC291, and MUSC292.
RESTRICTIONS: Requires permission of instructor.

MUSC 401  **SENIOR RECITAL 0 PF**
A 60-minute public recital.
RESTRICTIONS: Requires Senior status.

MUSC 407  **CONTEMPORARY MUSIC LITERATURE**  3
Analysis of styles and techniques of contemporary composers beginning with compositions of the late 1950s.
PREREQ: MUSC313 or permission of instructor.

MUSC 420  **ADVANCED COMPOSITION**  3
Creative writing in the vocal and instrumental media with individual and group criticism.
PREREQ: MUSC397.
RESTRICTIONS: May be repeated for up to nine credit hours.

MUSC 421  **SPECIAL PROJECTS IN MUSIC THEORY**  3
Theory majors do research and study under guidance of a faculty advisor on an approved topic for a formal paper to be presented at a public lecture.
PREREQ: MUSC485.

MUSC 427  **FRENCH ART SONG**  2
A literature survey of the standard vocal repertoire of the French tradition. Includes examples of the works of such composers as Fauré, Debussy, Duparc and Poulenc.
RESTRICTIONS: Requires Junior or Senior status.

MUSC 428  **TWENTIETH-CENTURY ART SONG**  2
A literature survey of the standard vocal repertoire of the 20th Century. Includes examples of the works of such composers as Barber, Britten, Schonberg, Ives, Vaughan Williams and Korng.
RESTRICTIONS: Requires Junior or Senior status.

MUSC 441  **ACCOMPANYING CHAMBER MUSIC: PIANO**  1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC342.

MUSC 442  **ACCOMPANYING CHAMBER MUSIC: PIANO**  1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC441.

MUSC 443  **CHAMBER MUSIC PERFORMANCE**  1
Survey of chamber music literature through performance. Emphasis is placed on the development of 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.
RESTRICTIONS: Requires permission of instructor.

MUSC 461  **PRIVATE STUDY**  1-8
The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC362.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 462  **PRIVATE STUDY**  1-8
The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC461.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 464  **INTERNSHIP**  1-3
Students are placed with performing arts organizations or music businesses both within and outside the state. Requires participation in Career's Colloquium, an informal series of lectures/roundtable discussions with guests currently employed in the music industry or with performing arts organizations.
RESTRICTIONS: Open to music management studies 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.

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.
RESTRICTIONS: Admission by audition, with permission of private instructor, and preference given to vocal performance majors.

MUSC 561  **ADVANCED PRIVATE STUDY**  1-4
Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument, e.g., Private Study (Piano).
PREREQ: MUSC462.

MUSC 601  **MASTER'S RECITAL 2 PF**
A sixty-minute public recital.
PREREQ: MUSC622.
COREQ: MUSC622.

MUSC 603  **CHAMBER MUSIC LITERATURE**  3
Survey of chamber music literature from the 17th century to the present.
RESTRICTIONS: Requires permission of instructor.

MUSC 605  **SYMPHONIC LITERATURE**  3
Historical and structural analysis of major symphonic works from the 18th century to the present.
RESTRICTIONS: 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.
RESTRICTIONS: 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 offering.
RESTRICTIONS: Requires satisfactory score on music history graduate placement exam.

MUSC 620  **LARGE ENSEMBLE**  1
Participation as a performer in a large ensemble.
RESTRICTIONS: Entry audition required.

MUSC 621  **CHAMBER ENSEMBLE**  1
Participation as a performer in a chamber ensemble.
RESTRICTIONS: Entry audition required.

MUSC 622  **MATERIALS AND METHODS OF RESEARCH**  3
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 3
Advanced conducting techniques for directors of instrumental performing groups.
RESTRICTIONS: Requires permission of instructor

MUSC 638 LARGE ENSEMBLE PRACTICUM 1
Participation in a large ensemble and seminar with ensemble director.
RESTRICTIONS: Requires permission of instructor

MUSC 640 HISTORY AND PHILOSOPHY OF MUSIC EDUCATION 3
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 1
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 661 ADVANCED PRIVATE STUDY 1-4
Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument, e.g., Private Study (Piano). 
RESTRICTIONS: Requires audition

MUSC 662 ADVANCED PRIVATE STUDY 1-4
Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument, e.g., Private Study (Piano).
PREREQ: MUSC661

MUSC 675 GENERAL MUSIC K-12 3
Learning strategies to develop listening, performing, creating and literacy skills in a general music curriculum. Recommended for directors of performing ensembles.
RESTRICTIONS: Requires permission of instructor.

MUSC 676 SEMINAR IN MUSIC EDUCATION 3
Advanced topics in music education.
RESTRICTIONS: Requires permission of instructor.

MUSC 679 PROFESSIONAL IMPROVEMENT PROJECT I 3
Development of a portfolio to include unit plans based on synthesis of content from prior courses.
RESTRICTIONS: Requires permission of instructor. Taken in sequence with MUSC680 as an alternative to thesis option.

MUSC 680 PROFESSIONAL IMPROVEMENT PROJECT II 3
Implementation of the portfolio developed in MUSC679.
PREREQ: MUSC679
RESTRICTIONS: Taken in sequence with MUSC679 as an alternative to thesis option.

MUSC 681 PEDIAGOGY AND LITERATURE 3
The study of teaching methods and literature (music scores, books and other media) showing teaching skills needed at the university level and lower.

MUSC 695 ADVANCED ANALYTICAL TECHNIQUES 3
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

NDTD 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 nutritional scientists. Introduces opportunities for undergraduate research. Introduction to concepts of a profession and relevant professional organizations.
RESTRICTIONS: Open to Freshmen and Sophomores.

NDTD 200 NUTRITION CONCEPTS 3
Functions and sources 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.

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

NDTD 222 NUTRITION CONTROVERSIES 1
Explores topical issues in nutrition via discussion format.
COREQ: NTDT200

NDTD 240 INTRODUCTION TO CLINICAL DIETETICS 3
Orientation to clinical dietetics; basic skills required for nutritional care; nutritional assessment, dietary counseling, clinical simulations, nutritional care plans and composition of basic therapeutic diets.
PREREQ: NTDT200

NDTD 255 MULTICULTURAL FOOD HABITS 3
Food habits of diverse cultural groups. Determinants of traditional and current food habits, historical and cultural context. Emphasis on ethnic population groups in the United States. Contribution of selected dietary patterns to knowledge of health and disease prevention. Impact of migration to different cultural settings.

NDTD 256 MULTICULTURAL FOODS LABORATORY 1
Sampling of foods of diverse cultural groups utilizing demonstrations by restauranteurs and individuals as well as class preparation. Field trips to markets and ethnic food stores.
COREQ: NTDT255

NDTD 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.

NDTD 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 NTDT201

NDTD 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

NDTD 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

NDTD 325 LABORATORY IN QUANTITY FOOD PRODUCTION AND SERVICE 1
Laboratory experience in quantity food production and delivery systems with emphasis on equipment, principles of safe food handling, quality standards and controls and menu planning.
COREQ: NTDT321

NDTD 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

NDTD 328 FOOD SERVICE FACILITY DESIGN 1
Development of quantity food production kitchen design. Considerations include material flow, equipment requirements, functional areas, safety and sanitation, and energy and water resources.
PREREQ: NTDT321, NTDT325
COREQ: NTDT321

NDTD 330 NUTRITION COUNSELING 3
Theories, skills and techniques of nutrition interviewing and counseling applied to changing food behaviors.
PREREQ: NTDT200 and NTDT201

NDTD 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

NDTD 366 INDEPENDENT STUDY 1-6

NDTD 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.
NUTRITION AND DIETETICS

NTDT 401 MICRO NUTRITION 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 I 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 440 NUTRITION AND DISEASE 3
Examination of the metabolic and physiological aberrations in selected conditions and implications for medical nutrition therapy
PREREQ: NTDT400 and BISC106 or BISC276

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: NTDT400

NTDT 450 MEDICAL NUTRITION THERAPY I 3
PREREQ: NTDT400, BISC276
COREQ: NTDT421

NTDT 451 MEDICAL NUTRITION THERAPY II 3
Continuation of Medical Nutrition Therapy 1. Pathophysiology, diet and disease relationships and diet therapy for diseases: renal, gastrointestinal, cancer, AIDS, iron and arterial nutrition. Metabolism. Critical care nutrition, institutional and home care, nutritional management of physiological stress and trauma
PREREQ: NTDT450

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 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 and NTDT440
COREQ: NTDT460

NTDT 466 INDEPENDENT STUDY 1-6

NTDT 475 TRANSCULTURAL FOODS AND CUISINE 3-5
Travel study of transtraditional food habits; attitudes, beliefs, customs and taboos. Visits to major food industries and health organizations and interaction with indigenous populations
PREREQ: NTDT200

NTDT 550 DIETETICS PRACTICUM I 4 PF
Continued supervised practice experiences for incorporation and application of skills, knowledge, and attitudes focusing on entry-level competence with special emphasis on current dietetic issues and current dietetic issues facing the health professional
PREREQ: 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 special emphasis on current dietetic issues facing the health professional
PREREQ: NTDT550
COREQ: NTDT651
RESTRICTIONS: Open to dietetic internship students only

NTDT 610 FUNDAMENTALS OF NUTRITION AND METABOLISM 3
Review of metabolic processes related to nutrition and current research related to macronutrient and micronutrient functions
RESTRICTIONS: Undergraduate preparation in biochemistry, physiology and basic nutrition

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 BISC406

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 functions; 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

NTDT 640 NUTRITION AND AGING 3
Addresses topics related to the effects of aging on fundamental nutrition processes, food and nutrient requirements, nutrition screening and assessment of nutritional status, nutrition intervention and food assistance programs and nutrition related disorders of older adults
PREREQ: NTDT310 or NTDT400 or NTDT401

NTDT 645 NUTRITION EDUCATION 3
Identification of objectives for nutrition education; selection and use of methods, materials and resources for different age levels; and integration of nutrition into the total health and consumer aspects of school, nonschool and adult programs
PREREQ: NTDT200

NTDT 650 CURRENT PERSPECTIVE IN DIETETICS 1 2
Introduces exploration of roles and responsibilities of today's dietitian in food service management, clinical and community dietetics. Emphasis on concepts relevant to evolving theories and technologies in the profession and issues influencing ethical, legal and professional responsibilities of dietitians

NTDT 651 CURRENT PERSPECTIVES IN DIETETICS II 2
Continued exploration of roles and responsibilities of today's dietitian in clinical, community and food service management dietetics. Emphasis on concepts relevant to evolving theories and technologies in the profession and issues that influence ethical, legal and professional responsibilities of dietitians
NTDT 652 Topics in Nutrition and Dietetics  1-3
Analysis of a specific topic in an area of nutrition and dietetics
RESTRICTIONS: Requires permission of instructor

NTDT 654 Ruminant Nutrition and Metabolism  3
See ANSC554 for course description

NTDT 660 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 led. Nutritional needs and programs. Nutrition program planning and evaluation; community assessment techniques.
RESTRICTIONS: Advanced nutrition course required

NTDT 665 Seminar  1-3 PF

NTDT 668 Research  1-6

NTDT 669 Field Project or Theoretical Paper  1-6
Development, preparation and defense of written report of field project observations or theoretical analysis.
RESTRICTIONS: Requires permission of instructor.

NTDT 675 Transcultural Food Habits  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
RESTRICTIONS: Only three credit hours may count toward graduation for majors

NTDT 868 Research  1-6

NTDT 869 Master's Thesis  1-6

NURSING

NURS 100 New Student Connections  1 PF
Assists new students in utilizing university resources, student services and technology. Interdisciplinary approach which promotes study habits and professionalism within the healthcare professions and introduces students to the roles of various healthcare professionals.

NURS 205 Societal Context of Nursing  3
Introduces conceptual frameworks for nursing practice within a pluralistic society. Utilizes historical perspective to examine the current status of nursing within the health care system. Discusses importance of professionalism, including ethical and legal responsibilities.
PREREQ: BISC208, CHEM105, CHEM106, ENGL110, STAT200 and SOCIO200-level or above
COREQ: NURS215
RESTRICTIONS: Open to nursing majors only

NURS 212 Pathophysiological Concepts  3
Application of sciences to maintenance of, and alterations in, homeostasis. Pathophysiological concepts relate to stress, inflammation, immunity, neoplasia, pain and alterations in fluid/electrolytes balance, blood flow and respiration. Exploration of disorders common throughout on individual's life span.
PREREQ: BISC208, BISC276, CHEM105, CHEM106, ENGL110, STAT200, and SOCIO200-level or above
COREQ: BISC300
RESTRICTIONS: Open to nursing majors only

NURS 215 Basic Nursing Practice Skills  1
Introduces basic client care skills. Emphasis on the intellectual, interpersonal and psychomotor skills foundational to nursing practice.
PREREQ: BISC208, CHEM105, CHEM106, ENGL110, STAT200 and SOCIO200-level or above
COREQ: NURS205
RESTRICTIONS: Open to nursing majors only

NURS 220 Concepts of Nursing Practice  3
Introduces 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.
RESTRICTIONS: Open to nursing majors only

NURS 222 Pharmacology  3
Focuses on the therapeutic and adverse biologic, 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: NURS220, NURS240
RESTRICTIONS: Open to nursing majors only

NURS 230 Foundations of Nursing  3
Examines the health continuum with an emphasis on wellness, therapeutic communication, teaching/learning concepts and healthcare delivery systems using problem solving/critical thinking. Clinical experiences in the laboratory and healthcare facilities provide opportunities to practice physical and health assessment skills.
PREREQ: BISC207, CHEM105, CHEM106 and a course in anatomy
COREQ: NURS220 and NURS240
RESTRICTIONS: Open to nursing majors only

NURS 240 Scientific Basis of Nursing  5
Examines pathophysiological concepts and prototype diseases. Laboratory practicum to provide practice of psychomotor skills.
PREREQ: BISC207, CHEM105 and an anatomy course.
COREQ: BISC300, CHEM106, NURS220 and NURS230.
RESTRICTIONS: Open to nursing majors only

NURS 306 Determinants of Wellness  5
Selected concepts/theories pertinent to promotion of optimal health of well clients of all ages from diverse sociocultural backgrounds within the context of family, community and health care system.
PREREQ: BISC276, BISC300, IFST201, NTDT200, NURS205, NURS215, NURS212, PSYC201 and STAT200
COREQ: NURS312, NURS314 and NURS315
RESTRICTIONS: Open to nursing majors only Offered in Fall

NURS 308 Restorative Nursing Practice I  4
Concepts/theories pertinent to promotion of optimal health of clients experiencing common and/or recurring health problems.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS317; NURS318 or NURS319; and NURS332
RESTRICTIONS: Open to nursing majors only Offered in Spring

NURS 312 Pathophysiology  3-4
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, NTDT200, NURS205, NURS215, NURS212, PSYC201 and STAT200
COREQ: NURS230, NURS312 and NURS315
RESTRICTIONS: Open to nursing majors only Nursing major must take 3 credits. BRN major must take 4 credits

NURS 314 Psychopathology  2-3
Delineates psychopathological processes across the life span. Emphasis on the etiology, manifestations and treatment options of selected psychopathological processes. Addresses current trends and issues in the mental health field.
PREREQ: BISC276, BISC300, IFST201, NTDT200, NURS205, NURS215, NURS212, PSYC201 and STAT200
COREQ: NURS319, NURS332 and NURS334
RESTRICTIONS: BRN major - Admission to BRN Program. Open to nursing majors only Nursing major must take 2 credit hours. BRN major must take 3 credit hours

NURS 315 Practicum I  4
Experiences for incorporation and application of selected concepts/theories underlying nursing care for well clients of all ages, from diverse sociocultural backgrounds, within the context of family, community and health care systems. Comprises 112 clinical hours.
PREREQ: BISC276, BISC300, IFST201, NTDT200, NURS205, NURS215, NURS212, PSYC201 and STAT200
COREQ: NURS312, NURS314, and NURS306
RESTRICTIONS: Open to nursing majors only Offered in Fall

NURS 317 Practicum II  3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of adult clients with common and/or recurring health problems. Emphasizes assessment and planning steps of nursing process. Comprises 64 clinical hours.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS308; NURS318 or NURS319; and NURS332
RESTRICTIONS: Open to nursing majors only Offered in Spring

NURS 318 Practicum III  3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of children with common and/or recurring health problems. Emphasizes assessment and planning steps of nursing process. Comprises 64 clinical hours.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS308, NURS317 and NURS332
RESTRICTIONS: Open to nursing majors only Offered in Spring

433
NURS 319 PRACTICUM IV 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of adults with mental illness. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours. PREQ: NURS304, NURS312, NURS314 and NURS315. COREQ: NURS308, NURS317 and NURS332. RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 332 PHARMACOLOGICAL NURSING RESPONSIBILITY 3
Uses the conceptual framework of human needs to focus on the therapeutic and adverse biological, psychological and social reactions to pharmacological agents; drug use and medication abuse; client teaching; pertinent laboratory tests; current research findings. Nursing responsibilities emphasized with the nursing process. PREQ: NURS306, NURS312, NURS314, and NURS315. COREQ: NURS306, NURS317, NURS318 or NURS319. RESTRICTIONS: Open to nursing majors only.

NURS 340 CURRENT PERSPECTIVES IN NURSING 2
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 2
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 1
Addresses issues related to the socialization and transition to baccalaureate nursing education and practice. Complements content of NURS340 and NURS342. Incorporates the practical application of evolving technologies with emphasis on nursing/client education. Introduces University and BRN Program resources. PREQ: NURS340 and NURS342.

NURS 344 WELLNESS AND HEALTH ASSESSMENT 2
Explores selected concepts, theories and skills utilized in health promotion and disease prevention of individuals, families, communities and diverse populations within the context of family, community and healthcare systems. Includes key elements of a biopsychosocial/cultural health history and health assessment of individuals across the life course. PREQ: NURS343.

NURS 352 NURSING CARE OF ADULTS I 2
Selected concepts and theories related to restoring and maintaining optimal health of patients experiencing common acute and/or chronic health problems. PREQ: NURS320, NURS3230, NURS3240 and NURS3222. COREQ: NURS353. RESTRICTIONS: Open to nursing majors only.

NURS 353 CLINICAL APPLICATION OF ADULT NURSING CARE I 3
Clinical experiences in the hospital, community and laboratory which reinforce information presented in NURS352. PREQ: NURS322, NURS3230 and NURS3240. COREQ: NURS355. RESTRICTIONS: Open to nursing majors only.

NURS 354 PSYCHOSOCIAL NURSING 2
Presents selected concepts and theories related to restoring and maintaining optimal health of patients experiencing psychopathology. PREQ: NURS220, NURS222, NURS3230 and NURS3240. COREQ: NURS355. RESTRICTIONS: Open to nursing majors only.

NURS 355 CLINICAL APPLICATIONS: PSYCHOSOCIAL NURSING 3
Application experiences in the hospital, community and laboratory which reinforce the information presented in NURS354. PREQ: NURS220, NURS222, NURS3230 and NURS3240. COREQ: NURS354. RESTRICTIONS: Open to nursing majors only.

NURS 356 CHILDREN AND FAMILIES NURSING CARE 2
Presents selected concepts and theories related to the nursing care of infants, children and adolescents and their families. PREQ: NURS222, NURS320 and NURS3240. COREQ: NURS357. RESTRICTIONS: Open to nursing majors only.

NURS 357 CLINICAL APPLICATION: CHILDREN AND FAMILIES NURSING CARE 3
Application experiences in the hospital, community and laboratory which reinforce information presented in NURS356. PREQ: NURS222, NURS320 and NURS3240. COREQ: NURS356. RESTRICTIONS: Open to nursing majors only.

NURS 358 CHILDBEARING FAMILY NURSING CARE 2
Presents selected concepts and theories related to the nursing care of the childbearing family. PREQ: NURS222, NURS3230 and NURS3240. COREQ: NURS359. RESTRICTIONS: Open to nursing majors only.

NURS 359 CLINICAL APPLICATION: CHILDBEARING FAMILY NURSING CARE 3
Application experiences in the hospital, community and laboratory which reinforce information presented in NURS358. PREQ: NURS222, NURS3240 and NURS3230. COREQ: NURS359. RESTRICTIONS: Open to nursing majors only.

NURS 362 RESEARCH CONCEPTS IN HEALTH CARE 3
Application of the research process and the research utilization process to healthcare practice. PREQ: STAT200 and NURS220. RESTRICTIONS: Open to nursing majors only.

NURS 366 INDEPENDENT STUDY 1-6

NURS 405 INTRODUCTION TO NURSING RESEARCH 2-3
Introduction to nursing research methods basic to identification of researchable nursing problems and to evaluation of existing research for consumers. PREQ: Nursing major. COREQ: NURS308, NURS317, NURS318 or NURS319, and NURS222. BRN major, NURS441. COREQ: Nursing major - NURS408, NURS417, NURS418 or NURS419. RESTRICTIONS: Nursing major must take 3 credit hours. BRN major must take 2 credit hours. Open to nursing majors only.

NURS 408 RESTORATIVE NURSING PRACTICE II 4
Concepts and theories pertinent to promotion of optimal health of clients with selected and less common health problems. PREQ: NURS308, NURS317, NURS318 or NURS3319 and NURS332. COREQ: NURS417; NURS418 or NURS419; and NURS405. RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 409 PROFESSIONALISM IN NURSING PRACTICE 2
Concepts, theories and issues that influence nursing's' legal, ethical and professional responsibilities to nursing and to the public. PREQ: NURS405; NURS408; NURS417; NURS418 or NURS419. COREQ: NURS420. RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 411 TOPICS IN HEALTH CARE DELIVERY 1-6
A consideration of selected issues and problems of nursing practice within the health care delivery system. Exploration of some topics may include a laboratory or clinical component. Variable topics. PREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332. No prerequisites for BRN major. COREQ: NURS405; NURS417; NURS418 or NURS419. RESTRICTIONS: Open to nursing majors only. May be repeated for up to six credit hours.

NURS 412 ISSUES IN ADULT HEALTH AND DEVELOPMENT 3
This multidisciplinary course provides broad exposure to the aging process through classroom experiences and one-on-one interaction with older adults participating in an affiliated health promotion program. Course content emphasizes age-related physiological, psychological and social changes and variability in the aging process. PREQ: NURS222. COREQ: NURS308, NURS317, NURS318 or NURS319; and NURS332. RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 417 PRACTICUM V 3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health for adult clients with less common health problems. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours. PREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332. COREQ: NURS405; NURS417; NURS418 or NURS419. RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 418 PRACTICUM VI 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of children with common and/or recurring health problems. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours. PREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332. COREQ: NURS408, NURS417 and NURS405. RESTRICTIONS: Open to nursing majors only. Offered in Fall.
NURS 419 PRACTICUM VII 3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health of adults with mental illness. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours.
PREREQ: NURS308, NURS317, NURS318 or NURS319, and NURS332
COREQ: NURS406, NURS417 and NURS405
RESTRICTIONS: Open to nursing majors only. Offered in Fall

NURS 420 PRACTICUM VIII 6
Selected experiences for the exploration and application of the basic concepts and theories of nursing leadership and management that facilitate transition to the professional role of the nurse. Comprises 168 clinical hours.
PREREQ: NURS405, NURS408, NURS417, and NURS418 or NURS419
COREQ: NURS409
RESTRICTIONS: Open to nursing majors only. Offered in Fall

NURS 441 LEARNING LABORATORY: HEALTH ASSESSMENT 1
Demonstrates and integrates physical and psychological assessment skills on selected clients in the laboratory setting. Incorporates the practical application of evolving technologies in nursing practice and administration. Includes orientation to BRN Role Practicum.
PREREQ: NURS344

NURS 442 COMMUNITY HEALTH NURSING 3
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: NURS340 and NURS342
COREQ: NURS344

NURS 443 BRN ROLE PRACTICUM 3
A preceptored clinical experience focused upon the integration of concepts learned in baccalaureate nursing education.
PREREQ: NURS441, NURS442 and NURS446
RESTRICTIONS: NURS446 is either a prerequisite or corequisite

NURS 445 NURSING RESEARCH APPLICATIONS 2
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: NURS443

NURS 452 ADULT NURSING CARE II 3
Focuses on gynecological and reproductive primary health care. Emphasis is on manifestations of disease in individuals throughout the life span. In addition to the concepts that will be studied:
PREREQ: NURS352 and NURS353
COREQ: NURS453
RESTRICTIONS: Open to nursing majors only

NURS 453 CLINICAL APPLICATION OF ADULT NURSING CARE II 3
Provides the basic principles and concepts of effective management of budgets for health care units. Includes analysis of the environment and departmental organization and their impact on health care
PREREQ: All required clinical courses except NURS827
RESTRICTIONS: Requires BSN and permission of instructor

NURS 454 NURSING OF POPULATIONS 2
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: NURS443

NURS 455 CLINICAL APPLICATION: NURSING OF POPULATIONS 4
Focuses on gynecological and reproductive primary health care. Emphasis is on manifestations of disease in individuals throughout the life span. In addition to the concepts that will be studied:
PREREQ: NURS352 and NURS353
COREQ: NURS454
RESTRICTIONS: Open to nursing majors only

NURS 466 INDEPENDENT STUDY 1-6
Explores professional issues related to the current and future roles of healthcare professionals and serves as a capstone course.
PREREQ: All 300 level nursing courses.
RESTRICTIONS: Open to healthcare majors only.
NURS 824 Management of Children's Health 3
Focuses on delivery of primary health care to children and adolescents. Emphasis is placed on physical and developmental variations and management of acute and episodic illness.
PREREQ: NURS 820 and NURS 821
COREQ: NURS 804 and NURS 822.

NURS 825 Management of Adult Episodic Health Needs and Problems 3
Focuses on delivery of primary care to adults and the elderly with acute episodic health problems. Emphasis is placed on the clinical decision making that is necessary to plan and provide primary health care services.
PREREQ: NURS 820 and NURS 821.
COREQ: NURS 804 and NURS 822.

NURS 826 Management of Adult Chronic Health Needs and Problems 3
Focuses on delivery of primary care to adults and the elderly with chronic health problems. Emphasis is placed on management of ongoing needs.
PREREQ: NURS 820 and NURS 821.
COREQ: NURS 804 and NURS 822.

NURS 827 Preceptorship II 3
Comprehensive course builds on all previous clinical courses. Emphasis is placed on clinical decision making in an interdisciplinary environment with the nurse practitioner as the principal provider of primary care.
PREREQ: All required clinical courses.
COREQ: NURS 817.

NURS 828 Nurse Practitioner Seminar 1
Culminating experience in role development. Emphasis is placed on the role of the nurse practitioner in the current health care system. Issues such as marketing, practice acts, reimbursement, and prescriptive privileges will be discussed.
PREREQ: All required clinical courses except NURS 827.

NURS 829 Advanced Management of Women's Health Care 3
Focuses on the delivery of primary care to women with acute and chronic obstetric and gynecologic problems.
PREREQ: NURS 823.

NURS 830 Advanced Management of Children and Adolescent Health Care 3
Focuses on the delivery of primary health care to specific populations. Emphasis is on the special problems of the neonate and high risk children and adolescents.
PREREQ: NURS 824.

NURS 831 Comprehensive Assessment of Older Persons 3
This course provides a conceptual foundation for geriatric/gerontological clinical nurse specialists and nurse practitioners. Content is directed at assessing older adults and their families and beginning to assist them with a continuum of health promotion, disease prevention and disease management care.
COREQ: NURS 804 and NURS 821.

NURS 832 Health and Disease Management for Older Persons 3-4
Focuses on the delivery of primary health care to older persons. Emphasis is on the special problems of the elderly and the elderly in the community.
PREREQ: NURS 831.

NURS 836 Health Administration Theories 3
Theories of administration, organization, management, and leadership of health care delivery. Focus is on the role of the manager in health care delivery.
COREQ: NURS 804/HSAD 818.

NURS 837 Health Planning Strategies 3
Analyzes the role of managers in personnel development, promoting research in clinical settings, and developing and implementing quality improvement initiatives and their implications for health care.
PREREQ: NURS 836.

NURS 838 Health Services Evaluation 3
Emphasizes the role of managers and administrators in personnel development, promoting research in clinical settings, and developing and implementing quality improvement initiatives and their implications for health care.
PREREQ: NURS 838.

NURS 840 Cardiopulmonary Nursing I 3-4
Focuses on the science of prevention programs for cardiopulmonary problems as well as on therapy for newly diagnosed or acute problems. Emphasis is on assessment and therapeutic intervention.
COREQ: NURS 804 and NURS 821.

NURS 841 Cardiopulmonary Nursing II 3-4
Focuses on the science of prevention programs for cardiopulmonary problems as well as on therapy for newly diagnosed or acute problems. Emphasis is on assessment and therapeutic intervention.
PREREQ: NURS 820.

NURS 845 Oncology/Immune Deficiency Nursing I 3-4
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 804 and NURS 821.

NURS 846 Oncology/Immune Deficiency Nursing II 3-4
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 804 and NURS 821.

NURS 850 Nursing of Women and Newborns I 3-4
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 804 and NURS 821.

NURS 851 Nursing of Women and Newborns II 3-4
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 804 and NURS 821.

NURS 855 Nursing of Children II 3-4
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 804 and NURS 821.

NURS 856 Health Services Administration Practicum 1-3
A practicum in health services administration. Emphasis is placed on the role of the manager in health care delivery.
PREREQ: NURS 820.

NURS 857 Health Services Administration Practicum 1-3
A practicum in health services administration. Emphasis is placed on the role of the manager in health care delivery.
PREREQ: NURS 820.

NURS 858 Research: Scholarly Paper 1-3
A research paper on a topic in health care management. Emphasis is placed on the role of the manager in health care delivery.
PREREQ: NURS 820.

NURS 869 Master's Thesis 1-6
A research paper on a topic in health care management. Emphasis is placed on the role of the manager in health care delivery.
PREREQ: NURS 820.

NURS 871 Psychiatric Mental Health Nursing I 3
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 820.

NURS 872 Psychiatric Mental Health Nursing II 4
Focuses on the science of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
PREREQ: NURS 820.

NURS 886 Clinical Nurse Specialist Role Integration 4
A research paper on a topic in health care management. Emphasis is placed on the role of the manager in health care delivery.
PREREQ: NURS 820.

NURS 887 Application of Research in Nursing 3
A research paper on a topic in health care management. Emphasis is placed on the role of the manager in health care delivery.
PREREQ: NURS 820.

436
OPERATIONS RESEARCH

ORES 401 INTRODUCTION TO OPERATIONS RESEARCH 3
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: MATH541 and MATH542

ORES 601 SURVEY OPERATIONS RESEARCH I 3
Covers various stochastic operations research models including decision theory, game theory, inventory models, simulation, Markov decision processes and queuing models.

PREREQ: Linear algebra

ORES 602 SURVEY OPERATIONS RESEARCH II 3
Covers various stochastic operations research models including decision theory, game theory, project planning, inventory models, simulation, Markov decision processes and queuing models.

PREREQ: Linear algebra and MATH630

ORES 603 SIMULATION MODELING AND ANALYSIS 3
Covers various stochastic operations research models including decision theory, game theory, project planning, inventory models, simulation, Markov decision processes and queuing models.

PREREQ: Linear algebra and MATH630

ORES 615 ADVANCED PRICES AND STATISTICS 3
See FREC615 for course description

ORES 650 URBAN TRANSPORTATION SYSTEMS 3
See OIEG650 for course description

ORES 664 OPERATIONS RESEARCH INTERNSHIP 1-6 PF
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
Seminars to be given by faculty and by visiting academia, 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 3
Models and principles of basic interest to the theory and practice of operations research.

Classic models of inventory and queuing 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 3
Applications of models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queuing theories, maintenance and replacement of 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 3
See FREC806 for course description

ORES 810 INTERNATIONAL AGRICULTURAL TRADE SPECIAL TOPICS 3
See FREC810 for course description

ORES 827 ADVANCED PRODUCTION ECONOMICS 3
See FREC827 for course description

ORES 834 SEMINAR IN RESOURCE ECONOMICS 3
See FREC834 for course description

ORES 868 RESEARCH 1-6
ORES 869 MASTER’S THESIS 1-6

ORES 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

ORES 969 DOCTORAL DISSERTATION 1-12 PF

PHILOSOPHY

PHIL 100 PHILOSOPHIES OF LIFE 3
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 3
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 Wittgenstein

PHIL 102 INTRODUCTION TO PHILOSOPHY 3
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 3
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 3
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 myths.

PHIL 125 TOPICS: PHILOSOPHY IN POPULAR CULTURE 1-4
Philosophical ideas expressed in popular media such as science fiction or fantasy literature, film and music. Topics are variable.

RESTRICTIONS: May be repeated for up to four credit hours.

PHIL 200 BUSINESS ETHICS 3
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 3
Classical and contemporary views on such problems as the proper scope and functions of government, on what a just distribution of wealth is, and on the extent of an individual’s rights, liberties and obligation to obey the law.

PHIL 202 CONTEMPORARY MORAL PROBLEMS 3
The application of philosophical techniques to contemporary moral problems such as abortion, punishment, biomedical ethics, reverse discrimination and sexual morality. May be crosslisted with WOMS202.

PHIL 203 ETHICS 3
Study of moral value, moral obligation and moral virtue through comparison of notable schools of ethical theory, including utilitarianism, existentialism, Kantianism, classical Greek eudaimonism, pragmatism and Thomism

PHIL 204 WORLD RELIGIONS 3
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 3
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 3
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 3
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 crosslisted with JWST208

PHIL 209 PHILOSOPHY OF RELIGION 3
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 3
See WOMS210 for course description

PHIL 211 BASIC DECISION THEORY 3
Rational decision-making using only elementary logic and high-school algebra. Decisions under ignorance: max-min rules for preference orderings. Decisions under risk: probability, utility, and the expected-utility rule. Game theory: equilibrium strategies; prisoner’s dilemma. Social choices: voting paradoxes and Arrow’s theorem

PHILOSOPHY
PHILOSOPHY

PHIL 216  INTRODUCTION TO FEMINIST THEORY  3
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 WOLS216.

PHIL 226  MIND, ESP AND SURVIVAL  3
An exploration of major philosophical concepts 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  3
See CSCC229 for course description

PHIL 241  ETHICAL ISSUES IN HEALTH CARE  3
See CSCC241 for course description

PHIL 244  PHILOSOPHY OF ART  3
An introduction to main philosophical problems concerning art: the nature, evaluation and
value of art.

PHIL 246  PHILOSOPHICAL PERSPECTIVES OF MEDICINE  3
See CSCC246 for course description

PHIL 250  ENGINEERING ETHICS  3
Concrete ethical problems in engineering practice, both professional/entrepreneurial and
and in industrial research settings. Other topics include the social responsibilities of engineer-
societies May be cross-listed with CSCC250.

PHIL 301  ANCIENT PHILOSOPHY  3
Beginnings of Western science and philosophy: the pre-Socratics, Sophists, Socrates,
Plato, Aristotle, the Epicureans, Stoics and Skeptics

PHIL 303  MODERN PHILOSOPHY  3
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  3
Major philosophies of the 19th century with special emphasis on Hegel and Nietzsche.

PHIL 305  TWENTIETH-CENTURY PHILOSOPHY  3
Major philosophical movements from the 20th century to the present includes logical
empiricism and the recent criticism of this movement

PHIL 306  PHILOSOPHY OF SCIENCE  3
A survey of central topics in the philosophy of science which may include the distinction
between science (astronomy) and pseudo-science (astrology), a study of the role of values in
science, scientific realism, scientific reductionism, as well as the nature of scientific theories, expla-
nations, and confirmation

PHIL 307  BLACK THOUGHT AND PHILOSOPHY  3
See BAMS307 for course description

PHIL 308  TOPICS IN JEWISH THEOLOGY  3
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 Introduction to Jewish Philosophy

PHIL 309  INDIAN RELIGION AND PHILOSOPHY  3
The Vedas, Upanishads, and Bhagavad-Gita; Shankara, Yoga, Nyaya, Vaiseshika and
Nimmanas; Jainism and Indian Hinayana and Mahayana Buddhism; Vedanta and modern
developments such as Aurobindo

PHIL 310  CHINESE RELIGION AND PHILOSOPHY  3
Ancient China: Confucianism, Taoism, and the 100 Schools, the Buddhist conquest of
China; Buddhism in China and Chinese Buddhism. Medieval Syntheses: Neo-
Confucianism. The Response to the West: Maoism and Modern Confucianism

PHIL 311  EARLY MEDIEVAL PHILOSOPHY  3
Examines the attempt to synthesize Greek philosophy with biblical religion in the late classi-
cical and early medieval period. Covers Plotinus, Augustine, Anselm and Abelard among
others, on topics including God, scepticism, evil, the happy life, universals and more

PHIL 312  LATE MEDIEVAL PHILOSOPHY  3
The rediscovery of Aristotle by the Islamic philosophers (10th-12th centuries) through
Ockham (14th century) and includes Avicenna, Al-Ghazali, Avempace, Maimonides,
Aquinas, and more. Topics include science and religion, divine command theory, talking
about God, among others

PHIL 315  METAPHYSICS  3
An introduction to central issues in metaphysics. Sample topics: universals and particulars,
possibility and necessity, identity over time, free will, causality, and the philosophy of

PHIL 316  AMERICAN PHILOSOPHY  3
Classical American philosophers, including Emerson, Thoreau, Peirce, James and Dewey.
Includes ethics, epistemology and social and political theory

PHIL 320  THEORY OF KNOWLEDGE  3
An examination of some central issues in epistemology: classical and contemporary analy-
yses of empirical knowledge; the nature of justification and rationality; implications for sci-
ence, religion and metaphysics

PHIL 321  PHILOSOPHY OF BIOLOGY  3
Examines philosophical issues raised by the theory of evolution. Topics may include the
challenge of scientific creationism, the units of selection problem, the debate about adap-
tationism, human sociobiology and evolutionary ethics.

PHIL 322  EXISTENTIALISM  3
Study of the origins and development of existential philosophy. Emphasis on the funda-
mental 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  3
Critical examination of scientific research on and arguments for and against the biologi-
ical 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 BAMS227 and/or WOLS227

PHIL 330  PHILOSOPHY OF MIND  3
Coverage of central issues in the philosophy of mind including such topics as the relation-
between mind and body, the nature of thought, consciousness, perception, personal iden-
tity 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  3
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 tra-
ditions, ecocentrism and American law.

PHIL 341  ETHICS OF ENGINEERING PROFESSION  3
Introduction to cases involving engineers' moral responsibilities. Emphasis on making rea-
sonable ethical choices. May be cross-listed with CGSC341.

PHIL 344  SCIENCE AND RELIGION  3
Examines the relationship between science and religion and focuses on: whether our cur-
rent 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 histo-
rians and the aim of historical inquiry. Speculation about the "meaning" of history and
the structure of historical process.

PHIL 366  INDEPENDENT STUDY  1-3
See WOLS366 for course description

PHIL 389  TOPICS: WOMEN AND HEALTH ISSUES  3
See WOLS389 for course description

PHIL 390  HONORS COLLOQUIUM  3
See ARSC390 for course description

PHIL 392  HONORS COLLOQUIUM  3
Race, sexism and speciesism. May be cross-listed with WOLS392.

PHIL 444  MEDICAL ETHICS  3
Seminar focuses on such topics as experimentation with human subjects, genetic engi-
neering and the moral problems of health care. May be cross-listed with CSCC444.
RESTRICTIONS: For students of philosophy and health professions.

PHIL 448  ENVIRONMENTAL ETHICS  3
Ethical problems associated with environmental protection, local, national, and interna-
tional relations to social and political movements. Seminar format

PHIL 454  PHILOSOPHY OF SOCIAL SCIENCE  3
Critical examination of the central historical and contemporary questions about the con-
cepts, methods, social structure and purposes of social science inquiry. May be cross-list-
ated with ANTH445
PREREQ: A theory of methodology course in a social science, or an epistemology or phi-
losophy 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.

438
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 distances 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 CONCEPTS 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.
RESTRICTIONS: Not for credit to students who have taken PHYS133.

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; Einstein's theory of relativity; Quantum Mechanics made fairly simple; and the Inflationary Universe.
RESTRICTIONS: Requires high school algebra.

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 199 EXPLORING PHYSICS CONCEPTS I 3
Exploration of physics concepts for first year students with no prior physics 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 two-part sequence with PHYS202 which provides a comprehensive introduction to physics for students in physical, biological, health, and environmental sciences. Topics include: geometrical optics, rectilinear mechanics, fluid dynamics and thermodynamics.
PREREQ: MATH115.
RESTRICTIONS: Requires a grade of "C" or better in MATH115 and strong mathematics background in geometry, algebra and trigonometry. MATH221 strongly recommended. Recommended for pre-dentistry students. Only one course among PHYS104, PHYS201, PHYS207 and SCEN101 can count toward graduation.

PHYS 202 INTRODUCTORY PHYSICS II 4
Second course in a two-part sequence with PHYS201 which provides a comprehensive introduction to physics for students in physical, biological, health, and environmental sciences. Topics include: rotational and oscillatory motion, waves, electricity and magnetism, structure and properties of nuclei, atoms, molecules and solids.
PREREQ: MATH115 and PHYS201.
RESTRICTIONS: Requires a grade of "C" or better in MATH115 and strong mathematics background in geometry, algebra and trigonometry. MATH221 strongly recommended. Recommended for pre-dentistry students. Only one course among PHYS202 and PHYS207 can count toward graduation.

PHYS 207 FUNDAMENTALS OF PHYSICS I 4
Calculus-based introduction to physics, with primary emphasis on mechanics. Integrates conceptual understanding with extensive problem solving and laboratory experience.
PREREQ: MATH242.
RESTRICTIONS: Only one course from among PHYS104, PHYS207 and SCEN101 can count toward graduation.

PHYS 208 FUNDAMENTALS OF PHYSICS II 4
Calculus-based introduction to physics, with primary emphasis on electricity and magnetism. Integrates conceptual understanding with extensive problem solving and laboratory experience.
PREREQ: PHYS207.
COREQ: MATH243.

PHYS 209 FUNDAMENTALS OF PHYSICS III 3
Calculus-based introduction to waves and quantum physics. Material on waves will include the damped and undamped harmonic oscillator, mechanical and electromagnetic waves, and the basics of Fourier series. The quantum physics material will include the Bohr model, diffusion and interference of electrons, photoelectric effect, blackbody radiation, Compton scattering, and the interpretation of the Schrodinger equation.
PREREQ: PHYS208.

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 306 COMPUTATIONAL METHODS OF PHYSICS 3
Introduction to basic computational techniques in physics with application to a number of modern topics of current interest to physicists.
PREREQ: MATH241, MATH242 and MATH243.
COREQ: MATH302.
RESTRICTIONS: Knowledge of a programming language is essential.

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: PHYS302.

PHYS 313 PHYSICAL OPTICS 4
Introduction to optics at an intermediate level with emphasis on physical concepts and the properties of waves. Appropriate for physics as well as engineering students and others with a physical science background.
PREREQ: PHYS302.
RESTRICTIONS: Requires a strong mathematics background.

PHYS 366 INDEPENDENT STUDY 1-3
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 442 QUANTUM MECHANICS 3
Introduces quantum mechanical concepts by reviewing experiments which cannot be explained by classical physics. The Schrödinger equation is solved for simple cases such as free-particle motion, the simple harmonic oscillator and the hydrogen atom, and provides a basic introduction to the interpretation of angular momentum. May be cross-listed with CHEM424 and/or ELEG424.
PREREQ: PHYS209, MATH302 and MATH349

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

PHYS 466 INDEPENDENT STUDY 1-3

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 will be used during the course.

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: PHYS209 or PHYS202
COREQ: MATH503

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
PREREQ: PHYS424

PHYS 616 KINETIC THEORY AND THERMODYNAMICS 3
Postulates of equilibrium thermodynamics; review of relevant mathematics; entropy maximization principle; Lagrange 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 cross-listed with ELEG616.
PREREQ: MATH243 and PHYS209

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 and waves in continuous systems. Provides a classical introduction to techniques that are used extensively in quantum and statistical physics.
PREREQ: MATH302 and MATH419.

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 PHYS521

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 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
Treatments of a specialized subject taken from the following list: particle astrophysics, magnetism, relativity, gravitation, quantum field theory, advanced condensed matter, and miscellaneous 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: PHYS208 or equivalent.

PHYS 646 INSTRUMENTATION FOR SCIENTISTS 3
Electronic measurements and instrumentation with emphasis on applications in science. Amplification, noise, low-level signal recovery, lockin amplifiers, digital signal averaging, frequency and time measurements, transducers, bridges, interfacing to laboratory computers and automation of experiments.
PREREQ: PHYS208 and PHYS545 or equivalents

PHYS 683 SOLID STATE PHYSICS 3
Crystal structure, mechanical, thermodynamic, electrical, optical and magnetic properties of solids; and imperfections in crystals.
PREREQ: PHYS624.

PHYS 689 ELECTROMAGNETIC THEORY 3
Review of statics; Maxwell's equations, physical optics and wave guides. May be cross-listed with ELEG609.
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. Gibbsian 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 cross-listed 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: PHYS620.

PHYS 838 ADVANCED TREATMENT OF SELECTED TOPICS 3
Selected topics 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
An introduction to the ethics, licensure laws and practice of physical therapy.
RESTRICTIONS: Open to MPT Program students only. Requires permission of instructor.

PHYT 601  EXERCISE PHYSIOLOGY: TREATMENT AND RESEARCH  3
Discusses research on the effects of exercise on various patient populations. Emphasis on muscle, bone and connective tissue remodeling. Examines cardiopulmonary rehabilitation, isokinetic and isotonic theories and research.
RESTRICTIONS: Open to MPT Program students only.

PHYT 602  PATIENT MANAGEMENT I  3
An introduction to the theory and skills necessary for the physical therapy management of patients commonly seen in primary care facilities.
RESTRICTIONS: Open to MPT Program students only.

PHYT 603  PHYSICAL AGENTS  2
Introduces the physics, physiology and clinical applications of various physical agents. Students incorporate this new knowledge into patient care problems.
RESTRICTIONS: Open to MPT Program students only.

PHYT 604  FUNCTIONAL ANATOMY AND BIOMECHANICS  3
Gives a description of normal and abnormal human movement. Emphasis on surface anatomy and evaluation procedures such as EMG and cinematography.
PREREQ: BISC401 and PHYT622.
RESTRICTIONS: Requires permission of instructor.

PHYT 605  CLINICAL INTERNSHIP  1-9 PF
Full- or part-time clinical experiences at various health care facilities.
RESTRICTIONS: Open to MPT Program students only with completion of prior professional coursework.

PHYT 606  RESEARCH METHODS  3
The research process will be studied. Among the topics covered are: scientific method, experimental design, statistical procedures and technical writing.
RESTRICTIONS: Open to MPT Program students only.

PHYT 607  ELECTROPHYSIOLOGICAL TREATMENTS AND EVALUATION  3
Emphasis on the physiological basis for the electrotherapeutic and electrophysiological evaluative procedures practiced in the physical therapy clinic.
RESTRICTIONS: Open to MPT Program students only.

PHYT 608  MUSCULOSKELETAL EVALUATION AND TREATMENT  3
Indepth analysis of evaluation and treatment strategies of spinal and extremity joints, muscles and connective tissue. Emphasizes research on the physiological basis of traction, mobilization and exercise.
PREREQ: PHYT604, PHYT622 and PHYT604.
RESTRICTIONS: Open to MPT Program students only.

PHYT 609  NEUROPHYSIOLOGICAL EVALUATION AND TREATMENT  3
Indepth analysis of evaluation and treatment strategies of neurologically involved patients. Emphasizes research on the physiological basis of traction, mobilization and exercise.
PREREQ: All first-year MPT courses
RESTRICTIONS: Open to MPT Program students only.

PHYT 610  PSYCHOSOCIAL ASPECTS OF DISABILITIES  2
Discusses the psychosocial characteristics of patient populations and therapists that impact on the rehabilitative process. Time management, death and dying, sexuality, love and hate and other topics are discussed.
PREREQ: All previous MPT courses.

PHYT 611  CLINICAL MANAGEMENT PRACTICES  1
Discusses concepts of administration and issues in the management of hospital clinics, private practice and consultative ventures.
PREREQ: All first-year MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 612  CLINICAL MANAGEMENT PRACTICUM  3
Full- or part-time practicum in a management setting. Advances skills in management.
PREREQ: All previous MPT courses.

PHYT 613  ADVANCED ORTHOPEDICS  3 PF
Discusses various schools of orthopedic intervention.
PREREQ: All previous MPT courses.

PHYT 614  SPORTS PHYSICAL THERAPY  3 PF
Analyzes the various competencies required in the practice of sports physical therapy. Clinical skill acquired.
PREREQ: All previous MPT courses.

PHYT 615  ADVANCED NEUROTHERAPEUTICS  3
Discusses an integration of the various neurodevelopmental approaches to the treatment of the neurological patient.
PREREQ: All previous MPT courses.

PHYT 616  PEDIATRICS SEMINAR  3 PF
Discusses selected problems encountered by the pediatric population. Studies the evaluation, treatment and research basis of these problems.
RESTRICTIONS: Open to MPT Program students only.

PHYT 617  PATIENT MANAGEMENT II  3
Continuation of PHYT 602. Teaches the theory and skills necessary for the physical therapy management of patients commonly seen in rehabilitation settings.
PREREQ: PHYT602.
RESTRICTIONS: Open to MPT Program students only.

PHYT 618  LIFE SPAN DEVELOPMENT  3
A study of human development and aging from birth through death. Emphasis on motor, sensory and cognitive functions and dysfunction.
PREREQ:All first-year MPT courses.

PHYT 619  ADVANCED SEMINAR  2
Lectures pursue various topics in greater depth and develop advanced clinical skills. Examples include burn and wound care, hand therapy, geriatrics and ob-gyn. Individualized clinical experiences may be arranged.
PREREQ: All previous MPT courses.

PHYT 620  EDUCATIONAL PROCESS IN COMMUNITY HEALTH  1
Focuses on the learning/teaching process for application to the teaching roles of the health professional.
RESTRICTIONS: Open to MPT Program students only.

PHYT 621  PRACTICE CLINIC  3 PF
Student participation in faculty practice clinic. Treatment referrals for physical therapy. All students participate in the clinic at least one semester.
RESTRICTIONS: Open to MPT Program students only.

PHYT 622  CLINICAL GROSS ANATOMY  6
Emphasis on structural and functional aspects of regions of body under study by means of human cadaver, lectures and demonstrations. Stresses clinical significance of anatomical structure.
RESTRICTIONS: Open to first-year physical therapy graduate students only.

PHYT 623  CLINICAL NEUROSCIENCES  4
A study of the structure and function of the human nervous system with major emphasis on the cause-effect relationships between lesions and their symptoms. Emphasis on the neural mechanisms controlling movement.
PREREQ: PHYT622.

PHYT 624  INTRODUCTION TO EVALUATION  1
Provides the student with an understanding of the philosophy and practice of patient evaluation and physical therapy diagnosis. Muscle performance testing and measurement of joint motion of the extremities will be emphasized.
RESTRICTIONS: MPT Program students only.

PHYT 626  ADVANCED REGIONAL ANATOMY  3 PF
Structural and functional aspects of regions of the body under study are emphasized by means of a dissection of a specific region of the human body.
PREREQ: PHYT622.
PHYSICAL THERAPY

PHYT 630 Human Movement Control 3
Examines important theoretical, methodological and empirical issues required for an understanding of the control and coordination of human movement. Readings and group discussion of the implication of issues raised in the literature. Development of a proposal to study an aspect of motor behavior.
PREREQ: Neuroanatomy/neurophysiology or equivalent

PHYT 801 Medical Science I 2
Lectures in pathology, clinical medicine, cardiology and pharmacology
RESTRICTIONS: Open to MPT Program students only

PHYT 802 Medical Science II 2
Lectures in orthopedics, radiology and rheumatology
PREREQ: All previous MPT courses

PHYT 803 Medical Science III 2
Lectures in neurology, pediatrics, geriatrics and other medical specialties as required
PREREQ: All previous MPT courses
RESTRICTIONS: Open to MPT Program students only

PHYT 868 Research 1-9
PREREQ: All previous MPT courses.
RESTRICTIONS: Requires permission of instructor

PHYT 869 Master's Thesis 1-6
PREREQ: All previous MPT courses.
RESTRICTIONS: Requires permission of instructor

PLANT AND SOIL SCIENCES

PLSC 100 Plants and Human Culture 3
Historical survey of internships 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, phylogeny and ecology

PLSC 105 Introductory Forestry 3
Distribution, ecology, value, measurement and management of forest systems
PREREQ: PLSC101

PLSC 133 Ornamental Horticulture 3
The use of ornamental plants. Emphasis on 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 4
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 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 Biotech: Science and Socioeconomic Issues 3
See ANSC270 for course description.

PLSC 300 Principles of Animal and Plant Genetics 3
See ANSC300 for course description.

PLSC 302 Vegetable Science 4
Basic factors affecting productivity and marketability of vegetable crops

PLSC 303 Introductory Plant Pathology 4
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

PLSC 305 Environmental Soil Management 4
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

PLSC 306 Introduction to Plant Molecular Biology 3
The molecular biology of higher plants, including organization of plant genes, genomes, gene expression, gene transfer and genetic engineering
PREREQ: BISC207, CHEM213

PLSC 310 Animal and Plant Genetics Laboratory 1
See ANSC310 for course description.

PLSC 313 Turf Establishment and Maintenance 4
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

PLSC 319 Environmental Soil Microbiology 4
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 CHEM102

PLSC 330 Landscape Construction Details 4
Introduction to principles involved in the design and installation of landscape elements: stone, brick, concrete, wood and metal

PLSC 331 Landscape Construction Systems 4
Introduction to principles involved in contour grading, site drainage, lighting and irrigation design related to landscaping

PLSC 332 Basic Landscape Design 4
Application of design principles to actual field problems, drafting and presenting techniques
PREREQ: PLSC212

PLSC 344 Forest Ecology 2
See ENT0344 for course description.
PREREQ: BISC208

PLSC 364 Landscape Horticulture Internship 1-6
Supervised, faculty-monitored, career-related experience in one or more aspects of the ornamental horticulture industry
PREREQ: PLSC133

PLSC 366 Independent Study 1-6
PLSC 401 **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 402 **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 403 **NURSERY AND GARDEN CENTER MANAGEMENT**  
Production, maintenance and marketing of plants relative to the establishment and management of a nursery or garden center  
PREREQ: PLSC101 or PLSC151.

PLSC 410 **INTRODUCTION TO PLANT PHYSIOLOGY**  
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

PLSC 411 **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 413 **PRINCIPLES OF PLANT DISEASE CONTROL**  
Principles of plant disease control by exclusion, eradication and resistance. Plant protection with emphasis on fungicides, bactericides, and nematocides and their use  
PREREQ: PLSC303.

PLSC 414 **PLANT CELL AND TISSUE CULTURE**  
Principles of culturing plants in vitro. Topics for both lecture and laboratory include cell suspensions, another culture, embryo rescue, micropropagation and regeneration via organogenesis and embryogenesis  
PREREQ: PLSC101.

PLSC 416 **PLANT VIROLOGY**  
Epidemiology, detection, identification and control of plant viruses and viruslike agents  
PREREQ: PLSC303

PLSC 417 **GREENHOUSE MANAGEMENT**  
Greenhouse structures, environmental control, cultural techniques and general management practices in greenhouse operations. Laboratory exercises supplement lecture material  
PREREQ: PLSC201 and PLSC204

PLSC 420 **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  
PREREQ: PLSC410.

PLSC 422 **PLANT PROPAGATION**  
Practical and physiological aspects of the propagation of economic plants including both sexual and asexual methods  
PREREQ: PLSC201

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  
PREREQ: PLSC201

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 **FATS/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 ENT0440 for course description

PLSC 444 **THE PHYSIOLOGY OF PLANT STRESS**  
The ways that green plants respond to biotic and abiotic environmental stressors: light, heat, cold, carbon dioxide, soil, drought, mineral nutrients and heavy metals, pathogens and herbivores, etc. at the physiological level  
PREREQ: PLSC410

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

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 DELINEATION**  
Soil taxonomy, use of a soil survey, properties of hydric soils and wetland delineation using soil characteristics, hydrology and plant ecological principles  
PREREQ: INTEGRATED PEST AND DISEASE MANAGEMENT

PLSC 465 **SEMINAR**  
Oral and written reports in one of the fields of plant science  
PREREQ: INDEPENDENT STUDY

PLSC 470 **WEED BIOLOGY AND CONTROL**  
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 601 **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 605 **PLANT BREEDING**  
Improvement of crops through the application of genetic principles to breeding methods  
PREREQ: ANIS300 or PLSC300 or introductory genetics course

PLSC 606 **SOIL GENESIS AND CLASSIFICATION**  
Soil forming factors and processes; chemical, physical and mineralogical parameters useful in characterizing soil; geologic and geomorphic 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. May be crosslisted with CHEM608  
PREREQ: CHEM102 or CHEM104 and PLSC204

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

443
PLSC 611 Diagnostic Plant Pathology 3
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 3
Exclusion, eradication, resistance and protection with emphasis on fungicides, bactericides and nematocides and their use.
PREREQ: PLSC303.

PLSC 614 Plant Cell and Tissue Culture 4
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 3
A developmental and comparative study of the cells, tissues and organs of vascular plants. Readings in the current anatomical literature.

PLSC 616 Plant Virology 4
The epidemiology, detection, identification and control of plant viruses and virus-like agents.
PREREQ: PLSC303.

PLSC 619 Soil Microbiology 4
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 2
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.
PREREQ: PLSC410.

PLSC 629 Introductory Mycology 4
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 635 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 ENTO640 for course description.

PLSC 644 The Physiology of Plant Stress 3
The ways that green plants respond to biotic and abiotic environmental stresses: light, heat, cold, carbon dioxide, soil, drought, mineral nutrients and heavy metals, pathogens and herbivores, etc., at the physiological level.
PREREQ: PLSC410.

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 PLSC207.

PLSC 660 Pesticides in the Environment 3
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.
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 106 INTRODUCTION TO POLITICAL SCIENCES: ISSUES 3
Selected problems of politics drawn from comparative and international politics, American government and political theory.

RESTRICTIONS: Cannot be substituted for POSC 150.

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 research, with emphasis on political phenomena. Prepares students in the skills needed to conduct scientific research.

RESTRICTIONS: Students cannot take both POSC 202 and POSC 300 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 POSC 211 or POSC 311 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 ASRC 260 for course description.

POSC 266 SPECIAL PROBLEMS 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 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 ECON 306 for course description.

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

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 POSC 211 or POSC 311 can count for degree credit.

POSC 312 EAST ASIAN POLITICAL SYSTEMS 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 WOMS 315.

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 COMM 319 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 cultural and 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 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 BAMS 322.

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

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 GEOG 329, HIST 329, and/or SOC 329.

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 GEOG 331 for course description.

POSC 333 COMMUNISM, FASCISM AND DEMOCRACY 3
Ideology and environmental backgrounds. Understanding of the operating nature and causes of these aspects of contemporary Western political life.

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

POSC 339 BRITAIN AND EUROPE 3
Examines Britain's role in an integrated Europe, with focus on contemporary problems and prospects of closer British ties to the European Union and related bodies.
POLITICAL SCIENCE

POSC 340  Politics and the Media  3
Political roles of the media in socialization, political competence, agenda setting, the electoral process and political crises. Emphasis on media-political system interaction and its impact for a democratic society. May be cross-listed with COMM340

POSC 341  Environment of Multinational Corporations  3
See BUAD341 for course description

POSC 343  Society, Politics and Health Care  3
Interdisciplinary study of the political, social, economic and humanitarian issues of health care and health policy. Students will develop the capacity to understand the political process and its relationship to the health care delivery system. May be cross-listed with CSCC343 and/or SOCI343

POSC 350  Politics and the Environment  3
The political context of environmental issues; air and water pollution, population control, and conservation

POSC 355  Urban Politics and Community Development  3
Examines the decision making processes and the exercise of political power in urban communities. Special focus placed on urban politics and government and the impact of social and economic problems on the development of urban society. Explores the concepts and practices of community development in urban communities

POSC 360  Humanities Colloquium  3
See ASCR360 for course description

POSC 362  Diplomacy  3
Diplomacy is the art of formal representation and policy implementation. Diplomats need to understand complex material and represent positions in an effective manner. These skills are applicable in a variety of contexts. Readings, discussions, cases and simulations are used to introduce diplomatic skills

POSC 363  International Law and Organization  3
Introduction to the development of international law and international organization

POSC 365  Model United Nations  3
Intensive preparation for effective participation in the National Model United Nations held in New York City each April

RESTRICTIONS: May be repeated once for credit. Open only to selected delegates to the National Model United Nations.

POSC 366  Independent Study  1-6

POSC 372  East Central European Politics  3
Survey of East Central European political systems (Poland, Hungary, Czech and Slovak, Germany, Romania, former Yugoslavia, Bulgaria and Albania) after World War II. The so-called new federal states in Germany (ex-DDR) will be emphasized

POSC 377  Arab-Israeli Politics  3
Development of the Arab-Israeli conflict analyzed from the Dreyfus Affair and the Balfour Declaration to current events

POSC 380  Introduction to Law  3
Broad overview of the nature, functions and limits of law. Emphasis on law as the political instrument used to regulate, control and promote behavior and deal with social problems. May be cross-listed with IEST380

POSC 387  American Political Thought  3
Overview of American political thought. Focuses on critical formative periods in American politics, such as the Founding, Civil War and Industrial Revolution, with readings selected from the writings and speeches of key American statesmen

POSC 390  Honors Colloquium  3
See ASCR390 for description

POSC 400  Practicum in Teaching Political Science  3 PF
Available to outstanding Senior political science majors interested in obtaining teaching experience at the college level. Provides opportunity to lead discussion sections of students in lower division courses.

RESTRICTIONS: Requires permission of instructor.

POSC 402  Civil Liberties I  3
Individual constitutional rights of expression, religion, "fundamental rights" (such as privacy and travel) and equal protection as developed by the U.S. Supreme Court. Role of the Supreme Court in American government

POSC 404  The Judicial Process  3
Structure, process and personnel of American courts; factors influencing decisions and judicial policy making

POSC 405  Constitutional Law of the United States  3
Constitutional principles regulating organization and function of federal government. United States Supreme Court decisions placed in a socio-political context

POSC 406  Civil Liberties II  3
Constitutional rights of the accused in the U.S. judicial system, especially as developed through Supreme Court cases

POSC 407  American Presidency  3
Modern American presidency with emphasis on presidential recruitment, organization and staffing. The nature and exercise of presidential power in the decision making process

POSC 408  International Organization  3
Analysis of the organization of the international system, its structure, operating principles, formal and informal components

POSC 409  Contemporary Problems of World Politics  3
Critical areas of international politics. Topics vary by instructor. May be cross-listed with WIST409

RESTRICTIONS: May be repeated once when topics vary

POSC 411  Politics and Poverty  3
Relationship of policy making and social conditions in the United States with regard to capacity of government to cope with problems arising from overpopulation and socio-economic differences

POSC 412  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 413  Problems in American Government  3
Contemporary problems in American government and politics. May be cross-listed with WOMS413

RESTRICTIONS: May be repeated for credit once when topics vary

POSC 414  Problems in American Foreign Policy  3
Contemporary problems in American foreign policy and policy making

RESTRICTIONS: May be repeated for credit once when topics vary

POSC 415  Force and World Politics  3
Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience

POSC 418  Constitutional Issues in American Public Schools  3
Case studies are used to explore how controversial issues have arisen in public education over the years, what laws and legal precedents presently govern them, how policies have evolved over time and what questions remain unsolved

POSC 419  Human Role in Environmental Change  3
Examines the impact that human activity has on earth systems and how the behavior of earth systems affects human activity. Topics include climate change, biodiversity, conservation, western water management and industrial ecology. Offered only in partnership with the Biosphere 2 Center in Arizona

POSC 420  Introduction to Political Economy  3
Recent political and economic history, contemporary economic policy disputes and an analysis of how the Democratic/Republican balance of power affects, and is affected by, changing economic conditions and the results of policies put into effect

POSC 422  Political Leadership  3
Study of the theories and practices of effective political leadership in both contemporary and historical contexts. Will include case materials and may include non-U.S. cases for study

POSC 423  Congress and Public Policy  3
Democratic functions of a modern legislature; legislative structures and processes; coalitions and cleavages; parties, ideological factions and interest groups; the Federal budget, national priorities and Congressional intervention in the economy; central policy issues before Congress; Congressional oversight of the bureaucracy; Congress and the Presidency; and election of the Congress

POSC 424  Energy Policy and Administration  3
World and U.S. energy policies with emphasis on nuclear power, solar energy and fossil fuels. Analyzes progress and design of U.S. science and technology policy in energy domain

POSC 425  Advanced Topics in Politics and Broadcast Journalism  3
See COMM425 for course description

POSC 426  Latin American Political Systems  3
Impact of social and economic change on the political processes

POSC 427  Politics in China  3
An in-depth study of who governs China and the relations among the major forces: the party, the military and the bureaucracy

POSC 428  Politics in Japan  3
An in-depth study of who governs Japan and how these relations have evolved since the end of World War II
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSC 429</td>
<td>Southeast Asia and the World</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>POSC 431</td>
<td>Latin American Politics: Countries</td>
<td>3</td>
<td>Contemporary political events in three Latin American nations. Comparisons of the actions and influence of the military, church, bureaucracies, political parties and guerrilla groups in three different Latin American settings: modern, transitional and traditional.</td>
</tr>
<tr>
<td>POSC 432</td>
<td>Political System of the Post-Soviet Union</td>
<td>3</td>
<td>Structure and process of the political system of the USSR and its most important successor states (Russia, Ukraine, Byelarus, Kazakhstan and others).</td>
</tr>
<tr>
<td>POSC 433</td>
<td>African Politics</td>
<td>3</td>
<td>Overview of politics and society in sub-Saharan Africa including: colonialism, the rise of nationalisms, decolonization, single-party and military rule, the role of social movements and religious, class and gender and ethnic identities and the move toward economic and political liberalization.</td>
</tr>
<tr>
<td>POSC 434</td>
<td>Political Thought I</td>
<td>3</td>
<td>From Plato to Machiavelli</td>
</tr>
<tr>
<td>POSC 435</td>
<td>Political Thought II</td>
<td>3</td>
<td>From Machiavelli to present</td>
</tr>
<tr>
<td>POSC 436</td>
<td>Politics and Literature</td>
<td>3</td>
<td>Class, civil rights, feminism, revolution and other political issues examined through novels, film and other literary works. May be cross-listed with WOMS436.</td>
</tr>
<tr>
<td>POSC 437</td>
<td>Who Governs: Perspectives on Political Power</td>
<td>3</td>
<td>Raises the question “Who Governs” and attempts to answer it by critically examining various schools of thought about who actually has and who should have political power in capitalist countries.</td>
</tr>
<tr>
<td>POSC 439</td>
<td>Problems in African Politics</td>
<td>3</td>
<td>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. May be cross-listed with BAM439.</td>
</tr>
<tr>
<td>POSC 441</td>
<td>Problems of Western European Politics by Country</td>
<td>3</td>
<td>Intensive examination of European politics from the perspective of a specific country, e.g., Spain, England and France.</td>
</tr>
<tr>
<td>POSC 442</td>
<td>Problems of Western European Politics</td>
<td>3</td>
<td>Examination of current political trends in Western European politics, including changes in party systems and problems of European integration.</td>
</tr>
<tr>
<td>POSC 443</td>
<td>China and the World</td>
<td>3</td>
<td>An objective examination of China’s relations with the major countries in the world. Special attention paid to China’s policy towards the superpowers and its role in the “Third World”.</td>
</tr>
<tr>
<td>POSC 444</td>
<td>Global Agenda</td>
<td>3</td>
<td>Seminar survey of current geopolitical problems facing the US government and global news media. Guest lecturers and practitioners in diplomacy and the international media. Explore the problems, US foreign policy and media influence upon them. May be cross-listed with COMM444.</td>
</tr>
<tr>
<td>POSC 445</td>
<td>Human Rights and World Politics</td>
<td>3</td>
<td>Alternative theories of human rights examined in cross-cultural and international contexts. International documents, contemporary cases (e.g., South Africa) and U.S. foreign policies also examined and evaluated.</td>
</tr>
<tr>
<td>POSC 446</td>
<td>International Human Rights on Film</td>
<td>3</td>
<td>A study of the history, evolution and current status of universal human rights using film as a primary medium. Content covers origins of the international human rights movement during and after WW2. A series of feature films and documentaries also highlights recent and current human rights violations in foreign nations.</td>
</tr>
<tr>
<td>POSC 448</td>
<td>Theories of International Relations</td>
<td>3</td>
<td>Surveys the theoretical debates regarding how we can conceive of and understand world politics, as well as how we can evaluate contending perspectives. Considers such schools of thought as ancient, idealist, realist, behavioralist, interdependence, radical, neorealist and post-structuralist perspectives.</td>
</tr>
<tr>
<td>POSC 450</td>
<td>Problems of Latin American Politics</td>
<td>3</td>
<td>Current political issues in selected Latin American countries. May be cross-listed with JWS452.</td>
</tr>
<tr>
<td>POSC 452</td>
<td>Problems in Urban Politics</td>
<td>3</td>
<td>Contemporary problems and political relationships in urban communities. May be cross-listed with JWST452.</td>
</tr>
<tr>
<td>POSC 454</td>
<td>Organizational Behavior and Theory in the Public Sector</td>
<td>3</td>
<td>Examines major administrative and organizational theories ranging from Weberian bureaucracy to organizational humanism as applied to public organizations. Explores various aspects of behavior in the public organizational settings through analysis of individuals, groups and the organizations as a whole.</td>
</tr>
<tr>
<td>POSC 455</td>
<td>Public Budgeting and Financial Management</td>
<td>3</td>
<td>Revenue and expenditure systems, alternative budget formats, basic principles of accounting and capital financing in the public sector.</td>
</tr>
<tr>
<td>POSC 456</td>
<td>Disaster and Politics</td>
<td>3</td>
<td>U.S. emergency management and disaster policy examined through books, articles and video tapes dealing with governmental preparedness for, and response to, natural and human-caused disasters and emergency incidents.</td>
</tr>
<tr>
<td>POSC 457</td>
<td>Management and Nonprofit Organizations</td>
<td>3</td>
<td>Explores the historical and theoretical context of nonprofit organizations. Discusses how nonprofit organizations are organized and structured in the pursuit of their mission. Designed to prepare students for a career as an administrator in a nonprofit organization.</td>
</tr>
<tr>
<td>POSC 458</td>
<td>Community Service Fieldwork</td>
<td>3</td>
<td>Allows students to earn academic credit for fieldwork experiences in public or private community service agencies. Students will share and analyze experiences in a seminar setting with academic requirements.</td>
</tr>
<tr>
<td>POSC 464</td>
<td>Fieldwork in Political Science</td>
<td>1-6</td>
<td>Offers students an opportunity to earn academic credit while undertaking an internship in a political science or international relations related field. Includes preparation of a journal of activities and a final project.</td>
</tr>
<tr>
<td>POSC 465</td>
<td>Model OAS</td>
<td>3</td>
<td>Theoretical and practical preparation for participation in the Model Organization of American States conference held in Washington, D.C. each year. Participation as delegate to the week-long simulation. May be cross-listed with EDUC465.</td>
</tr>
<tr>
<td>POSC 466</td>
<td>Independent Study</td>
<td>1-6</td>
<td>Students will experience the development, institutional structure, and prospects of the United Nations and U.N. system.</td>
</tr>
<tr>
<td>POSC 468</td>
<td>Undergraduate Research</td>
<td>1-6</td>
<td>Research conducted under the direction of an instructor. May result in a major research paper or be incorporated into a faculty project.</td>
</tr>
<tr>
<td>POSC 470</td>
<td>Senior Honors Seminar</td>
<td>3</td>
<td>A seminar of advanced and honors courses designed to integrate students' accrued knowledge and skills in Political Science. Emphasizes analytical, written and oral communication skills.</td>
</tr>
<tr>
<td>POSC 499</td>
<td>Capstone in Political Science</td>
<td>1</td>
<td>Designed to integrate students' acquired knowledge and skills in Political Science. Emphasizes analytical, written and oral communication skills.</td>
</tr>
<tr>
<td>POSC 604</td>
<td>International Law</td>
<td>3</td>
<td>See MAST667 for course description.</td>
</tr>
<tr>
<td>POSC 605</td>
<td>Topics in Law and Courts</td>
<td>3</td>
<td>Content of this seminar varies from year to year. Possible topics may be comparative public law, jurisprudence, constitutionalism. A major research paper is required.</td>
</tr>
<tr>
<td>POSC 612</td>
<td>Foreign Policy of the Post-Soviet Union</td>
<td>3</td>
<td>Principles, foreign policies and administration of the former Soviet government and its most important successor states.</td>
</tr>
<tr>
<td>POSC 614</td>
<td>Judicial Process</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>POSC 615</td>
<td>Force and World Politics</td>
<td>3</td>
<td>Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.</td>
</tr>
<tr>
<td>POSC 624</td>
<td>Energy Policy and Administration</td>
<td>3</td>
<td>World and U.S. energy policies with emphasis on nuclear power, solar energy and fossil fuels. Analyzes progress and design of U.S. science and technology policy in energy domain. May be cross-listed with MAST620 and/or UAPP625.</td>
</tr>
<tr>
<td>POSC 626</td>
<td>Conservation and Renewable Energy Policy</td>
<td>3</td>
<td>See UAPP626 for course description.</td>
</tr>
</tbody>
</table>
POLITICAL SCIENCE

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, region- al and global levels. Discussion of contemporary issues including the emergence of econom- ic 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, Byelarus, 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 an aspect 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, democra- tization 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 Health Care 3
Prepares students to understand and assess the American health care delivery system. Examines the political dynamics involved in developing health care 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 3
See UAPP659 for course description

POSC 678 Coastal 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: Theory and Design of Political Inquiry 3
Introduces basic topics of political inquiry including philosophies of science, epistemolo- gies and theory building, and research design. Concepts and normative issues are explored. Each participant has an opportunity to write a research proposal that is then critiqued by members of the class and the instructor

POSC 801 Research Methods for Political and Policy Sciences 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 transition- al countries of Africa, Asia, Eastern Europe and Latin America in a global governance context. Topics may include democratic transition and consolidation, comparative democ- racy, political economy of liberal economic reform, religion and political culture, new nationalism and ethnic conflict, and international systemic influences on all the above

POSC 803 Seminar: Public Administration 3
Reading and discussion of theories and problems of public administration, including organi- zation, coordination, field administration, contracts, personnel, policy making, participa- tion, adjudication, budgeting and administrative behavior. May be cross-listed with UAPP803

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 reforms, party systems, civil society and new social movements, regional inte- gration 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. Topics 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 theo- retical 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 analy- sis

POSC 814 Political Economy of the Environment 3
See UAPP810 for course description

POSC 815 Public Management Statistics 3
See UAPP815 for course description

POSC 816 Advanced Social Statistics 3
Provides advanced training in applied social statistics. Topics include analysis of vari- ance, regression analysis, analysis of covariance, multi-dimensional cross-classifications and future analysis. Lectures supplemented by laboratory work involving computer statis- tical packages and simulations. May be cross-listed with UAPP816

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 devel- opment and conservation, as well as intergovernmental relations in environmental pro- gram 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
<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 201</td>
<td>General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Families and Developmental Disabilities</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 301</td>
<td>Personality</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 303</td>
<td>Introduction to Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 309</td>
<td>Measurement and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 310</td>
<td>Sensation and Perception</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 312</td>
<td>Learning and Motivation</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 314</td>
<td>Brain and Behavior</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 317</td>
<td>Sexual Behavior and Motive</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 324</td>
<td>Industrial Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 325</td>
<td>Child Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 333</td>
<td>Psychology of Women</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 334</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 340</td>
<td>Cognition</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 350</td>
<td>Developmental Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 365</td>
<td>Psychology Field Placement</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 366</td>
<td>Independent Study</td>
<td>1-6</td>
</tr>
<tr>
<td>PSYC 370</td>
<td>Research in Personality</td>
<td>3</td>
</tr>
</tbody>
</table>

**PSYCHOLOGY**

**PSYC 201 General Psychology 3**
A foundation course in the application of the scientific method to problems of human behavior and experience

**PSYC 270 Families and Developmental Disabilities 3**
See IFST270 for course description.

**PSYC 301 Personality 3**
A survey of data and theories of human personality and affect
PREREQ: PSYC201

**PSYC 303 Introduction to Social Psychology 3**
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
PREREQ: PSYC201

**PSYC 309 Measurement and Statistics 3**
Theory and the application of statistical techniques to psychological data.
PREREQ: One course in basic college mathematics and PSYC201

**PSYC 310 Sensation and Perception 3**
Theories and experimental study of sensation and perception.
PREREQ: PSYC201 and PSYC309

**PSYC 312 Learning and Motivation 3**
Experimental study of contemporary theories of learning and motivation.
PREREQ: PSYC201 and PSYC309

**PSYC 314 Brain and Behavior 3**
Study of the brain mechanisms underlying hunger, sex, aggression, learning, memory, perception, sleep and waking. May be cross-listed with CGSC314.
PREREQ: PSYC201

**PSYC 317 Sexual Behavior and Motive 3**
An objective view of sex from physiological, psychological, sociological and anthropological studies. Readings include Masters and Johnson, Freud, Kinsey, Reiss, and Ford and Beach. Practical sexual information, e.g., contraception, also discussed, sometimes by outside experts.
PREREQ: PSYC201 and PSYC309

**PSYC 324 Industrial Psychology 3**
Psychological factors in selection, training, fatigue, morale, attitudes, accidents, and other aspects of worker efficiency.
PREREQ: PSYC201 and PSYC309

**PSYC 325 Child Psychology 3**
Survey of the interactions of physiological, psychological, and environmental factors determining psychological development. Consideration of major theories of child development.
PREREQ: PSYC201

**PSYC 333 Psychology of Women 3**
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. May be cross-listed with WCOM333.
PREREQ: PSYC201 or any 300-level psychology course

**PSYC 334 Abnormal Psychology 3**
Disorders of behavior and consciousness including the various psychoses, psychoneuroses, mental deficiency, and other conditions.
PREREQ: PSYC201

**PSYC 340 Cognition 3**
Survey of major themes in human thought processes, concept formation, problem solving, creativity, language use and cognitive development. May be cross-listed with CGSC340.
PREREQ: PSYC201 and PSYC309

**PSYC 346 Psychology and the Law 3**
See CNUJ346 for course description.

**PSYC 350 Developmental Psychology 3**
An analysis of theory and research in developmental psychology, including the topics of developmental processes, developmental risk, systems theory and contemporary social issues.
PREREQ: PSYC201 and PSYC309

**RESTRICTIONS:** If both PSYC325 and PSYC350 are taken, only PSYC325 will count for major credit. Open to psychology majors and minors only.

**PSYC 365 Psychology Field Placement 3**
Student contracts with any psychology instructor. Requirements include a minimum of four hours per week working in an agency, institution or business, reading 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.
PREREQ: PSYC201 and PSYC309

**PSYC 366 Independent Study 1-6**

**PSYC 370 Research in Personality 3**
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.
PREREQ: PSYC201 and PSYC309

**RESTRICTIONS:** If both PSYC201 and PSYC370 are taken, only PSYC301 will count for major credit. Open to psychology majors and minors only.
PSYC 380  PSYCHOPATHOLOGY  3
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 videotaped interviews with patients used to illustrate these disorders.
PREREQ: PSYC201 and PSYC309
RESTRICTIONS: If both PSYC334 and PSYC380 are taken, only PSYC334 will count for major credit. Open to psychology majors and minors only.

PSYC 390  SOCIAL PSYCHOLOGY  3
An analysis of theory and research in social psychology including the topics of social cognition, attitudes, interpersonal, group and intergroup relations. Includes laboratory/tutorial session with analysis and presentation of scenes from dramatic literature to illustrate integration of emotion, cognition and action.
PREREQ: PSYC201 and PSYC309
RESTRICTIONS: If both PSYC303 and PSYC390 are taken, only PSYC303 will count for major credit. Open to psychology majors and minors only.

PSYC 403  PSYCHOLOGY OF NONVERBAL BEHAVIOR  3
A seminar on the 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.
PREREQ: PSYC309 and PSYC303 or PSYC390.

PSYC 404  EDUCATIONAL PSYCHOLOGY: COGNITIVE ASPECTS  3
See EDUC 441 for course description.
RESTRICTIONS: Does not count toward the 6 credits of 400-level psychology courses required for the major.

PSYC 406  REDUCTION OF INTERGROUP CONFLICT  3
The reduction of intergroup conflict in business, educational and experimental laboratory settings, with special attention given to organizational mergers. Investigation of strategies for reducing intergroup conflict.
PREREQ: PSYC309; and PSYC303 or PSYC390.

PSYC 410  BIOLOGICAL BASIS OF MOTIVATION AND EMOTION  3
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, leisure, phobias, learned helplessness, voodoo death, fear, love and aggression.
PREREQ: PSYC201 and PSYC309.

PSYC 411  BRAIN AND COMPUTER  3
The computing machinery of the brain: a hands-on introduction to neural models and networks. May be cross-listed with COSC 411.
PREREQ: PSYC309 or PSYC312 or PSYC314 or PSYC340.

PSYC 413  EDUCATIONAL PSYCHOLOGY: SOCIAL ASPECTS  3
See EDUC 413 for course description.
RESTRICTIONS: Does not count toward the 6 credits of 400-level psychology courses required for the major.

PSYC 414  DRUGS AND THE BRAIN  3
Topics covered include drug treatment of mental illness, and drug abuse/addiction.
PREREQ: PSYC309; PSYC 314.
RESTRICTIONS: PSYC380 or PSYC334 recommended in addition to Prerequisites.

PSYC 415  HISTORY AND SYSTEMS OF PSYCHOLOGY  3
Psychology from the early Greeks through the more important "schools" of the 20th century. May be cross-listed with BAMS 432.
PREREQ: Two of the following: PSYC310, PSYC312, PSYC314 or PSYC340 as well as one of: PSYC330, PSYC370, PSYC380 or PSYC390.

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 BAMS 432.
PREREQ: PSYC309; and PSYC390 or PSYC303.

PSYC 417  ANIMAL BEHAVIOR  3
Seminar on naturalistic and experimental investigations of species-typical behavior.
PREREQ: PSYC309.

PSYC 418  HUMAN EMOTIONS  3
Emotions, cognition and behavior. Roles 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.
PREREQ: PSYC309; and PSYC301 or PSYC370 or PSYC325 or PSYC350.

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.
PREREQ: PSYC309, and PSYC303 or PSYC390.

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.
PREREQ: PSYC325 or PSYC350.

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 developed and a discussion of their psychological plausibility. May be cross-listed with COSC 441.
PREREQ: PSYC340.

PSYC 443  TOPICS IN ORGANIZATIONAL COMMUNICATION  3
See COMM 442 for course description.

PSYC 444  THE PSYCHOLOGY OF AESTHETICS  3
Psychological and psychobiological theories and empirical investigations of aesthetic experience.
PREREQ: PSYC309; and PSYC310 or PSYC314.

PSYC 445  TOPICS IN ADOLESCENT PSYCHOLOGY  3
Analysis of the physiological, psychological and social factors influencing psychological development from late childhood through adolescence.
PREREQ: PSYC309; and PSYC325 or PSYC350.

PSYC 460  ASSESSMENT OF YOUNG CHILDREN  3
See IFST 452 for course description.

PSYC 462  LANGUAGE ACQUISITION  4
See EDUC 462 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.
PREREQ: PSYC309; and PSYC334 or PSYC380.
RESTRICTIONS: Open to psychology majors and minors only.

PSYC 482  CONTROVERSIES IN ABNORMAL PSYCHOLOGY AS PORTRAYED IN MOVIES  3
Uses movies to illustrate certain types of psychiatric diagnoses and a text presenting journal articles representing pro and con views about controversies concerning these disorders. Students discuss the disorders and controversies using the fictionalized characters and events as illustrations.
PREREQ: PSYC309 or PSYC334.
RESTRICTIONS: Course limited to psychology majors or minors, Juniors and Seniors.

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.
PREREQ: PSYC309.
RESTRICTIONS: Open to Junior and Senior psychology majors and minors only.

PSYC 491  PSYCHOLOGY OF TEMPORAL ORIENTATION  3
The psychology of time and the scientific study of how temporal frames of reference regarding the past, present and future affect a variety of basic human processes. The purpose of this course is to learn more about these concepts and in the process, learn something about human behavior.
PREREQ: PSYC309; and PSYC334 or PSYC301.
RESTRICTIONS: Open to 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.
PREREQ: PSYC309.
RESTRICTIONS: Requires permission of instructor.

PSYC 616  COMPUTER MODELS OF COGNITION  3
Survey of computer models for perception, language and problem-solving. Covers representation schemes and control structures used in artificial intelligence models. Emphasis placed on their psychological relevance. May be cross-listed with COSC 456.
RESTRICTIONS: Requires permission of instructor.
PSYC 624  INDUSTRIAL SOCIAL PSYCHOLOGY  
Social psychology applied to problems of productivity, satisfaction, communication and organization.
PREREQ: PSYC303
RESTRICTIONS: Requires permission of instructor.

PSYC 626  NEUROSCIENCE I  
See BISC626 for course description.

PSYC 627  NEUROSCIENCE II  
See BISC627 for course description.

PSYC 630  NEURONS AND NETWORKS  
Introduction to computational neuroscience: computing by real and artificial neurons and networks and the modeling of brain function. Covers theoretical background and involves hands-on projects to explore processing of sensory information, pattern discrimination, learning, memory and the generation of movement. May be cross-listed with CBBSC630
RESTRICTIONS: Requires permission of instructor.

PSYC 642  MENTAL REPRESENTATION AND MEMORY  
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 CBBSC642.
RESTRICTIONS: Requires permission of instructor.

PSYC 668  RESEARCH  
See EDUC675 for course description.

PSYC 673  LANGUAGE ACQUISITION  
See EDUC675 for course description.

PSYC 692  SOCIAL SKILLS TRAINING FOR CHILDREN  
See EDUC692 for course description.

PSYC 804  SEMINAR: HUMAN DEVELOPMENT  
Selected research literature in developmental psychology. May be cross-listed with EDUC837
RESTRICTIONS: Requires permission of instructor.

PSYC 806  PSYCHODIAGNOSTICS: OBJECTIVE TRAIT AND BEHAVIORAL ASSESSMENT  
RESTRICTIONS: Requires permission of instructor.

PSYC 808  GROUP AND INTERPERSONAL PROCESSES  
Addresses basic theoretical and empirical knowledge of group processes, structures and interactions.
RESTRICTIONS: Requires permission of instructor.

PSYC 813  SEMINAR IN INTERGROUP RELATIONS  
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  
See EDUC817 for course description.

PSYC 819  PSYCHOTHERAPY I  
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  
RESTRICTIONS: Requires permission of instructor.

PSYC 823  LEARNING AND DEVELOPMENT  
See EDUC823 for course description.

PSYC 824  COMMUNITY MENTAL HEALTH  
The community's role in contributing to mental illness and the mode and feasibility of organizing community mental health agencies into a concerted preventive mental hygiene effort. Focuses on the Greater Wilmington community.
RESTRICTIONS: Requires permission of instructor.

PSYC 827  PSYCHOTHERAPY II  
Schools, theories and techniques of psychotherapy, including research on psychotherapy and review of evaluative studies. Supervised practice.
PREREQ: PSYC819.
RESTRICTIONS: Requires permission of instructor.

PSYC 829  ADVANCED PSYCHOPATHOLOGY  
Noseology and etiology of the behavior disorders of non-organic origin. 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  
Limited diagnostic and therapeutic practice in clinical setting under professional supervision.
RESTRICTIONS: Requires permission of instructor.

PSYC 835  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY II  
Continuation of PSYC834
RESTRICTIONS: Requires permission of instructor.

PSYC 836  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY III  
Continuation of PSYC834 and PSYC835
PREREQ: PSYC834 and PSYC835
RESTRICTIONS: Requires permission of instructor.

PSYC 837  SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY IV  
Continuation of PSYC834, PSYC835 and PSYC836
PREREQ: PSYC836
RESTRICTIONS: Requires permission of instructor.

PSYC 845  CHILDHOOD PSYCHOPATHOLOGY  
See EDUC813 for course description.

PSYC 860  PSYCHOLOGICAL STATISTICS  
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  
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  
See EDUC813 for course description.

PSYC 869  MASTER'S THESIS  
See EDUC813 for course description.

PSYC 964  PRE-CANDIDACY STUDY  
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  
Recreation and Park Administration

RUSSIAN

RUSS 105  RUSSIAN I - ELEMENTARY  
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  
Completion of basic Russian increasing mastery of the basic skills of listening, speaking, reading and writing.
PREREQ: RUSS105
RESTRICTIONS: Two to three years of high school Russian acceptable in lieu of prerequisite.

RUSS 107  RUSSIAN III - INTERMEDIATE  
Review of grammar, continued practice in speaking and writing, and reading texts of average difficulty.
PREREQ: RUSS106.
RESTRICTIONS: Four years of high school Russian acceptable in lieu of prerequisite. Satisfies the Arts and Science foreign language requirement.

RUSS 200  RUSSIAN GRAMMAR REVIEW  
Systematic review of elementary and intermediate Russian grammar, study of complex sentence structure and idioms. Some conversational practice.
PREREQ: RUSS107.

RUSS 205  RUSSIAN CONVERSATION  
Practical use of the language. Emphasis on topics drawn from contemporary Russian life and literature.
PREREQ: RUSS107.
RUSSIAN

RUSS 211  RUSSIAN READING AND COMPOSITION: SHORT FICTION  3
Reading and discussion of 20th century Russian short stories and novels. Several short compositions. Grammar review where appropriate.
PREREQ: RUSS107

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: RUSS211

RUSS 312  INTRODUCTION TO RUSSIAN LITERATURE II  3
Masterpieces of poetry, narrative prose and drama from the 20th century.
PREREQ: RUSS211

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: RUSS211

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, verb 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, PHYS101, PHYS201 or PHYS207 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, PHYS202 or PHYS208 can count toward graduation.

SCEN 103  CONCEPTS OF SCIENCE AND TECHNOLOGY  3
Introduction to some of the fundamental science concepts underlying 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 Milford 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 Milford 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. Awareness, authority, management, strategies and teaching for understanding.
COREQ: EDUC400.

SOCIOMETRY

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 202  SOCIAL DEViance  3
Defining deviance, research on deviance and explaining deviance.

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 stratification 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.

SOCI 266  SPECIAL PROBLEM  1-3

SOCI 270  FAMILIES AND DEVELOPMENTAL DISABILITIES  3
See IFST270 for course description.

SOCI 301  INTRODUCTION OF SOCIOLOGICAL RESEARCH  3
Survey of research methods and data analysis employed in sociology.
PREREQ: SOCI201 and completion of the College of Arts and Science math requirement.
RESTRICTIONS: Strongly recommended - Junior status and 12 social science credits.

SOCI 303  JUVENILE DELINQUENCY  3
Historical definition of delinquency, abuse and neglect, research in delinquency, causes and treatment of delinquents. May be cross-listed with CRJU303.
PREREQ: SOCI201 or SOCI209.

SOCI 304  CRIMINOLOGY  3
The nature, kinds and causes of crime. Criminal liability, criminal careers and organized racketeering. May be cross-listed with CRJU304.
PREREQ: SOCI201 or SOCI202 or SOCI209.

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.
PREREQ: SOCI201, SOCI203 or PSYC201.
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. 
PREREQ: SOCI201 or SOCI202 or SOCI203 or PSYC202

SOCI 311 SOCIOLOGY OF HEALTH CARE 3
Professionalization of health occupations, hospitals as social systems, medical education and practice organizations, health care organizations and their interrelationships (politics of health), and health service patterns. May be cross-listed with CSCI311.

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. 
PREREQ: SOCI201

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, roles, ideologies, and dynamics, such as political consensus and cleavage. Attention given to particular methods of research in this specific area of social behavior. 
PREREQ: SOCI201 or SOCI203 or PSYC201 or PSYC150.

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 CRU402.

SOCI 327 SOCIOLOGY OF ORGANIZATIONS 3
Business enterprises, the military, governmental bureaus and other large-scale organizations. 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 CRU336 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: 18 credit hours in sociology, psychology, political science or economics

SOCI 343 SOCIETY, POLITICS AND HEALTH CARE 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 CRU435.

SOCI 346 GENDER AND AGING 3
Empirical and theoretical investigation of the aging process. 
PREREQ: SOCI201 or SOCI202 or SOCI203 or PSYC201.

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 356 RACE, CLASS AND CRIME 3
See CRU356 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.

SOCI 366 INDEPENDENT STUDY 1-3
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 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. 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.

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.

SOCI 409 SEVENTEENTH-CENTURY RELIGIOUS CULTS AND MOVEMENTS 3
Sociological analysis of major religious cults 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 410 HEALTH SERVICES PRACTICUM AND SEMINAR 4 PF
Field experience and related seminar. Placement in health service settings where student works for approximately 160 hours under supervision of health service administrators. Students meet in a weekly seminar with coordinator.

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: SOCI401

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: SOCI401

SOCI 414 DATA ANALYSIS 3
Methods of analyzing data in sociological research focusing on multivariate approaches. May be cross-listed with CRU444.

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. Searches for alternative theories and methods serve to create knowledge about contemporary concerns with everyday life, democracy, equality, social structure and power. 
PREREQ: SOCI312

453
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 428 CORPORATE CRIME 3
Nature and causes of the deviant behaviors and crimes of large organizations. How organiza-
tions act, are accused of deviance and defend themselves in cases such as price-fix-
ing, sale of unsafe drugs and illegal spying. May be cross-listed with CRJU428

SOCI 430 COMPARATIVE SOCIOLOGY 3-6
Explores sociological similarities and differences between the United States and a select-
end country on a number of critical sociological topics. Topics include ethnic and religious
diversity, culture, demographic structure, social institutions, social stratification and urban-
ization. May be cross-listed with JWST430
RESTRICTIONS: Requires permission of instructor. Only 3 credits from this course 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 JWST435.
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
institutions 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 BASED 4
Field experience and research seminar on the social organization and dynamics of the legal profession.
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
Focuses on the role of organizational action and policy in shaping the development of political structures and behavior.
PREREQ: SOCI201

SOCI 454 LAWYER'S ETHICS 3
An exploration of the ethical, moral, and legal dilemmas that confront attorneys in the
practice of law and how they attempt to resolve them. May be cross-listed with CRJU454.
PREREQ: SOCI201 and three additional sociology courses
RESTRICTIONS: Open to Junior and Senior sociology majors only

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 pre-
sentation skills. May be cross-listed with GEOG460, IGST460, and/or WOMS460.

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
A substantive and theoretical introduction to the major issues in environmental sociology:
the emergence and development of the environmental movement; the development of envi-
ronmental 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 fac-
ulty in carefully supervised experiences such as discussion leader, crafting questions, con-
sulting 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 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 SOCIATIONAL 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 techniques.
PREREQ: SOCIO605.

SOCI 621 THEORIES AND APPROACHES IN SOCIAL DEVIANCY 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 625 CORPORATE AND GOVERNMENTAL DEVIANCE 3
A study of corporate crime and governmental deviance.

SOCI 626 LAW AND SOCIETY IN HISTORICAL PERSPECTIVE 3
Examines the social history of law, crime and judicial behavior in the United States from
colonial times to present. Focus is on the role that law has historically played in allo-
cating resources, structuring social relationships, and distributing political power.
May be cross-listed with HIST637.

SOCI 627 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 628 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.

SOCI 666 SPECIAL PROBLEM 1-12
SPANISHSOCI 813 CURRENT ISSUES IN SOCIAL THEORY 3 Deals with current controversies in social theory such as the public/private distinction, the development of symbolic interactionism and Neo-Marxism. RESTRICTIONS: Must have completed one graduate-level course

SPAN 206 CULTURE THROUGH CONVERSATION 3 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.

SOCI 835 SEMINAR IN CRIMINAL AND DELINQUENT BEHAVIOR 3 A review of the basic issues in the sociological study of criminal behavior, including definition and measurement, and the relationship between age, gender, race, peers, family, class and economy and crime

SOCI 836 SEMINAR IN CRIMINAL AND DELINQUENT BEHAVIOR 3 An analysis of the major forms of criminal behavior such as violent crime, property crime, public order crime, organized crime, white collar crime and juvenile delinquency

SPAN 200 SPANISH COMPOSITION AND GRAMMAR 3 Intensive study of selected grammatical topics (subjunctive, ser-estar, preterite and imperfect). Vocabulary exercises and short compositions. PREREQ: SPAN 107 or SPAN 112.

SPAN 201 SPANISH READING AND COMPOSITION 3 Major emphasis on reading development, composition and literary analysis. PREREQ: SPAN 200.

SPAN 202 SPANISH CONVERSATION 3 Practical use of Spanish by means of oral reports and discussions. Emphasis on improvement of basic conversational skills. Grammar review where appropriate, and/or some written work. PREREQ: SPAN 107 or SPAN 112, or one 200-level course. RESTRICTIONS: Prerequisites require a minimum grade of B. Not intended for native speakers.

SPANISH

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 350 Advanced Business Spanish 3
Development of strategies to initiate and maintain oral and written communication in the world of business. Practice in speaking Spanish in business situations, letter writing and article reading. Functional and cultural approach
PREREQ: Any two 200-level Spanish courses, one preferably being SPAN250.

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: SPAN200.
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 366 Independent Study 1-3
A systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises
PREREQ: Any 300-level Spanish course.

SPAN 401 Advanced Spanish Grammar 3
History of the Spanish language from Latin to the present. Historical phonology and morphology.
PREREQ: Any 300-level Spanish course.

SPAN 406 Advanced Spanish Language 3
Advanced grammatical structure and stylics 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 Quijote 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
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 - Echegaray, Benavente and Martinez, Mistral, Jimenez, Asturias, Neruda and Garcia Marquez - 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 San Pedro, Alman, Juan de la Cueva, Cervantes, Luis de Leon, Garcian and Quevedo
PREREQ: One SPAN300-level survey of literature.

SPAN 430 Latin American Novel and Cinema 3
Study of a selection of novels of the 20th century that have brought international recognition to the 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 433 Modern Spanish Literature 3
Spanish drama and lyric poetry from Romanticism to contemporary period.
PREREQ: One SPAN300-level survey of literature.

SPAN 434 Modern Spanish Literature 3
Prose from costumbrismo to the present.
PREREQ: One SPAN300-level survey of literature.

SPAN 436 Studies in the Literature of the Spanish Golden Age 3
The poetry and prose of the 16th and 17th centuries.
PREREQ: One SPAN300-level survey of literature.

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, Juan Benet, Carmen Martin Gaite, Ana Maria Moix and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism.
PREREQ: One SPAN300-level survey of literature.

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 Spanish literature course.

SPAN 451 Contemporary Spanish Poetry 3
Covers the works of Spanish and Latin American Nobel Prize authors. Echegaray, Benavente and Martinez, Mistral, Jimenez, Asturias, Neruda and Garcia Marquez - in relation to their cultural milieux on the regional, national and international levels and in relation to their authors' biographies.
PREREQ: One SPAN300-level survey of literature.

SPAN 482 Theatre of the Spanish Golden Age and Its Legacy 3
Compares the masters of the Golden Age Theatre with today's internationally-known Spanish playwrights. Studies the comedies of Tirso de Molina, Lope de Vega and Calderon de la Barca, and finds their legacy in the plays of Saavedra, Zorrilla, Garcia Lorca and Casona. Investigates the sources and interpretation of the contemporary theatre, and how they have been influenced by the earlier dramatists.
PREREQ: One SPAN300-level survey of literature.

SPAN 484 Contemporary Spanish Theatre 3
Twentieth-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Buero Vallejo and Sastre
PREREQ: One SPAN300-level survey of literature.

SPAN 501 Independent Study 1-3
Systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises.

SPAN 507 Advanced Spanish Grammar 3
History of the Spanish language from Latin to the present. Historical phonology and morphology.

SPAN 515 Latin American Literature and Its Political Context 3
In-depth 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 516 Cervantes: Don Quijote 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
PREREQ: One SPAN300-level survey of literature.

SPAN 517 Hispanic Nobel Prize Authors 3
Studies the works of Spanish and Latin American Nobel Prize authors - Echegaray, Benavente and Martinez, Mistral, Jimenez, Asturias, Neruda and Garcia Marquez - in relation to their cultural milieu on the regional, national and international levels and in relation to their authors' biographies.

SPAN 518 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, Alman, Juan de la Cueva, Cervantes, Luis de Leon, Garcian and Quevedo
PREREQ: One SPAN300-level survey of literature.

SPAN 530 Latin American Novel and Cinema 3
Study of a selection of novels of the 20th century that have brought international recognition to the 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 533 Modern Spanish Literature 3
Spanish drama and lyric poetry from Romanticism to contemporary period.

SPAN 534 Modern Spanish Literature 3
Prose from costumbrismo to the present

SPAN 536 Studies in the Literature of the Spanish Golden Age 3
The poetry and prose of the 16th and 17th centuries.

SPAN 539 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, Juan Benet, Carmen Martin Gaite, Ana Maria Moix and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism.
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, confidence intervals, analysis of variance, simple linear regression, chi-square tests for independence. PREREQ: College algebra.

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, modelling and estimating and making inferences from environmental data, especially data collected over space and/or time. 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 GEOG475. PREREQ: MATH243 and GEOG250. RESTRICTIONS: If MATH243 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; hypotheses testing; special topics. PREREQ: STAT601.

STAT 603 Vector Spaces and Optimization 3
Topics include 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 611 Regression Analysis 3
Simple linear and nonlinear regression. Subset regression; principal component and ridge regression. Introduction to experimental design and design models. PREREQ: MATH202 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 II 3
Planning of experiments, designs for specific problems, fractional factorials, qua-sifactorial experiments, balanced and unbalanced designs, confounding, introduction 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 unrestricted 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. PREREQ: STAT371.

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 674 Applied Data Base Management 3
See FREC674 for course description.

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: STAT600.
STATISTICS

STAT 815 LINEAR STATISTICAL INference I 3
Vector random variables, matrix operations, multivariate normal distribution, 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: biometry, bootstraping, 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. Focuses on Box and Jenkins technique of fitting data to 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 methods of estimating and interpreting the spectrum
PREREQ: STAT602

STAT 832 TOPICS IN DATA ANALYSIS 3
Topics: graphical analysis; model evaluation, robust procedures; influence functions; multidimensional 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

STAT 840 STATISTICAL COMPUTING 3
PREREQ: STAT602 and knowledge of Fortran or equivalent

STAT 852 ADVANCED TOPICS IN MATHEMATICAL STATISTICS 3
Selected topics: Sequential methods, reliability theory, multivariate contingency tables, large sample theory, density estimation, robust and nonparametric estimation
REstrictions: Requires permission of department

STAT 969 DOCTORAL DISSERTATION 1-12 PF

SWAHILI

SWAH 105 SWAHILI I - ELEMENTARY 4
Introduction to the Swahili language and development of speaking, listening, reading and writing skills through the use of basic texts. Media Center resources utilized

SWAH 106 SWAHILI II - ELEMENTARY/INTERMEDIATE 4
Completion of basic Swahili. Increasing mastery of the basic skills of speaking, listening, reading and writing. Media Center resources utilized
PREREQ: SWAH105
Restrictions: Two to three years of high school Swahili acceptable in lieu of prerequisite

SWAH 107 SWAHILI III - INTERMEDIATE 4
Review of grammar, continued practice in speaking and writing, and reading texts of average difficulty
PREREQ: SWAH106
Restrictions: Four years of high school Swahili acceptable in lieu of prerequisite. Satisfies Arts and Sciences foreign language requirement

THEA 102 INTRODUCTION TO PERFORMANCE 3
A survey of performance training techniques for the non-minor, including the elements of voice, improvisation, movement, dance, character analysis and portrayal

THEA 104 INTRODUCTION TO THEATRE AND DRAMA 3
Survey of the elements of theatre and drama. Includes attendance at theatrical productions, readings of representative plays, discussion of a method of dramatic analysis, explanation of staging in periods of major importance and discussion of the actor, the designer and the director

THEA 106 THE THEATRICAL EXPERIENCE ABROAD 3
Survey of the elements of performance, theatre and drama in relationship to observed field performances. Attendance at rigorous program of theatrical performances. Studies elements of voice, improvisation, movement, dance, character analysis and portrayal specifically based on observed performances
Restrictions: Taught abroad

THEA 200 INTRODUCTION TO THEATRE PRODUCTION 3
Processes involved in the production of scenery, properties, lighting, sound and costumes for live performance events. Plays read and analyzed for production requirements
Restrictions: Mandatory attendance at performance events

THEA 202 INTRODUCTION TO THEATRE DESIGN 3
Survey of the evolution of design theory and aesthetics for live production. Elements include the design of scenery, properties, costumes, lighting and sound. Plays read and analyzed for design requirements
Restrictions: Mandatory attendance at performance events

THEA 203 INTRODUCTION TO COSTUMING 3
Explores the evolution of costume design and technology. Discusses and analyzes all aspects of costuming through reading of plays

THEA 204 INTRODUCTION TO VOICE AND SPEECH 3
The use of voice and speech in performance. Includes exercises to develop relaxation, breath support, resonance, vocal strength, optimum pitch and articulatory precision, as well as studies in basic vocal anatomy. Studio format
Restrictions: Involves some strenuous physical activity

THEA 206 INTRODUCTION TO DANCE 3
Examines the function and impact of dance in the lives of individuals, societies, and cultures. Lecture and participatory format

THEA 207 TECHNICAL PRODUCTION PRACTICUM 1-4
Laboratory course for the production of scenery, properties, lighting and sound for public performances of the Professional Theatre Training Program Productions

THEA 209 COSTUME PRODUCTION PRACTICUM 1-4
Laboratory course for the production of costumes and costume crafts for public performances of the Professional Theatre Training Program Productions

THEA 226 FUNDAMENTALS OF ACTING 3
Exploration of basic elements of the actor's art and craft so as to deepen and broaden the experience of viewing the theatre. May utilize theatre games, basic text work, improvisation and lecture/demonstrations

THEA 236 FUNDAMENTALS OF JAZZ DANCE 3
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 3
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

THEA 301 FUNDAMENTALS OF PROPERTIES CONSTRUCTION 3
Introduces basic principles of 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

THEA 302 FUNDAMENTALS OF STAGE LIGHTING 3
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

THEA 303 FUNDAMENTALS OF SCENE PAINTING 3
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
THEA 304  FUNDAMENTALS OF AUDIO FOR THE THEATRE  3
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

THEA 305  FUNDAMENTALS OF COSTUME CONSTRUCTION FOR THE STAGE  3
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 PATTERNMAKING FOR THE STAGE  3
Teaches basic patterning techniques required in costume design, including cutting, shaping, and fitting garments. Provides basic experience in several crafts-related areas commonly used in costume design and construction. Students create muslins or finished garments from at least four historical periods.
PREREQ: THEA203

THEA 307  FUNDAMENTALS OF DRAPING FOR THE STAGE  3
Teaches 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  3
Provides basic experience in several crafts-related areas commonly utilized in costuming, including maskmaking, surface design, hatmaking, leatherwork, and thermostatic costume construction techniques.
PREREQ: THEA203

THEA 309  FUNDAMENTALS OF STAGE MANAGEMENT  3
Study of the techniques and procedures used in managing theatrical productions from conception through performance.
PREREQ: THEA200

THEA 310  FUNDAMENTALS OF MASKMAKING  3
Teaches basic techniques for creating theatrical masks. Students will create masks based on various historical styles.
PREREQ: THEA203

THEA 341  THEATRE/DRAMA: CLASSIC/MEVAL  3
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the 1700s and 1900s. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMLT341.

THEA 342  THEATRE/DRAMA: RENAISSIANCE TO 1700  3
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the 1700s and 1900s. 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 1700s and 1900s. 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 1900s and 2000s. 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 346  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, costume, 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, tableaux, and practice. Survey of function and role of the dramaturg in contemporary theatre. Readings in primary and secondary material.

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 informs the day-to-day practices, values and behavior of the individual artist.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program. May be repeated for up to twelve credit hours.

THEA 601  DYNAMICS  1
A vocal/physical warm-up. Exercises designed to prepare student for the day's work.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to six credit hours.

THEA 602  VOICE DEVELOPMENT IA  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 IB  1
Continuation of THEA602.
PREREQ: THEA602

THEA 604  VOICE DEVELOPMENT IIA  1
Continuation of THEA603, with an emphasis on range extension and the development of greater variety in expressiveness.
PREREQ: THEA603

THEA 605  VOICE DEVELOPMENT IIB  1
Continuation of THEA604.
PREREQ: THEA604

THEA 606  VOICE DEVELOPMENT IIIA  1
Individual instruction to identify habitual vocal patterns and to strengthen individual weaknesses in voice.
PREREQ: THEA605

THEA 607  VOICE DEVELOPMENT IIIB  1
Continuation of THEA606.
PREREQ: THEA606

THEA 608  STAGE MOVEMENT IA  1
Exercises and assignments to develop alignment, strength, flexibility, awareness, endurance, rhythmic sensitivity, balance, and expressiveness. Requires enrollment in the Professional Theatre Training Program/Acting or Directing.

THEA 609  STAGE MOVEMENT IB  1
Continuation of THEA608.
PREREQ: THEA608

THEA 610  STAGE MOVEMENT IIA  1
Continuation of THEA609, with an emphasis on stage combat, tumbling, circus and other advanced movement techniques.
PREREQ: THEA609

THEA 611  STAGE MOVEMENT IIB  1
Continuation of THEA610.
PREREQ: THEA610

THEA 612  STAGE MOVEMENT IIC  1
Individual instruction to identify habitual movement patterns and to strengthen individual weaknesses in stage movement.
PREREQ: THEA611

THEA 613  STAGE MOVEMENT IIIB  1
Continuation of THEA612.
PREREQ: THEA612
THEA 614  STAGE SPEECH IA  1-2
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 scanion.
PREREQ: THEA614

THEA 616  STAGE SPEECH IIA  1
Continuation of THEA615 with an emphasis on phrasing and verse scanion.
PREREQ: THEA615

THEA 617  STAGE SPEECH IIB  1
Continuation of THEA616.
PREREQ: THEA616

THEA 618  STAGE SPEECH IIIA  1
Stage dialects and advanced work in phrasing and verse scanion individual tutoring in problem areas.
PREREQ: THEA617

THEA 619  STAGE SPEECH IIIB  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 for up to 24 credit hours.

THEA 633  STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IA  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

THEA 634  STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IB  1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA633

THEA 635  STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIA  1-2
Development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA634

THEA 636  STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIB  1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA635

THEA 638  STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIIA  1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA637

THEA 639  STAGE MANAGEMENT PRODUCTION SKILLS IA  1-2
Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management

THEA 640  STAGE MANAGEMENT PRODUCTION SKILLS IB  1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA639

THEA 641  STAGE MANAGEMENT PRODUCTION SKILLS IIA  1-2
Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA640

THEA 642  STAGE MANAGEMENT PRODUCTION SKILLS IIB  1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA641

THEA 644  STAGE MANAGEMENT PRODUCTION SKILLS IIIIB  1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA643

THEA 645  REHEARSAL AND PERFORMANCE/STAGE MANAGEMENT  1-5
Practical instruction and assignments in the preparation, rehearsal and performance of theatrical productions.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management. May be repeated for up to 24 credits.

THEA 646  COSTUME CONSTRUCTION  1-2
Introductory course exploring the mechanics and technology of the art of costuming Surveys all aspects of the costumer's craft including practical work in the costume shop.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Construction

THEA 644  INTERNSHIP IN PROFESSIONAL THEATRE  1-9
Engagement with professional theatre in individual discipline area
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to 18 credit hours.

THEA 665  THEATRE LITERACY  1-6
Discussion, research, and practicum in theatre terminology, literature and history
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to 12 credit hours.

THEA 666  RESEARCH  1-6

THEA 674  SCENERY PRODUCTION  1
Materials, tools, hardware and construction methods used for scenery construction. Focus on traditional scenic construction with wood as the primary material.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 675  PROPERTIES PRODUCTION  1
Concentrates on property production techniques with emphasis on properties management, acquisition, and health and safety.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 676  SCENERY: METALWORKING  1
Materials, tools and methods of working with metal for scenery construction.
PREREQ: THEA674

THEA 677  PROPERTIES PRODUCTION II  1
Tools, materials and methods for upholstery and drapery, casting, mold-making, and other properties techniques.
PREREQ: THEA675

THEA 679  SCENERY: STAGE RIGGING  1
Tools, hardware and methods of rigging scenery. Emphasis on standard theatre rigging systems.
PREREQ: THEA674

THEA 680  LIGHTING PRODUCTION  1
Electrical theory and practice as applied to stage production. Emphasis on current lighting production practice, systems and equipment.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 681  AUDIO PRODUCTION  1
Sound theory and practice as applied to contemporary theatre production. Emphasis placed on utilizing current systems, equipment and technology for audio production.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program/Technical Production.

THEA 682  LIGHTING DESIGN  1
Essential skills and procedures for creating, documenting and realizing a lighting design for a theatrical production.
PREREQ: THEA680

THEA 683  PRODUCTION PROJECT MANAGEMENT  1
Examines how project management techniques are applied to technical production. Techniques for project analysis, priority setting, scheduling, resource allocation and project tracking will be examined.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production

THEA 684  TECHNICAL PRODUCTION SEMINAR  1
Investigation and discussion of technical problems and issues encountered in productions. May be repeated for up to 6 credit hours.
### URBAN AFFAIRS AND PUBLIC POLICY

**UAPP 605 TOPICS IN URBAN AFFAIRS**
- Focuses on selected topics in urban affairs such as urban politics and government, urban education and neighborhood analysis.
- **Restrictions:** May be repeated for up to nine credits when topics vary.

**UAPP 606 LOCAL ECONOMIC DEVELOPMENT: POLICY AND PRACTICE**
- 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**
- Examines the complex ways in which the concepts of community analysis and development are used and understood.
- Students connect the concepts to issues, problems, or policy alternatives affecting local communities.
- Participation in applied projects.
- **Restrictions:** May be cross-listed with IFST 607.

**UAPP 608 POVERTY, NEIGHBORHOODS AND COMMUNITY DEVELOPMENT**
- Examines social science literature through which multidisciplinary analysts have described explained poverty, analyzed neighborhoods, and categorized community development efforts.
- Focuses on the United States, particular attention is paid to analyses from 1960 to the present.
- **Restrictions:** May be cross-listed with IFST 608.

**UAPP 609 FINANCIAL STATEMENT ANALYSIS FOR NONPROFITS**
- Geared toward graduate students with little or no background in accounting or reading financial statements.
- Intends to give basic understanding of financial statement analysis.
- Will cover basic accounting concepts with an emphasis understanding the financial statements of nonprofit organizations.

**UAPP 610 URBAN LAND USE PLANNING AND ADMINISTRATION**
- 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 612 URBAN HOUSING POLICY AND ADMINISTRATION**
- Problems associated with providing adequate and affordable housing in the U.S.
- Structure and dynamics of the housing market; demand and supply factors; market failure; financing methods; and federal, state and local public policy affecting housing, including taxation, regulation, subsidy programs, and land use controls.

**UAPP 613 PLANNING THEORY AND URBAN POLICY**
- 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**
- 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 postsuburban trends.
- May be cross-listed with GEOG 614 and/or HIST 614.

**UAPP 615 URBAN, REGIONAL AND ENVIRONMENTAL PLANNING**
- 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 quality.
- May be cross-listed with GEOG 615.

**UAPP 617 CONTEMPORARY ISSUES IN ENVIRONMENTAL AND ENERGY POLICY**
- 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**
- Centers on operational practices and administration of human service systems.
- Use of human service systems concepts and practices, delivery practices, administrative human service system 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**
- Brings recognized scholar-policy leaders in urban affairs together with students.
- Provides an opportunity for wide-ranging discussion of current policy and research issues concerning communities and their citizens related to development, planning, demographic analysis, social equity, and governance in multiple contexts.

**UAPP 622 RESOURCES, DEVELOPMENT AND THE ENVIRONMENT**
- See GEOG 622 for course description.

**UAPP 623 INDEPENDENT STUDY IN GEOGRAPHICAL INFORMATION SYSTEMS (GIS)**
- 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**
- Discussion and evaluation of institutional components of criminal justice systems.
- Includes police, judicial and correctional systems.

**UAPP 625 ENERGY POLICY AND ADMINISTRATION**
- See POSC 624 for course description.

**UAPP 626 CONSERVATION AND RENEWABLE ENERGY POLICY**
- Covers current policy issues for energy conservation, energy efficiency, and renewable energy sources.
- Some prior background in energy policy is assumed, and the course will go into substantial depth.
- Topics will include environmental impacts, utility programs, and international comparisons.
- May be cross-listed with MAST 626 and/or POSC 626.
- **Restrictions:** May be repeated for up to 20 credit hours.

**UAPP 627 COMPARATIVE ENVIRONMENTAL POLITICS**
- Examines the effect of institutional and systemic factors in the formulation and implementation of environmental policy in several developed and developing countries.
- Considers the impact of modes of political participation, level of development, and type of political economy on policy.
- May be cross-listed with MAST 628 and/or POSC 628.

**UAPP 628 ISSUES IN LAND USE AND ENVIRONMENTAL PLANNING**
- See GEOG 628 for course description.

**UAPP 629 SEMINAR IN HISTORIC PRESERVATION**
- Survey of historic preservation and management of cultural resources examining cultural contexts and public policy.
- Covers techniques of protection, legal and legislative basis of preservation programs, with particular attention to National Register of Historic Places.
- May be cross-listed with ART 628, HIST 652, and/or MAST 629.

**UAPP 630 METHODS IN HISTORIC PRESERVATION**
- Upper-level field research seminar concentrating on developing graphic, photographic, and narrative skills for architectural documentation.
- Includes classroom and field sessions.
- May be cross-listed with ART 634 and/or HIST 634.
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 public or data systems in the public sector. Discussion and appraisal of various 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. May be cross-listed with POSC815.

UAPP 816 ADVANCED SOCIAL STATISTICS 3
See POSC816 for course description.

UAPP 817 PUBLIC INVESTMENT POLICY 3
Focuses on the means by which government 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 systems, 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, and time series. May be cross-listed with POSC819.
PREREQ: Lotus 123 or 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. Examines 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 EDUC823 and/or IFST823.

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, heteroscedasticity, and simultaneity), different estimators, comparison of models, dummy dependent variables, dynamic models and logs, and multi-equation models.
PREREQ: UAPP815
RESTRICTIONS: A statistics course that introduces regression analysis.

UAPP 827 PROGRAM AND PROJECT ANALYSIS 3
Explores how public sector decision makers evaluate feasibility of government programs and projects. Governmental and societal costs incurred and benefits that would result if public programs or capital projects were undertaken in urban areas. Considers how issues of time, program design, urban activities and structures, and potential effectiveness should be handled. Considers the equity of government programs and their potential impact in the future.

UAPP 828 URBAN ANALYSIS AND POLICY ALTERNATIVES 3
Explores a variety of theories of the city and their ability to explain the contemporary conditions and problems of cities. Critically examines the role of analysis in the formation of urban policy.

UAPP 829 TAXATION AND FISCAL POLICIES 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. May be cross-listed with POSC829.

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 POSC839.
PREREQ: UAPP834

UAPP 834 ECONOMICS IN PUBLIC AND NONPROFIT SECTORS 3
Develops microeconomic concepts and applies them to public issues, policies, and programs. Topics include revenues, expenditures, intergovernmental and cross-sectoral relationships, budgeting, debt management, and asset allocation. 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 POSC835.

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 policies 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
Examines the board of directors, the CEO, and the relationship between the two. Focuses on the roles of the board and CEO in managing the organization.

UAPP 842 STRATEGIC PLANNING FOR NONPROFIT ORGANIZATIONS 3
Provides students with the skills and knowledge required for carrying out strategic planning in private nonprofit and public agencies. Focuses on the organizational environment in which strategic planning takes place, examines the theories which underlie planning in general and strategic planning in particular and presents a usable model for strategic planning.

UAPP 843 GLOBAL GOVERNANCE: THEORY AND CASES 3
See POSC843 for course description.

UAPP 860 INTERNSHIP SEMINAR 3
(1) Assists student in making decisions about specialization and internship objectives related to the Master's in Public Administration program and identifies related skills. Develops short- and long-term career skills.

UAPP 863 DOCTORAL RESEARCH PAPER 3
Requirement of the doctoral program, the doctoral research paper is prepared prior to the dissertation proposal.
RESTRICTIONS: Ph.D. students only
URBAN AFFAIRS AND PUBLIC POLICY

UAPP 864 INTERNERSHIP FIELDWORK 2
Three-month (or equivalent) fieldwork completed along with seminars, performance evaluation and career reflection paper.

UAPP 868 RESEARCH 1-6

UAPP 869 MASTER'S THESIS 1-6

UAPP 870 READINGS 1-6

UAPP 872 ANALYTICAL PAPER 3-6
A requirement of the M.A., M.P.A. and M.E.P. programs. The paper demonstrates the student's ability to analyze a particular policy or administrative problem and develop an appropriate response.

UAPP 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.

UAPP 969 DOCTORAL DISSERTATION 1-12 PF

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 skills necessary for university success and provides structured, regular time for LIFE cluster students to meet with peer mentors.

UNIV 102 FIRST YEAR EXPERIENCE II 1 PF
Continuation of UNIV101.
PREREQ: UNIV101.

UNIV 120 UNIVERSITY FORUM 1 PF
Taught in conjunction with the University Forum Lecture Series. Students attend all forum lectures (approximately ten), read selected texts and/or journal essays designed to supplement the lecture series and take a final exam.

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 II 1 PF

UNIV 320 CONTEMPORARY ISSUES FOR RESIDENT ASSISTANTS 1
Introduces new Resident Assistants to issues affecting college students. All topics covered in the course focus on the needs of the new resident assistant in the Office of Housing and Residence Life.
RESTRICTIONS: Must be a resident assistant.

UNIV 330 DEL CENTRAL YEAR ABROAD 0 NR

UNIV 350 NATIONAL STUDENT EXCHANGE PROGRAM 0 NR

UNIV 351 SEMESTER IN COPENHAGEN 0 NR

UNIV 352 SEMESTER IN VIENNA 0 NR

UNIV 354 SEMESTER IN LONDON 0 NR

UNIV 359 SEMESTER AT BIOSPHERE 2 CENTER 0 NR

UNIV 368 HONORS WORKSHOP: ADVANCED TOPICS 1
Multidisciplinary seminar with emphasis on discussion of state-of-the-art research topics by Accounting/Business/Economics faculty. New topic each semester. Includes assessment of the research approach, substantive findings, related research and possible extensions.
PREREQ: BUAD301 and BUAD311.
RESTRICTIONS: Requires GPA of 3.0 or higher and Junior or Senior status.

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 credit for UNIV 401 and UNIV 402 not to exceed six.

UNIV 402 SENIOR THESIS 2-4
Continuation of UNIV401.
RESTRICTIONS: Total credit for UNIV 401 and UNIV 402 not to exceed six.

UNIV 490 HONORS TUTORIAL: HUMANITIES 3
Designed faculty direct the studies of up to three students per semester. Readings of classical works in the humanities described. Group as well as individual discussions.
RESTRICTIONS: Requires 3.4 GPA, Sophomore standing or above, and permission of the Honors Program.

UNIV 491 HONORS TUTORIAL: NATURAL/SOCIAL SCIENCE 3
Designed faculty direct the studies of up to three 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, Sophomore standing or above and permission of the Honors Program.

UNIV 495 HONORS SEMINAR 3
Topics vary; usually interdisciplinary.
RESTRICTIONS: Requires 3.0 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 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 SOCI206.

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 SOCI211.

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.

WOMS 213 MOTHERHOOD IN CULTURE AND POLITICS 3
See SOCI213 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**  
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 CSCC233.

WOMS 240  **WOMEN AND VIOLENCE**  
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**  
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.

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 HIST291.

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 BAMS298.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 299  **RESEARCH ON WOMEN**  
Interdisciplinary lectures in which faculty, staff 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 HIST300 for course description.

WOMS 302  **WOMEN IN MUSIC: AN ALTERNATE SURVEY**  
See MUSC302 for course description.

WOMS 305  **THE EVOLUTION OF HUMAN SEX ROLES AND REPRODUCTION**  
See ANTH305 for course description.

WOMS 311  **RENAISSANCE WOMEN, SOCIETY AND ART**  
See ARTH311 for course description.

WOMS 315  **THIRD WORLD WOMEN IN POLITICS**  
See PSCS315 for course description.

WOMS 318  **STUDIES IN FILM**  
See ENGL318 for course description. 
PREREQ: ENGL110.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 320  **VARYING AUTHORS AND GENRES**  
See FLIT320 for course description.

WOMS 322  **TOPICS: CLASSICAL LITERATURE IN TRANSLATION**  
See FLIT322 for course description.

WOMS 323  **INTRODUCTION TO WOMEN AND POLITICS**  
See PSCS323 for course description.

WOMS 326  **TOPICS: HISPANIC LITERATURE IN TRANSLATION**  
See FLIT326 for course description.

WOMS 327  **RACE, GENDER, SCIENCE**  
See PHIL327 for course description.

WOMS 328  **TOPICS: JAPANESE LITERATURE IN TRANSLATION**  
See FLIT328 for course description.

WOMS 329  **TOPICS: ITALIAN LITERATURE IN TRANSLATION**  
See FLIT329 for course description.

WOMS 330  **VARYING AUTHORS, THEMES AND MOVEMENTS**  
See FLIT330 for course description.

WOMS 333  **PSYCHOLOGY OF WOMEN**  
See PSYC333 for course description.

WOMS 350  **GENDER AND CRIMINAL JUSTICE**  
See CRJU350 for course description.

WOMS 352  **STUDIES IN NINETEENTH-CENTURY LITERATURE**  
See ENGL352 for course description. 
PREREQ: ENGL110.

RESTRICTIONS: May be repeated once for credit when topics vary.

WOMS 353  **TWENTIETH CENTURY BRITISH LITERATURE**  
See ENGL353 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 ANTH363.

WOMS 366  **INDEPENDENT STUDY**  
1-6

WOMS 375  **TOPICS: RUSSIAN AND SOVIET CULTURE IN TRANSLATION**  
See FLIT375 for course description.

WOMS 380  **WOMEN WRITERS**  
See ENGL380 for course description.

WOMS 381  **WOMEN IN LITERATURE**  
See ENGL381 for course description.

WOMS 382  **STUDIES IN MULTICULTURAL LITERATURE IN ENGLISH**  
See ENGL382 for course description.

WOMS 385  **WOMEN AND THE ECONOMY**  
See ECON385 for course description.

PREREQ: ECON111.

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 CSCC389 and/or PHIL389.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 390  **HONORS COLLOQUIUM**  
See ARSC390 for description. May be cross-listed with ANTH390, IFST390, and/or PHIL390.

WOMS 392  **HONORS COLLOQUIUM**  
See PHIL392 for course description.

WOMS 401  **FOUNDATIONS OF HUMAN SEXUALITY**  
See PSYC401 for course description.

WOMS 407  **SOCIOLOGY OF SEX AND GENDER**  
See SOC407 for course description and restrictions.

WOMS 410  **CRITICAL ISSUES IN FEMINIST SCHOLARSHIP**  
Capstone course for majors. Culminates in a senior conference. Students must complete one of the following options: 400-level seminar course cross-listed with WOMS, a women's studies internship (WOMS409B), study abroad program with a WOMS component in the senior year, or a WOMS thesis (WOMS411) 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, the study abroad option, the thesis option or equivalent, or the internship option must register for the appropriate courses.

WOMS 411  **SEMINAR IN AMERICAN HISTORY**  
See HIST411 for course description.

WOMS 413  **PROBLEMS IN AMERICAN GOVERNMENT**  
See POSC413 for course description.

WOMS 415  **RACE, CLASS AND GENDER**  
See SOC415 for course description.

WOMS 418  **RACE, GENDER AND POVERTY**  
See SOC418 for course description.

PREREQ: SOCI420.
### WOMEN'S STUDIES

**WOMS 420  WOMEN'S STUDIES SENIOR THESIS  3-6**
Senior thesis for women's studies majors or minors
COREQ: Students enrolled in WOMS420 must also take WOMS410 the same semester or the following semester
RESTRICTIONS: Women's studies majors or minors and permission of the WOMS program

**WOMS 430  TEACHING FAMILY LIFE  3**
See IFST430 for course description

**WOMS 436  POLITICS AND LITERATURE  3**
See POSC436 for course description.

**WOMS 439  WOMEN AND REVOLUTION IN AFRICA  3**
See HIST439 for course description

**WOMS 440  TOPICS IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICATION  3**
See COMM440 for course description

**WOMS 442  TOPICS IN ORGANIZATIONAL COMMUNICATION  3**
See COMM442 for course description

**WOMS 444  SEMINAR: WOMEN IN THE ISLAMIC MIDDLE EAST  3**
See HIST444 for course description

**WOMS 460  WOMEN IN INTERNATIONAL DEVELOPMENT  3**
See SOCI460 for course description

**WOMS 465  STUDIES IN LITERATURE GENRES, TYPES AND MOVEMENTS  3**
See ENGL465 for course description

**WOMS 466  INDEPENDENT STUDY  1-6**

**WOMS 472  SEMINAR IN MEDIEVAL HISTORY  3**
See HIST471 for course description

**WOMS 475  TOPICS  1-4**
Cross-listed on a term basis with courses in other areas of instruction. Course title, description, credit hours and grade type same as cross-listed course. May be repeated for credit when courses cross-listed with it are different.

**WOMS 480  SEMINAR  3**
See ENGL480 for course description

**WOMS 484  WOMEN IN SPORTS  3**
See HESC484 for course description

**WOMS 498  INTERNSHIP IN WOMEN'S STUDIES  3**
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

**WOMS 610  CRITICAL ISSUES IN FEMINIST SCHOLARSHIP  3**
Provides a survey introduction to women's studies for graduate students