ENGINEERING BASIC

100 Seminar (1) Overview of the College, engineering as a profession, engineering ethics. Consideration of each major and the various engineering disciplines. Satisfactory/No credit.

101 Computer Programming (3) Introduction to computers, algorithms, flow charts, and structured programming. Programming in BASIC and FORTRAN languages and application of these concepts and applications to computer graphics. Prereq: 111, 121, Math 141. Coreq: 121 and Math 141.

ENGINEERING AEROSPACE


362 Dynamics/Vibrations (3) Central force motion, transfer orbits, free and forced vibrations of single and multiple degree vibrating systems. Prereq: EES&M 231. F.


422 Aerodynamics (3) Theory and design of aerodynamic bodies. Potential flow, viscous effects, compressibility effects. Subsonic, transonic, and supersonic airfoils. Prereq: 370. F.


425 Propulsion (3) Principles of propulsion devices; turbojet, ram jet and rocket engines. Prereq: 351. F.

426 Introduction to Aerospace Design (2) Design process, synthesis, safety, reliability, patients, product liability, economic analysis, optimization, design standards, design studies, Individual design reports required. Prereq: 351, 370, 393. Coreq: Mech. E. 344. F.

429 Aerospace System Design (4) Synthesis and design of a complete aerospace system including economic and technical aspects. Participation in team design effort including formal presentations and design report. Prereq: 425, 429. Sp.

431 Mechanical Engineering/Aerospace Engineering Seminar (1) Topics related to engineering including ethics. Formal oral presentations by students on engineering topics. Prereq: Senior standing. F.

449 Aerospace Engineering Laboratory (3) Designing, conducting, and reporting results of experimental exercises. Test standards and specifications. Analysis of data and formation of conclusions. 3 hours lab per week. Prereq: 345, 351. F.

494-495 Selected Topics in Aerospace Science (1-4, 1-4) Current problems and topics in aerospace science and engineering for the several areas of aerospace science. Prereq: Consent of instructor. F, Sp.

111 Fundamentals of Engineering Graphics (3) Technical sketching, geometrical construction, with emphasis on plane surface analysis; presentation of engineering data; graphical solution of three dimensional space problems. Prereq: 361, 362. Two three-hour periods or three two-hour periods, including one hour of lecture per week.

121 Statics (3) Vectors, forces and moments; equivalent force systems; free body diagrams, equilibrium, frames, trusses and friction. Coreq: Math 141.

131 Particle Dynamics (3) Kinematics, simple harmonic motion; kinetics, Newton's laws, work-energy, impulse-momentum; impact. Prereq: 121; Coreq: Math 142.


ENGINEERING CHEMICAL


240 Fluid Flow and Heat Transfer (3) Force, energy and mechanical energy balances; flow in tubes, piping system, Surface boundary layers; transfer, condensation, evaporation and metering; steady and unsteady state heat conduction; heat transfer in tubes and heat exchangers; radiation. Prereq: 200.

310 Chemical Engineering Laboratory (3) Thermo-dynamics: fundamentals; present transfer in chemical engineering. Prereq: 240, 330.

330 Chemical Engineering Thermodynamics (3) Basic concepts and chemical engineering applications of thermodynamics: emphasis on flow processes, real gases, estimation of properties, phase equilibria and chemical equilibria. Prereq: 240.

340 Mass Transfer (3) Stagewise operation; application of analytical, graphical and computer methods to design of stagewise separatory operations. Differential equations-application of analytical and computer methods to design of the design of processes. Applications include gas absorption, distillation, extraction, humidification, ion exchange and membrane separations. Prereq: 330.

360 Process Dynamics and Control (4) Introduction to process dynamics and industrial control system design. Mathematical tools for characterizing dynamic behavior of processes; theory and practice of operating and controlling process systems. Includes laboratory work. Prereq: Math 240.

380 Seminar (1) Presentation and discussion of topics in the practice of chemical engineering. Satisfactory/No credit.

401 Chemical Engineering Data Analysis (3) Analysis of experimental data; identification of system extremals; statistical properties of samples; empirical modeling of processes; statistical process control; optimization techniques.

403 Introduction to Optimization (3) Principles and applications of optimization techniques to chemical engineering problems; unconstrained and equality constrained optimizations, linear programming, dynamic programming, and geometric programming. Prereq: Math 241.

410 Chemical Engineering Laboratory II (3) Laboratory investigations of mass transfer and chemical reaction phenomena in chemical engineering. Prereq: 440, 450.

415 Computer Applications in Chemical Engineering (3) Introduction to computer solution of chemical engineering problems. Primary focus on the application of personal computer programs. Includes flow sheet simulation, spreadsheet, report, graphics and program modeling.


440 Transport Phenomena (3) Overview of momentum, heat and mass transfer phenomena. Flow through cylindrical and spherical tubes, differential and macroscopic balances, applications involving molecular diffusion, including simultaneous mass transfer and chemical reaction. Prereq: 340.

450 Chemical Reactor Fundamentals (3) Homogeneous and heterogeneous reaction kinetics; design of homogeneous reactor models, both for closed and flow systems; corrections for non-ideal residence time distribution and identification of scaling parameters; catalyst effectiveness factors and conversion in fixed bed catalytic reactors. Prereq: 340, Chemistry 350.

451 Advanced Process Dynamics and Control (3) Process and control system simulation and advanced industrial system design. Cascades, feedback, feedforward, multivariable, deadtime, adaptive, and nonlinear control system design. Includes computer and laboratory work. Lab. Prereq: 360.

469 Engineering Internship in Process Control (4) Selected students work in small groups on industrial problems in process dynamics and control. Directed by faculty and engineers from host company. Prereq: 360 and consent of instructor.

475 Fundamentals of Bio reactor Design (3) Reactor modeling, analysis and design for microbial fermentations and cell culture, including batch, fed batch and continuous operation. Separation processes, bioreactors, immobilized systems; factors affecting productivity and control.

476 Principles of Biochemical Separations (3) Selection and design of separation processes including chromatography, electrophoresis, centrifugation, membrane processes, and conventional and supercritical fluid extraction.


485 Hydrocarbon Processing (3) Chemical and physical properties of selected petroleum and processes utilized in conversion of raw material into various fuels and selected chemical feedstocks. Prereq: 340.

486 Coal Processing to Liquid Fuels (3) Characterization of various coals with respect to current gasification and liquefaction technologies; modeling of conversion processes and estimation of product yields and the associated water, oxygen, and energy requirements; catalytic hydrogenation and reactor design considerations; economic assessments. Prereq: 485.


494 Special Problems in Chemical Engineering (3) Chemical engineering problems related to recent developments in industrial practice or engineering research. Prereq: Consent of instructor. May be repeated. Maximum credit 6 hours.

ENGINEERING CIVIL

210 Engineering Surveys (3) Mensuration through application of surveying techniques; theory of errors and their analysis; concepts of horizontal, vertical and angular measurements and control; construction surveys; and route surveys through vertical and horizontal curves. Prereq: Topographic mapping.

251 Transportation Engineering I (3) Transportation problems and perspectives, rural and urban; use of a systematic planning process; analysis of existing systems, modes and characteristics; characteristics of alternatives and the evaluation of civil engineering projects. Civil engineering decision making and appli-
cations of economic analysis. Prereq: Sophomore standing.

261 Stresses in Framed Structures (3) Stress and strain in structural members; determination of moment of inertia; reactions, moments, shears, and stresses in beams, columns, and torsional members. Prereq: Basic Engr. 121.

310 Route Surveying (3) Basic principles and practices of topographic survey, division, and alignment of transportation routes, including compound, reverse and parabolic curves and spiral transitions. Includes electronic computations by micro-computer. Prereq: 210.


330 Introduction to Soil Behavior (3) Physical and mechanical properties of soils, theory of compaction, seepage, and effective stress. Consolidation theory, time rate and settlement, and shear strength of sands and clays. Two lectures and 1 lab. Prereq: 261.

335 Foundation Engineering (3) Fundamentals of geotechnics applied to design and analysis of soil-structure systems; subsurface investigation; design of structures on foundation soil. Lateral earth pressure and retaining structures. Analysis of homogeneous slopes. Prereq: 330.


352 Transportation Engineering II (3) Introduction to design, construction, maintenance, and financing of various transportation modes, their guideways and terminals. Two lectures and 1 lab. Prereq: Junior standing and 210.

361 Analysis of Framed Structures I (3) Forces in trusses; influence lines; deflections and beams and trusses; analysis of indeterminate structures; moment distribution. Prereq: 261.

380 Water and Waste Treatment (3) Principles of unit operations employed in physical, chemical, and biological treatment of water, wastewater, and solid wastes. Prereq: Junior standing and 390.

390 Hydraulics (3) Basic laws and properties of incompressible fluids. Units and dimensional analysis; drag forces; continuity, energy, and momentum equations; slope pipe; flow measurement; open channel flow and culverts; pump characteristics. Two lectures and 1 lab. Prereq: ESM & 231, Basic Engr. 101.

396 Hydrology (3) Concept of hydrologic cycle; weather processes. Hydrological cycle; measurement and distribution; abstractions, and runoff; storm hydrograph and peak flow analyses, including design floods; reservoir and channel routing; rainfall and stream flow frequency analyses; groundwater flow. Prereq: 390.

400 Senior Design Project (3) Open-ended design projects including problem formulation, specification, feasibility and work design components. Topics vary but include problems typical of those designed by Civil Engineering consulting firms. Prereq: Completion of all technical courses through junior year.


405 Seminar (2) Selected topics including historical and modern civil engineering achievements, professional and ethical responsibilities. Prereq: Senior standing and completion of all junior level non-technical engineering courses.

406 Legal and Ethical Aspects of Engineering (2) Legal principles underlying engineering work; laws of contracts, property; problems of professional registration and ethics. Prereq: Senior standing.

409 Special Topics (1-3) Recent developments and current practice in civil and environmental engineering through readings and/or self-study. Prereq: Consent of instructor and department head. May be repeated.

410 Land Surveying (3) Procedures of locating properties; evaluation of evidence; subdivision of property, to create land divisions, and to prepare plots; laws of land surveying. Prereq: 210.

421 Portland Cement and Asphallic Concrete (3) Aggregate properties and tests, tests of portland cement; mix design methods for concrete and asphalt; concrete admixtures, tests of asphalt and asphalt mixes, and nondestructive testing. Two lectures and 1 lab. Prereq: 321.

433 Earthquake-Resistant Structures (3) Same as Architecture 433.

434 Elementary Structural Matrix Methods (3) Same as Architecture 434.

440 Civil Engineering Systems Design and Management (2) Methods of data analysis and modeling of civil engineering systems to enhance resource allocation for specific application to problems of transportation, environmental, water resources, structural analysis materials. Emphasis on microcomputer applications. Prereq: Junior standing or consent of instructor.

451 Highway Engineering (2) Design, construction, operation, and maintenance of highway facilities; includes application of various engineering principles and techniques to design for safety. Design of highway facilities; covers both geometric and pavement design. Prereq: 210, 251, 352.

452 Traffic Engineering (3) Characteristics of driver, vehicle, and roadway and their interrelationship; traffic studies; basic considerations of traffic circulation and control, lighting, capacity analysis, roadway safety analysis and design. Prereq: 210, 251, 352.

453 Airport/Railroad Planning and Design (3) Airport master planning and railroad engineering. Runway configuration, airfield capacity, geometrics and terminal layout and design. Railroad capacity, geometics and system layout and design. Prereq: 210, 251, 352.

456 Analysis of Framed Structures II (3) Maximum stresses due to moving loads; uses of influence lines; lateral forces due to earthquake and wind; analysis of portals, building frames, and space frames; matrix methods; use of computer in structural analysis. Prereq: 361.

471 Introduction to Structural Design (3) Selection of rolled structural steel beams, design of structural steel members for axial tension and compression loads, reinforced concrete beams; use of standard specifications. Prereq: 361.

472 Steel Design (3) Design of plate girders and composite beams; consideration of members subjected to combined loads; design of a typical framed building including connections. Prereq: 461.

474 Reinforced Concrete Design (3) Reinforced concrete continuous beams and floor slabs, columns with combined axial loads and bending, footing and retaining walls. Prereq: 461.

480 Water and Waste Transport (3) Theory and design of water distribution systems, wastewater collection systems and solid waste collection systems. Prereq: 390.

490 Water Resources Project Design (3) Development of multi-purpose reservoir and dam project, including data acquisition; spill-way and outlet works design; earthen and gravity dam stability analyses; drains and filters; maintenance and operation principles; and dam safety concepts, including dam break analyses. Prereq: 390, 395.

494 Urban Drainage Engineering (3) Design and management of stormwater conveyance and control facilities; collection of hydrologic and hydraulic principles to design of drainage systems for urban, strip mining, and highway development; design of nontidal, tidal, and detention retention basins; application of commonly-used computer runoff models; evaluation of land-uses changes of streamflow quantity and quality. Prereq: 390, 395.

495 Water Resources Development and Management (3) Institutional framework including: water law, evaluation and procedures for licensing development; among water resources development alternatives, multi-objective planning, principles of engineering economics, finance, cost analysis, and revenue, environmental impact assessment procedures; decisions using risk-based methods; case studies. Prereq: Senior standing.

ENGINEERING ELECTRICAL AND COMPUTER

201 Circuits I (3) Fundamental laws of circuit analysis. Ohm’s Law, Kirchoff’s current and voltage laws, the RCL of coil and contrast of RLC circuits with operational independent and dependent voltage and current sources, resistance, conductance, capacitance and inductance analyzed using mesh analysis, superposition and source transformations, and Norton’s and Thévenin’s Theorems. Steady state analysis of DC and AC circuits. Complete solution for transient analysis. Prereq: All course work in the Freshman Engineering curriculum. Coreq: Physics 221 and Mathematics 221. Prereq: Basic lecture, computer course and laboratory course.

202 Circuits II (3) Average complex, imaginary and real parts; effects of circuit elements; voltages and currents; delta and yoke connections, power measurement using two wattmeters. Complex frequency; simulation procedures for comparing and selecting RCL circuits; normal and abnormal cases, series and parallel circuits. Scaling: magnitude and frequency. Mutual inductance, conductance, transconductance, transresistance; linear and ideal transformers; admittance, impedance and hybrid parameters; trigonometric and complex Fourier series. Prereq: 201, Coreq: Physics 209, Mathematics 241.

209 Circuits Laboratory (1) Use of computer in laboratory preparation and analysis of circuits. Use of voltmeters, ammeters, and oscilloscopes; RLC transients; active element - operational amplifier; measurement of voltages and the phaser plots. Frequency response of the operational amplifier. Steady state and transient analysis; the transform; digital simulation of solution of second order differential equations. Passing grade is required in order to pass 202. Coreq: 202.

301 Circuits and Electro Mechanical Components (3) DC and AC Circuits, Transients, Transformers, Motors, Generators. For non-majors only. Prereq: Mathematics 231, Physics 221.

302 Electronics and Computer Circuits (3) Analog Circuits, operational amplifiers, digital systems and logic Circuits, Semiconductor Devices. For non-majors only. Prereq: 301.


312 Linear System Analysis (3) Steady-state and transient analysis of continuous and discrete time systems, stability, block diagram and signal flow graphs, introduction to feedback theory. Prereq: 311; Coreq: 319.

319 Systems Lab (1) Experiments and projects demonstrating systems discussed in 312.

321 Energy System Components (3) Iron core magnetic circuits, transformers, single phase, three phase, per unit notation; steady state behavior of induction motors; synchronous machines; dc machines; alternate energy systems and direct-energy conversion. Prereq: 202.


329 Electrical Energy Lab (1) Experiments and projects demonstrating electrical energy discussed in 321 and 322.
331 Electronic Devices (3) Fundamentals of energy band theory of p-n junctions; diodes, field effect transistors, and bipolar transistors; integrated circuit fundamentals; device applications, simple power supplies, and amplifiers; project laboratory. Prereq: 202.


339 Electronic Labs (1) Experiments and projects demonstrating electronics discussed in 332.

341 Fields I (3) Coulomb's law, Gauss's law, and Ampere's law, Maxwell's equation for electrostatic and magnetostatic cases; Maxwell's equations for dynamical case, dynamic potentials, uniform plane wave propagation. Prereq: 202.


349 Communications Lab (1) Experiments and projects demonstrating communications discussed in 342.


352 Small Computer Systems (3) Structured assembly language programming; control of peripherals through device service routines; data collection under the control of the small computer using A/D converters; D/A converter output to CRT displays; on-line, real time data analysis; fast Fourier Transform, digital filters; automatic test equipment; computer-aided circuit application; word processing; information management; communications between computers. Prereq: 351. Coreq: 359.

359 Computers Lab (1) Experiments and projects demonstrating computers discussed in 352.

361 Introduction to Plasma Engineering (3) Particle motion in electric and magnetic fields; collective motions of plasmas; Alfven waves and the Langmuir probe; plasma light sources and lasers; radio waves in plasmas and the ionosphere; MHD generators, fusion and plasma electronics. Prereq: 202 for E&CE majors; or Physics 232 or 238 for all others. Coreq: 369.

369 Plasma Engineering Lab (1) Experiments and projects demonstrating plasma engineering concepts discussed in 361. Prereq: 361.


413 Passive and Active Network Synthesis (3) Network analysis techniques, passive network driving point synthesis, transfer function synthesis, approximation theory, topics in active network synthesis. Prereq: 312.

421 Power Systems (3) Bulk power systems planning and control; reliability; system stability. Prereq: 322.

422 Machines (3) Dynamic behavior of rotating machines; transfer functions for the common modes of operation of d.c. machines; response to different types of electrical phenomena; equivalent circuits, a.c. machines and their numerical solutions. Prereq: 322. Coreq: 426.


426 Machines Lab (1) Experiments and projects demonstrating machines discussed in 422.

429 Power Electronics Lab (1) Experiments and projects demonstrating power electronics discussed in 423.

431 Digital and Analog Integrated Electronics (3) Basic processing and fabrication of active and passive components for monolithic integrated circuits; characteristics of bipolar, MOS and JFET transistors in typical analog and digital integrated circuit designs; standard digital logic circuits including TTL, ECL, Schottky, CMOS, and GaAs gates and arrays; design concepts for op-amps, comparators, references, regulators, and other linear functions. Acceptable as a designated design course. Prereq: 332. Coreq: 435.

432 Analog Signal Processing Electronics (3) Transducer signal and interfacing characteristics; analog integrated operational, instrumentation, isolation, and amplifier circuits, rms and logarithmics, rms and logarithmic converters, multipliers, and functional generation circuits; passive and active filter circuits, level and phase detection, multipliers, modulation and demodulation, sample and hold, and comparators. Acceptable as a designated design course. Prereq: 332. Coreq: 436.

433 Electronic Amplifiers (3) Feedback amplifier principles; wideband linear amplifier design; radio frequency and audio power amplifier design; linear regulated power supply design; oscillator principles. Acceptable as a designated design course. Prereq: 332. Coreq: 439.

435 Digital and Analog Integrated Electronics Lab (1) Experiments and projects demonstrating electronics discussed in 431.

436 Analog Signal Processing Electronics Lab (1) Experiments and projects demonstrating electronics discussed in 432.

439 Electronic Amplifiers Lab (1) Experiments and projects demonstrating electronic amplifiers discussed in 433.


443 Microwave Circuits and Electronics (3) Scattering theory description of circuits to include isolators and amplifiers, microwaves and power dividers, circulators, phase shifters. Loading and interconnection of systems. Power generation and amplification by vacuum and solid state (bulk and junction) devices. Microwave wave switching, filtering and multiplexing devices. Transmission lines and waveguide components. Prereq: 342. Coreq: 449.


449 Microwave Circuits and Electronics Laboratory (1) Experiments and projects demonstrating microwave circuit and electronics discussed in 443.

451 Microprocessors in Computer Engineering (3) Projects carried out using a microcomputer kit having a monitor program and development system with cross- compilers, file management, and emulation capabilities; interfacing and hardware/software trade-offs in interrupt-driven applications. Grade is dependent upon number of projects completed, homework solutions, and engineering notebook. Acceptable as a designated design course. Prereq: 352. Coreq: 455.


453 Data Acquisition Systems (3) Digital-to-Analog conversion techniques; Quad and 2-R ladder networks; error analysis; D/A converters; Sample and Hold circuits; digital-to-analog conversion techniques; open loop systems; direct and matrix converters; closed loop systems; system stability and system design; introduction; error analysis of A/D converters; accuracy, linearity, drift, dynamic range, frequency response, signal to noise and distortion. Acceptable as a designated design course. Prereq: 352 or equivalent. Understanding of the C language as demonstrated by the understanding of the material included in The C Workshop. Consent of instructor.

455 Microprocessor Laboratory (1) Experiments and projects demonstrating microprocessor systems discussed in 451.

456 Digital System Design Laboratory (1) Experiments and projects demonstrating digital systems discussed in 452.

459 Data Acquisition Systems Laboratory (1) Experiments and projects demonstrating digital communications discussed in 453.

461 Plasma Magnetohydrodynamic Engineering (3) The MHD approximation; MHD waves and instabilities; MHD in static and dynamic systems; MHD in pulsed and steady-state power generation; interactions of fusion energy, industry, and astrophysics. Prereq: 361.

462 Plasma Kinetic Theory Engineering (3) Introduction to kinetic theory; beam-plasma system; driven waves in a plasma; transition from multiple beams to a continuum; Vlasov and Landau theory; microwave breakdown in plasmas and interaction of electron masers in circular geometry; the gyrotron and helicon. Design of plasma devices. Acceptable as a designated design course. Prereq: 361 or consent of instructor.

463 Introduction to Fusion Energy I (3) High temperature plasma physics relevant to fusion plasma, principles of fusion reactors, and engineering aspects of physics relevant to tokamak reactor, alternate magnetic confinement concepts, advanced fusion fuels, fusion technology, plasma propulsion, and applications. Prereq: 361 or consent of instructor. (Same as Nuclear Engineering 463.)

464 Introduction to Fusion Energy II (3) Continuation of 463. This course includes principles of high temperature plasma technology, tokamak reactor, alternate magnetic confinement concepts, advanced fusion fuels, fusion technology, plasma propulsion, and applications. Prereq: 361 or consent of instructor. (Same as Nuclear Engineering 464.)
Courses of Instruction

305 Motion and Time Study (3) Design of work methods and time standards for the measurement of work and determining standards. For non-industrial engineering students. Prereq: Junior standing.

400 Manufacturing Materials/Processes (3) Characteristics of materials and processes used in modern manufacturing. Prereq: Senior standing or consent of instructor. ESM 321.

401 Integrated Manufacturing Systems (3) NC and CNC machine tools, robotics and related materials handling systems, hard automation, alternative integrated manufacturing systems, and manufacturing information systems. Prereq: 400G.


403 Production Facilities Design and Material Handling (3) Design of production facilities including plant layout and analysis and planning for overall moving, packaging and storage of materials. This includes office layout and service areas. Principles applicable to design of facilities for such diverse groups as hospitals, banking, and industry. Prereq: 302, 401.

404 Senior Seminar (1) Discussions, lectures and trips to unify students educational experience. Prereq: Senior standing in Industrial Engineering.

405 Engineering Economy (2) Methods and problems in selection or replacement of equipment. Decisions among engineering alternatives involving capital recovery, economic life of equipment, and rate of return on investment.


410 Predetermined Time Systems (2) Work design and measurement using predetermined time system such as Methods Time Measurement, Basic Motion Time Study or Work Factor. Theory and application. Prereq: 303.


412 Quantitative Methods in Project Management (2) Project planning, scheduling, and control based on network analysis and computer programming methods. Includes resource allocation and time-cost trade off algorithms, multi-project control, computer applications, and PERT methods of handling uncertainty in activity time estimates.

413 Research Methods in Industrial Engineering (3) Methods to collect and analyze data related to industrial engineering. Topics such as process control, statistical modeling of processes, behavioral sampling, single subject experimental designs, classical experimental design methods, and time series models of experiments. Validity and reliability concepts as related to measurement and collection of data. Strategies to control rival hypotheses such as randomization, matching, control, etc. Experiments involving artificial variables and building extraneous variables into an experiment. Selection of appropriate experimental designs for given research objectives and to analysis of messy data. Prereq: 300 and senior standing, Statistics 251.

414 Laboratory and Methodology in Human Factors Engineering (3) Project and laboratory-oriented investigations of human factors problems. Instrumentation and measurement of human capabilities and limitations, environmental factors that affect work such as temperature-humidity, lighting and noise. Measurement, design and evaluation of interface design on human performance. Student-selected group project. Prereq: 304 and senior standing.

421 Informational Systems I (3) Systems engineering approach to design, development, implementation, and maintenance of systems of information. Emphasizes informational aspects of IE systems. Study of data structures and database management systems. Prereq: 200 and senior standing.

422 Senior Industrial Engineering Problems Analysis and solution. Application of Industrial Engineering to field assignments in local organizations, including problem definitions, analysis and presentation. Prereq: 402, 403 and 405.


494-495 Special Topics in Industrial Engineering (1,3) Recent developments in industrial engineering including new areas of application, new research techniques and new methodologies. May be repeated once. Prereq: Senior Standing and consent of instructor.

ENGINEERING MATERIALS SCIENCE

201 Introduction to Materials Science and Engineering (3) Correlation of atomic structure, crystal structure and microstructure, etch patterns, x-ray diffraction, physical, mechanical and chemical properties of engineering significance. Prereq: Chemistry 130, E.

202 Fundamentals of Materials Engineering (3) First law of thermodynamics, mass and energy balances, stoichiometry, introductory kinetics, introduction to materials processing. Coreq: 201, F.

203 Experimental Methods in Materials Science (2) Laboratory including data acquisition and processing, error analysis, measurement and control techniques, use of computers in data acquisition and analysis. 1 hour and 3 hour lab. Prereq: 201. Sp.

205 Metallurgical Processing (2) Overview of the scope of the discipline. Production technology for ore beneficia
tion, reduction processes, semi-finished and finished metallic products.

301 Diffusion and Phase Transformations (3) Diffusion in solids; the diffusion equations, point defects and atomic mechanisms of diffusion. Thermodynamics of phase equilibrium. Kinetics and morphology of phase transformations. Prereq: 202, F.

302 Mechanical Behavior of Materials (3) Loading behavior for ceramics, polymers and metals; standard
dized tensile testing procedures; analytical treatment of stress, strain, and constitutive equations; theory of failure for ductile materials; analytical linear elastic fracture mechanics. Prereq: 201, sophomore mathematics, ESM 321. Sp (Same as Engineering Science and Mechanics 323.)

303 Thermodynamics of Solids (2) Applications to solids of free energy; activity. Raoul's and Henry's laws; condensed phase equilibrium; phase stabili
ty; phase rule; multicomponent systems. Prereq: Chemistry 371. Sp.

304 Introduction to X-ray Diffraction (3) Generation of x-rays; diffraction theory; powder technique; determi
nation of lattice constants; phase identification; measurement of orientation; chemical analysis by x-ray spectroscopy. Includes laboratory. Sp.

310 Electronic Properties of Solids (3) Electrical, thermal, magneto-optical, and atomic interactions of electrons and the atom in crystals, solids, Brillouin zones, periodic structures, temper
ture and compositional dependence; application of solid state concepts to electronic, nuclear and magnetic science and engineering students. Prereq: 201. Coreq: Physics 232.
320 Physical Metallurgy (3) Phenomenology and microstructure of deformation in cast and wrought ferrous and nonferrous alloys. Applications of microstructure to mechanical properties; phase transformations; solidification; the effects of heat treatment; corrosion and wear; and fatigue. Prereq: 201. 3 hours or 2 hours and 1 lab. Sp

340 Introduction to Polymer Science and Engineering (3) Synthesis and molecular structure of polymers; polymerization kinetics; molecular characterization; crystalline and glass transition temperatures; crystallization mechanisms; rheological properties of polymers. Prereq: 340 or consent of instructor. F

342 Structure-Property Relationships in Polymers (3) Structure and behavior of polymer materials. Kinetic models of structural order: polymer structure and property relationships with respect to crystallization kinetics, deformation modes, and orientation types. Electrical properties of polymers. Prereq: 340 or consent of instructor. F

360 Introduction to Ceramic Materials and Processing (3) Characterization of ceramic materials as to their crystal structure, their mechanical, electrical, and optical properties. Ceramic fabrication processes from the initial green body fabrication through the firing state. Prereq: 201.

400 Microanalytical Techniques (3) X-ray diffraction techniques and the concept of the reciprocal lattice. Kinematical theory of electron scattering to include diffraction contrast imaging, geometrically induced contrast, and electron diffraction. Preparation techniques for electron microscopy. Preparation techniques for electron microscopy. Operating principles of electron microscopes and electron diffraction. Prereq: 302. F

421 Mechanical Metallurgy (3) Brittle fracture due to metallurgical and environmental factors; stress-life and strain-life fatigue analysis; residual stresses; creep and stress-rupture; finite plastic strain; fatigue fracture; fabrication by forging, rolling, deep drawing, stretch forming; formability testing. Prereq: 302 or 201 and MIE 446. Also suggested for mechanical engineering and engineering science and mechanics majors. F

422 Chemical Process Metallurgy (3) Application of chemical thermodynamics to metallurgical processing, Ferrous and nonferrous pyrometallurgical refining, slag-metal equilibrium, solidification, gas-metal processing. Prereq: 300. F

423 Metallurgical Fabrication (3) Principles and practices of processing; fabrication methods; solidification, segregation, heat microstructure, residual stresses, thermal treatments including sintering and annealing, properties. Prereq: 300 (3 hours or 2 hours and 1 lab). F

424 Metallurgical Process Design (3) Property control through composition, thermal and mechanical properties, metallography, casting, forging, extruding, rolling, powder metallurgy. Prereq: 302. F

425 Metallurgical Applications in Manufacturing and Processing (3) Fabrication methods, standards and specifications; principles of theromechanical processing for finished and semi-finished products; casting, forming, joining, heat treatment, powder metallurgy, corrosion control. Prereq: 201. Sp


443 Polymer Processing (3) Rheological measurements; flow through tubes and slits, including and extrusion; injection molding; extrusion, injection molding, synthetic fibers, including structure development, properties. F

444 Plastics Fabrication and Design (3) Lectures, laboratory, and field trips; unit operations of plastics fabrication; plastics classification; design and selection criteria; processing techniques; characterization laboratory. Sp

470 Corrosion Science and Engineering (3) Mechanisms and control of corrosion processes; thermodynamics and electrode kinetics of corrosion reactions; electrochemical measurement techniques; applications to design. Prereq: 201. Recommended for chemical engineering, mechanical engineering, civil engineering and engineering science and mechanics majors. Sp

471 Semiconductor Materials (3) Theory properties and processing of semiconductors with emphasis on applications to solid-state devices; basic physics of semiconductor materials; crystal growth, films, doping, annealing, etching, property and performance evaluation. Prereq: 310. F

472 Fundamental Principles of Composite Materials (3) Physical principles basic to the design, fabrication and application of fiber reinforced polymers, metals and ceramics. Prereq: 302 or equivalent. Sp (Same as Engineering Science and Mechanics 426).

474 Biomaterials (3) Metals, polymers and ceramics utilized in orthopedic, cardiovascular, and dental surgical implant devices; corrosion and degradation problems; material properties of primary importance; tissue response to synthetic materials. Prereq: 201. Recommended for engineering science and mechanics majors. Sp

475 Fracture-Safe Design (3) (Same as Engineering Science and Mechanics 423).

490 Seminar (1) Economic, political, social, ethical and professional issues of significance to practicing materials engineers. S/NC

494 S/P Special Project Laboratory (1-3) Group or individual investigation of problems related to materials science and engineering. May be repeated to a maximum of 6 credits. Prereq: 201, 202, 203 and consent of instructor.

495 Thesis (3) Research problems in materials science and engineering with prior approval of a professor. May be repeated once. Prereq: Senior standing or consent of professor.

496 Special Topics in Materials Science and Engineering (1-3) Recent developments in materials science and engineering; topics in engineering and science and engineering with prior approval of a professor. May be repeated once. Prereq: Senior standing or consent of instructor.

499 Design and Analysis (3) Lecture and laboratory sessions on design and analysis of performance; standards, codes, failure analysis, design projects, reports. Prereq: Senior standing or consent of instructor.

500 Engineering Analysis (2) Analysis techniques for engineering problems. Prereq: 310. F


568 Manufacturing Processes (2) Processes related to metal forming, machining, casting, hot and cold forming, metal removal and weldments. Manufacturing tolerances and surface finishes. Prereq: Materials Science 201, F, Sp

391 Engineering Analysis (2) Analysis techniques for problems of importance to materials scientists and engineers. Emphasis on approximate solutions. Prereq: Basic Engr. 201 and Mathematics 231, F, Sp, Su

401 Thesis (3) Problem investigation and report. Prereq: Senior standing. F, Sp, Su

415 Energy Conversion Systems (3) Fossil fuel energy systems with emphasis on coal technology. Coreq: 475.

416 Turbo-Machinery (3) Basic principles of turbomachinery; systematic methods of analysis, design, performance evaluation. Prereq: Aerospace Engnr. 351.

422 Environmental Noise (3) Acoustics - measurements and control of noise in industrial and community environments. Prereq: Senior standing or consent of instructor.

431 Seminar (1) Topics related to engineering including ethics. Formal oral presentation by students on engineering topics. Prereq: Senior standing, F

445 Lubrication (3) Hydrodynamic theory of lubrication bearings, boundary and mixed lubrication, solutions to infinite and finite bearings, analytical and numerical solutions; applications to design. Prereq: 344, Aerospace Engr. 351.

449 Mechanical Engineering Laboratory (3) Design, construction and testing of a mechanical or manufacturing experiment. Test standards and specifications. Analysis of data and formation of conclusions. 3 hours per week. Prereq: 322, 344, 345. Coreq: 475, Sp, Su

451 Systems and Controls (3) Analytical models of physical systems; comprised of combinations of mechanical, fluid, electrical, and thermal components; feedback control systems, transient and frequency response, stability analysis; non-linear control of linear systems; sampled data systems, digital filters. Prereq: 341, 363, ECE301-302, F, Sp

455 Introduction to Machine Design (2) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering solid mechanics systems. Participation in team design effort; requires design report. Prereq: 363, 465, F

466 Introduction to Thermodynamic Design (1) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering thermal-fluid systems. Participation in team design effort; requires design report. Prereq: 332, 344, F


462 Tool Design (3) Principles underlying tool and die design; design for high volume production; work holding fixtures; comparison of material removal methods; selection of tool material; plastics production. Prereq: Mech. Engr. 366 or Industrial Engr. 404, ES&M 321.


468 Elements of Machine Design II (3) Application of statistical techniques to properties of materials, design factors, and theories of failure to design of machine elements. Mini-design experiences. Prereq: Materials Science 201, ES&M 321, F, Sp

469 Machine Design (4) Design of complete machine; documentation including complete specifications, design calculations, working drawings, and cost analysis. Written and oral report. Prereq: 455, 466. Sp

471 Refrigeration and Air Conditioning (3) Vapor compression and absorption cycles; heat pump systems, psychrometrics, air washers; cooling towers; solar radiation; building heat transmission. Prereq: 332, 344.

474 Solar Energy Utilization (3) Nature and availability of solar radiation; review of heat transfer topics pertinent to solar energy collection and use; design analysis of solar energy collectors and methods of storage; selected applications. Prereq: 332, 344 or consent of instructor.

475 Thermal Engineering (3) Thermal systems with emphasis on turbomachinery, heat exchangers, combustion and system analysis and design including second law and economic analysis. Prereq: 332, 344, F, Sp.

479 Thermal Engineering Design (4) Design of a complex fluid system including economic, technical and optimization aspects. Participation in team design engineering including oral presentations and design report. Prereq: 455, 475, Sp.

481 Internal Combustion Engines (3) Thermo-chemical phenomena in combustion and propulsion engines. Combustion, detonation; equilibrium; dissociation; homogeneous and heterogeneous engines using ideal and real fluids. Prereq: 332, 344.

494-495 Selected Topics in Mechanical Engineering (1-4, 1-4) Problems and topics related to development and practice in mechanical engineering. Prereq: Consent of instructor. F, Sp, Su

ENGINEERING NUCLEAR

201-202 Seminar (1, 1) Topics related to nuclear engineering. Satisfactory/No credit.

203 Thermodynamics I (3) First law analysis of open and closed systems. Properties of ideal gases and real fluids. Prereq: Mathematics 142.

204 Thermodynamics II (3) Second law, development of entropy concept and availability. Various power plant cycles and systems. Prereq: 203.

301 Introduction to Nuclear Engineering (3) Nuclear systems, radioactive decay, cross sections, fission, fusion, reactor theory. Prereq: Physics 232, Mathematics 231.


304 Nuclear Engineering Laboratory (3) Radiation detection and counting instrumentation, counting statistics, half-life and decay schemes, gamma detectors, heat transfer experiments. Prereq: 305, Coreq: 302.

305 Energy Transport (3) Development of differential and integral energy conservation; conduction and convection heat transfer; including numerical methods; application to nuclear reactor fuel elements, reactor cores, and heat exchangers. Prereq: 304.

306 Designing for Energy Transport (3) Radiation heat transfer, hydrodynamics and heat transfer in boiling thermal and condensing systems; boiling crises; fuel element and heat exchanger thermal design; steam generator design. Prereq: 305.

310-311 Thermalhydraulics (3,3) Energy and the management of flow. They are transferred and transported. First and second laws of thermodynamics with applications from power cycles; transfer of heat through conductive and radiative mechanisms; and development of fluid flow principles for the transport of energy. Prereq: Mathematics 241.

342 Thermal Science (3) Fluid statics; conservation equations of mass, momentum, and energy; applications to fluid machinery; heat transfer processes, heat conduction, forced and natural convection. For non-departmental majors only.

401 Nuclear Reactor Theory (3) Thermal spectrum computational methods; heterogeneous effects in fast and thermal spectra; considerations in reactor core design; equations that relate thermal and neutronic variables; power distribution calculations and reactivity control methods. Prereq: 302.

402 Nuclear System Design (4) First order design and analysis of a nuclear system, interface with non-nuclear aspects of system design including system reliability and economics, class project. Prereq: 401.

403 Nuclear Engineering Laboratory (3) Cross-section measurement, diffusion properties of neutrons, critical loading experiment, control rod calibration, statistical weight, shielding, neutron poisoning, dynamics and controls experiments. Prereq: 304 or equivalent. Coreq: 401, 405.

404 Nuclear Fuel Management (3) Topics relative to nuclear fuel cycle including mining and milling, fuel fabrication, fuel reprocessing and waste disposal. Economic and regulator issues. Prereq: 302.


463 Introduction to Fusion Energy I (3) (Same as Electrical and Computer Engineering 463.)

464 Introduction to Fusion Energy II (3) (Same as Electrical and Computer Engineering 464.)

ENGINEERING SCIENCE AND MECHANICS

231 Dynamics (3) Kinematics of rigid bodies; center of mass; kinetics of systems of particles; mass moments of inertia; kinetics of rigid bodies; Newton's laws, work-energy, impulse-momentum. Prereq: Basic Engr. 131, Mathematics 142.

271 Introduction to Biomedical Engineering (3) Overview of biomedical engineering; anatomy, physiology, biochemistry, biophysics, bioinstrumentation, and biomechanics. Coreq: Mathematics 241 or consent of instructor.

301 Seminar (1) Engineering professionalism and career planning: seminars on current topics. Satisfactory/No credit. Prereq: Junior standing in ES&M.


322 Mechanics of Materials II (3) Analysis and design of beams, singularities functions, energy methods, thick-walled pressure vessels, inelastic bending and torsion, theories of failure and fatigue. Prereq: 321.

323 Mechanical Behavior of Materials (3) (Same as Materials Science 302)


421 Materials of Engineering (3) Mechanical properties of engineering materials; data collection and processing; time and cyclic dependent properties. 3 hours or equivalent laboratory. Prereq: 321, Materials Science 201. (Same as Materials Science 475.)

425 Principles of Nondestructive Testing (3) Principles and theory of nondestructive testing methods; liquid penetrant, magnetic particle, eddy current, ultrasonic, acoustic emission, and radiographic methods. Laboratory, Prereq: 321, Materials Science 201. (Same as Physics 425.)

426 Fundamental Principles of Composite Materials (3) (Same as Materials Science 472)

431 Fundamentals of Vibrations (3) Free and forced vibrations of damped and undamped lumped parameter systems; energy methods; free vibration of continuous bodies. Prereq: 231, Mathematics 231.

433 Dynamic Systems (3) Three dimensional dynamical systems and applications to nonlinear mass systems; central force motion; Lagrange's equations; stability; transfer functions. Prereq: 231.

435 Engineering Acoustics (3) Concepts of acoustics, measures of sound and their units; noise generation and transmission, noise control principles and applications, materials and procedures for noise abatement. Prereq: 431.

442 Fluid Mechanics II (3) Differential forms of the basic laws; compressible flow, isentropic flow, shock, duct flows with heat transfer and friction; open channel flow, critical flow, energy methods; internal and external viscous flows, boundary layers, elementary turbulent closure models. Prereq: 341, Mathematics 231.

452 Computational Mechanics II (3) Integration of fundamental physical laws, mathematical methods and computational techniques necessary to develop engineering analysis and design capabilities. Prereq: 351.

453 Project in Design and Development (3) Conceptualization, analysis, design, and presentation of an engineering science project. Standing in ESM: 301, 452; IE 405. Coreq: ME 344.

454 Computational Mechanics III (3) Integration of fundamental physical laws, mathematical methods and computational techniques necessary to develop engineering analysis and design capabilities. Prereq: 452.

461 Experimental Stress Analysis (3) Theory, techniques, and instrumentation of resistance strain gauges; theory and techniques of brittle coating method; introduction to other strain measuring devices. 2 hours and laboratory. Prereq: 321, ECE 301.

463 Photonics (3) Photoelasticity, photelastic coating method, Moire' method, interferometry, and holography, 2 hours and laboratory. Prereq: 321, Physics 232.

465 Dynamic Data Acquisition (3) Use and calibration of instrumentation for measuring and recording dynamic events; Fourier analysis, transfer function analysis, digital signal processing, transduction, experimental parameter estimation with applications to modal vibration analysis. 2 hours and laboratory. Prereq: 431, ECE 301.

471 Clinical Engineering and Biostatistics (3) Fundamentals and current problems of health care delivery systems including hospital organization and health care economics; development and management prin-
corder for a hospital-based clinical engineering pro-
gram. The course covers: data acquisition, data
characteristics; performance of transducers, signal
conditioning, data readout and storage devices; eval-
uation of transport processes in therapeutic devices;
bioengineering and interpretation of pharmacokinetic
and procurement methods, custom-designed sys-
tems, equipment maintenance and control programs
for design and evaluation. Effectiveness and profes-
sionalism in clinical engineering. Prereq: 271, ECE 301.

473 Biomechanics (3) Mechanical properties of living
isolating; biomechanics of injury; mechanics of prosth-
ees; measurement and reliability of prosthesis devices;
bioengineering and biomechanical problems related to impact. Prereq: 321.

475 Design of Artificial Internal Organs (3) Design-
development and evaluation of artificial internal organs;
analysis of transport processes in therapeutic devices
for design optimization; review of currently available
devices; federal regulation and ethical considera-
tions. Prereq: 341, Mathematics 231.

476 Transport Phenomena in Living and Life Support
Systems (3) Application of mass, momentum and heat
transport theory to quantitative analysis of in vivo phys-
ological function; analysis of transport phenomena in
life support systems including design considerations for
artificial organs; application to blood rheology, mass
diffusion, mass transport in bio-sen-
tence systems, and heat transfer in living systems

494-495 Special Engineering Science Topics (3,3)
Problems related to recent developments and prac-
tice. May be repeated once for credit. Prereq: junior
or senior standing, consent of instructor.

ENGLISH

101 English Composition I (3) Expressive, informa-
tive, and persuasive writing, with emphasis on invention,
organization, style, and revision; practice in writing
journals, letters, and reports, as well as expository
and persuasive essays; intensive study of prose for
reading, writing, and critical thinking; development system operational
ences on individual writing problems. A,B,C,NC grading.

102 English Composition II (3) Analytical writing based
on the study of literature and the study and practice of
research writing: individual conferences. Prereq. 101.
A,B,C,NC grading.

103 Writing Workshop (1) Self-paced laboratory course
only for students remanded to it at the beginning
of the semester by their English Composition teachers.

118 Honors English Composition (3) Open only to
students who are selected on the basis of placement
scores and high school record. Grading scale and
workload the same as regular sequence. Expository
and analytical writing based on the study of literature
and non-fiction prose; the study and practice of research
writing; individual conferences. Students receiving a
grade below B in 118 will complete a year's work in
English composition by taking 102. Students receiv-
ing a grade of A or B will complete their Freshman
English requirements by choosing 182, a sophomore
literature course in the English Department or 355.
A,B,C,NC grading.

121 English Grammar Review for Foreign Students
(4) Comprehensive review of English grammatical
struk-
ture to prepare for English 157. Prereq: their first semester selection
in the University of all foreign students who demonstrate on
the English Placement Examination a need for work
in English structures. Admission to this course by
the English Placement Exam only. Meets four hours
a week. A,B,C,F grading.

130 Composition for Non-Native Speakers of English
(3) Writing based on reading and discussion. Empha-
sis on research techniques and writing research papers.
Individual conferences. Admission to this course by
the English Placement Exam only. A,B,C,NC grading.

201 British Literature I: Beowulf through Johnson (3) Major
literary works from three periods: Middle Ages,
Renaissance, and Restoration and Eighteenth Centu-
ry. Writing-emphasis course: at least one in-class exami-
nation and 3000 words of writing outside the classroom.

202 British Literature II: Wordsworth to the Present (3) Major
literary works from three periods: Romani-

207 Honors British Literature I (3) Enriched section
of 201 designed for students with a 3.25 or higher GPA.

208 Honors British Literature II (3) Enriched section
of 202 designed for students with a 3.25 or higher GPA.

221 Literature of the Western World I: Ancient, Medie-
val, and Renaissance (3) Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

222 Literature of the Western World II: Enlighten-
ment, Romantic, and Modern (3) Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

227 Honors Literature of the Western World I (3)
Enriched section of 221 designed for students with
a 3.25 or higher GPA.

228 Honors Literature of the Western World II (3)
Enriched section of 222 designed for students with
a 3.25 or higher GPA.

231 American Literature I: Colonial Era to the Civil
War (3) Development of American literature from its
beginnings to the Civil War. Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

232 American Literature II: Civil War to the Present
(3) Development of American literature from Civil
War to the present. Writing-emphasis course: at least
one in-class essay examination and 3000
words of writing outside the classroom.

233 Major Black Writers (3) Black American literature
as a literary tradition. Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

237 Honors American Literature I: Colonial Era to
the Civil War (3) Enriched section of 231 designed
for students with a 3.25 or higher GPA.

238 Honors American Literature II: Civil War to the
Present (3) Enriched section of 232 designed for
students with a 3.25 or higher GPA.

248 Honors Introduction to Poetry (3) Enriched section
of 251 designed for students with a 3.25 or higher GPA.

251 Introduction to Poetry (3) Poetry as a distinct
mode of artistic expression: Critical tools for percep-
tion of reading of poems. Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

252 Introduction to Drama (3) Critical tools for per-
ceptive reading of play texts. Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

253 Introduction to Fiction (3) 5-7 novels from the
eighteenth century and the twentieth centuries, with emph-
asis on English and American authors. Critical tools
necessary for judging longer works of fiction. Writing-
emphasis course: at least one in-class essay exami-
nation and 3000 words of writing outside the classroom.

258 Honors Introduction to Drama (3) Enriched sec-
tion of 252 designed for students with a 3.25 or higher GPA.

263 Introduction to Creative Writing (3) Practice in
writing poetry and fiction, combined with study of
poetry and techniques. Writing-emphasis course: at least one
in-class essay examination and 3000 words of writing
outside the classroom.

268 Honors Introduction to Fiction (3) Enriched sec-
tion of 253 designed for students with a 3.25 or higher GPA.

281 Introduction to Film Studies (3) Selected world
feature films. Critical techniques necessary for
understanding and analysis of narrative cinema.
Basic elements of film expression and contours of
film history. Writing assignments.

301 British Culture to 1660 (3) English literature in
the context of parallel developments in art, architecture,
music, and social and intellectual history. Writing-
emphasis course: at least one in-class essay exami-
nation and 3000 words of writing outside the classroom.

302 British Culture: 1660 to present (3) English litera-
ture in the context of parallel developments in art,
architecture, music, and social and intellectual histo-
ry. Writing-emphasis course: at least one in-class essay examination
and 3000 words of writing outside the classroom.

306 Introduction to Shakespeare (3)

322 Women in American Literature (3) Women as
writers and as subjects in American literature from its
beginnings to the present. (Same as Women’s Studies 332.) Writing-emphasis course: at least one in-class essay examination and 3000
words of writing outside the classroom.

333 Black American Literature and Aesthetics (3)
Black American literature and aesthetics since 1899
with emphasis on cultural evaluations and the prin-
ciples of being “American”. Writing-emphasis course:
at least one in-class essay examination and 3000
words of writing outside the classroom.

334 Film and American Culture (3) American films as
both works of art and social documents. Relationship
between the medium of film and American culture in
the twentieth century. (Same as American Studies 334.) Writing-emphasis course: at least one in-class essay examination and 3000
words of writing outside the classroom.

351 The Short Story (3) Enriched section of 201 designed
for students with a 3.25 or higher GPA.

354 Writing Fiction (3) Introduction to writing fiction.

365 Writing Drama and the Screenplay (3) Introduc-
tion to writing one-act and full-length plays, as well as
screenplays.

371 Foundations of the English Language (3) Pho-
nology, morphology, and syntax of English. History of
the English language to 1800. (Same as Linguistics 371.)

372 The Structure of Modern English (3) Survey of
approaches—traditional, descriptive, and generative
(formalism to the structure of modern Eng-
ish. (Same as Linguistics 372.)

376 Colloquium in Literature (3) Methods and objectives
of literary study; conferences to plan student’s pro-
gram in major.

392 English Studies in the Bible (3) The Bible: leg-
ends, folktale, history, biography, myth, legend, proverbs, riddles, superstitions, dan-
os, games, and stories of writing outside of models
and other literatures.

399 Literature of the English Bible (3) Types of litera-
ture in the Bible: legend, folktale, history, biography,
poetry, prophecy, apocalyptic. (Same as Religious Studies 399.)
courses. Finance 301 is prerequisite to all 400 level courses.

301 Financial Management (3) Principles of financial management. Investments, long-range financial planning, and management functions of the firm.

400 Special Topics (3) Seminar. Topic(s) announced prior to offering.

421 Investment Analysis (3) Principles and concepts of asset valuation in competitive and efficient financial markets. Basic analytical tools are developed and used to study valuation of different types of securities. Major writing requirement.

422 Portfolio Analysis and Management (3) Portfolio theory and evidence of behavior of security returns with a view to determining rational investment policy. Includes statistical analysis for risk and return of portfolios, portfolio evaluation and revision, capital market theory, and extensions of portfolio analysis. Prereq: 421.

430 Financial Markets (3) Role of short and long term financial markets in the process of capital formation and allocation. Theories and mathematics of interest rates in money and capital markets.

431 Financial Institutions (3) Management policies of financial institutions, including asset, liability and capital management. Legal, economic and regulatory environment and their implications for management. Financial institutions' structure and competition and changing trends in the U.S. Financial System.

450 Financial Management: Theory and Practice (3) Decision making topics in financial management including valuation, capital budgeting under uncertainty, cost of capital, capital structure theory and dividend policy. Major writing requirement.

460 Advanced Topics in Financial Management (3) Contemporary issues in corporate finance, liquidity, and current asset management, corporate growth and control; international financial management, and pension fund management. Prereq: 450.

470 Risk Management and Insurance (3) Identification, measurement and decision making with regard to insurance-type risks facing the firm. Emphasizes handling these risks in the most cost-efficient manner.

471 Estate and Financial Planning (3) Process of estate accumulation, safekeeping, and distribution, with particular emphasis on impact of insurance and taxation.

481 Real Estate Finance and Investment Analysis (3) Principles of financing and investing in real property. Utilizes discounted cash flow models and ratio analysis. Current federal tax law applicable to real property. Emphasis on mortgage, real estate, and other joint ventures. (Same as Urban Studies 481.)

482 Urban Development and Finance (3) Economic analysis of determinants of urban land value and urban growth. Impact of urban problems in the United States. Primary and secondary mortgage markets and economic analysis of the effects of these markets on urban development. (Same as Urban Studies 482.)

FOOD TECHNOLOGY AND SCIENCE

140 The Food Industry (3) Role of the food industry in providing an adequate, safe food supply for the United States and international markets. Interaction of the food industry with governmental agencies and consumers. 2 hours and 1 lab. F

269 Meat Evaluation and Grading (2) Grading standards for quality and yield; principles for evaluating beef, pork and lamb, and application of standards for institutional meat cuts. Practice grading, judging carcasses, and cuts and application of purchase specifications. F

360 Meat Science (2) Carcass characteristics of meat animals, muscle structure and composition, cut identification, curing, freezing and cookery.

369 Meat Science Lab (1) Slaughter and processing methods of beef, pork, lamb, and poultry. Prereq: 369 or concurrent enrollment. Sp

401 Food Technology and Science Seminar (1-2) Review of scientific literature, oral and written reports. May be repeated; maximum 3 credit hours. Prereq: Senior standing or consent of instructor, F, Sp.

410 Food Chemistry I (3) Reactions of proteins, enzymes, and lipids. Study of physicochemical interactions of food materials. Prereq: Chemistry 110 or equivalent. 2 hours and 1 lab. F

411 Food Chemistry II (3) Reactions of inorganic compounds, carbohydrates, lipids and vitamins in foods. Prereq: Chemistry 110 or equivalent. 2 hours and 1 lab. F

420 Food Microbiology (2) Physical, chemical and environmental factors moderating growth and survival of foodborne microorganisms; pathogenic and spoilage microorganisms affecting quality of foods and their control. Prereq: Microbiology 210, Coreq: 429. F

429 Food Microbiology Lab (3) Methods for examination, enumeration, cultivation and identification of foodborne microorganisms. Prereq: Microbiology 210; Coreq: 420. F

430 Sensory Evaluation of Food (3) Principles and methods of sensory evaluation of foods. Prereq: Basic statistics. 2 hours and 1 lab. F


450 Dairy Products I (3) Procurement, processing and distribution of fluid milk. Manufacture of butter, frozen and condensed dairy products. Prereq: 140 or consent of instructor. 2 hours and 1 lab. F


460 Meat Products Technology (4) Processing methods of meats. Emphasis on safety, quality and economic aspects of meat products. 2 hours and 1 lab. F

470 Food Crop Products (3) Food products from plants emphasizing types, manufacturing systems, quality attributes and utility. Prereq: 3 hours Biological Science. 2 hours and 1 lab. Sp-E.

480 Cereal Science and Bakery Products (3) Chemistry and technology of processing cereal grains; interactions of ingredients during production and storage of baked products. Prereq: 410 or 411 or equivalent. 2 hours and 1 lab. F-O.

493 Special Problems in Food Technology and Science (1-3) Research problems in student's area of interest. Supervised field experience in approved food industry. May be repeated; maximum 6 credit hours. Prereq: Consent of instructor. E

FORESTRY

321 Forest Recreation (3) Philosophical foundation of recreation; planning, development, and management of recreation facilities; an introduction to forest resources. Open elective option for credit hours. May be repeated; maximum 6 credit hours. Prereq: Consent of instructor. E

628 Applied Silviculture (3) Application of silvicultural techniques; tree improvement; use of herbicides; fire management. Prereq: Forestry, Wildlife and Fisheries 312. Coreq: 332, 324, 325 and Entomology and Plant Pathology 306. Sp


324 Forest Resource Analysis (3) Growth and yield prediction; harvest determination; goal setting under multiple use concepts; approaches to regulation; financial aspects of forestry with computer simulation. Prereq: Forestry, Wildlife and Fisheries 315. Coreq: 322, 323, 325 and Entomology and Plant Pathology 306. Sp

325 Forest Resource Inventory and Surveying (3) Volume and growth estimation; timber appraisal; surveying techniques; road layout and construction as applied to forestry; timber harvesting techniques. Prereq: Forestry, Wildlife and Fisheries 313. Coreq: 322, 323, 324 and Entomology and Plant Pathology 306. Sp

331 Wood Properties and Uses (2) Fundamental structural, mechanical, and physical properties of wood. Prereq: Botany 110 or consent of instructor. Coreq: 332 for Forestry and Wood Utilization majors. Sp.

332 Wood Identification (1) Macro and micro identification of important commercial softwoods, hardwoods, and foreign woods. Prereq: Forestry, Wildlife and Fisheries 311 or consent of instructor. Coreq: 331 for Forestry and Wood Utilization majors. 1 lab. Sp.

421 Forest and Wildland Resource Economics (3) Production functions, supply-demand and market analysis; non-market programs and projects; economic analysis and decision models; investment and financial management; management, economic, taxes; forest products marketing. Prereq: 324 or consent of instructor. F

422 Forest and Wildland Resource Policy (3) Policy formulation, budgeting, criteria for policy determination; forest and wildland law and regulation; theory of conflict resolution; formal and informal resolution. Prereq: Senior standing. F.

423 Forest Recreation Planning and Management (3) Planning processes, master and site planning, site design projects; management strategies, methods of visitor and recreation site management; case studies. Prereq: 321, 323, Ornamental Horticulture and Landscape Design 280, or consent of instructor. 1 hour and 2 labs. Sp.

331 Solid Wood Processing (3) Production processes for solid wood products including sawmilling, secondary edging, finishing, and grading. Prereq: 331 and 332, or consent of instructor. 2 hours and 1 lab. Sp.

332 Practicum in Wood Products (2) Standard laboratory procedures used in the evaluation of wood and wood products. Plant visitations including sawmills, pulp, plywood, flooring, furniture, composite panel, and wood treatment. Prereq: Senior standing in Wood Utilization or consent of instructor.

333 Wood Composites and Gluing (3) Principles of adhesion; wood adhesives; fundamentals of plywood panel manufacture; adhesives; properties; testing bond strength and durability. Prereq: 331 and 332, or consent of instructor. 2 hours and 1 lab. F.

343 Measurement and Marketing of Wood Products (3) Planning processes, master and site planning, site design projects for forest products. Application of market principles and analysis to wood products markets and economic structure of wood products industry. Prereq: 343, 347 and 348, and Forest, Wildlife and Fisheries 313, or consent of instructor. Sp.

349 Fire Management I (2) Fire management and planning. Prereq: 347 or consent of instructor. 1 lab. F.

353 Independent Study in Forestry (1-15) Special research or individual problem in forestry. B, C, or S.

347 Independent Study in Wood Utilization (1-15) Special research or individual problem in wood utilization. B, C, or S.

FORESTRY, WILDLIFE AND FISHERIES

211 Introduction to Forestry, Wildlife and Fisheries (3) History of natural resources policies and prac-

Principles, current policies, social trends, and forest practices; social perspectives and attitudes concerning practice of management of organizations that administer analysis of land management determinants - legal, economic, institutional, and social. Theory and practice of management of organizations that administer and use forest and wildlands. Prereq: 211. 2 hours and 1 lab. F

Principles of Forest and Wildland Management (3) Land management tools and systems including planning use of forest resources, environmental impact statements and geographic information systems. Analysis of land management determinants - legal, institutional, economic and social. Theory and practice of management of organizations that administer and use forest and wildlands. Prereq: 211. 2 hours and 1 lab. F

Principles of Wildlife and Fisheries Management (3) Ecological relationships of wild animals with other animals and their habitats. Biological, social and economic aspects of their management. Coreq: 312, 313, and 315, or consent of instructor. F

Planning and Management of Forest and Wildland Resource (3) Integrated forest and wildland resource management through developing land management plans and analyzing case studies including conflict resolution. Prereq: Senior standing, 1 hour and 2 labs. Sp

111-112 Elementary French (3,3) Introduction to French. May not be repeated for credit by students with two years of high school or one year college French. Must be taken in sequence. Language Laboratory required.

210 Intermediate French Transition (3) A thorough study of the fundamentals of French language for those who have completed two or more years of high school study but whose placement test results indicate that they are not prepared for the 211-212 sequence. Special emphasis on developing communicative proficiency in French. The course will meet five hours a week and will cover grammar and vocabulary, reading, and spoken French in preparation for upper division courses in the language. Must be taken in sequence. Language Laboratory required.

211-212 Intermediate French (3,3) Sequence stresses the written and oral language. Reading, writing, spelling, and speaking of French to prepare for upper division courses in the language. Must be taken in sequence. Language Laboratory required.

217-218 Honors: Intermediate French (3,3) For students of superior ability in French. Incoming freshmen admitted on basis of diagnostic test, high school average, and performance on ACT. Casis held to a maximum of 15 for individual attention. Students follow enriched program with emphasis on speaking ability and reading, including literary selections. Students with a grade of A in 211 may enter 212 with permission of instructor. Credit for only those students receiving a grade of A or B in the course.

291-292 French Literature in English Translation (3,3) From the origins through the Age of Voltaire. Song of Roland, Rabelais, Montaigne, the Classical period, and Voltaire. 292-Diderot, 19th and 20th centuries; Flaubert, Rimbaud, Sartre, Camus. May not be counted toward the major or minor. Writing-emphasis course: count at least one in-class essay examination and 3000 words of writing outside the classroom.

300 French Transition (2) Development of linguistic skills necessary for satisfactory work in courses above 300. Recommended for students who would benefit from additional training beyond 212 in basic skills of reading, speaking and writing French. May not be counted toward the major or minor.

301-302 Elements of French for Upper Division and Graduate Students (3,3) Elements of language, elementary and advanced readings. Open to graduate students preparing for language examinations, and upper division students desiring reading knowledge of the language. Undergraduate credit only. Not for credit for those having had 111-112 or equivalent. No auditors.

311-312 History of French Literature (3,3) Chronological view of French literature in relation to the specific historical periods that have influenced it. Prereq: 212, 216 or equivalent.

313 Aspects of French Literature (3) Study of masterpieces from the great literary movements and countermovements. Prereq: 212 or equivalent.

324 Women in French Culture (3) Role of women in shaping French history and culture. Feminists (George Sand), and male writers (Mme de Maintenon), intellectuals (Mme de Stael); actresses (Sarah Bernhardt), scientists (Marie Curie). Taught in English. May not be counted toward the major or minor. (Same as Women's Studies 324.)

341-342 Intermediate Composition and Conversation (3,3) Grammatical analysis of modern French prose; review of grammar; reading, their application in translation from English to French, both written and oral, in free composition. Prereq: 212, 216 or equivalent. Either 342 or 345 may be applied toward the major, but not both.

345 French for Business (3) Contemporary French language as it applies to business transactions. Understanding and composing business letters; oral communication and elements of French culture related to good business practices. Either 342 or 345, may be applied toward the major but not both. Prereq: 341 or consent of instructor.

400-401 Consecutive and Simultaneous French-English and English-French Translation (3,3) 400-Consecutive Translation to and from English. Introduction to simultaneous translation from French. 401-Simultaneous Translation to and from English, training of students with good knowledge of French for consecutive and simultaneous translation from French into English, and vice versa, on a variety of subjects such as business, politics, science. Prereq: 342, 345 or equivalent. Preferably taken in sequence.

410 Medieval French Literature (3) Major representative works of Medieval French Literature. Texts in modern French. Prereq: 212, 218 or equivalent. (Same as Medieval Studies 410.)

411 French Literature of the 16th Century (3) Highlights of 16th century French literature. Excerpts from Rabelais and Montaigne; readings of poems from the writers from Lyon and members of the Pléade. Prereq: 212, 218 or equivalent.


413 French Literature of the 18th Century (3) Major works of the Enlightenment. Prereq: 212, 218 or equivalent.

414 French Literature of the 19th Century (3) French Romanticism an its counter movements: Realism, Parnassianism and Naturalism. Prereq: 212, 218 or equivalent.


416 Survey of Francophone Literature (3) Introduction to writing in French outside of France. Prereq: 212, 218 or equivalent.

419 Readings in French Literature (3)

420 French Cinema (3) The French cinema from its earliest days through the New Wave directors. Prereq: 212, 218 or equivalent. Can be applied to major or minor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

421 Phonetics (3) Foundation in the science of phonetics. Principles and individual performance. Laboratory training highly recommended. Prereq: 212, 218 or equivalent.

422 Advanced Grammar (3) Improving one's own style studying basic and more refined structures of the French language. Writing creative free-style compositions. Prereq: 342 or 345.

423-424 Advanced Conversation (1,1) Informal conversation with native speaker on contemporary topics. Stresses in class contact rather than outside preparation. Meets three times a week for one semester. Credit. Prereq: 342 or 345.

425 Introduction to Descriptive Linguistics (3) Phonetics and phonemics, morphology and syntax. Types of languages, linguistic groups, dialects, and dialect geography. Application of descriptive linguistics-field linguistics, dialect study; its practical use in learning languages and in language teaching. Introduction to transformational grammar. Prereq: six hours of upper division French or six hours of upper division courses in a modern or ancient language (exclusive of German and French 301-320), courses in literature in translation, and general courses in Latin and Greek requiring no knowledge of these languages, or consent of department. (Same as German 425, Russian 425, Spanish 425, French 425.)

426 Methods of Historical Linguistics (3) (Same as Russian 426, German 426, Spanish 426 and Linguistics 426.)

429 Romance Linguistics (3) Development of Classical Latin through Vulgar Latin into major Romance languages. (Same as Spanish 429 and Linguistics 429.)

430 Theatrical French (2-3) Performance in one or more French plays. Prereq: 212, 216 or equivalent and consent of instructor. Can be applied to major.

431 Highlights of French Civilization (3) Survey of French Civilization from the Gauls to World War II. Historical events, daily life, all forms of arts. Prereq: 212, 218 or equivalent. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

432 Contemporary French Culture (3) French contemporary civilization and culture since World War II. Problems, trends and organization of French society today. Prereq: 212, 218 or equivalent.

440 Capstone Experience in French (4) Synthesizing senior colloquium and tutorial in which students reflect on the raison d'etre of the discipline from a multidimensional point of view. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)

GEOGRAPHY

101-102 World Geography (3,3) Selected topics and world regions, especially those with problems or situations of contemporary interest, to illustrate geographical points of view, concepts, and techniques. Must be taken in sequence.
131-132 Geography of the Natural Environment (4,4) Characteristics and processes of the earth's surface and lower atmosphere; their interaction to produce a working pattern of distinctive environments significant to humanity. Must be taken in sequence. 3 hours lecture and 2 hours lab per week. Not open to students who have taken 330.

141 Introduction to Economic Geography (3) Location and interrelations among the world's major types of economies: agriculture, energy and mineral production, manufacturing, transportation, trade, and services.

310 Introduction to Maps, Aerial Photographs, and Cartography (3) Properties, sources, uses, design and production, interpretation, and other forms of spatial images as tools for geographical analysis. 2 hours lecture and 2 hours lab per week.

320 Cultural Geography: Core Concepts (3) Background and method of cultural geography; basic concepts and theories focusing on cultural landscape, culture regions, cultural ecology, innovation and diffusion, cultural integration, and world patterns of cultural phenomena.

322 Behavioral Geography (3) Types of human behavior, such as shopping, territoriality, commuting, residential mobility, and regional consciousness as they relate to distribution of natural environment, and culture. (Same as Urban Studies 323.)

330 Physical Geography: Core Concepts (3) Topics in physical geography emphasizing climate, land forms, and the circulation of water. Not open to students who have taken 311.

334 Meteorology (3) Dynamic atmosphere and resulting weather events. Nature of individual weather elements, their measurement and analysis over time and space.


361 Regional Geography of the United States and Canada (3) Physical, economic, and social distributions as they interrelate to give distinctive character to regions of the United States and Canada. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

363 Geography of the American South (3) Geographical appraisal of the southeastern United States, including physical environment and human resources. Origin and development of contemporary economic and cultural traits of the area. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

365 Geography of Appalachia (3) Interrelation of physical, economic, and social patterns that give distinctive character to the region and its parts, especially in southern Appalachia. Appalachia in perspective in the current American scene. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

372 Geography of Middle America (3) Physical, cultural, and economic characteristics of Mexico, Central America, and the West Indies. (Same as Latin American Studies 372.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

373 Geography of South America (3) Physical, cultural, and economic characteristics of South America. (Same as Latin American Studies 373.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

375 Geography of the Soviet Union (3) Geographical appraisal of the Soviet Union, including physical environment, economic conditions, patterns, and human resources. (Same as Russian and East European Studies 375) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

379 Geography of Africa (3) Physical, cultural, and economic characteristics of Africa, with particular emphasis on the area to the south of the Sahara. (Same as Afro-American Studies 379.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

411 Computer Mapping and Geographic Information Systems (3) Concepts, management, and presentation of digital data for spatial analysis, with emphasis on cartographic data structures. 2 hours lecture and 2 hours lab per week. Prereq: 310 and knowledge of a computer language or consent of instructor.

412 Cartography (3) Cartographic techniques applied to design, compilation, and reproduction of maps and other graphics. 2 hours lecture and 2 hours lab per week. Prereq: 310 or consent of instructor.

413 Remote Sensing: Types and Applications (3) Principles and uses of remote sensing imagery, digital data, and spectral data, with particular emphasis on geographic interpretation and mapping techniques. Prereq: 310 or consent of instructor.

415 Quantitative Methods in Geography (3) Geographic application of statistical techniques, point pattern analyses, and analysis of areal units. Prereq: Mathematics 115 or two semesters of calculus or consent of instructor.

419 Practicum in Cartography/Remote Sensing (2-6) Supervised practice in design and production of maps and other graphic materials in the Cartographic Services Laboratory or a similar organization. Prereq: Written consent of department prior to registration.

421 Geography of Folk Societies (3) Geographical study of folk culture and diffusion, cultural integration, and world patterns of distinctive environments significant to humanity. Must be taken in sequence. 3 lecture hours and one 2-hour lab or field period.

425 Historical Geography of the United States (3) Survey of the changing human geography of the United States during four centuries of settlement and development. Emphasis on changing population patterns, development of agricultural regions, and patterns of urban-industrial development. Prereq: 361 or consent of instructor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

433 The Land-Surface System (3) Nature and regional variations in relationships among surface form, water, vegetation, and surface materials. People as evaluators and agents of change. Prereq: 131-132 or 330 or consent of instructor.

434 Climatology (3) General circulation system leading to world pattern of climates. Climatic change and modification, and interrelationships of climate and human activity. Prereq: 131-132 or 330 or 334 or consent of instructor.

435 Biogeography (3) Study of the changing distribution patterns of plants and animals on a variety of spatial and temporal scales. The effects of continental drift, Pleistocene glacial-interglacial changes, and human activities on world biota are emphasized. Prereq: 131-132 or 330 or consent of instructor.

436 Water Resources (3) Global water resources and hydrologic processes, including water availability, flooding, and water quality issues examined from physical and economic geographic perspectives. Prerequisite: 131-132 or 330 or consent of instructor.

441 Urban Geography (3) Concepts and theories concerning development and significance of systems of cities and urban morphology of cities. Prereq: 101-102 or 141 or 340 or consent of instructor. (Same as Urban Studies 441.)

443 Rural Geography (3) Geographical appraisal of rural areas of the United States. Traditional small towns and urban fringes. Problems and potentials of rural America. Prereq: 101-102 or 141 or 340 or consent of instructor.

445 Geography of Resources (3) Factors related to variations in resource availability from time to time and place to place, with particular emphasis upon energy and metallic resources. Prereq: 101-102 or 141 or 340 or consent of instructor.

449 Geography of Transportation (3) Examination of transportation systems, emphasizing their effects on trade patterns, land use, location problems, and development. Prereq: 141 or 340 or consent of instructor.

450 Process Geomorphology (3) (Same as Geology 450.)

491 Foreign Study (1-15) Prereq: Written consent of department required prior to registration.

492 Off-Campus Study (1-15) Prereq: Written consent of department required prior to registration.

493 Independent Study (1-15) Prereq: Written consent of department required prior to registration.

499 Proseminar in Geography (3) Major themes in geography, especially trends over the past 40 years. Required for majors. Not open to graduate students. Prereq: Senior standing and completion of at least 12 hours of major or minor requirements in geography. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

GEOLOGY

100 The World's Oceans (3) Geological, physical, and biological aspects of oceans and human interactions with the marine environment. 3 lecture hours per week.

101-102 General Geology I, II (4,4) Physical processes within and upon the Earth's surface, including the formation of rocks, plate tectonics and earthquake hazards, and landscapes. 102-Fossil fuels: evolution and ancient environments, plus a review of 4.5 billion years of earth history. Must be taken in sequence. 3 lecture hours and one 2-hour lab or field period.

201 Fossils and the Meaning of Evolution (3) Theories and evidence of evolution presented in a non-technical manner, with emphasis on its relevance to modern society. Topics include creationism, purpose of life, progress. 2 lecture hours and one 2-hour lab. May not be applied toward the Geology major.

203 Geography of National Parks (3) Geologically spectacular landscapes and geologic history of national parks. Emphasis on changing population patterns as they relate to the Earth's geologic heritage. 3 lecture hours, plus a field trip during the term. May not be applied toward the Geology major.

210 Basic Geology for Engineers (2) Materials and structures of the earth. For College of Engineering students only. 2 lecture hours and one 2-hour lab or field period.

310 Mineralogy (3) Crystallography and study of minerals. Laboratory includes hand specimen, optical, and x-ray methods of identification. Prereq: 101, Chemistry 120-130 or equivalent. 2 lecture hours and one 2-hour lab.

320 Paleobiology (3) Fossils and their uses in functional morphology, paleoecology, biogeography, biostratigraphy, and evolution. Prereq: 102 or consent of instructor. 2 lecture hours and one 2-hour lab or field period.

325 Geological History of Land Organisms (3) Origin and development of terrestrial organisms in space and time with emphasis on the fossil and recent record of land plants and animals. Prereq: Elementary biology sequence or consent of instructor. 2 lecture hours and one 2-hour lab or field period.

326 Economic Geology (3) Classification and properties of igneous and metamorphic rocks, the processes that produce them, and the tectonic environments in which they form. Prereq: 310, 2 lecture hours and one 2-hour lab.

340 Stratigraphy and Sedimentation (3) Stratigraphic principles and sequence of deposition. Prereq: 101, 102 and 310. 2 lecture hours and one 2-hour lab or field period.

345 Geology of East Tennessee (1) Geology of the Southern Appalachians in Tennessee. Prereq: Completion of major core courses or consent of instructor. 1 lecture hour plus fieldtrips.
460 Principles of Geochemistry (3) Application of chemical principles to geologic problems. Emphasis on crystal chemistry and relation between basic atomic structure and distribution and behavior of elements in the Earth's crust. Prereq: Chemistry 150-130; recommended: 101-102. 3 lecture hours and one 2-hour lab. (Same as Botany 346.)

470 Applied Geophysics (3) Basic principles and applications of seismic, gravity, magnetic, and electrical Prospecting methods. Recommended: Math 141-142 or 147-148 and Physics 131. 2 lecture hours and one 2-hour lab.

480 Principles of Economic Geology (3) Ore-forming processes, classification of mineral deposits, survey of different types of mineral deposits with examples, and metallogenesis. Prereq: 310 and 330 or equivalents. Recommended: 460. 2 lecture hours and one 2-hour lab.

485 Principles of Geohydrology (3) Principles governing flow of water through rock systems. Applications to groundwater contamination, ore-forming hydrothermal fluids, and paleohydrologic systems. Prereq: 101 or 210. Chemistry 120-130 or equivalent, Math 141-142 or equivalent.

490 Special Problems in Geology (1-3) Directed study or special topics. Prereq: Consent of instructor. May be repeated. Maximum 6 hours.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)

497 Senior Honors (1-6) Admission by consent of instructor. Taught off-campus at the Field Station and x-ray diffractometer methods of mineralogy. Prereq: 310 or consent of instructor. 2 lecture hours and one 2-hour lab.

420 Paleontology I (3) Preservational processes and geologically important representatives of Protoplast, Porifera, Cnidaria, Bryozoa, and Brachiopoda. Emphasis on functional morphology, skeletal structures, ecology, and stratigraphic distribution. Prereq: 320 or consent of instructor. 2 lecture hours and one 2-hour lab.

421 Invertebrate Paleontology I (3) Preservational processes and geologically important representatives of Protoplast, Porifera, Cnidaria, Bryozoa, and Brachiopoda. Emphasis on functional morphology, skeletal structures, ecology, and stratigraphic distribution. Prereq: 320 or consent of instructor. 2 lecture hours and one 2-hour lab.

422 Invertebrate Paleontology II (3) "Higher invertebrates": Annelida and other worms, Mollusca, Arthropoda, Echinodermata, Graptoloza, Conodonta, Chordata. Emphasis is on functional morphology, skeletal structures, ecology, and stratigraphic distribution. Prereq: 320 or consent of instructor. 2 lecture hours and one 2-hour lab.

425 Evolution and the Geologic Record (3) Evolution of life viewed from the fossil record. Includes mass extinctions, macroevolution, and evolutionary rates. Prereq: 320. 2 lecture hours and 1 seminar.

426 Paleobotany and Palynology (3) Evolutionary history of terrestrial plant life through examination of the fossil record. Includes major plant families, spores and pollen grains. Origin and diversification of Gymnosperms and Angiosperms; changes in floristic provinces through geologic time. Prereq: 102; Botany 310-320 or consent of instructor. 3 lecture hours and one 2-hour lab. (Same as Botany 426.)

440 Field Geology (6) Summer field course for advanced undergraduate geology majors and first-year graduate students in geology. Taught off-campus at the Geology Field Station and requires the full time of the student. Field techniques demonstrated, practiced, and evaluated in solution of geologic problems. Prereq: Completion of major core courses and consent of instructor.

445 Regional Geology of the United States (3) Evolution of geologic provinces within the United States with emphasis on integration of several types of geologic data. Prereq: 330, 340, 370. 3 lecture hours.

450 Process Geomorphology (3) Integrative approach to the development of the surface of the Earth based upon case histories, maps, remote sensing imagery, 2 lecture hours and one 2-hour lab. Prereq: 161-162. (Same as Geography 450.)

455 Basic Environmental Geology (3) Applications of the geological sciences toward a comprehension of the effects of geological processes on humans and the effects of human activities on the earth's environment. Prereq: 12 hours of geology courses, 2 lecture hours and one 3-hour lab or field period.

461 Principles of Geochsmology (3) Application of chemical principles to geologic problems. Emphasis on crystal chemistry and relation between basic atomic structure and distribution and behavior of elements in the Earth's crust. Prereq: Chemistry 150-130; recommended: 101-102. 3 lecture hours and one 2-hour lab. (Same as Botany 346.)

470 Applied Geophysics (3) Basic principles and applications of seismic, gravity, magnetic, and electrical Prospecting methods. Recommended: Math 141-142 or 147-148 and Physics 131. 2 lecture hours and one 2-hour lab.

480 Principles of Economic Geology (3) Ore-forming processes, classification of mineral deposits, survey of different types of mineral deposits with examples, and metallogenesis. Prereq: 310 and 330 or equivalents. Recommended: 460. 2 lecture hours and one 2-hour lab.

485 Principles of Geohydrology (3) Principles governing flow of water through rock systems. Applications to groundwater contamination, ore-forming hydrothermal fluids, and paleohydrologic systems. Prereq: 101 or 210. Chemistry 120-130 or equivalent, Math 141-142 or equivalent.

490 Special Problems in Geology (1-3) Directed study or special topics. Prereq: Consent of instructor. May be repeated. Maximum 6 hours.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)
Activity (3) Emphasis on taking personal responsibility and health promotion efforts. F to Advanced First Aid and Emergency Care certification. Theory and practice of first aid and emergency care. 310 Advanced First Aid and Emergency Care (3)

306 Health Instruction in Elementary Grades (2) Topics involving health education goals, roles, target populations in voluntary and official health agencies. May not be repeated for credit. Maximum 9 hours. Prereq: 401-402 or consent of instructor.

HEALTH

110 Personal Health and Wellness (3) Information and behavior necessary to approach health and wellness scientifically and to develop confidence in judgments affecting personal health and wellness. E

200 Seminar in Human Sexuality (2) Problems and responsibilities of being male and female as they relate to health and wellness. Satisfactory/No Credit only. F, Sp

225 Alcohol/Drugs and the College Student (2) Problems related to use and abuse of substances potentially harmful to health and wellness. Covers alcohol, drugs, tobacco and other substances. Satisfactory/No Credit only. F, Sp

230 Cardiopulmonary Resuscitation (1) Theory and skills to implement basic cardiopulmonary resuscitation and cardiac arrest due to such conditions as heart attack, drowning, electrocution, suffocation, poisoning, drug intoxication, and vehicular and other accidents. Educational and preventive aspects of controlling cardiovascular disease. Leads to basic life support certification. F, Sp

300 Health Education, Promotion, and Behavior (3) Health education goals, roles, target populations in school, community and health care settings; health care providers and health care services/products. (Same as Public Health 400.) E

405 Alcoholism and Alcohol Education (3) Factors which make alcoholism a serious health and safety problem. Various types of instructional/educational and intervention programs. F, Sp

406 Death, Dying and Bereavement (3) Aspects of dying, death and handling the trauma of loss. Medical, financial, physical, legal and social implications of death. F, Sp

410 Pre-Internship Seminar (1) Objectives and policies of internship program. Must be completed in the term immediately preceding the internship. Prereq: Admission to Teacher Education Program. Satisfactory/No Credit only. F, Sp

414 Physical Activity and Fitness (2) (Same as Physical Education 414.)

415 Field Evaluation of Physical Fitness (1) (Same as Physical Education 415.)

520 Sex Education and Human Sexuality (3) Education of children, parents, teachers, school administrators, nurses and other paraprofessional personnel in family planning, marriage, child rearing, and social foundation of the cities, their political and cultural development and their physical structure. 251-252 History of the United States (3,3) 251-Settlement to 1865. 252-1865 to present.

530 Curriculum Development for Health Education Programs (3) Current health education curricula for elementary and secondary schools, community and health care settings. Su

540 Evaluation in Health Education (3) Principles of evaluation of health instruction and programs in regard to health knowledge, attitudes, and behavior. Construction of instruments and criticism of existing instruments. Sp

HISTORY

151-152 Development of Western Civilization (3,3) Historical survey of the civilization of the western world. 151-Ancient world to 1715. 152-1715 to present. E

157-158 Honors: Development of Western Civilization (3,3) Consent of department required. 157-F. 158-Sp Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

161-162 A History of World Civilization (3,3) Historical survey of world civilization. 161-Origins to 1500. 162-1500 to present. 161-F. 162-Sp Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

195-196 Afro-American History: An Introduction (3,3) Afro-American experience to 1890. Traditional African societies from which Afro-Americans emerged; evolution of prejudice and racism in America; institution of slavery. F; 195-Sp Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

251-252 History of the United States (3,3) 251-Settlement to 1865. 252-1865 to present. E

253-254 United States History for International Students (3,3) United States History for International Students (3,3) 253-1877. 254-1877 to present.

255-256 United States History for International Students (3,3) United States History for International Students (3,3) 255-1877. 256-1877 to present.

257-258 History of the United States (3,3) Prereq: Consent of department. 257-F. 258-Sp

307 Honors: Introduction (3) Historical analysis and interpretation, philosophy of history, principles and techniques of research. Required of students working for honors in history. Prereq: Consent of department.

308 Honors: Historical Problems (3) Application of techniques and insights from 307 to selected historical issues to emphasize problems of evidence, interpretation, and objectivity. Required of students working for honors in history. Prereq: Consent of department.

310-311 The Ancient World (3,3) 310-Development of an American democracy; its successes and failures; poll crisis of the fourth century B.C.; emergence of Hellenistic civilization. 311-Origins of Roman imperialism, its conquests and empire, socioeconomic changes, constitutions crises, emergence of military and political autocracy.
flowering known as the "Enlightenment", and the European emphasis upon historical interpretation. The modern world. Interrelationship of cultural, social, economic, political and intellectual developments, with an emphasis upon historical interpretation.

315 Reformation Europe, 1500-1650 (3) The period during which the church was witnessed by religious, political, economic dislocation and insecurity, political centralization, intellectual skepticism, the origins of modern science, and the witch craze. (Same as Religious Studies 312-313.)

316 Early Modern Europe, 1650-1800 (2) Dynamic conflict of a search for order in an age of revolutions, seen in the continued push for political centralization, the impact of the scientific revolution, the intellectual flowering known as the "Enlightenment", and the English and French revolutions.

319 Modern Europe, 1750-1914 (3) Political, industrial and intellectual revolutions against traditions. Topics such as the modern population explosion, urbanization, the political emergence of the middle class and the masses, nationalism, imperialism, rationalism and Realism in art and politics. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

320 Contemporary Europe, 1900-Present (3) The transformation of Europe as a political, industrial and cultural region, its disintegration, and the transformation of the European nation-state. Topics such as war and depression and the consequent political, social and cultural changes in the 20th century; globalization; decolonization; the impact of Freud, Einstein and existentialism; welfare states; and the problems of European unification. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

321 New Testament Origins (3) (Same as Religious Studies 321.)

330-331 History of England (3,3) 330-to 1668. 331-1689 to the present. Medieval state, church, and society origins of Anglo-Saxon kingship, the monarchical and parliamentary government, the Reformation, 17th-century revolutions, commercial, agricultural and industrial revolutions; class conflict; empire, the welfare state, world wars, economic crisis.

332-333 History of France (3,3) 332-The emergence of modern France from the Renaissance to 1789. 333-France since the Revolution, 1789 to present.

334-335 History of Germany (3,3) 334-Germany I, 1815 to 1914. The failure of national unification, the development of the German lands, from the medieval empire to the Holy Roman Empire, to an unstable truncated republic, to an exploited Third Republic. The failure of national unification, the development of the German lands, from the medieval empire to the Holy Roman Empire, to an unstable truncated republic, to an exploited Third Republic. The failure of nationalism in the 19th century. The impact of World War I and the Treaty of Versailles on the post-war order.


337-338 History of the Middle East (3,3) 337-Middle East, 5000 B.C. to 1500 A.D. The origin and development of the Semitic peoples, their contacts with the Mediterranean world, and the development of modern nation states. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

407-408 Honors: Senior Paper (3,3) 407-Supervised research, bibliographic search, conceptual clarification, research, 406-Organization and writing of the senior honors paper. Both are required of students working for honors in history.

431 Oriental Intellectual and Cultural History (3,3) 431-Sino-Renaissance to Revolution, 1300-1789. 431-Romanticism to Realism, 1750-Present.

432 Women in European History (3) Comparative analysis of the roles of women in Medieval, Renaissance and Victorian Europe. Relationship between family structure, sexual attitudes and the economic and political roles of women with an emphasis on specific historical writings by women. (Same as Women's Studies 432.)

433 War and Society in Europe from Medieval to Modern Times (3) Relationship between the nature of war and society in Europe which covers medieval, renaissance and modern times, culminating in the World Wars of the 20th Century.

440-431 African Intellectual and Cultural History (3,3) 440-Renaissance to Revolution, 1300-1789. 441-Romanticism to Realism, 1750-Present.

443-444 History of the South (3,3) 443-The South from the Colonial Period to the Present (3) Topics in 19th and 20th American history.

445 The Afro-American Experience from the Colonial Period to the Present (3) Topics in 19th and 20th American history. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

375 Revolutions in Historical Perspective (3) Comparative history of major revolutions which transformed political, social, and economic structures and values, such as those in France, Russia, China, Mexico, and Latin America. 376 History Behind the News (3) Contemporary analysis and the historical background of selected newsy events in North and South America, Europe, and the Western Pacific. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

446 Historical Issues (3) Broad, thematic issues in the development of the United States since 1877 (3) Dilemma of two cultures existing side by side; the search for identity as it underwent drastic changes, as part of the Hapsburg collection of states, and its disintegration, and the problems of centralization versus nationalism. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

447 Historical Problems (3) 447-Historical Problems (3) 448-Historical Problems in the United States (3) Historical problems in the United States since 1877. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

448 Historical Problems in the United States (3) Historical problems in the United States since 1877. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

454-445 The African-American Experience from the Colonial Period to the Present (3) Topics in 19th and 20th American history. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.
450 History of American Foreign Relations (3) Rise of United States from weak nation to global power. May be repeated. Maximum 9 hours. 452 The American Experience in World War II (3) Diplomacy and warfare in Europe and Asia and the impact of the war on American society. (Team-taught course.) 453 Women in American History (3) Approaches of 432 applied to American society. (Same as Women's Studies 453.) 454 Cities and Urbanization in American History (3) Origins, growth, and influence of American cities in development of the nation, from colonial era to present. (Same as Urban Studies 454.) 455 Local and Regional History (3) History of the concept of regionalism, the applicability of regionalism, and an analysis of the United States regional models. 456 History of Sports in the United States (3) Development of sports and their significance in American life from colonial period to present. Emphasis on social, cultural, economic and political impact of both spectator and participatory sports in 20th century. 459 Introduction to Quantitative Methods for Historians (3) Collecting, collating, coding and analyzing machine-readable data with SAG (Statistical Analysis System). Uses practical historical problems in urban and rural perspectives. 470 Studies in British History (3) Variable content. Selected themes and issues in British history. May be repeated. Maximum 9 hours. 471 Studies in Western European History (3) Variable content. Particular aspects of Western European history, such as witchcraft, revolutions, or nationalism. May be repeated. Maximum 9 hours. 472 Studies in Central European History (3) Variable content. May be repeated. Maximum 9 hours. 473 Studies in Eastern European History (3) Variable content. Particular aspects of Eastern European history, especially on Russian and Polish history. May be repeated. Maximum 9 hours. 474 Studies in Medieval and Early Modern European History (3) Variable content. Particular aspects of medieval and early modern Europe. May be repeated. Maximum 9 hours. 475 Studies in Latin American History (3) Variable content. Significant issues in Latin American history. May be repeated. Maximum 9 hours. (Same as Latin American Studies 475.) 476 Studies in Asian History (3) Variable content. Particular aspects of Middle Eastern and East Asian history such as modernization in the Middle East, Vietnam in Cambodia, Laos, and others. May be repeated. Maximum 9 hours. 478 Studies in United States History (3) Variable content. Particular aspects of United States history. May be repeated. Maximum 9 hours. 480 Study of African History (30 Variable content. Different areas of the continent and diverse aspects of the African experience such as African resistance movements, African political parties, the relationship of social and economic development under coloni- 481 Studies in History (3) Variable content. Subject matter not covered in other courses. May be repeated. Maximum 9 hours.
481 Foreign Study (1-15)
492 Off-Campus Study (1-15)
493 Independent Study (1-15)

INTERIOR DESIGN

410 Introduction to Interior Design I (2) Orientation to the profession; relationship to allied fields; contemporary developments; philosophical approaches. Open only to majors in interior design and architecture. F

150 Visual Studies (3) Classification and properties of two and three-dimensional visual organization; design principles; visual and auditory elements within simple and complex visual systems; role of movement in experiencing scale and volumetric space. Open only to majors in interior design and architecture. F

200 Human-Environment Systems (3) Role of culture in defining environment; physical, social and conceptual aspects of human-environment systems; impact of environment on human behavior, feelings and values; mutual causality properties of behavior-environment systems. (Same as Urban Studies 200.) F

240 Fundamentals of Interior Design I (4) Principles of spatial organization; creative problem solving and communication techniques for micro-interior environments; parametric interior model building; experimentation with various media. Prereq.: 140, Arch 172. F

250 Fundamentals of Interior Design II (4) Problem solving, spatial organization of micro environments, increasingly larger scale; communication of total design solution, graphic, audio and photographic techniques. Prereq.: 240. Sp

270 History of Interior Architecture I (3) Interior architecture, decoration and decorative arts within cultural context, ancient through seventeenth century. Emphasis on Italy, France, and England. Prereq.: one semester Art History. Sp

280 Micro-Computers for Interior Design (3) Electronic spreadsheets and data-base organization and management; data-base information to relate anthropometrics to furniture dimensioning and specifications for maximizing design, criteria of human-computer and product trade-offs in meeting budget constraints. Prereq., or Coreq.: 240. Interior Design students only. F

310 Survey of Interior Design (3) Planning and organizing interior spaces (rooms, apartments, residences) to meet personal and family housing needs; relation of furnishings to architectural space. Not open to Interior Design majors. Prereq. Three-year preference given to Home Economics Education and Hotel Restaurant Administration majors. A, Sp

315 Survey of Contract Interiors (3) Planning and organizing interior space for restaurants and lodging facilities; relation of furnishings to architectural space. Open only to Hotel Restaurant Administration majors. (Offered Fall and Spring in even years; A, F.)

340-350 Intermediate Interior Design I, II (4,4) Studio problems of intermediate complexity; integrates and extends previous knowledge of working drawings, materials and sources, design methods, spatial organization and planning of micro and macro environments, Prereq.: Third year in Interior Design; courses must be taken in sequence. F, Sp

360 Business Principles and Practices (3) Interprofessional relationships and business practices, responsibilities, and liabilities. Prereq.: Third year in Interior Design. F

370 History of Interior Architecture II (3) Interior architecture, decoration and decorative arts within cultural context, eighteenth through the nineteenth centuries; emphasis on France, England and America. Prereq.: 270 or consent of Instructor. F

400 Proxemics (3) Analysis of spatial behavior; emphasis on cultural basis of spacing behavior. Prereq.: 200 or consent of instructor. A, Sp

410 Environment as Code (3) Advanced theoretical issues in environment as a medium of human communication. Prereq.: 200, 400 or consent of instructor. A, Sp

417 Honors: Interior Design I (4) Advanced research in interior design problems for juniors or seniors. May be repeated. Maximum 8 hours. Prereq.: Consent of Interior Design faculty. E

420 Practicum for Interior Design (15) Supervised experience in a professional design firm; business practice; project management; interpersonal and communication skills. Prereq.: Third year in Interior Design, 360 and consent of instructor. Sp

430 Computer-Aided-Design (3) Interaction between computer-aided-design process, data-base, spreadsheets, software cost estimating, construction drawings related to space planning. Prereq.: 280, 340; Interior Design majors only. Sp

440-450 Advanced Interior Design I, II (4,4) Complex problems on causing systematic design methodology, commercial and institutional environments, and/or historic preservation/adaptive reuse of older structures with considerations of governmental policies. Prereq.: 350 for 440; 440 for 450 and fifth year in Interior Design. F

460 Lighting for Interior Designers (3) Application of elements and principles of lighting and wiring to design of visual environment. Prereq.: Third year in Interior Design. Sp

470 History of Contemporary Interior Architecture (3) Historical developments in interior architecture and decorative arts within cultural context, colonial through nineteenth century. Prereq.: 370 or consent of instructor. Sp

480 Furniture Design (4) Human factors data applied to design of body support, task support, storage and systems, construction drawings and scale models; advanced millwork design; materials and manufacturing processes. Prereq.: 200, 350 and fifth year in Interior Design. F

485 Interior Design Synthesis (4-8) Student and instructor initiated advanced research; topics must be approved by supervising Interior Design faculty. Prereq.: 450 or consent of instructor. Sp

491 International Study (1-15) Individual or group study abroad; academic research, field investigation, or studio experiences. May be substitu- able for 420 in student's professional curriculum. Determination of credit based on particular international experience. Prereq.: Consent of department head. Sp

493 Directed Study in Studio (1-4) Student and instructor initiated independent study for special topics. Elective credit only. May be repeated. Maximum 8 hours. Prereq.: Consent of department head. E

ITALIAN

111-112 Elementary Italian (3,3) Introduction to Italian. May not be taken for credit by students with two years of high school or one year college Italian. Must be taken in sequence. Language Laboratory required. 211-212 Intermediate Italian (3,3) Sequence stresses reading, writing, listening and speaking Italian to prepare for upper division courses in the language. Must be taken in sequence. Language Laboratory required. 311-312 History of Italian Literature (3,3) Chronological view of Italian literature in relation to the specific historical developments that have influenced it. Prereq.: 212 or equivalent.

341-342 Intermediate Grammar, Composition and Conversation (3,3) Grammatical analysis of Italian prose; review of grammatical principles and their application in oral communication from English to Italian; bi-weekly written and oral exercises in free composition. Prereq.: 212 or equivalent.
401 Dante and Medieval Culture (3) Introduction to the significance of this great Italian writer. Prereq: 212 or consent of instructor. (Same as Medieval Studies 401.)

402 Petrarch and Boccaccio (3) Prereq: 212 or consent of instructor. (Same as Medieval Studies 402.)

403-404 Literature of the Rinzascimento (3,3) From Pico to Tasso, the Quattrocento and the Cinquecento. Prereq: 212 or consent of instructor.

405 Modern Italian Poetry (3) Prereq: 212 or consent of instructor.

406 The Modern Italian Novel (3) Prereq: 212 or consent of instructor.

409 Directed Readings (3)

491 Foreign Study (1-15)

JOURNALISM

201 Publicity and Public Relations (3) Principles and practice of writing for mass media. Public information campaigns for organizations and institutions. Not available for majors in the College of Communications. Prereq: English 102. F, Sp

203 Editing (3) Methods and practice in judging news, editing copy, writing headlines and designing newspaper and magazines. Emphasis on precise word use and news display. Prereq: Communications 200. E

270 Public Relations Principles (3) Theories and principles of public relations. Overview of public relations in management of business, government, institutions, and organizations. Case studies and basic public relations projects. Prereq: 201 or Communications 200. 200, F, Sp

290 Photographic Journal (3) Principles and practice of photography as a creative tool of communication. Basic camera technique, darkroom work, historical and contemporary photography. Lecture and laboratory. Prereq: 201, or Communications 200, or consent of instructor. E

310 Feature Writing (3) Skills of journalism for writing feature articles for newspapers, magazines and company publications. Critiquing of students' work in writing workshops, and writing short-in-class pieces as assigned. Prereq: 203, or consent of instructor.


390 Communications Graphics (3) Principles and practice in the visual aspect of communications. Emphasis on graphic design, typography, illustration and photography, printing and production techniques and publication design. Lecture and laboratory. Prereq: 201, or Communications 200, or consent of instructor.

403 International Communications (3) Development and operations of world mass communications channels and agencies. Comparative analysis of media, media practices, flow of news throughout the world. Print and broadcast systems studies in terms of relevant social, political, economic, and cultural factors. Relation of communication practices to international affairs and understanding. Sp

412 Opinion Writing (3) Analysis of editorial positions, practices, and pages. Writing editorials and columns for newspapers, magazines, and company publications, with emphasis upon study and use of rhetorical devices and logic. Prereq: 203 or consent of instructor.

414 Magazine Article Writing (3) Techniques of writing in-depth articles for mass circulation and specialized magazines. Organizing and presenting material, with attention to problems in areas such as business, science, agriculture, human interest. Prereq: 203 or consent of instructor.

416 Issues in Journalism (3) Topics vary. May be repeated. Maximum credit 6 hours. Prereq: Consent of instructor.

420 Print Media Management (3) Current business practice among print news media, especially newspapers. Problems in management and production, and the outlook for new technologies. Prereq: 6 hours math and/or accounting, and senior standing. Sp


433 Advanced Editing (3) Primary focus is on sensitivity to language and editing skills. Includes headline writing, layout and production. Prereq: 203.

460 Mass Communications History (3) Development of the press and the role of mass communications in American history. Newspapers, radio, television and magazines. F

470 Public Relations Campaigns (3) Preparation of communications materials to implement planned public relations programs. Preparation of news releases. Research, planning, communication and evaluation of major public relations projects and campaigns. Prereq: 203, 270, and senior standing. F, Sp

480 Journalism in the High School (3) Functions and methods of high school publications. Staff selection, content of publications, copy, layout, photography, printing, advertising and business. Planning course outlines and curricula for journalism/mass media studies.

490 Advanced Photojournalism (3) Advanced principles and methods of black-and-white photography, introduction to color photography. News and feature photographs, photo essays. Prereq: 290, or consent of instructor. Sp

492 Field Experience (1-3) Approved internships and other supervised practice in journalism and public relations. May be repeated for a maximum of 4 credit hours. Prereq: Senior standing and consent of instructor. E

493 Independent Study (3) May be repeated for a maximum of 6 hours. Prereq: Consent of instructor.

LATIN

111-112 Beginning Latin (3,3) Must be taken in sequence.

251 Intermediate Latin: Grammar Review and Readings (3) Prereq: 112 or equivalent.

252 Intermediate Latin: Vergil's Aeneid (3) Prereq: 251 or equivalent.

351 Cicero and Sallust (3) Prereq: 252 or equivalent.

352 Roman Lyric Poetry (3) Poetry of Catullus, Horace, and the elegists. Prereq: 252 or equivalent.

414 Cicero and Techniques of Latin Prose Composition (3) For advanced students in Latin. Practice in prose composition, the writings of Cicero the model. Prereq: 351-352 or consent of instructor.

431-432 Selected Readings from Latin Literature (3,3) For advanced students in Latin. Oratory, historical writings and poetry of ancient Rome, in the original Latin. May be repeated for credit. Maximum 9 hours. Prereq: 351-352 or consent of instructor.

435 Medieval Latin (3) Selected readings from the Latin prose and poetry of medieval Europe. Prereq: Consent of instructor.

LATIN-AMERICAN STUDIES

251-252 Introduction to Latin American Studies (3,3) Societies of Latin America with special emphasis on dominant culture patterns, social classes, and impact of nationalism. 251-Pre-Colonial and Colonial periods through Independence era. 252-Latter 19th century and the Modern period. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

311 Aspects of Luso Brazilian Literature (3) (Same as Portuguese 311.)

321 Aspects of Spanish American Literature (3) (Same as Spanish 312.)

315 Peoples and Cultures of Mesoamerica (3) (Same as Anthropology 313.)

355 Latin American Government and Politics I (3) (Same as Political Science 355.)

360 History of Latin America (3) (Same as History 360.)

361 History of Latin America (3) (Same as History 361.)

372 Geography of Middle America (3) (Same as Geography 372.)

373 Geography of South America (3) (Same as Geography 373.)

401 Cultural Plurality and Institutional Changes in Latin America (3) Value systems, behavioral patterns, political parties, role of the military, the church, educational institutions, dictatorship and nationalism. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

402 Latin American Studies Seminar (3) Selected topics in Latin American studies. May be repeated. Maximum 6 hours.

431 Directed Readings in Brazilian and Portuguese Literature (3) (Same as Portuguese 431.)

432 Directed Readings in Brazilian and Portuguese Literature (3) (Same as Portuguese 432.)

450 20th Century Hispanic Theater (3) (Same as Spanish 450.)

455 Latin American Government and Politics II (3) (Same as Political Science 455.)

471 Latin American Civilization (3) (Same as Spanish 471.)

472 Masterpieces of Spanish American Literature (3) (Same as Spanish 472.)

473-474 Survey of Spanish American Literature (3) (Same as Spanish 473-474.)

475 Studies in Latin American History (3) (Same as History 475.)

479 Social Protest Literature of Latin America (3) (Same as Spanish 479.)

LIBRARY AND INFORMATION SCIENCE

310 Finding Information: Resources and Strategies (3) Information as a critical resource for research and decision making, emphasis on planning and executing information searches and using library resources. E

330 Books and Related Materials for Children (3) Materials for children in leisure time or classroom activities; criteria for selecting books, magazines, record-ings, films and related materials; storytelling and other devices for encouraging reading. Undergraduate Credit only. E

360 Books and Related Materials for Young People (3) Materials for teenagers in leisure time or classroom activities; criteria for selecting books, magazines, recordings, films and related materials; book talks and other devices for encouraging reading. Undergraduate credit only. Sp

430 History of the Book (3) History of writing and various methods of bookmaking from earliest times through the 19th century. Sp

475 Utilization of Instructional Media (3) Same as Educational Curriculum and Instruction 475. E
401 Materials and Traffic Management (3) Planning and management of logistics activities including purchasing, transportation, storage and control, and supply strategies. Materials management tools and organizational structures for various industries. Prerequisite: 301.

402 Transportation Operations and Cost Management (3) Freight and passenger carrier operations with the development of carrier costs and their control, considered by each mode individually and in coordination with each other. Prerequisite: 302.

441 International Transportation and Logistics (3) Multi-national logistics strategy, import-export processes, international sea, surface and air operations, comparative transport systems analysis. Prerequisite: 301-302.

461 Seminar in Logistics Strategy (3) Senior seminar in development of strategy to logistics management. Major writing requirement. Prerequisite: 401.

462 Seminar in Transportation Strategy (3) Senior seminar in evaluation of freight and passenger carrier strategies to compete in transportation marketplace. Major writing requirement. Prerequisite: 402.

493 Independent Study (1-6) Directed research on subject of mutual interest to student and staff member. Prerequisite: Consent of instructor.

497 Honors: Executive-in-Residence in Transportation and Logistics (3) Student interaction with top-level logistics and transportation executives. Focus on the strategic decision-making process. Prerequisite: Consent of instructor.

MANAGEMENT

301 Principles of General and Operations Management (3) Basic functions of general management and the concepts and techniques used in operations management. Includes lectures and discussion/problem-solving sessions. Prerequisite: Statistics 201.

303 Management Information Systems (3) Management information concepts. Organizational information needs, management decisions relating to technology and systems design. Data base management systems and applications development software.

311 Labor Relations and Collective Bargaining (3) American labor history, structure and philosophy of contemporary unions, nature of collective bargaining, and dispute settlement. (Same as Economics 343.)

321 Organizational Structure and Behavior (3) Behavioral processes in organizations; motivation, leadership, decision making, communication; behavioral consequences; group behavior, informal organizations, organizational structure, conflict, politics, change and development.

341 Operations Management I (3) Design of operations systems. Process and methods analysis and measurement, location and layout, project management, operational forecasting. Prerequisite: Statistics 201.

401 Business Strategy/Policy (3) Strategy and policy which affect the character and success of the total enterprise. Capstone course which integrates all functional areas in the formulation and implementation of strategy which will enable the organization to reach objectives. Major writing requirement. Prerequisite: Completion of business core courses and senior standing. Must be admitted to a business major.

421 Business Strategy Formulation and Implementation (3) General business simulation used by teams which formulate and implement business strategy. Application of strategic planning and group management skills. Prerequisites: 311, 321, 341.

431 Personnel Management (3) Theory, methods and issues pertaining to successful personnel management. Prerequisite: 310.

432 Implementation and Evaluation of Personnel Programs (3) Methods of identifying, developing, implementing and evaluating various personnel programs. Prerequisite: 431, senior standing.

440 Organizational Psychology (3) (Same as Psychology 440.)

441 Operations Management II (3) Planning and control of operations systems. Aggregate planning; scheduling systems, materials management. Prerequisite: 341.

461 Database Management in Business (3) Application, logical structure, and implementation of database systems. Management of data resources to effectively support information systems in organizations. Prerequisite: Computer Science 261.

471 International Management (3) Factors significant to the manager in international business activities.

481 Management Science (3) Quantitative methods for production and operations management. Linear, dynamic and network programming, as well as decision analysis. Markov, inventory and queueing models. Prerequisite: Mathematics 121, 122 and Statistics 201.

MARKETING

301 Marketing Management (3) Institutions comprising the marketing system; principal environmental opportunities and constraints facing the marketing manager. Prerequisite: Economics 201.

10 Buyer Behavior - Analysis for Marketing (3) Comprehensive framework of consumer behavior concepts and processes. Application to market analysis, design and control of marketing programs. Prerequisite: 301.

320 Marketing Research and Information Planning (3) Marketing Research process from its inception to implementation of the study's results. Student should be able to critically evaluate the merit of a research project, as well as possess the ability to design a sound marketing project. Major writing requirement. Prerequisite: 301 and Statistics 201.

420 Promotion Management (3) Principles and practices of promotion management and their relationship to overall marketing program. Managerial focus emphasizing types of decisions continually confronting promotion executives. Prerequisite: 301.

430 Marketing Analysis and Strategy (3) Approaches for finding markets and evaluating them for opportunity. Concepts, types of information and analysis techniques combined into a framework for strategic decisions. Major writing requirement. Prerequisite: 301 and 320.

493 Independent Study (1-6) Directed research on subjects of mutual interest to student and staff member. Prerequisite: Consent of instructor.

497 Honors I & II (3,3) Topics may include non-business marketing applications, macro-environmental issues, market segmentation, international marketing, services marketing and related issues. Prerequisite: Consent of instructor.

MATHEMATICS

110 Algebraic Reasoning (3) A course in the applications of elementary mathematics to life in the modern world. Includes applications in financial mathematics, consumer mathematics, and other areas. Students preparing to take 121 should take 110 instead of 110. Prerequisite: Two years of algebra and one year of geometry. This course should not be taken to remove an entrance requirement.
115 Statistical Reasoning (3) An introduction to prob-
ability and statistics without calculus. Not available for students in the College of Business Admin-
istration. Prereq: Two years of algebra and one year of
geometry in high school, plus satisfactory place-
ment test score of 110, or 119, or 130.

119 Precalculus A (3) A review of algebraic functions,
equations, and inequalities for students who satisfy
the course prerequisites for 121 but whose place-
ment test scores indicate additional preparation is
necessary. Students who receive a grade of C or
crider in any course numbered 121 or higher may not
subsequently receive credit for 119. Prereq: Two years
of geometry, plus satisfactory placement. This course
should not be taken to remove a placement require-
ment.

121 Calculus A (3) For students not planning to major
in science, engineering, mathematics, or computer
science. Calculus of algebraic, exponential, and loga-
ithmic functions, with applications. No student who
has received credit for Math 141 or 151 with a grade
of C or better may subsequently receive credit for 121.
Prereq: Two years of algebra and one year of
gometry in high school, plus satisfactory placement
test scores, or 110, or 130.

122 Precalculus B (3) Sequel to 121, including elementa-
try matrix algebra, multivariable calculus, and optimization.
No student who has received credit for 241 or 251
may subsequently receive credit for 122. Prereq: 121,
or 141, or 151.

130 Precalculus I (4) Review of algebraic, logarith-
monic, exponential, and trigonometric functions for students
who satisfy the course prerequisites for 141 or 151, but
who did not take the placement test of entrance. This course
is not available for students in the College of Business Admin-
istration. Prereq: Two years of algebra, a year of geometry,
and half a year of trigonometry in high school. Students who
did not study trigonometry in high school may take the noncredit
course in trigonometry simultaneously with 130.

141-142 Calculus I, II (4,4) Standard first-year course in
single variable calculus, especially for students of
science, engineering, mathematics, and computer
science. Differential and integral calculus with applications.
Credit will not be given for both 141 and 151. Prereq:
Two years of algebra, a year of geometry, and half a year
of trigonometry in high school, plus satisfactory placement

143-144 Microcomputer Laboratory I, (1) Optional sup-
plement to the calculus courses, featuring computer

145 Applications in Mathematics (1) Open to superior
students at the secondary level. The use of micromini-
cputers to study concepts and problems in mathematics.
Prereq: 141-142 or consent of instructor.

151-152 Biocalculus I, II (3,3) For students majoring in
life sciences. Topics from calculus of algebraic func-
tions, logarithmic, and exponential functions, probability and
statistics, with emphasis on applications to life sciences.
Credit will not be given for both 141 and 151.

200 Matrix Computations (1) Introduction to matrix
algebra, including functions of matrices, eigenvalues, and
eigenvectors. For students in the College of Engi-
neering and College of Business Statistics majors only.
Students who have received a grade of C or
better in 251 may not subsequently receive credit for
200. Prereq: 141-142.

221-222 Discrete Mathematics I, II (3,3) Logic, sets,
combinatorics and probability, functions and relations,
and an introduction to elementary number theory.
Prereq: 141 or 151.

231 Differential Equations I (3) First course, empha-
sizing solution techniques. Includes first-order equations
and applications, second-order ordinary differential equa-
tions with constant coefficients, Laplace transforms,
and series solutions. Prereq: 141-142.

241 Calculus III (4) Functions of two or more dimensions,
partial differentiation, multiple integration, and selected
topics in vector calculus. Prereq: 141-142.

243 Microcomputer Laboratory I (Optional supple-
ment to 241, featuring computer demonstrations and
projects. Coreq: Students registering for 243 must also be reg-
istered for 241.

247 Honors: Calculus III (4) Prereq: 147-148 or invit-
ation of the department.

251 Matrix Algebra I (3) First course in the algebra of
simultaneous linear equations and matrices. Includes Gaussian elimination, determinants, vector spaces,
linear transformations, eigenvalues, and eigenvectors.
Prereq: 141-142.

253 Microcomputer Laboratory I (Optional supplement
to 251, featuring computer demonstrations and projects.
Coreq: Students registering for 253 must also be reg-
istered for 251.

257 Honors: Matrix Algebra I (3) Prereq: 147-148 or invit-
ation of the department.

233 Probability I (3) Probability models; discrete prob-
ability spaces, conditional probability and stochastic independence; discrete and continuous random variables (including binomial, Poisson, uniform and normal); joint distributions, expectations and variances and moment generating functions; random variables with large numbers and the central limit problem. Prereq: 241.

314 Analysis I (3) Introduction to the theory of the
real number system, limits of sequences, and func-

351 Algebra I (3) Introduction to abstract algebra,
emphasizing integers and polynomial rings. Prereq:
221 and 251.

371 Numerical Algorithms I (3) Selection of algo-
rithms and associated software for problems
selected from roots of equations, systems of linear

equations, least squares data fitting, interpolation, numer-
cial integration, numerical methods for ordinary
differential equations. Prereq: 251, 241, 251, and knowl-
dge of a high level programming language, such as
FORTRAN. (Same as Computer Science 371)

399 Studies in Mathematics (3) May be repeated.
Maximum 9 hours. Prereq: Consent of instructor.

400 History of Mathematics (3) Development of math-
ematics from ancient to modern times. Does not satisfy
major requirements for a B.S. or M.S. in mathematic-
s. Term paper required. Prereq: 141-142 or equivalent.

401 Mathematics and Microcomputers (3) Primarily
for students seeking certification in mathematics teach-
ers at the secondary level. The use of microcomputers
to study concepts and problems in mathematics.
Does not satisfy major requirements for a B.S. or M.S. in mathematics.
Prereq: 141, 221 or 504.

404 Applied Vector Calculus (3) Topics from mul-
tivariable and vector calculus including line and surface
integrals, the divergence theorem and the theorems of

405 Models in Biology (3) Difference and differential
equation models for biological systems. Prereq: 141-
or 151-152.

411 Mathematical Modeling (3) Construction and anal-
ysis of mathematical models used in science and
industry. Includes solid analytic geometry, linear systems of differen-
tial equations, Frobenius method, Sturm-Liouville
problems, phase plane analysis. Prereq: 200 or 251, and 231.

435 Partial Differential Equations (3) Separation of
variables, Fourier series, solution of Laplace, wave and

443 Complex Variables I (3) Introduction to the theory
of functions of a complex variable, including residue
test theory and contour integrals. Prereq: 241; one 300 or
400-level mathematics course recommended.

444 Complex Variables II (3) Applications of complex
variables to steady-state temperatures, electrostat-
ics, and fluid flow. Prereq: 243.

445-446 Advanced Calculus I, II (3,3) Introduction to the
sequence of sequences, series, differentiation, and
Riemann integration of functions of one or more vari-
ables. Prereq: 341 or consent of instructor.

447-448 Honors: Advanced Calculus I, II (3,3) Honors
version of 445-446. Prereq: 441 or consent of instruc-
tor.

451 Topics in Algebra (3) Topics chosen from number
theory, and the theory of matrices. Prereq: 351 or
453.

453 Matrix Algebra II (3) Advanced topics in matrix
theory, including the Jordan canonical form. Prereq:
251.

455-456 Advanced Algebra I, II (3,3) Introduction to
algebraic structures such as groups, rings, fields, vector
spaces and linear transformations. Prereq: 351 or
consent of instructor.

457-458 Honors: Abstract Algebra I, II (3,3) Honors
version of 455-456. Prereq: 351 or consent of instruc-
tor.

460 Geometry (3) Axiomatic and historical development
of neutral, Euclidean, and hyperbolic geometry stress-
ing proof technique and critical reasoning. Models of
Non-Euclidean geometries. A term paper required.
Prereq: 141-142 and 221, or consent of instructor.

461 Topology (3) Includes topology of line and plane,
separation properties, compactness, connectedness,
continuous functions, uniform continuity, and topological invariants. Prereq: 341 or consent of
instructor.

471 Numerical Analysis (3) Introduction to compu-
tation, instabilities, and rounding. Interpolation and
approximation by polynomials and piecewise poly-
nomials. Quadrature and numerical solution of initial
and boundary value problems of ordinary differential
equations, including stiff systems. Prereq: 371. (Same
as Computer Science 471.)

472 Numerical Analysis (3) Direct and iterative meth-
ods for systems of linear equations. Solution of a
single nonlinear equation and nonlinear systems. Orthog-
nal decomposition, least squares and the algebraic
(Same as Computer Science 472.)

480 Readings in Mathematics (1-3) Open to superior
students with consent of department head. Indep-
end study with faculty guidance. May be repeated.
Maximum 9 hours. Prereq: Agreement of faculty mentor
to supervise independent work.

489 Seminar in Mathematics (1-3) Students must reg-
ister for the number of credit hours announced for a
particular seminar. May be repeated. Maximum 9 hours.
Prereq: Consent of instructor. Writing-emphasis course:
at least one in-class essay examination and 3000 words
of writing outside the classroom.
MEDICAL BIOLOGY

410 Laboratory Safety Education (2) Preparation for teachers of laboratory safety. Hazards of flammable, corrosive chemicals, isotopes, pathogens, potential injuries and first aid. Techniques of safe operation and handling will be presented.

411 Undergraduate Research Participation (1-3) Experience in active biomedical research projects under supervision of faculty. Students in pre-med and other biology majors may conduct their own research projects within designated areas. Prereq: Junior or senior standing; permission of consent of faculty member. May be repeated with consent. Maximum 9 hours. Satisfactory/No Credit only.

MEDICAL TECHNOLOGY


420-421 Clinical Chemistry (5,5) Clinical aspects of biochemistry, including overview of principles and instrumentation with emphasis on practical laboratory application of analytical procedures, specimen collection and handling, significance of results, and quality assurance. Includes blood gas analysis, including immunoassays, and analysis of blood and other body fluids for enzymes, hormones, and other constituents of clinical interest; utilizing both automated and manual techniques, physical characteristics, detection, and use of short-half-life radioactive materials for in vivo procedures such as radioimmunoassay which utilize radiotopes.

430-431 Hematology and Clinical Microscopy (4,4) Principles, theories, and instrumentation related to qualitative and quantitative evaluation of cellular elements of blood and other body fluids; factors of hemostasis, quantitative chemical analysis of urine, and renal function studies. Emphasis on microscopic identification of cells and significance and correlation of laboratory data.

440-441 Immunohematology (3,3) Theory and practice in blood bank operation, erythrocyte antigens and their normal and abnormal immunology. Standard technical practices used in evaluating blood typing, crossmatching, antibody detection, and preparation of blood and bone marrow for transplantation. Safety control methods standard to efficient blood bank.

450 Clinical Serology and Immunology (1) Performance and interpretation of broad range of clinical serological and immunological procedures with emphasis on principles and clinical correlation. Formal lecture series included.

460 Nuclear Medicine (1) Physical characteristics, detection and use of short half-life radioactive materials in nuclear medicine. Technical and theoretical of in vitro procedures such as radioimmunoassay which utilize radiotopes.

470 Orientation and Basic Techniques (1) For facilitation of students from campus to hospital community and clinical laboratory. Introduction to medical terminology, ethics, and health team concept. Orientation to basic techniques including procedures for collection and handling of specimens, principles of operation of many laboratory instruments, review of laboratory math, and introduction to quality control procedures. Portions of course extend over entire clinical year.

480 Principles of Supervision and Education in Medicine (1) Seminars in basic principles of management, supervision, and education theories and methods. Comprehensive examination covers entire course.

MEDIEVAL STUDIES

201 Medieval Civilization (3) Introduction to basic themes in medieval experience, approached from interdisciplinary points of view and including philosophy and religion, art and architecture, language and literature, social and political history.

261 Medieval Culture: Readings from the Early Middle Ages, 500-1000 (3) Critical analysis and interpretation of selected works from the early medieval period. Focuses on major types of literature produced during the period 600-1000 A.D., e.g., cultural, religious, rhetorical, lyric, epic, biographical. Includes Augustine's Confessions, Boethius' Consolation, St. Gregory's Life of St. Benedict, The Life of Charlemagne, etc. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

262 Medieval Culture: Readings from the Later Middle Ages, 1000-1500 (3) Critical analysis and interpretation of selected works from the later medieval period. Focuses on romantic, allegorical and mystical writings from the high and later Middle Ages, e.g., the Song of the Nibelungen, the Romance of the Rose, St. Bernard's Commentary on the Song of Songs, Peter Abelard's History of My Calamities. Should be taken in sequence with 261. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

312-313 Medieval History (3,3) (Same as History 312-313.)

322 Medieval Philosophy (3) (Same as Philosophy 322.)

371 Early Christian and Byzantine Art, to 1350 (3) (Same as Art 371.)

372 Northern European Painting, 1350-1600 (3) (Same as Art 372.)

381 Medieval Art of the West, 800-1400 (3) (Same as Art 381.)

382 The Art of Italy, 1250-1450 (3) (Same as Art 382.)

401 Dante and Medieval Culture (3) (Same as Italian 401.)

402 Petrarch and Boccaccio (3) (Same as Italian 402.)

403 Seminar in Medieval Studies (3) Interdisciplinary treatment of selected topics. Content varies. May be repeated. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

410 Medieval French Literature (3) (Same as French 410.)

415 Medieval Architecture (3) (Same as Architecture 415.)

475 Ancient and Medieval Political Thought (3) (Same as Political Science 475.)

MICROBIOLOGY

200 Microbiology for Student Nurses (3) Only for student nurses in diploma program of hospitals affiliated with The University of Tennessee. Microbiological principles as they apply in ensuring care of the patient, epidemiology of infection, and principles of immunity and allergy.

210 General Microbiology (3) General properties of bacteria and viruses including physiology, metabolism, genetics, applied bacteriology, pathogenesis, and immunity. May not be used as part of the major in microbiology. 2 hours and 2 labs. E

310 Introduction to Microbiology (3) Introduction to bacteria and viruses including physiology, metabolism, and genetics of bacteria and replication and expression of viruses; bacterial and viral pathogenicity; mechanisms of resistance to disease. Coreq: 319. F, Sp

319 Introductory Microbiology Laboratory (1) Basic techniques for the examination, cultivation, and identification of microorganisms. Coreq: 310. F, Sp

400 Laboratory Problems in Microbiology (2-4) Research projects under the direction of a faculty member. May not be used for credit toward the major. May be repeated. Maximum 9 hours. Satisfactory/No Credit only. Prereq: Consent of instructor. E

410 Physiology and Genetics of Bacteria (3) Modern concepts of the structure and function of the bacterial cell, including metabolism, energy flow, and the transmission and expression of genetic information. Prereq: 310.

419 Bacterial Physiology and Genetics Laboratory (1) Laboratory exercises designed to accompany 410. Coreq: 410.

420 Pathogenic Bacteriology (2) Disease producing microorganisms including bacteria, rickettsia, and chlamydia. Prereq: 310.


430 Immunology (2) Principles of inflammation and immunity; immunoglobulin structure and theories of formation and diversity; complement, hypersensitivities, cell cooperation and recognitions in immune mechanisms; soluble factors. Prereq: Biology 220. (Same as Zoology 430.)

439 Immunology Laboratory (1) Laboratory exercises designed to accompany 430. Coreq: 430. (Same as Zoology 430.)


480 Mycology (3) Morphology, physiology, genetics, and taxonomy of yeasts and molds; pathogenesis of disease causing fungi. Prereq: 310.

489 Mycology Laboratory (1) Laboratory exercises designed to accompany 489. Coreq: 489.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)

495 Senior Seminar (3) In-depth consideration of microbial problems of current interest requiring an integration of two or more disciplines. Emphasis on current literature and the experimental basis of current knowledge. Historical background, impact on society, predictions of the future, and ethical implications. Written reports required. A capstone course. Prereq: Senior standing. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

MILITARY SCIENCE

110 Basic Military Science (3) Formation and functioning of the American defense establishment, customs and traditions of the army, application of the principles of war, and current military threat faced by the United States. Introduction to leadership, leadership and mountaineering. Prereq: United States citizen; freshman or sophomore standing. Students with higher standing require consent of instructor. Letter grade only, F, Sp

120 Leadership Development Techniques (2) Introduction to basic leadership theory, human motivation theory, and principles of efficient and effective communications. Application of theories and principles in individual and group exercises. Prereq: 110 or consent of the Professor of Military Science. Letter grade only, F, Sp

200 Basic Military Studies - Practicum (4) 240 contact hours of instruction and evaluation at Fort Knox, Kentucky over a six week period during the summer.
Music General

100 Fundamentals of Music (3) Theory and practice of basic elements of music. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

110 Music Appreciation (3) Developing listening skills and understanding of Western music from the ancient world through the 20th century. For non-music majors. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

120 History of Rock (3) Study and appreciation of rock music, its origins in blues and rock and roll, its development and cultural dimensions to the present. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

130 Music Performance (3) Individualized course of study combining participation in a University musical ensemble with collateral study of an instrument or voice. One hour of applied study (Music Performance 103-446) and ensemble rehearsals as scheduled (Music Ensemble 301-389). May be repeated once for credit. Requires payment of Applied Music fee. For non-majors only. Prerequisite: Performing ability on an instrument or voice.

200 Solo Class (0)

301 Junior Recital (0)

Music Ensemble (301-501 Woodwind Choir (1,1) May be repeated.

302-503 Small Jazz Ensemble (1,1) May be repeated. Maximum 12 hours.

504-505 Jazz Ensemble (1,1) May be repeated.

305-505 Studio Orchestra (1,1) May be repeated. Maximum 12 hours.

506-506 Trombone Choir (1,1) May be repeated.

509-509 Tube Ensemble (1,1) May be repeated.

310-510 Percussion Ensemble (1,1) May be repeated.

311-511 Marinello Choir (1,1) May be repeated.

312-512 Baroque Ensemble (1,1) May be repeated.

313-513 Synthesizer Ensemble (1,1) May be repeated.

314-514 Brass Choir (1,1) May be repeated.

315-515 Chamber Music Ensemble (1,1) May be repeated. Maximum 12 hours.

320-520 UT Singers (1,1) May be repeated.

330-530 Chamber Singers (1,1) May be repeated.

332-532 Collegium (1,1) May be repeated.

334-534 Saxophone Choir (1,1) May be repeated.

340-540 Opera Theatre (1,1) May be repeated.

342-542 Opera Workshop (1,1) May be repeated.

350-550 Concert Band (1,1) May be repeated.

352-552 Campus Band (1,1) May be repeated.

354-554 Varsity Band (1,1) May be repeated.

356-556 Laboratory Band (1,1) May be repeated.

359-559 Marching Band (1,1) May be repeated.

370-570 Symphony Orchestra (1,1) May be repeated.

380-580 Concert Choir (1,1) May be repeated.

382-582 University Chorus (1,1) May be repeated.

383-583 Men's Chorale (1,1) May be repeated.

389-589 Women's Chorale (1,1) May be repeated.

399-599 Accompanying (1,1) May be repeated.

Music Education

210 Class Woodwind Methods (3) Structure, use, techniques of playing, care and repair of principal instruments in school instrumental organizations. Emphasis on techniques necessary for basic understanding and effective teaching of the instruments. Practical use of current instructional materials. Letter grade only. F

220 Class Brass Methods (3) Structure, use, techniques of playing, care and repair of principal instruments in school instrumental organizations. Emphasis on techniques necessary for basic understanding and effective teaching of the instruments. Practical use of current instructional materials. Letter grade only. Sp

230 Class Percussion Methods (3) Structure, use, techniques of playing, care and repair of principal instruments in school instrumental organizations. Emphasis on techniques necessary for basic understanding and effective teaching of the instruments. Practical use of current instructional materials. Letter grade only. Sp

200 Solo Class (0)

301 Junior Recital (0)

MUSIC ENSEMBLE

301-501 Woodwind Choir (1,1) May be repeated.

302-503 Small Jazz Ensemble (1,1) May be repeated. Maximum 12 hours.

504-505 Jazz Ensemble (1,1) May be repeated.

305-505 Studio Orchestra (1,1) May be repeated. Maximum 12 hours.

506-506 Trombone Choir (1,1) May be repeated.

509-509 Tube Ensemble (1,1) May be repeated.

310-510 Percussion Ensemble (1,1) May be repeated.

311-511 Marinello Choir (1,1) May be repeated.

312-512 Baroque Ensemble (1,1) May be repeated.

313-513 Synthesizer Ensemble (1,1) May be repeated.

314-514 Brass Choir (1,1) May be repeated.

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356-556 Laboratory Band (1,1) May be repeated.

359-559 Marching Band (1,1) May be repeated.

370-570 Symphony Orchestra (1,1) May be repeated.

380-580 Concert Choir (1,1) May be repeated.
330 Percussion Literature (1) Prereq: Consent of instructor.

340-350 String Literature I, II (2,3) Survey of string techniques, issues, research and pedagogies; topical presentations by the applied string faculty and guests. 350-Development of the violin family of instruments and bowing techniques; survey of string literature, performances, and performance styles; application of historical, analytical, and pedagogical procedures to performance. Prereq: 340 and applied enrollment in strings at 300 level or above or consent of instructor.

410 Band Arranging (3) Study and application of techniques employed in scoring for the marching and concert bands. Prereq: Music Theory 320.

490 Instrumental Conducting (3) Knowledge and skills in instrumental conducting; various periods and composers and relationship of different styles to the conductor's art; musical analysis and practice in conducting. Prereq: Music Education 320 or equivalent.

495 Suzuki Violin Method (2) Psychology, procedures, and literature of the Suzuki violin method and pedagogy. May be repeated. Maximum 8 hours. Prereq: Consent of instructor.

MUSIC JAZZ

110 Jazz Theory (3) Fundamentals of the jazz language, including terminology, chord symbols, chord scales, and chord progressions, plus ear training lab. Prereq: Music Theory 110.

120 Analysis of Jazz Styles (2) Individual improvisatory styles through analysis of their transcribed solos. Training and function of the ear in music. Transcription of solos from recordings and preparation of analysis. Prereq: 110.

130-140 Jazz Piano I, II (1,1) Harmonic language of jazz. Interpretation of chord symbols, formulae for voicing chords, chord progressions, and fundamental melody-playing and improvisation for right hand. Must be taken in sequence.

150 Studio Guitar Styles (2) Introduction to guitar styles in jazz, rock, country, and blues idioms. Prereq: Consent of instructor.

160 Introduction to Styles in Jazz Drumming (2) Examination of major composers and performers who have contributed significantly to creation of principal styles of jazz drumming.

210-220 Jazz Improvisation I, II (2,2) Study and application of principles of improvisation, including nomenclature, chord progressions, chord scales, patterns, melodic development, and tune styles. Prereq: 110.

310 Jazz Composition and Arranging (3) Prereq: Consent of instructor.

320 Jazz Band Arranging (2) Arranging and scoring for the Big Jazz Band. Prereq: Consent of instructor.

410 Advanced Improvisation (3) Development of individual skills and solving individual problems in jazz improvisation. Prereq: 210-220.

420 Jazz Pedagogy (1) Methods and materials relating to teaching of jazz, designing and administering jazz programs, and rehearsal techniques for jazz ensembles. Prereq: Studio Music and Jazz major or consent of instructor.

430-440 Piano Pedagogy I, II (2,2) Pedagogical methods and materials related to the development of principles of learning; specific programs based on pupil aptitude and background; collaborative teaching experience. Must be taken in sequence. Prereq: Consent of instructor.

460-470 The Organ and Its Literature I, II (3,3) Development of the organ and organ literature from the Middle Ages to the present; problems of style and interpretation; pedagogical literature and methods; organ design. Prereq or Coreq: Music History 220 and consent of instructor.

480-490 Teaching Class Piano (1,1) Historical survey and evaluation of teaching materials and methodology for college and/or adult beginning piano classes, with collateral teaching experience. Prereq: Consent of instructor.

495 Suzuki Piano Method (2) Study of the psychology, procedures, and literature of the Suzuki Piano Method. Prereq: Consent of instructor.

MUSIC PERFORMANCE

103-203-303-403-503 Flute (1-4) May be repeated.

105-205-305-405-505 Oboe (1-4) May be repeated.

110-210-310-410-510 Bassoon (1-4) May be repeated.

115-215-315-415-515 Clarinet (1-4) May be repeated.

120-220-320-420-520 Saxophone (1-4) May be repeated.

125-225-325-425-525 Horn (1-4) May be repeated.

130-230-330-430-530 Trumpet (1-4) May be repeated.

135-235-335-435-535 Trombone (1-4) May be repeated.

140-240-340-440-540 Baritone (1-4) May be repeated.

145-245-345-445-545 Tuba (1-4) May be repeated.

150-250-350-450-550 Percussion (1-4) May be repeated.

155-255-355-455-555 Voice (1-4) May be repeated.

160-260-360-460-560 Violin (1-4) May be repeated.

165-265-365-465-565 Viola (1-4) May be repeated.

170-270-370-470-570 Cello (1-4) May be repeated.

175-275-375-475-575 String Bass (1-4) May be repeated.

176-276-376-476-576 Electric Bass (1-4) May be repeated.

179-279-379-479-579 Guitar (1-4) May be repeated.

180-280-380-480-580 Piano (1-4) May be repeated.


190-290-390-490-590 Organ (1-4) May be repeated.

254-394-494-594 Composition (1-3) May be repeated.

Prereq: Consent of instructor.
MUSIC THEORY

110-120 Theory I, II, (3,3) Materials of music including basic elements through triads and seventh chords and modulation. Exercises in writing and analysis of music with emphasis on common practice.


210-230 Theory III, IV, (3,3) Materials of music with emphasis on literature of Classic, Romantic, and contemporary periods. Exercises in writing and analysis. Must be taken in sequence. Prereq: 120 or consent of instructor.


250 Composition (2) Writing short vocal and instrumental compositions. Prereq: 220 or consent of instructor. May be repeated for credit. Maximum 4 hours.

290 Sound Recording Techniques (3) Theory and applications of tape recording's sound reproduction and reinforcement systems. Topics include room acoustics, audio measurements, microphones, studio and real-time processing, noise reduction, mixing, editing, monitors, system wiring, and maintenance.

310 Form and Analysis (3) Study and practice in analysis of forms of music from smallest structural units to large compound forms. Prereq: 220.

320 Instrumentation (3) Basic techniques in scoring for voices, brass, woodwind, and string choirs; and percussion. Prereq: 220.

390 Sound Synthesis Techniques (3) Studio and real-time applications of synthesizers. Historical background, theoretical concepts, equipment interface and usage, analysis of sounds and compositions. Prereq: 290 or consent of instructor.

400 Survey of Music Theory (3) Emphasis on harmonic practice of Baroque, Classic, and Romantic periods. Exercises in writing and analysis. Recommended as a review course for graduate students. Prereq: Consent of instructor.

420 Orchestration (3) Advanced techniques in instrumental writing with emphasis on scoring for the concert orchestra. Prereq: 320.

430-440 Counterpoint I, II, (3,3) 430-Species counterpoint in modal and tonal styles with emphasis on works of Palestrina and J.S. Bach. Prereq: 220. 440-Writing of contrapuntal forms of the 18th century and fugue analysis of works from the 18th through the 20th centuries. Prereq: 430.

493 Independent Study in Music Theory (1-5) May be repeated for credit. Prereq: Consent of department head.

MUSIC VOICE

110 Class Voice I (1) Development of basic vocal skills. May be repeated for credit. Maximum 2 hours.

120 Class Voice II (1) Prereq: Consent of instructor. May be repeated for credit. Maximum 2 hours.

210 Vocal Techniques in Popular Music (1) Development of performance techniques in Broadway and other contemporary music styles. Prereq: Consent of instructor. May be repeated for credit. Maximum 4 hours.

220 Introduction to Music Theatre Technology (2) Stage technology unique to lyric stage.


240-250 Diction I, II, (2,2) Sounds by phonetic symbols. Opera and art songs used for examples. Performance practice.

330 Opera Production (1-3) Supervised work on opera production and the interaction of music and drama. Prereq: Consent of instructor. Maximum 12 hours.

410-420 Song Literature I, II, (2,2) 410-420 German songs. 420-French, Italian, Russian, Scandinavian, Czechoslovakian, British, and American art songs.

430 Styles in Opera Acting (2) Study and practice of styles in opera acting based on historical and national characteristics. Prereq: 230.

440 Projects in Opera Theatre (1-3) May be repeated for credit. Prereq: Consent of instructor. Maximum 9 hours.

450-460 Pedagogy I, II, (1,1) 450-460 Concepts and approaches to teaching singing (past and present). 460-Vocal teaching materials; includes collaborative teaching experiences. Prereq: Consent of instructor.

NURSING

214 Integrated Biomedical and Health Sciences (1-3) Examination and application of selected theories from physical, chemical, and microbiological sciences and nutrition to nursing process. Each module carries one credit. Prereq: One year of biology or chemistry consent of instructor.

301 Clinical Pharmacology (3) Biochemical and pharmacological effects of therapeutic drugs on the human body; positive and negative reactions to drugs and interaction effects between and among drugs. Prereq: Chemistry 100-105 and 6 semester hours of anatomy and physiology.

302 Introduction to Professional Nursing (9) History, philosophy, and scope of nursing practice with emphasis on nursing process; cognitive and psychomotor skills necessary for effective nursing/client interactions. Clinical laboratory experiences emphasize the nursing process and its application to the care of individuals whose health problems require in-patient services. 6 lectures, 3 lab. Coreq: 301 and 304.

304 Nursing Assessment and Wellness Promotion (4) Developmental, psychosocial, cultural, environmental, spiritual, family, and physical dimensions of health assessment. Collection, analysis, and application of assessment data in formulation of wellness-oriented nursing diagnoses and use of the nursing process in promotion and wellness. Evolution and expansion of the nursing role in wellness promotion and education. Laboratory sessions for development of nursing assessment skills. 3 lectures, 1 lab. Coreq: 301, 302, 304.

305 Transition to Professional Nursing (6) Current status of professional nursing; utilization of the nursing process in a changing health care delivery system; philosophy and conceptual framework of the baccalaureate nursing program and selected physiological and behavioral deviations demonstrated by clients whose health problems require in-patient services. 5 lectures, 1 lab. Prereq: For RN's only.

311 Acute Care Nursing (10) Continuation of 302 with emphasis on physiological and behavioral deviations which underlie or are associated with more complex and critical illnesses of adults and children. Clinical laboratory experiences in adult and pediatric acute care settings for enhanced knowledge and skill in providing nursing care for acute, complex and critical illnesses. 6 lectures, 4 labs. Prereq: 301, 302, 304.

312 Acute Care Nursing (6) Theoretical component of 311. For RN's only. Prereq: 305.
412 Psychosocial Long-Term Nursing Theory (3) Theoretical component of 411. For RN's only. Prereq: 312. S, Sp

414 Community Mental Health Nursing (8) Nursing needs of clients with disorders of the addictions, extended care groups, and community settings. 3 lectures, 3 lab. Prereq: All 300 level nursing courses. For non-nurse MSN students only. F

415 Family/Community Health Nursing (6) Application of the nursing process to individuals, families, groups in the childbearing/rearing stages of development. Clinical experiences are provided in a variety of health care settings. 3 lectures, 3 lab. Prereq: All 300 level nursing courses. For non-nurse MSN students only. Sp

450 Physiological Principles (3) Concepts and principles of normal human physiology; tissue and organ physiology as a basis for integration of system physiology and for understanding pathophysiological mechanisms. Prereq: RN status or consent of instructor. No credit for students who have taken 305, 306, 311 or 312. F, Sp

451 Computers and Nursing Care (3) Computerized information processing with application to patient care, health care administration, nursing education, and nursing research. 2 lectures, 1 lab. Prereq: All 300 level nursing courses or consent of instructor.

453 Oncology Nursing (5) In-depth exploration of cancer principles and issues. A student who has received credit for NFS 250 through junior standing is not eligible to receive course credit. Topics determined by faculty and student interest. Prereq: Consent of instructor. E

465 Advanced Study (1-3) Other topics of interest not covered in other courses. Topics are determined by faculty and student interest. Prereq: Consent of instructor. E

480 Special Topics (1-3) In-depth study of selected nursing topics not covered in other courses. Prereq: Junior or Senior standing. No credit for students who have taken 200 with a grade of C or better for NFS 480. Prereq: NFS 100 or equivalent, Zoology 230, or consent of instructor. A, Sp

311 Science of Food (4) Chemical and physical properties of food related to functional and nutritional properties; sensory evaluation and concepts and techniques; effects of processing on food; application of food principles to meal planning and presentation; computer applications. Prereq: 100 or 107, 201. Micro 210. 3 hours and 1 lab. F

312 Science of Food (4) Chemical and physical properties of proteins and lipids related to functional and nutritional properties; application of food principles to meal planning and presentation; computer applications. Prereq: 100 or 107, 201, Micro 210. 3 hours and 1 lab. Sp

313 Advanced Nutrition (4) Integrated knowledge of physiological chemistry and physiology applied to understanding human nutrition requirements; computer analysis for dietary adequacy. Prereq: 100 or 107, 201, Zoology 230. F

410 Professional Issues in Dietetics (1) Dietetic registration, licensing, and/or certification processes; internship application preparation; public policy in dietetic practice. Prereq: Senior standing. E

411 Nutrition in Disease (4) Metabolic processes of diseased organisms and the effects of disease on nutrition and modifications required. Prereq: 311, 312, 313. F

412 Food and Nutrition Resources Management (3) Integration of community food and nutrition resources; geographic, social, economic, educational, cultural, health characteristics associated with food and nutritional problems and the need for services by individuals in community; public policy. Prereq: 411. Sp

412 Experimental Food Science (3) Individual and group laboratory experimentation in food science; microcomputer techniques. Prereq: 311, 312, PSSC 471. 1 hour and 2 labs. F

414 Nutrient-Drug Interactions (2) Nutrient effects on efficacy and toxicity of drugs; drug effects on absorption, metabolism of nutrients. Prereq: 300 or equivalent. A, Sp

423 Foodservice Systems Design and Equipment (3) Physical facility design; production, delivery system analysis; equipment selection, purchase. Prereq: HRA 320, 321 or consent of instructor. A, F

450 Special Topics: Nutrition and Food Sciences (1-3) Developments, issues and problems in Nutrition and Food Sciences; topics variable. Prereq: Junior or Senior standing in NFS or consent of instructor. May be repeated. Maximum 3 credits. E

487 Honors: Nutrition and Food Sciences (1-3) Senior project. Prereq: Senior standing and consent of instructor. E

492 Field Experience: Nutrition and Food Sciences (1-3) Prereq: Junior or Senior standing, consent of instructor. Satisfactory/No Credit only. E

493 Directed Study: Nutrition and Food Sciences (1-3) Individual student:faculty experience. Prereq: Junior or Senior standing, consent of instructor. Satisfactory/No Credit only. E

O R N A M E N T A L H O R T I C U L T U R E A N D L A N D S C A P E D E S I G N

110 Environmental Horticulture (3) Basic plant sciences and their relationship to ornamental horticulture. Introduction to awareness and appreciation of ornamental plants of the home landscape, selection and use of herbaceous plants and turfgrasses. 3 hours. F

210 Floral Design (2) Principles and techniques of floral arrangement with emphasis on arrangements for home and special use. Lab fee will be charged. 2 labs. S, Sp

220 Basic Landscape Plants (3) Identification, classification, adaptation, culture and landscape design using basic ornamental trees, shrubs, and vines. Prereq: 8 hours Botany or consent of instructor. 2 labs. E

230 Interior Plants (2) Identification, culture, design applications and propagation of foliage plants used in the interiorscape; introduction to interiorscape management. 2 labs. Sp

280 Fundamentals of Landscape Design (3) History of landscape design as it relates to contemporary applications; awareness and sensitivity to the landscapescapic graphic skills and design theory with an emphasis on residential landscape planning. Introduction to color, form, and basic composition. Prereq: 110, 220 or consent of instructor. 1 hour and 2 labs. E

310 Greenhouse Production and Management (3) Management and operation of a greenhouse for commercial purposes, research and institutional use, and home hobby purposes. Culture and management of economically important florists' crops in the United States; basic plant physiological principles, including photoperiodism, thermoperiodism, growth regulation, and nutritional requirements of crops. Prereq: 110. 3 labs. E

320 Plant Materials (2) Identification, culture and design uses of ornamental plants including flowers, shrubs, vines and herbaceous plants and generally excluding those covered in 220. Prereq: 220 or consent of instructor. 2 labs. E

330 Plant Propagation (3) Physiology, methodology, and environmental requirements for propagation. Prereq: 110 and 5 hours Botany or consent of instructor. 2 hours and 1 lab. F

340 Turfgrass Management (3) Practical turfgrass management, cultivation and sensitivity to the establishment; basic applied fertility programs, mowing, and irrigation practices, and thatch and compaction control. Prereq: Identification and basic compositions. Prereq: 110, Plant and Soil Science 210 and 8 hours of Botany or consent of instructor. 2 hours and 1 lab. F

350 Basic Landscape Construction (3) Basic materials and detailing, introduction to the landscape construction industry; application of landscape materials, wood, concrete and masonry construction, site drainage, and landscape grading. Prereq: 220, 2 hours Botany or consent of instructor. 2 hours and 1 lab. F

360 Practicum in Landscape Construction (3) Practical experience in implementation of landscape development projects. Directed lab and field instruction in planning, design and construction methods as applied to retail and wholesale nurseries and landscape contracting firms. Methods of producing liners, container and field-grown woody ornamental plants. Prereq: 220, 330, and Plant and Soil Science 510. 2 labs. F

440 Advanced Turfgrass Management (4) Principles and scientific basis of turfgrass culture; adaptation, ecology, physiology, soil fertility, and grass nutrition; climatic influences on grass culture; physiology of clipping and water management; design, construction, and management of golf courses; physiological
influences of pest infestation and control measures. Prereq: 346 or consent of instructor. 3 hours and 1 lab. Sp

450 Specialty Landscape Construction (2) Design, materials, and construction techniques for specialized components of the landscape industry. Irrigation systems, outdoor lighting, pools and other water features, and interior space construction. Prereq: 350. Two 2 hour labs. F

460 Professional Practices in Landscape Construction and Management (2) Professionalism, salesmanship, proposals, bidding, estimating, specifications, and contract management in landscape services industry. Comprehensive applicable to all landscape construction and contracting industry. Includes presentations by industry representatives. Prereq: 350 or consent of instructor. 2 hours. Sp

483 Advanced Landscape Design (4) Comprehensive application of landscape design skills. Design applications involving site layout, landscape grading, applied landscape construction, and planting design. Analysis, programming, design, detailing, estimating, and specifying applicable to a variety of landscape projects. Prereq: 280, 350, and 380. 1 hour and 2 three hour labs. Sp

490 Seminar (1) Current problems in ornamental horticulture and landscape design. Prereq: Senior standing. Sp

492 Off-Campus Internship (1-3) Work experience in applicable ornamental horticulture and landscape industry. May be repeated. Maximum of 6 credits. E

493 Individual Problem Study (1-3) May be repeated. Maximum of 6 credits. E

PHILOSOPHY

110 The Human Condition: Value and Reality (3) The meaning of life, the existence of God, freedom of the will, human nature and value. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

111 The Human Condition: Knowledge and Reality (3) The place of mind in a material universe and the nature and possibilities of human knowledge. May be taken before 110. Writing-emphasis in place of mind: one in-class essay examination and 3000 words of writing outside the classroom.

120 Foundations of Western Thought: Antiquity through 1500 (3) Plato, Late Antiquity and the Medieval Period. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

121 Foundations of Western Thought: 1500 through Early Twenty-First Century (3) Development of scientific and ethical thought from the Renaissance to the early twenty-first century. Prereq: 120. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

130 Critical Thinking (3) Analysis, evaluation, and construction of reasoning in ordinary language.

135 Formal Logic (3) Introduction to formal deductive systems: propositional and predicate logic.

200 Special Topics (3) When content varies, may be repeated. Maximum 6 hours.

240 Ethics (3) Theories of ethical values. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

290 Social and Political Philosophy (3) Basic problems and concepts of social and political philosophy.

320 Ancient Western Philosophy (3) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

322 Medieval Philosophy (3) Development of medieval thought from St. Augustine to William of Ockham. Secondary and primary sources. (Same as Medieval Studies 222.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

324 Seventeenth- and Eighteenth-Century Philosophy (3) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

326 Nineteenth- and Twentieth-Century Philosophy (3) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

335 Intermediate Formal Logic (3) Metatheory of formal logic and philosophy of logic. Prereq: 135 or consent of instructor.

342 Business Ethics (3) Ethical problems as they confront both business as a social institution and individuals in business.

344 Professional Responsibility (3) Critical analysis of selected classic texts from philosophy, religious studies, and social sciences dealing with responsibility and the nature of professionalism. Theoretical principles and analytical skills applied to selected case studies and other detailed descriptions of professional practice from engineering/architecture, business/ accounting; and at least one of law/politics; helping professions (social work, human services, ministry); teaching. (Same as Religious Studies 344.)

345 Medical Ethics (3) Ethical issues in medicine such as abortion, euthanasia, human experimentation, fairness in health care delivery and the doctor-patient relationship. (Same as Religious Studies 345.)

349 War and Morality (3) Moral justification for war (jus ad bellum); legal and moral constraints in war (jus in bello).

350 Aesthetics (3) Philosophical discussion of art.

353 Philosophy and Literature (3) Nature of literature; philosophical assumptions in literary works.

360 Introduction to Philosophy of Science (3) Standard topics in philosophy of science: scientific method, nature of laws and theories, problem of induction, explanation, measurement. No background in logic is presupposed.

363 Conceptual History of Science (3) Historical evolution of thought in astronomy, mechanics, and the study of motion from the Greeks through the early twentieth century. Prereq: 8 hours of physical science or consent of instructor.

370 Philosophy of Religion (3) Analysis of basic issues of religion. (Same as Religious Studies 370.)

374 Philosophy and Religion of India (3) (Same as Religious Studies 374.)

376 Buddhist Philosophy and Religion (3) (Same as Religious Studies 376.)

379 Religion and Philosophy in China (3) (Same as Religious Studies 379.)

380 The Concept of Woman (3) The nature of woman as it has been conceived by major western philosophers from Plato to Simone de Beauvoir. (Same as Women's Studies 380.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

382 Philosophy of Feminism (3) Various feminist theories and their application to social issues of concern to women today. (Same as Women's Studies 382.)

390 Philosophical Foundations of Democracy (3) Philosophical problems relating to the nature of the democracy, the political and social science, or consent of instructor. When content varies, may be repeated. Maximum 6 hours.

393 Marxism (3) Basic philosophical issues in Marxism thought: ideology, dialectics, praxis, the critique of modern society. (Same as Russian and Eastern European Studies 393.)

395 Existentialism (3) Themes related to freedom and finitude in 19th century thought that begins with Kierkegaard and Nietzsche, and extends to Heidegger and Jaspers, Sartre and Merleau-Ponty.

400 Special Topics (3) When content varies, may be repeated. Maximum 6 hours.

411 Modern Religious Philosophies (3) (Same as Religious Studies 411.)

412 Classical Indian Systems of Philosophy: The Moksha Tradition (3) (Same as Religious Studies 412.)

420 Topics in History of Philosophy (3) One or more figures or movements from antiquity through mid-twentieth century. Prereq: 6 hours of philosophy or consent of instructor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

430 Topics in Logic (3) Prereq: 6 hours of logic or consent of instructor. When content varies, may be repeated. Maximum 6 hours.

440 Contemporary Ethical Theory (3) Topics in meta-ethics or ethics. Prereq: 6 hours of philosophy or consent of instructor.

446 Theoretical Issues in Medical Ethics (3) Prereq: 240 or 345 or consent of instructor. (Same as Religious Studies 446.)

460 Philosophy of Science (3) Methodological and conceptual issues in the natural and social sciences: patterns of theory formation and replacement, the nature of explanation and causation, the status of theoretical entities. Prereq: 360 and one year of natural or social science, or consent of instructor.

465 Philosophy of History (3) Speculative and critical aspects of philosophy of history. Prereq: 6 hours of philosophy or consent of instructor.

473 Philosophy of Mind (3) Problems of mind and body in relation to consciousness and personal identity. Prereq: 6 hours of philosophy or consent of instructor.

475 Analytic Metaphysics and Epistemology (3) Topics in metaphysics and epistemology in recent Anglo-American tradition. Prereq: 6 hours of philosophy or consent of instructor.

476 Philosophy of Language (3) Survey of issues such as meaning, reference, and truth. Prereq: 6 hours of philosophy or consent of instructor.

479 Studies in Recent Continental Philosophy (3) Selected thinkers or topics from such areas as Existentialism, Phenomenology, Hermeneutics, Structuralism, Post-Structuralism, Feminism. Prereq: 6 hours of philosophy or consent of instructor. When content varies, may be repeated. Maximum 6 hours.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)

PHYSICAL EDUCATION

100 Orientation to Physical Education (2) Overview of the professional and disciplinary areas in physical education with special emphasis on introductory field experiences.

102 PE Major: Basketball (1) Fundamentals of basket ball, including individual and team skills with consideration of techniques for effective teaching of these fundamentals.

103 PE Major: Tennis (1) Development of skills, rules and game strategies to an intermediate level in tennis with application to the various techniques of teaching.

104 PE Education Major: GYMNASTICS (1) Beginning to intermediate skills in tumbling and on selected men’s and women’s gymnastics apparatus. Tumbling skills include forward, backward, and balance skills. Apparatus include vaulting, balance beam, and pommele horse. Special emphasis on teaching techniques, safety, progression, and spotting.
105 PE Major: Folk and Square Dance (1) Basic folk and square dance steps, patterns, and designs with emphasis on skill development, terminology, etiquette and teaching techniques.

106 PE Major: Track and Field (1) Basic skills of track and field with consideration of techniques for effective teaching.

271 PE Major: Soccer/Softball (1) Basic fundamentals, including individual and team skills with consideration of techniques for effective teaching.

272 PE Major: Volleyball (1) Elementary and intermediate volleyball skills, general rules, and strategy related to the game of volleyball with particular emphasis on teaching techniques and skill development.

273 PE Major: Golf (1) Fundamental skills, general rules, and strategies related to the game of golf with emphasis on skill development and teaching techniques.

274 Physical Education Major: Gymnastics II (1) Beginning to intermediate skills in tumbling and on selected men’s and women’s gymnastics apparatus. Tumbling skills will include twisting skills, kips, and combinations of previous skills. Apparatus will include uneven bars, horizontal bar, parallel bars, and still rings.

275 PE Major: Ballroom Dance (1) Basic ballroom dance patterns and designs, terminology and etiquette with application to the various techniques of teaching.

290 Human Motor Behavior (3) Theories and principles related to motor development. Includes physiological factors related to and/or affecting motor skill acquisition and performance. Prereq: At least sophomore standing.

291 Sport in American Society (3) For all university undergraduates on the study of sport in American society from a sociological perspective. (Same as Sociology 291.)

292 Field Studies I (3) Builds on observational techniques from Physical Education Orientation. Provides opportunities to lead, instruct, manage and test individuals and small groups in K-12 physical education settings. Includes peer teaching and video-taped analyses. Prereq: 100.

311 Coaching Football (1) Theoretical and practical application of various coaching techniques in football for the prospective secondary/college coach. Includes analysis and selection of appropriate equipment, rules, general conditioning and training programs, practice organization, player evaluation, scouting, individual and team offensive and defensive. Prereq: Consent of instructor.

312 Coaching of Basketball (1) Individual and team fundamentals for the high school coach; conditioning, schedule making, and other business arrangements. Prereq: Consent of instructor.

313 Coaching of Track and Field (1) Coaching methods and training techniques for various track and field events, including experience observing and working at meets and practices. Prereq: Consent of instructor.

314 Coaching of Gymnastics (1) Fundamentals used in the coaching and judging of competitive men’s and women’s gymnastics. Emphasis on the safety and spotting of competitive gymnastics skills. Prereq: Consent of instructor.

315 Coaching of Baseball/Softball (1) Theoretical and practical application of various coaching techniques in baseball/softball for the secondary/college coach. Topics include analysis and selection of appropriate game plans, specific conditioning and training programs, practice organization, player evaluation, scouting, individual and team offensive and defensive strategies. Prereq: Consent of instructor.

321 World History of Sport and Physical Education (2) Historical survey of the development of sport and physical education from ancient primitive to twentieth century civilization. Prereq: Admission to Teacher Education Program or progression to the major.

322 Fitness Activities (2) Methods of instructing and leading fitness activities, including jogging, dance, exercise to music, water activities, and fitness games. Prereq: At least junior standing and progression to the major.

325 Athletic Training Techniques (2) Prevention of athletic injuries through sound conditioning programs and practices; recognition and immediate treatment of injuries. Prereq: Progression to the major.

326 Practicum in Preschool Aquatics (2) Individualized planning and teaching of aquatic experiences to 3 to 5 year-old children within the context of a broad-based motor movement experience.

330 Wellness Through Health, Leisure, and Physical Activity (3) (Same as Health 330.)

332 Applied Anatomy (3) Structure and roles of bones, joints and muscles in human movement and exercise. Prereq: Junior standing and admission to Teacher Education Program or progression to the major.

355 Approaches to Physical Education for Children (3) Theories and practices of instruction and teaching/learning in the major. Prereq: Admission to Teacher Education Program.

356 Human Growth and Motor Development (3) Evolution of movement patterns in the context of structural and functional development, analysis of changes in motor performance and underlying attributes across the lifespan. Prereq: Admission to Teacher Education Program or progression to the major.

372 Philosophy of Sport and Physical Education (2) Theories of reality and value as they apply to sport with emphasis on ethical issues. Prereq: Admission to Teacher Education Program or progression to the major.

380 Special Topics (1-3) Study in selected disciplinary or professional areas of Physical Education. May be repeated. Prereq: Progression to the major.

391 Psychology of Coaching (2) Major topics and theories dealing with social-psychological factors affecting and relating to sport performance, with practical implications and applications to teaching and coaching. Prereq: Admission to Teacher Education Program or progression to the major.

405 Sociology of Sport (3) Social meaning, organization and process of sport. Difference between sport and play and the role of sport in society. Prereq: 291 or Sociology 292, and admission to Teacher Education Program.

406 Sociology of Sport (3) Social meaning, organization and process of sport. Difference between sport and play and the role of sport in society. Prereq: 291 or Sociology 292, and admission to Teacher Education Program.

407 Measurement and Evaluation of Physical Education (1) Relationship of measurement and evaluation in Physical Education. Prereq: Admission to Teacher Education Program.

409 Measurement and Evaluation of Physical Education (3) Techniques in measurement and evaluation of physical education programs. Prereq: 200, 292, and admission to Teacher Education Program or progression to the major.

410 Internship I: Grades K-12 (3-6) Methods and theories relevant to student needs with a physical education teacher, physical or occupational therapist, at a school for the handicapped. May be repeated. Maximum 4 hours.

411 Special Practicum in Adapted Physical Education (1) Clinical practicum for the prospective secondary/college instructor who is a high-educational risk and a section with experience relevant to and/or affecting motor skill acquisition and performance. Prereq: At least sophomore standing. May be repeated. Maximum 4 hours.

412 Practicum in Adapted Physical Education (1) Clinical practicum for the prospective secondary/college instructor who is a high-educational risk and a section with experience relevant to and/or affecting motor skill acquisition and performance. Prereq: At least sophomore standing. May be repeated. Maximum 4 hours.

415 Field Evaluation of Physical Fitness (1) Measurement and evaluation of cardiorespiratory function, body composition, and healthy low back. Emphasis on tests that can be used in large groups with a minimum of equipment. Prereq: Progression to the major. Coreq: 414. (Same as Health 415.)

416 Athletic Coaching Field Experience (1) Practical experience in coaching and related responsibilities. May be repeated. Maximum 2 hours. Prereq: Approval of instructor.

420 Methods in Physical Education (3) Application of theory and styles of teaching to teaching/learning environment including planning, presenting, and evaluating lessons concerning knowledge, skills, and strategies for physical activity. Prereq: Admission to Teacher Education Program.

422 Applied Kinesiology (3) Human movement with emphasis on biomechanical principles and their application to movement and neuromuscular fitness. Prereq: 322 and admission to Teacher Education Program or progression to the major.

423 Readings in Physical Education (2) Current and classic literature in physical education.

424 Program Planning in Physical Education (2) Curriculum principles, practices and issues specific to physical education with opportunities to develop and evaluate K-12 physical education programs. Prereq: Admission to Teacher Education Program.

426 Practicum for Physical Education Majors (1-10) Experiences in the community to support and clarify career goals. May be repeated. Maximum 10 hours. Prereq: Consent of instructor and progression to the major.

428 Administration of Physical Education and Athletics (2) Topics in co-operative administrative and management strategies as related to physical education programs and athletics in the public schools. Prereq: Admission to Teacher Education Program or progression to the major.

450 Field Studies II (3) For physical education majors to design and implement learning units and evaluation techniques appropriate for K-12 physical education settings. Includes video-taping of learning experiences in the school setting. Prereq: 292 or 466 and admission to Teacher Education Program.

469 Motor Development Laboratory: Preschool or Primary (3) Application of selected perceptual-motor development, movement education, and pedagogical concepts to performance assessment and motor task/lesson design and presentation to normally developing preschool or primary grade children. Participation in intra- or inter-disciplinary research projects. Prereq: 100 and admission to Teacher Education Program.

481 Internship I: Grades K-12 (3-6) Methods and theories relevant to student needs with a physical education teacher, physical or occupational therapist, at a school for the handicapped. Prereq: Admission to Teacher Education Program. Prereq: 410 and admission to Teacher Education Program. Satisfactory/No Credit only. F

482 Internship II: Grades K-12 (3-6) Demonstration of professional competence in planning, instruction, and classroom management. Internship is completed in local public schools. Prereq: Admission to Teacher Education Program. Satisfactory/No Credit only. Sp
PHYSICAL EDUCATION SERVICE PROGRAM

200 Special Topics (2)
201 ARC WSI-Handicapped (1)
202 Badminton (1)
203 Elementary Ballet I (2)
204 Elementary Ballet II (2)
205 Basketball (1)
206 Bowling (1)
209 Flag Football (1)
210 Folk and Square Dance (1)
211 Golf (1)
212 Handball (1)
213 Ice Skating (1)
214 Elementary Jazz I (2)
215 Elementary Jazz II (2)
216 Martial Arts: (Special Topics) (1)
219 Coed Gymnastics: Men's Apparatus (1)
220 Elementary Modern Dance I (2)
221 Elementary Modern Dance II (2)
222 Paddleball (1)
223 Personal Safety and Self-Defense (1)
224 Physical Fitness: Conditioning (1)
225 Physical Fitness: Exercise and Weight Control (1)
226 Physical Fitness: Exercise and Weight Control (2)
227 Physical Fitness: Exercise and Weight Control (1)
229 Physical Fitness: Joggling (1)
230 Physical Fitness: Swimming (1)
231 Physical Fitness: Walking (1)
232 Racquetball I (1)
233 Racquetball II (1)
234 Soccer (1)
235 Social Dance (1)
236 Softball (1)
239 Swimming I: Elementary (1)
240 Swimming II: Lifesaving (1)
241 Swimming III: WSI (1)
242 Tap Dance I (2)
243 Tap Dance II (2)
244 Tennis I (1)
245 Tennis II (1)
246 Track and Field (1)
249 Tumbling I (1)
250 Tumbling II (1)
251 Volleyball (1)
252 Weight Training (1)
253 Coed Gymnastics: Women's Apparatus (1)

254 Yoga and Relaxation (1)

PHYSICS

121-122 Introductory Physics (3,3) For students whose major is outside the physical sciences. Concepts of physics developed by observation of phenomena and logic, using a minimum of mathematical analysis. 121- Description of motion, forces, energy and momentum, properties of matter. 122-Electricity, magnetism, light, topics from modern physics including properties of atoms and nuclei. Must be taken in sequence. Prereq: Coreq: Mathematics 141-142. 3 hours lecture including demonstration lab. Prereq: Algebra.

131-132 Fundamentals of Physics: Mechanics and Heat (4,4) For engineers and liberal arts majors in mathematics and the physical sciences. Basic Engineering 121-131 is equivalent course for engineers. Must be taken in sequence. Coreq: Mathematics 141-142. 3 hours lecture, 2 hours lab.

137-138 Honors: Fundamentals of Physics: Mechanics and Heat (4,4) Honors for physics and engineering physics majors and qualified students from other disciplines. Must be taken in sequence. Coreq: Mathematics 141-142. 3 hours lecture, 2 hours lab.

141-142 Nature of the Physical World (3,3) Concepts, vocabulary, and principles of physics to establish a unified picture of the physical universe. 141-Principles of mechanics, electricity, and wave motion are developed and applied to fields such as solar systems, atomic and molecular behavior, radiation, dynamic changes in atmospheres and in earth's crust. 142-Principles applied to topics such as stellar and galactic phenomena, nuclear energy, cosmology, atmospheric and oceanic phenomena, drifting continents, and science and society. Must be taken in sequence. 3 hours lecture including demonstration lab.

145 Physics of Athletic Activity (3) Principles of physics, particularly mechanics and energy with emphasis on their role in physical activities, particularly sports-related. Topics include statics, equilibrium, linear and angular motion, momentum, force, work, and energy. 3 hours lecture and demonstration.

151-152 Elements of Physics for Computer Scientists (4,4) For students majoring in computer science. Principles of mechanics, heat and thermodynamics, wave motion and sound, electricity and magnetism, light, relativity, and modern physics. Must be taken in sequence. Coreq: Mathematics 141-142. 3 hours lecture, 2 hours lab.

181 Physics of Music (3) Production, transmission, and reception of sound waves. Frequency, intensity, pitch, timbre. Basic acoustics of instruments and voice. 3 hours lecture and demonstration.

221-222 Elements of Physics (4,4) Basic physical principles and applications required in pre-medical, pre-dental, pre-pharmacy and pre-veterinary programs. 221-Mechanics, heat, wave motion, and optics. 222-Electricity and magnetism, modern physics. Must be taken in sequence. 3 hours lecture, 3 hours lab. Prereq: Mathematics 121-122 or 141-142 or 151-152.

231 Fundamentals of Physics: Electricity and Magnetism (3) For engineers and liberal arts majors in mathematics and the physical sciences. Required of all engineering students. Prereq: 131-132 or Basic Engineering 121-131. Coreq: Mathematics 231. 2 hours lecture, 3 hours lab/recitation.

232 Fundamentals of Physics: Wave Motion, Optics, and Modern Physics (4) Continuation of 231, required of all engineering students. Prereq. 231. Coreq: Mathematics 241. 3 hours lecture, 3 hours lab/recitation.

237 Honors: Electricity and Magnetism and Light (4) Honors course for selected students admitted on basis of performance in 131-132, 137-138 or Basic Engineering 131-132. Coreq: Mathematics 231. 3 hours lecture, 3 hours lab.

238 Honors: Wave Motion and Modern Physics (4) Honors course for selected students. Continuation of 237. Prereq: 237. Coreq: Mathematics 241. 3 hours lecture, 3 hours lab/recitation.

241 Background of Physics (2) Historical development and philosophical foundations of natural science. Classical theories of gravitation, electromagnetism, and relativity. Unifying mathematical principles underlying physical applications. Readings from important original papers, thought-provoking problems and order-of-magnitude calculations combining different fields of classical physics. Written report on independent study. Prereq: Senior standing in Physics or consent of instructor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

401 Forefront of Physics (2) Modern developments in physics: various forms of quantum mechanics, quantum electrodynamics and recent theories of particles, fields and their interactions. Interpretation of physics, experiments of current interest, readings in recent literature, and applications in other fields. Final oral report and term paper. Prereq: 401 or consent of instructor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.


421 Modern Optics (4) Transmission of light in uniform, isotropic media, reflection and transmission at interfaces; mathematics of wave motion and interference effects. Rudiments of Fourier optics and holography. Prereq: 421 or 232 and consent of instructor. 3 hours lecture, 3 hours lab.

425 Principles of Non-Destructive Testing (3) (Same as Engineering Science and Mechanics 425.)


PLANT AND SOIL SCIENCE

210 Introduction to Soil Science (4) Differences in soils; soil genesis; physical, chemical, and biological properties of soil; relation of soils to land use and pollution; soil management relative to tillage, erosion, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Prereq: Chemistry 130 or equivalent. 3 hours and 1 lab. F

230 Introduction to Crop Science (3) Fundamentals of structure, classification, growth and reproduction of important food plants and their production habits. Prereq: Botany 110, 120 or Biology 110, 120. F

282 Soil Morphology (1) Intensive course involving describing, classifying and interpreting soils in preparation for regional and national soil judging contests. Prereq: 210 and consent of instructor. May be repeated. Maximum 4 hours. 1 hour and 1 lab. F, Sp

311 Soil Fertility (3) Influence of soil properties on plant nutrient availability and uptake. Principles of fertilizer use and their reaction in soils. Prereq: 210, 2 hours and 1 lab. Sp

312 Soil and Water Conservation (3) Principles, practices and control of soil erosion by water and wind; farms and towns in a changing atmosphere; minimum and no-tillage farming; forest management; soil-water-plant relationships. Prevention of soil, water, and air contamination in agriculture. Prereq: 210. 2 hours and 1 lab. Sp

331 Field and Forage Crops (3) Agronomic principles of crop production and management. Crop improvement, crop rotation in systems, tillage, fertilization, pest management, harvest and utilization of major field and forage crops. Prereq: 210 or 230. 2 hours and 1 lab. Sp

332 Fruit Crops (3) Fundamentals of site selection. Fruit propagation, tree training, pest control and related management factors for deciduous fruit crops will be emphasized. Prereq: 230. 2 hours and 1 lab. F-A

333 Vegetable Crops (3) Characteristics, economic importance, influence of soil properties on production of vegetables for fresh and processing markets with emphasis on both warm and cool season crops. Prereq: 210 or 290. 2 hours and 1 lab. Sp-A

342 Weed Management (3) Principles of weed interference, integration, management, herbicide selection, use and behavior; specific recommendations for various crop and non-crop situations. Prereq: 210. 2 hours and 1 lab. F-A

392 Practicum in Agriculture (2-4) Working with agricultural-related enterprises in area of student's career interest. May not be used as 300-level prerequisite for any course in Plant and Soil Science. Prereq: Consent of advisor and faculty committee.

426 Crop Physiology and Ecology (3) Principles and methods of growing selected crop plants. Structure, use, mode of action, degradation and the soil ecosystem; microbial transformations of residues; dynamics of soil organic matter. Prereq: 210 and Biochemistry 311 or consent of instructor. F

431 Crop Physiology and Ecology (3) Plant physiology and ecology applied to crop production. Effects of environmental factors on physiological processes. Prereq: 230, Botany 321. 2 hours and 1 lab. F-A

432 Agricultural Climatology (3) Interactions between world, regional and local climates and agricultural systems; quantification of macro- and micro-climates, effects of macro- and micro-climatic factors on plant and animal distributions and productivity. Prereq: One year of physical or biological science, junior standing. 2 hours and 1 lab. F-A

433 Agricultural Pesticides (3) Regulation of pesticide development, manufacture, transportation, marketing and use. Structure, use, mode of action, degradation and environmental impact of pesticides used in agriculture, forestry and related areas. Prereq: 1 year biological sciences and 1 semester chemistry. 2 hours and 1 lab. Sp

453 Principles of Plant Breeding (3) Genetic principles and techniques used in crop improvement. Prereq: Biology 220 or equivalent. 2 hours and 1 lab. Sp

471 Statistics for Biological Research (3) Notation, descriptive statistics, probability, distributions, confidence intervals, student's t and chi-square tests, analysis of variance, mean separation procedures, linear regression and correlation. Prereq: Math 121 or equivalent. 3 hours and 1 rec. F

493 Problems in Plant and Soil Science (1-3) Special research in plant and soil science. May be repeated. Maximum 6 hours. E

POLITICAL SCIENCE


102 Introduction to Political Science (3) Analysis of politics and political systems in various countries.

107 Honors: United States Government and Politics (3) Analysis and exploration of the American political system for students with superior ability. Admission by permission of department for students with at least a B average; entering freshmen accepted on basis of strong placement scores and high school record.

301 Introduction to Political Analysis (3) Nature, character, and functions of research design, data collection, and statistical techniques used in the study of politics.

310 Political Community (3) Examination of a variety of value systems and social and political structures related to political community.

311 Contemporary Issues in American Public Policy (3) Selected public policy issues confronting the nation, including the background, nature, and effects of present policies, and options for the future. Writing- emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

312 Popular Culture and American Politics (3) Popular culture related to American politics and government focusing on the role of film, television, fiction, music, drama, art and sports. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

315 Tennessee Government and Politics (3) Major elements in Tennessee government and politics.

320 State Government and Politics (3) Setting, institutions, and processes of government in the fifty states; generalizations and comparisons, with emphasis on federalism and inter-governmental relations.

321 Urban Politics and Process (3) Development of policies and policy-making in the Modern American city. (Same as Urban Studies 430.)

322 Minority Group Politics in the United States (3) Content varies. May be repeated with the consent of the department. Maximum 6 hours. (Same as Afro-American Studies 322.)

330 Law in American Society (3) Law as a process through which social problems are addressed in the United States. Examples from case law, legislation, and administrative regulation. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

331 Judicial Process (3) Courts as components of political systems, and public policy formulation through judicial decision making.

340 Introduction to Public Administration and Public Policy (3) Public agencies, their organization, personnel, and financial management and administrative responsibility; the policy-making process, political environment.

350 Political Change in Developing Areas (3) Characteristics and problems of political changes with primary focus on developing areas. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

355 Latin American Government and Politics I (3) Introduction to contemporary governmental systems in Latin America. (Same as Latin American Studies 355.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

361 Politics in Western Democracies (3) Political culture patterns, and institutions of Western democratic systems. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

365 Introduction to International Relations (3) Resource availability, international economics, international security and peace (imperialism, war, diplomacy, the balance...
of power, international law and international organization.)

Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

366 United States Foreign Policy Process (3) Processes whereby United States foreign policies are made and implemented, focusing on interaction within federal bureaucracy and roles of the President, Congress, the courts, and public opinion.

370 Contemporary International Problems (3) Analysis of current international events.

374 American Political Thought (2) Major themes and ideas in American political thought related to the development of American political institutions, values, and competencies. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

387-388 Junior Honors Seminar (3,3) Required of honors majors; admission with consent of department.

410 Special Topics in United States Government and Politics (3) May be repeated with consent of department. Maximum 6 hours.


420 Political Attitudes and Opinions (3) Nature, formation, development, and dissemination of politically relevant attitudes and opinions in the American political system.

421 Political Parties and Interest Groups (3) Role of political parties and organized groups in American politics and government.

422 Political Campaigns and Elections (3) Nature of campaigns and elections in the American political process.

430 United States Constitutional Law: Sources of Power and Restraint (2) Judicial review, constitutional powers of President and Congress, federalism, sources of regulatory authority, and constitutional protection of political and economic rights.

431 United States Constitutional Law: Civil Rights and Liberties (3) Current issues in civil rights and liberties including: first amendment freedoms, equal protection, privacy and the rights of the accused.

440 Public Management and Human Resources (3) How to mobilize and manage technical and human resources in pursuit of public sector organization goals.

441 Budgetary Process and Financial Management (3) Fiscal planning, budget and expenditure processes in government, their policy and administrative implications.

442 Administrative Law (3) Legal dimensions of administrative power and procedures, and constitutional controls over administrators.

452 Black African Politics (3) Recent evolution and current political environment of Black African nations. (Same as Afro-American Studies 452.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

454 Government and Politics of China and Japan (3) Political systems, structure, processes, and policies in China and Japan. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classrooms.

455 Latin American Government and Politics II (3) Selected topics on Latin American political dynamics, including consideration of leading theoretical explanations. (Same as Latin American Studies 455.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

459 Government and Politics of the Soviet Union (2) Origins and development of the Soviet political system, and selected policy areas. (Same as Russian and East European Studies 459.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

460 Revolution (3) Characteristics, theories, and consequences of revolution with particular focus on left-wing revolutions and movements.

461 Policy Making in Democracies (3) Comparative approach to theory and process of making public policies in democracies.

463 Contemporary Middle East Politics (3) Governments and movements in the Middle East, their characteristics, bases, and interrelationships.

464 Special Topics in Comparative Government (3) May be repeated with consent of department. Maximum 6 hours.

469 Soviet Foreign Policy (3) Soviet international behavior since 1917 and selected problems of Soviet foreign policy post World War II. (Same as Russian and East European Studies 469.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

470 International Law (3) Nature and development of international law and compliance with it. Particular attention to function of international law in the context of international conflict.

475 Ancient and Medieval Political Thought (3) Major western political thinkers from Socrates to Marsilio of Padua. (Same as Medieval Studies 475.)

476 Modern Political Thought (3) Major western political thinkers from Machiavelli to Marx.

487-488 Senior Honors Thesis and Seminar (0-6) Required of honors majors; admission with consent of department. Students register for zero hours credit fall semester and six hours credit in spring semester. Credit is granted on completion of thesis.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)

PORTUGUESE

111-112 Elementary Portuguese (3,3) Introduction to Portuguese. May not be taken for credit by students with two years of high school or one year college Portuguese. Must be taken in sequence. Language Laboratory required.

211-212 Intermediate Portuguese (3,3) Stresses reading, writing, listening, and speaking of Portuguese to prepare for upper division courses in the language. Must be taken in sequence. Language Laboratory required.

300 Portuguese for Spanish Speakers (3) Accelerated class for beginning students of Portuguese with a strong background in another Romance language. Introduction to grammar, reading, and culture of Portugal and Brazil. Prereq: 3 hours at 300 level in another Romance language or equivalent.

311 Aspects of Luso-Brazilian Literature (3) Luso-Brazilian literature, with emphasis on contemporary works. Genres may vary. Prereq: 212 or equivalent. (Same as Latin American Studies 311.)

322 Conversation and Composition (3) Development of speaking, listening and writing skills in Portuguese; some review of grammar. Prereq: 212 or 300 equivalent.

341-432 Directed Readings in Brazilian and Portuguese Literature (3,3) May be repeated with consent of instructor. (Same as Latin American Studies 431-432.)

491 Foreign Study (1-15)

PSYCHOLOGY

110 General Psychology (3) Introduction to primary approaches to the study of human behavior and experience.

117 Honors: General Psychology (3) Enriched introduction with extra readings. Prereq: Consent of instructor.

210 Biological Basis of Behavior (3) Survey of theories and research concerning the role of genetic factors, nervous and endocrine systems, and other biological influences on behavior. Recommended: 110 or equivalent.

220 Behavior and Experience: Humanistic Psychology (3) Behavioral and phenomenological analysis of individuals and their development in natural environments.

300 Child Psychology (3) The normal child from conception through infancy, childhood, and adolescence. Physical, cognitive, social, and emotional development. Prereq: 110 or equivalent and 200 or 210.

310 Learning and Thinking (3) Survey of theory and findings of research concerning both humans and nonhumans. Prereq: 110 or equivalent. Recommended: 210, 220.

320 Motivation (3) Survey of theories and related research; discussion of applications. Prereq: 110 or equivalent. Recommended: 210, 220.


359 Laboratory in Human Relations (3) Interpersonal relations and communication techniques and experiences in small groups. Prereq: 110 or equivalent, and consent of instructor. May be repeated. Maximum 6 hours.

360 Social Psychology (3) Theories, methods, and findings of research concerning individual behavior in a social context. Prereq: 110 or equivalent.

370 Ethology and Sociobiology (3) Basic concepts in the evolutionary approach to behavior, including applications to psychology, the social sciences, and the arts. (Same as Zoology 370.)

382 Contemporary Topics in Psychology (3) Current issue or problem, such as architectural psychology, impact of technology, artificial intelligence, or stereo-types. Different topic each semester. Prereq: 110 or equivalent. May be repeated. Maximum 9 hours.

385 Statistics in Psychology (3) Descriptive statistics; logic of hypothesis-testing and statistical inference. Basic parametric and non-parametric tests. Prereq: Mathematics 110. Not open to students with credit in Mathematics 115, Statistics 201, or equivalent.

395 Methods of Research in Psychology (3) Fundamentals in the design, conduct, and interpretation of research, including systematic observation, experiments, quasi-experiments, and program-evaluations. Focus on both laboratory and natural settings. Prereq: 110 or equivalent.

396 Laboratory in Psychology (2-3) Introduction to techniques used in the laboratory to study different topics is psychology, such as perception, memory, learning, and social behavior. Supervised experience in the use of laboratory techniques, collection and interpretation of data. Different topic each semester. Prereq: 110 or equivalent, 210, 220, 385, 395. May be repeated. Maximum 9 hours.

399 Supervised Research and Field Work (1-3) Field experience in community-based research and service placements. Prereq: 110 or equivalent, 210, 220, 385, 395. May be repeated. Maximum 12 hours in 399, 489, 491, 492, and 493 combined may be applied toward the major.


409 Group Facilitation (3) Study of theory and techniques for group facilitation in small groups. Prereq: 359 and consent of instructor. May be repeated. Maximum 6 hours.

Courses of Instruction


304 Psychology and the Law (3) Psychological aspects of the legal system. Emphasis on legal maintenance, upper-division standing and consent of instructor.

306 Health Psychology (3) Psychological factors related to health and illness, including stress, personality, and environment. Applications of psychological treatment to physical illness. Prereq: 110 or equivalent, 210.

304 Psychology of Gender (3) Biological, psychological, and social factors in gender. Importance of gender roles and stereotypes for behavior and experience. Prereq: 110 or equivalent, 210, 220. (Same as Women's Studies 434.)

400 Organization Psychology (3) Social-psychological analysis of organizations, emphasizing role-theory and systems theory. Prereq: 360. (Same as Management 440.)


450 Comparative Animal Behavior (3) (Same as Zoology 450.)

459 Comparative Animal Behavior Laboratory (3) Coreq: 450. (Same as Zoology 458.)

461 Physiology Psychology (3) Nervous system and physiological correlates of behavior. Biological basis of emotion, learning, memory and stress. Prereq: 110 or equivalent, 210, and one year of Biology or Zoology introductory sequences or equivalents.

469 Laboratory in Physiological Psychology (3) Laboratory studies of nervous system and physiological correlates of behavior. Coreq: 461.

470 Theories of Personality (3) Major theories of human personality and their development. Prereq: 220 and 300 or 330.

480 Theories of Learning (3) Classical and current approaches to learning and cognition. Prereq: 310.

482 Topics in Psychology (3) Intensive analysis of special topics, such as Afro-American Psychology or evaluation of programs in the community. Prereq: 110 or equivalent. Recommended: 210, 220, 385, 395. May be repeated. Maximum 6 hours.

489 Supervised Research (1-9) Prereq: Consent of instructor. May be repeated. Maximum 12 hours in 399, 489, 491, 492, and 493 combined may be applied toward the major.

491 Foreign Study (1-15) Prereq: Consent of instructor. May be repeated. Maximum 12 hours in 399, 489, 491, 492, and 493 combined may be applied toward the major.

492 Off-Campus Study (1-15) Prereq: Consent of instructor. May be repeated. Maximum 12 hours in 399, 489, 491, 492, and 493 combined may be applied toward the major.

493 Independent Study (1-15) Prereq: Consent of instructor. May be repeated. Maximum 12 hours in 399, 489, 491, 492, and 493 combined may be applied toward the major.

496 Seminar: Great Ideas in Psychology (3) Key ideas that have shaped conceptions of human-kind. Exploration of historical development, scientific evaluation, and social context. Prereq: Consent of instructor and senior standing. Writing-essmship course: at least one in-class essay examination and 3000 words of writing outside the classroom.

PUBLIC HEALTH

300 Introduction to Public Health (3) Aspects of public health including discussion of contemporary and controversial issues. E

305 Communicable and Noncommunicable Diseases (3) Modern concepts of diseases; etiology of common communicable and chronic disease problems including prevention and control. Prereq: 1 year of biological science or consent of instructor. F, Sp

310 Environmental Management and Control (3) Conventional principles of control of disease-producing agents in our environment. Emphasizes concepts for effective application of control principles to vocational endeavors and/or daily living activities. Includes: Drinking water quality (chemical, physical and biological), waste management (solid, liquid, and hazardous), vector control, safe food management, recreational sanitation and safety to include pool management, shelter hygiene (homes, child care, schools, hospitals, etc.), occupational health and safety. F, Sp

400 Consumer Health (3) (Same as Health 400.)

410 Health in the Work Environment (3) Fundamental activities involved in field of industrial health aimed at reducing health problems for employees. Emphasis on workplace health hazards and problems of concern to nurses, medical staff, management, engineers and others involved in industrial health and safety fields. Prereq: Consent of instructor. May not be taken for credit by occupational health concentration (MPH) majors. F, Sp

480 Special Topics (3) Instructional or research topics to be assigned. Prereq: Consent of instructor. May be repeated under different topick. Maximum 6 hours. F, Sp

493 Directed Independent Study (1-3) Individual study of selected issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hours. E

RECREATION AND LEISURE STUDIES

110 Foundations for Leisure Studies and Services (3) Focuses on understanding concepts, principles, and practices relevant to providing leisure service including philosophy, history and theory, programming, economics, leadership, and a survey of leisure services organizations and occupational opportunities. F, Sp

210 Dynamics of Recreation Leadership (3) Theories, practices and concepts as they apply to all roles of recreation leadership. F

220 Introduction to Therapies and Medical Terminology (1) Responsibilities of recreation, occupational, physical, horticulture, art, and music therapists. Basic terminology used in medical environment. Sp

250 Specialized Study in Leisure Education (1-3) Focus on developing positive attitudes toward leisure. Concepts for leisure and physical health. Creative Cooking, Bike Hikes, New Games. E

290 Field Practice (1-2) Supervised practice in approved agency offering leisure services. Each hour's credit requires 25 hours of work in field agency. For recreation students only. Prereq: Permission of instructor. E

310 Leisure Program Development and Evaluation (3) Essentials and basic principles involved in organization, administration, marketing, evaluation of various types of recreation programs with emphasis on development of program objectives, practical and comprehensive designs and evaluation for population and facility within student's particular area of interest. Prereq: 210 or consent of instructor. Sp 320 Analysis of Leisure and Special Populations (3) Principles, concepts, historical development of recreation, therapeutic recreation, and leisure services to special populations. Explanation of legislation, attitudes, barriers to participants, mainstreaming, advocacy, as related to leisure fulfillment. Prereq: 220 or consent of instructor. F

390 Field Practice (1-2) Supervised practice in approved agency offering leisure services. Each hour's credit requires 25 hours of work in field agency. For recreation majors only. Prereq: 290 and permission of instructor. E

410 Maintenance and Management of Recreation and Sports Related Facilities (3) Principles for operationalizing modern facility maintenance systems and management of recreation and sports related facilities and settings. Cost tracking, inventory systems, specialized maintenance techniques, safety guidelines, security. Prereq: 110, 310 or consent of instructor. F

420 Principles of Therapeutic Recreation (3) Principles and practices in therapeutic recreation including activity analysis, activity and program selection adaptation, individual assessment, diagnosis on occupational health and safety. Prereq: 310 or consent of instructor. F

430 Organization and Administration of Leisure Service (3) Principles of administration applied to provision of leisure service offered by public, private and/or commercial enterprises. Organizational structures, personnel management, evaluation, legal authority, introduction to budgeting and fiscal procedures. Prereq: 310 or consent of instructor. F

440 Dimensions of Private and Commercial Recreation Businesses (3) Nature and function of recreation in private, commercial, and industrial settings. Development and management of commercial goods and services offered in leisure market, factors influencing participation, management considerations, and impact in commercial recreation and tourism. Prereq: 110, junior standing or consent of instructor. F

450 Specialized Study in Leisure Education (1-6) Special interest leisure activities for developing positive attitudes toward leisure. Contribution of leisure to mental and physical health. May be repeated. Maximum 8 hours. E

490 Practicum in Recreation (12) Full time practice in approved recreation agency. Emphasis on supervisory and administrative procedures. Prereq: 290, 390, senior standing. Satisfactory/No Credit Only. E

RELIGIOUS STUDIES

101 World Religions in History (3) Introduction to religion in culture and society, including examination of religious traditions from China, India, and the Mediterranean world. Writing-essmship course: at least one in-class essay examination and 3000 words of writing outside the classroom.

102 The Comparison of World Religions (3) Intro- duction to religion in culture and society, focusing on cross-cultural interpretation and the treatment of common problems and themes within religious tradi- tions. Writing-essmship course: at least one in-class essay examination and 3000 words of writing outside the classroom.

211 Ways of Understanding Religion (3) Sources and methods used in the study of religion and religious belief. Writing-essmship course: at least one in-class essay examination and 3000 words of writing outside the classroom.

212 Criticism of Religion (3) Classical and contempo- rary forms of criticism of western religious thought as in the work of Marx, Freud, Nietzsche, and current feminist and liberal movement writers. Writing-essmship course: at least one in-class essay examination and 3000 words of writing outside the classroom.

232 Varieties of Religious Community (3) How different forms of religious communities (civts, tribes, sects, monastic orders, denominations, families, etc.) have sought to reject, reinforce, transform, ignore, or dominate their culture and society. (Same as Sociology 232.)

235 Issues in Religious Studies (1-3) Introduction to the study of religion through selected themes, problems, controversies, or contemporary issues. Variable content. May be repeated. Maximum 6 hours.

301 Religious Myth, Symbol, and Ritual (3) Distinc- tive models of religious thought. Examines theo- retical approaches appropriate to their particular social and cultural functions in religions.
302 Religion of Primitive Peoples (3) Religions of selected non-literate peoples. Role of religion in their social and cultural systems. (Same as Anthropology 302.)

305 Contemporary Religious Thought (3) Major themes, issues, and thinkers in twentieth century religion.

309-310 Elementary Classical Hebrew (3,3) Basic elements of Hebrew phonology, script, morphology and syntax. Introduction to basic elements of text, form, and literary criticism.

311 Ancient Hebraic Religious Traditions (3) Development of ancient Israelite and early Jewish traditions with attention to relationships concerning the Exodus, Davidic kingship, and Zion in historical, prophetic and apocalyptic material. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

312 Religious Aspects of Biblical and Classical Literature (3) Ways in which contemporary modes of literary study enhance appreciation of biblical and classical material. Ways in which the western liturgical tradition has appropriated and recast the biblical and classical heritage. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

313 Religious Aspects of Modern Literature (3) Issues raised for religious inquiry in contemporary literature. Literature of religious and moral considerations to problems of literary analysis; relation between religious language and forms of human expression (symbol, metaphor, myth) studied in study of literature. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

315 Reformation Europe, 1500-1650 (3) (Same as History 315.)

316 Topics in Religion and Literature (3) Selected themes that suggest points of intersection between literary art and the religious imagination. Variable content. May be repeated. Maximum 6 hours.

319 Sociology of Religion (3) (Same as Sociology 319.)

321 New Testament Origins (3) Influence of pre-Christian Judaism and Greek culture and philosophy on early Christianity. Motivations and guiding concepts which led to the formation of the New Testament. Victory of the Christian Church over the forces of persecution and the Constantantine settlement (311 A.D.). (Same as History 321.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

322 Christian Thought (3) Principal forms of Christian thought and institutions through the interpretation of representative thinkers and movements from Augustine to D. H. Lawrence. Kant. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

326 Images of Jesus (3) Major portrayals of Jesus Christ from the first century to the twentieth within the context of the cultural milieu which gave birth to each. Extensive use of slides, video material, recordings, and literature.

329-330 Intermediate Classical Hebrew (3,3) 329-Readings in narrative material from the Hebrew Bible. 330-Readings in poetic and prophetic material from the Hebrew Bible. Prereq: 329 or consent of instructor.

331 Judaism (3) Comprehensive introduction to the historic traditions, culture, and religious institutions of Judaism, and interactions with modern culture.

332 Islam (3) Comprehensive introduction to the origin and early history of Islam, rapid spread as a missionary religion, development of theology and culture, and interactions with modern culture. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

342 Religious Ethics (2) Selected ethical theories and moral perspectives of religious communities and thinkers, their action-guides for individuals and institutions, their application to persons and social problems.

344 Professional Responsibility (3) (Same as Philosophy 344.)

345 Medical Ethics (3) (Same as Philosophy 345.)

351 Introduction to United States Religious History (3) Religious thought, institutions, and movements in the United States, formation of denominations, church and state, American theology, non-protestant traditions, African American religion. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

352 Afro-American Religion in United States (3) Historical and critical examination of formation and development of Afro-American religious thought and institutions in America. (Same as Afro-American Studies 352.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

353 Topics in Afro-American Religion (3) Selected figures, themes, movements, or problems in the Afro-American religious tradition. Variable content. May be repeated. Maximum 6 hours.

356 Religion and Culture in the United States (3) Selected figures, movements, and problems in American religious life, thought, and culture from pre-colonial period to present. Prereq: 351 or consent of instructor. May be repeated. Maximum 6 hours. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

360 Philosophy of Religion (3) (Same as Philosophy 360.)

361 Eastern Religions and Western Thought (3) Comparative study of selected movements, thinkers, and practices of religious traditions, Asian and Western. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

370 Philosophy and Religion in India (3) Survey of the development of the major non-Buddhist themes of philosophic and religious thought in India. (Same as Philosophy 370.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

374 Philosophy and Religion in India (3) Survey of the development of the major non-Buddhist themes of philosophic and religious thought in India. (Same as Philosophy 374.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

376 Buddhist Philosophy and Religion (3) Survey of the origins of Buddhism in India and further development of Buddhist philosophy and religion in India, China, Korea, Japan, the countries of Southeast Asia, and beyond. (Same as Philosophy 376.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

379 Religion and Philosophy in China (3) Traditional thought and religion of China in its cultural setting as basis for understanding modern China. (Same as Philosophy 379.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

383 Religion in Japan (3) Traditional religious heritage and contemporary expressions of religion in Japan with attention to questions of persons to nature, self-mastery and spontaneity, individual and community and secular to sacred. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

384 Zen Buddhism (3) Historical, philosophical, and meditational aspects of Zen. Special emphasis on motifs of emptiness, no-mind, and enlightenment and on practices of meditation and the use of the koan. Recommended Prereq: One or more of the following: 376, 379, 383.

388 Literature of the English Bible (3) (Same as English 388.)
ogy spreads from scientists to change agents and then to laypersons, influence-decision process; commu-
nication behavior, mass media, role of professional change agents, opinion leadership and conse-
quencies of technological change. Prereq: 300 or consent of instructor. (Same as Sociology 480.)

RUSSIAN
101-102 Elementary Russian (4,4) Must be taken in sequence.
201-202 Intermediate Russian (4,4) Must be taken in sequence.
221-222 Russian Literature in English Translation (3,3) Nineteenth and twentieth-century Russian liter-
ature. No foreign language credit. Writing-emphasis courses: at least one in-class essay examination and 3000 words of writing outside the classroom.
226 Russian Philosophical and Theological Thought (3) Development of philosophical and theological thought in Russia from the Middle Ages to the Revolution. Emphasis on expression of this thought in Russian literature and literary criticism. No knowledge of Russian required.
301-302 Introduction to Russian Literature (3,3) Russian poetry, short stories, and short novels. Prereq: 202. Need not be taken in sequence. (Same as Russian and East European Studies 301-302.)
311-312 Russian Composition and Conversation (3,3) Practice in writing and speaking; grammar review and vocabulary building. Prereq: Completion of 226.
321 Works of Dostoevsky in English Translation (3) Crime and Punishment, Brothers Karamazov, and other works. (Same as Russian and East European Studies 321.)
322 Works of Tolstoy in English Translation (3) War and Peace, Anna Karenina, and other works. (Same as Russian and East European Studies 322.)
326 Special Topics in Russian Literature in English Translation (3) Topics vary and are announced in advance. Student suggestions for topics are wel-
come. No foreign language credit. May be repeated once. (Same as Russian and East European Studies 326.)
371-372 Background and Main Currents of Russian Culture (3,3) Interdisciplinary approach to the appreciation of the language, religion, litera-
ture, art, music, history, geography, and social problems of Russia. No knowledge of Russian required. Writing-
emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.
401-402 Advanced Grammar, Conversation and Com-
position (3,3) Prereq: 312 or equivalent. (Same as Russian and East European Studies 401-402.)
425 Introduction to Descriptive Linguistics (3) (Same as German 425, French 425, Spanish 425 and Lin-
guistics 425.)
426 Introduction to Historical and Comparative Linguistics (3) (Same as German 426, French 426, Spanish 426 and Linguistics 426.)
451-452 Senior Seminar (3,3) For majors in Russian; minors admitted at the discretion of the instructor. Intensive study of language, literary style, and literary criticism based on selected major novels. (Same as Russian and East European Studies 451-452.)
491 Foreign Study (1-15)
493 Independent Study (1-15)

RUSSIAN AND EAST EUROPEAN STUDIES
301-302 Introduction to Russian Literature (3,3) (Same as Russian 301-302.)
321 Works of Dostoevsky in English Translation (3) (Same as Russian 321.)
322 Works of Tolstoy in English Translation (3) (Same as Russian 322.)
326 Special Topics in Russian Literature in English Translation (3) (Same as Russian 326.)
340-341 History of Russia (3,3) (Same as History 340-341.)
375 Geography of the Soviet Union (3) (Same as Geography 375.)
393 Marxism (3) (Same as Philosophy 393.)
401-402 Advanced Russian Grammar, Conversation and Composition (3,3) (Same as Russian 401-402.)
410 Selected Topics in Russian and East European Studies (3) Interdisciplinary seminar on a selected topic using a comparative approach; Requires research using Russian language sources, regardless of coun-
try, and a paper of 25-30 pages. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.
451-452 Senior Seminar (3,3) (Same as Russian 451-452)
459 Government and Politics of the Soviet Union (3) (Same as Political Science 459.)
469 Soviet Foreign Policy (3) (Same as Political Sci-
ence 469.)

SAFETY
400 Directed Independent Study (1-3) Individual identification and study of safety or safety education problem/issue. Specific proposal must be made to instructor before registration. May be repeated. Maximum 12 hours. Prereq: Consent of instructor.
441 Driver and Traffic Safety Education (3) Preparation of teachers of driver education in schools and col-
leges. Students are required to teach at least one non-driver. Valid driver's license required. 2 hours and 2 labs. E
442 Advanced Driver and Traffic Safety Education (3) Teaching driver education through use of simula-
tion, multimedia, and multiple driving range. Emphasis placed on teaching skills and supervision. 2 hours and 2 labs. Sp
443 Sports and Recreational Safety (3) Accident pre-
vention and injury control in sports activities; philosophy of sports safety; human environmental factors and interrelationship in sports injury control; risk-
taking and decision solution strategies; and contribu-
tions of sports medicine to safety. 3 hours and 2 labs. Sp
452 General Safety (3) Principles, practices, and pro-
cedures in general safety. Safety problems in school, traffic, recreation, industry, home, and other public areas. E
470 Special Topics (1-3) Study in selected discipli-
ary or professional areas of safety. May be repeated. Maximum 12 hours.

SOCIAL WORK
200 Introduction to Social Work (3) Emergence of the social work profession; professional mission; knowl-
edge, skills, and values; practice settings; client groups; helping services; career patterns; practice methods. Designed to assist students to consider their ability for careers in social work.
250 Social Welfare (3) Development, structure and function of the social welfare institution. Analysis of social welfare programs and impact of the institution on society.
310 Social Work Research (3) Scientific method and research strategies to evaluate one's practice and/or social service delivery. Knowledge of statistical tech-
niques required. Prereq: Sociology 392 or Psychology 385. Coreq: 380.
312 Social Work Practice I (3) Knowledge, values, and skills for entry-level generalist practice in a varie-
ty of settings. The social work problem solving process, different size client systems, ethical-sensitve assump-
tions, and the worker's role for person-environment configuration. Concurrent skills labora-
313 Social Work Practice II (3) In-depth study of generalist practice with individuals and families. Practi-
ce roles, value dilemmas, and working with people of diverse backgrounds. Concurrent skills laboratory. Prereq: Initial progression, 312. Coreq: 310 and 385.
314 Human Behavior and the Social Environment (3) Interrelatedness of biological, social, cultural, envi-
ronmental and psychological factors in human behavior. Person-in-environment over the life span with special attention to diversity, impact of racism, sexism, and other sociocultural factors. Integration of knowledge into a social work practice perspective. Prereq: Initial progression.
380 Field Practice in Social Work I (3) Eight-hour-
week, supervised field experience with practice situations for developing professional skills, values and attitudes. Concurrent seminar focuses on inte-
412 Social Work Practice III (3) Generalist practice with emphasis on groups and communities, including treatment theories, techniques, and issues. Prereq: Full progression. Coreq: 416 and 480.
450 Integrative Seminar (2) Social work content for entry-level professional practice and current issues influencing the profession. Includes development of a portfolio reflecting BSW competencies. Prereq: Full progression. Coreq: 481.
480-481 Field Practice in Social Work II, III (4,4) Six-
teen-hour-per-week supervised agency field practicum for integration of theory and practice and critical exam-
ination of oneself as a professional helping person. Concurrent field seminar on integration of knowledge with practice experiences. Prereq: Full progression.
491 Foreign Study (1-15) Prereq: Consent of instruc-
tor.
492 Off-Campus Study (1-15) Prereq: Consent of instruc-
tor.
493 Independent Study (1-15) Prereq: Consent of instruc-
tor.

SOCIOLOGY
100 General Sociology (3) Major concepts and theo-
retical approaches of the discipline and socialization, social organization, and social stratification.
110 Social Problems and Social Change (3) Increasingly acute and intense problems such as alcoholism, violence, crime, inequality, life-style preferences, and environmental abuse within the context of social change. Assessment of control strategies. May be taken instead of 100.
200 Sociological Analysis (3) Selected set of con-
temporary issues emphasizing theoretical and logical structure of the issues and development of data needed to enter into informed debate on the issues. Students are expected to develop their own analytical argu-
ments. Prereq: English 102 or consent of instructor.
220 Interpersonal Communication (3) (Same as Speech 220.)
232 Varieties of Religious Community (3) (Same as Religious Studies 232.)
291 Sport in American Society (3) (Same as Physical Edu-
cation 291.)
310 American Society (3) Institutional organization of contemporary American society with particular atten-
375 Gender in Society (3) Exploration of gender in society utilizing various sociological perspectives with special focus on the relationship between social structures, social roles, and gender identities. (Same as Women's Studies 375.)

380 Rural Sociology (3) (Same as Rural Sociology 380.)

400 Special Topics (3) Variable topics. Scope of subject matter determined by student and instructor with consent of department. Prereq: Determined by department. May be repeated. Maximum 6 hours.

405 Sociology of Sport (3) Social meaning, organization, and control of sport. Prereq: Permission of instructor. (Same as Physical Education 405.)

413 Formal Organization (3) Organizational models, typologies, and theories; hierarchies of authority; communication; interpersonal relations in work settings; organization change.

414 Organization of Medical Care (3) Organization of health care facilities, staff-patient relationships, demographic characteristics, and prevalence of disease.

415 Sociology of Aging (3) How roles and statuses change with age in relation to the major social institutions; the impact of a rapidly increasing number of older people have on society, the effect of society on older people.

446 The Modern World System (3) Critical examination of the causes of the world-system as a social system: its coherence, boundaries, regions, member groups, cleavages, and patterns of conflict. Analysis of who gets what, why, and how in the global political economy. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

451 Criminal Justice (3) A critical assessment of the criminal justice apparatus and its components. Brief examination of the police, with most of the emphasis on the criminal courts and institutions and programs such as the prison, probation, and parole. Analysis of their operation and impacts. Prior completion of 350 is recommended.

455 Society and Law (3) How laws and legal processes affect the social environment. Prereq: 212, 218 or equivalent. (Same as Legal Studies 212.)

459 Organizational and Corporate Crime (3) Crime and deviance committed by organizations. Case studies of corporate and organizational crime, the organizational dynamics of crime, and theories of corporate crime, and organized responses to this type of crime by governmental regulatory agencies.

462 Population (3) Demographic factors and social structure of population growth, migration, distribution, and composition; population policy.

464 Urban Ecology (3) The relation of humans to their urban environment with emphasis on conservation and the use of appropriate technology. (Same as Urban Studies 464.)

471 Sociolinguistics (3) (Same as English 471 and Linguistics 471.)

480 Diffusion of Agricultural Technology (3) (Same as Rural Sociology 480.)

491 Foreign Study (1-15) Prereq: Advance departmental approval of number of hours and topics. May be repeated. Maximum 15 hours.

492 Off-Campus Study (1-15) Prereq: Advance departmental approval of number of hours and topics. May be repeated. Maximum 15 hours.

493 Independent Study (1-15) Prereq: Permission of instructor. May be repeated. Maximum 6 hours. For elective credit only.

491 Foreign Study (1-15) Prereq: Advance departmental approval of number of hours and topics. May be repeated. Maximum 15 hours.

492 Off-Campus Study (1-15) Prereq: Advance departmental approval of number of hours and topics. May be repeated. Maximum 15 hours.

493 Independent Study (1-15) Prereq: Permission of instructor. May be repeated. Maximum 6 hours. For elective credit only.

210 Intermediate Spanish Transition (3) A thorough study of the fundamentals of Spanish language for those who have completed two or more years of high school but who will not take the ACT. Students are required to form critical appreciations of the topics addressed.

211-212 Intermediate Spanish (3,3) Reading, listening and speaking of Spanish to prepare for upper division courses in the language. Must be taken in sequence. Language Laboratory required. Prereq: 111-112 or equivalent.

217-218 Honors: Intermediate Spanish (3,3) Honors course for students of superior ability in Spanish. Incoming freshmen are admitted on the basis of a diagnostic test, high school average and performance on the ACT. Classes normally held to a maximum of 15 students. Students follow enriched program with continuing emphasis upon speaking ability and with an introduction to reading literary selections. Students earn 6 and 218 receive credit for 300. Prereq: 111-112 or equivalent.

291 Spanish Literature in English Translation (3) From the Golden Age, Don Quixote, the picaros novel, and St. John of the Cross, to the modern, Unamuno, Lorca, Ortega, and Cela. No foreign language or major credit. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

292 Spanish American Literature in English Translation (3) Contemporary Spanish American fiction such as Borges, Fuentes, Marquez, Asturias. No foreign language or major credit. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

300 Spanish Transition (3) Development of linguistic skills necessary for satisfactory work in courses above 300. Recommended for students who would benefit from additional training beyond 212 in the skills of speaking, reading and writing Spanish. Particular attention for preparation to read Hispanic literature and other advanced-level material.

311 Aspects of Spanish Literature (3) Introduction to Spanish literature, using selections from prose, drama, and poetry of the medieval, Golden Age and modern periods. Required of all majors. Prereq: 212, 218 or equivalent.

312 Aspects of Spanish American Literature (3) Introduction to the study of Spanish American literature, with emphasis on contemporary works. Genres may vary. Prereq: 212, 218 or equivalent. (Same as Latin American Studies 312.)

323-324 Intermediate Conversation and Composition (3,3) Designed to improve proficiency in oral and written communication in Spanish.

421 Phonetics (2) Prereq: 212, 218 or equivalent.

422 Advanced Grammar (3) Finer points of grammatical structures. Required of all majors. Native speakers must receive permission from the instructor to take this course. Prereq: 212, 218 or equivalent.

423-424 Advanced Conversation and Composition (3,3) Advanced conversation and written skills in Spanish for pre-professionals.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, Russian 425 and Linguistics 425.)

426 Methods of Historical Linguistics (3) (Same as French 426, German 426, Russian 426 and Linguistics 426.)

429 Romance Linguistics (3) (Same as French 429 and Linguistics 429.)
431 Spanish Civilization (3) Major social, political, and cultural achievements of the Spanish people from the origins of their civilization until today. Prereq: 311, 312 or equivalent. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

432 Cervantes (3) Emphasis upon selections from Don Quixote and study of the shorter Novelas ejemplares. Prereq: 311, 312 or equivalent.

433 Masterpieces of Spanish Literature (3) Selections from both the Golden Age and the modern period of works of all genres. Prereq: 311, 312 or equivalent.

435-436 Survey of Spanish Literature (3,3) 435-Spanish literature through the Golden Age. 436-Spanish literature since 1700. Prereq: 311, 312.

450 20th Century Hispanic Theatre (3) Emphasis on major 20th century Spanish American dramatists. Prereq: 311,312 or equivalent. (Same as Latin American Studies 450.)

459 C aptone Colloquium in Spanish (3) An integrative course. 474-Major literary movement, range of issues and topics that affect much of the Spanish-speaking world and also involve those who specialize in Hispanic Studies. Prereq: 311, 312 or equivalent. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

460 Capstone Tutorial in Spanish (1) Independent study project supervised closely by a faculty member. Prereq: Admission to Teacher Education Program. Spanish. Prereq: 311, 312 or equivalent. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

471 Latin American Civilization (3) Latin America's diverse heritage and major social and political institutions. Prereq: 311, 312 or equivalent. (Same as Latin American Studies 471.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

472 Masterpieces of Spanish American Literature (3) Selected works by major Spanish American writers such as Darío, Paz, Borges, Fuentes and others. Genres and periods may vary. Prereq: 311, 312 or equivalent. (Same as Latin American Studies 472.)

473-474 Survey of Spanish American Literature (3,3) 473-Historical survey from the Conquest to late 19th century. Prereq: 311, 312 or equivalent. (Same as Latin American Studies 473-474.)

479 Social Protest Literature of Latin America (3) Literature of social protest of Latin America. Prereq: 311, 312 or equivalent. (Same as Latin American Studies 479.)

480 Voice Disorders (3) (Same as Audiology and Speech Pathology 480.)

481 Policies, Procedures, and Practices in Special Education (3) Comprehensive review of Federal and State laws and regulations which direct implementation of special education programs in all public and private facilities and agencies. Offered only by permission of instructor. Prereq: Admission to Teacher Education Program. Sp

482 Speech and Language Services in the Schools (3) Organization and implementation of speech and language programs. Emphasis on the IEP process as it affects assessment, case-selection, and programming for students age 4-21. Procedures and materials, group intervention, and classroom consultation. Prereq: Admission to Teacher Education Program.

483 Clinical Practice in Communication Disorders in Schools (3) Supervised practice with children with communication disorders. Prereq: 482 and Audiology and Speech Pathology 433, 434 (80-100 clinical contact hours) and admission to Teacher Education Program.

484 Internship with Hearing Impaired Children (6) Supervised practicum with preschool, day school and residential students. Prereq: Admission to Teacher Education Program.

485 Student Teaching in Special Education (3-10) Intended for students in the four year program or equivalent. Not to be substituted for internship (Education Curriculum and Instruction 471, 472) and admission to Teacher Education Program, permission of Mentoring Team, and Enrollment Manual and Instruction 2501 (1). Satisfactory/No Credit only.

490 Field Experience with Moderately and Severely Handicapped Students (3) On-site teaching experience with children and youth. Prereq: Admission to Teacher Education Program. Coreq: 452. Sp

494 Introduction to Aural Rehabilitation (3) (Same as Audiology and Speech Pathology 494.)

SPEECH COMMUNICATION

100 Introduction to Speech Communication (3) Fundamental theories and practices with particular reference to interpersonal, group, organizational, and public communication.

200 Developing Speech Confidence (1) Principles and techniques for coping with apprehension about communicating. Recommended for students who are concurrently enrolled in 200 level speech courses and desire additional work in dealing with their anxiety about speaking.

210 Public Speaking (3) Preparation and delivery of informative and persuasive speeches. Topics include research, organization, adapting to an audience, topic selection, reasoning, and evaluating the discourse of others.

220 Interpersonal Communication (3) Process by which thoughts, feelings and actions are communicated and affected by the face-to-face communication situation. (Same as Sociology 220.)

240 Business and Professional Speaking (3) Basic principles of oral communication within organizations, including such topics as organizational/communication theory, group problem solving, formal presentations, and interviewing.

270 Argumentation and Debate (3) Reasoned decision-making using evidence, reasoning, constructing and refuting arguments.

271-272 Intercollegiate Forensics (1,1) Supervised work in tournament debate and individual events. Prereq: Consent of instructor.

280 Introduction to Oral Interpretation (3) Art of reading aloud; development of interpretive techniques and their application to selected passages of prose, poetry, and drama. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

300 Nonverbal Communication (3) An exploration of nonverbal communication from human communication perspective: origins and research, usage and coding of nonverbal behavior, research strategies, and theoretical approaches.

310 Persuasion (3) Principles which contribute to effective and ineffective persuasion. Topics include credibility, nonverbal variables, and tactics of persuasion.

320 Intercollegiate Communication Processes (3) Social dimensions of interpersonal communication and relationships. (Same as Sociology 320.)
330 Group Communication (3) Small group decision-making, evidence, argumentation, leadership, roles, and norms as they affect critical thinking in groups.

350 Communication Theory and Research (3) Survey of contemporary communication theories, their applications in society, and the process by which theories are created, tested, and changed.

360 Topics in Communication and Society (3) Content varies. Studies in social function of such communication forms as posters, speeches, songs, plays, demonstrations. May be repeated with consent of department. Maximum 6 hours.

370 Evidence and Argumentation (3) Concept of evidence in public controversies, uses and sources of evidence, and conditions affecting credibility.

371-372 Intercollegiate Forensics (1, 1) Continuation of 271-272. Prereq: Consent of instructor.

380 Oral Interpretation of Prose Literature (3) Individual oral interpretive techniques of fiction and nonfiction; ensemble interpretation including readers and chamber theatre forms. Prereq: 280 or consent of instructor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

385 Oral Interpretation of Poetry (3) Individual and group performances of poetry. Prereq: 280 or consent of instructor. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

400 Topics in Speech Communication (3) Variable content course affording opportunity to offer subject matter not covered in an existing course. Topics, scope of subject matter, and prerequisites to be determined by department. May be repeated. Maximum 6 hours. Major credit limited to 3 hours.

420 Communication and Conflict (3) Communication as a significant factor in the development, management, and resolution of conflict at the interpersonal, small group, organizational, or societal levels.

440 Organizational Communication (3) Organizational setting and those variables of the communication process that affect the quality of human interaction both within and outside the organization. May be repeated. Maximum 6 hours.

450 History of Rhetorical Theory (3) Western rhetorical theory from Plato to the present.

465 Studies in Rhetorical History and Criticism (3) May be repeated. Maximum 6 hours.

466 Rhetoric of the Women's Rights Movement (3) Historical and critical study of public address in campaign for women's rights from the 1830's to present. May be repeated. Maximum 6 hours.

460 Topics in Communication (3) Study of communication as a significant factor in the development, management, and resolution of conflict at the interpersonal, small group, organizational, or societal levels.


492 Off-Campus Study (1-15) Seedescription of major concentration.

493 Independent Study (1-15) Description of major concentration.


261 Computing for Data Management and Analysis (3) Use of computer operating system commands and packaged programs for managing data files and statistical analysis. Prereq: 251, Sp.

285 Writing for Business and Industry (3) Conceptual bases of business and professional writing. Process for communicating in business, industry, or government, culminating in a written and oral report. Prereq: of Department Undergraduate Affairs Committee. Satisfactory/No credit only.

312 Undergraduate Seminar (1) Directed readings and active participation in the Department's undergraduate seminar program. Prereq: Senior standing and consent of Chairperson of Statistics Department Undergraduate Affairs Committee. Satisfactory/No credit only. May be repeated. Maximum 6 hours.


400 Topics in Speech Communication (3) Variable content course affording opportunity to offer subject matter not covered in an existing course. Topics, scope of subject matter, and prerequisites to be determined by department. May be repeated. Maximum 6 hours. Major credit limited to 3 hours.

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352 Practicum in Industrial Education (1-3) Upgrading and
  upgrading experiences in non-traditional settings for
  technical teachers. May be repeated. Maximum of
  6 hours. Satisfactory/No Credit only. E

354 Job Analysis Techniques and Curriculum Development (3)
  Instructional materials development utilizing the
  techniques of job analysis. F

355 Microcomputer Applications in Technology (3) Use and
  application of microcomputers for educational and
  productivity training programs. F

356 Lab Organization, Management, Maintenance, and Safety (3)
  Principles of laboratory organization, maintenance, safety,
  and management in vocational and technical laboratories. Sp

361 Graphic Reproduction Processes (3) Principles of
  printing, duplicating, photography, and other forms of
  graphic communication; includes laboratory experi-
  ence in SLR camera applications, camera copy
  processing, layout, stripping, platemaking, and offset presswork. Prereq:
  Admission to Teacher Education Program. F

363 Applications of Integrated Electronics (3) Elec-
  trical circuit analysis and IC applications; including
  amplifiers, oscillators, and tuned circuits, oscilloscope
  and logic test equipment; understand and apply the
  basic principles and applications of digital elec-
  tronics through lecture and laboratory experiments
  and digital design techniques. Prereq: 363 or consent of instructor and
  admission to Teacher Education Program. F

365 Manufacture of Wood Products (3) Design and
  construction of case and carcass furniture and build-
  ings. Emphasizing use of wood as material. Prereq:
  186, Sp

366 Manufacturing Technology (3) Manufacturing sys-
  tem, including researching and developing products,
  preparing to produce, producing, marketing, and ser-
  vicing products. Prereq: 185, 186, and admission to
  Teacher Education Program. Sp

372 Job Analysis (3) Applied techniques of job analy-
  sis to determine job descriptions, training requirements,
  performance standards and sequence of training tech-
  nical personnel. F

373 Instructional Techniques in Industrial Education (3)
  Employment and evaluation of instructional tech-
  niques, and instructional strategies to technical and
  related subjects. F

374 Planning Instruction for Human Resource Develop-
  ment (3) Selection, design, and development of perform-
  ance-based training programs. Prereq: 372 or consent of instructor.

401 Utilization of Community Resources (3) Strate-
  gies of developing linkages between vocational education.
  and the private sector through advisory committees,
  councils and working partnerships. Development and
  management of public relations programs. Prereq: Three years of teaching experience. A

410 Pre-Student Teaching Seminar (1) Objectives and
  policies of the student teaching program. Must be
  completed the term immediately preceding stu-
  dent teaching. Prereq: Admission to Teacher Education Program. Satisfactory/No Credit only. F, Sp

413 Special Topics in Technological and Adult Edu-
  cation (3) Content to be assigned. May be repeated.
  Maximum 6 hours. E

414 Individual Study in Technological and Adult Edu-
  cation (3) Prereq: Consent of supervising instructor
  with approval form filed in the office of the depart-
  ment head. May be repeated. Maximum 6 hours. E

415 Coordination Techniques (3) Necessary procedures,
  duties and responsibilities to implement, maintain, and
  evaluate a successful cooperative education pro-
  gram. A

420 Introduction to Adult Education (3) Breadth of
  adult education programs and the diversity of adult
  clients, including opportunities for professional prac-
  tice apart from traditional instructional settings. A

421 Adult Education Program Design and Management (3)
  Processes of program identification and special
  application to adult training programs. F

422 Adult Development and Training (3) Application
  of adult development concepts to design and man-
  agement of training programs for adults. Sp

430 Principles and Organization of Business Marketing
  Education (3) Historical background and develop-
  ment of marketing education, coordination of voca-
  tional education in business and marketing, marketing
  curricula, establish, evaluating, and improving the programs. Prereq:
  Admission to Teacher Education Program. F

431 Word Processing and Office Technology (3) Word
  processing concepts and applications, methodology
  for teaching word processing and machines. Prereq:
  Advanced typewriting skill and permission of instruc-
  tor. Sp

432 Methods and Materials in Business and Marketing Education (3)
  teaching techniques, aids and evaluation
  in subject matter fields. Prereq: Admission to
  Teacher Education Program. Sp

433 Methods in Office Technology (3) Materials, meth-
  ods, evaluation procedures, and recent research in
  typewriting, shorthand, and other office procedures. F

434 Methods in Accounting and Data Processing (3)
  Methods, materials, evaluation procedures, and recent
  research in accounting and data processing. Auto-
  mated accounting is introduced. Prereq: Admission to
  Teacher Education Program. F

436 Supervised Occupational Experience (3) Practi-
  cal field experience in business and marketing
  settings under the supervision of practitioner and departmen-
  tal representative. May be repeated to a maximum of
  9 credits. E

439 Internship in Marketing (3) Marketing, personnel devel-
  opment, operations and management as these affect
  the instructional leadership program in marketing edu-
  cation. Sp

440 Special Topics in Business and Marketing Education (1-3)
  Topics to be assigned. May be repeat-
  ed. Maximum 9 hours. E

450 Seminar in Industrial Education (1-3) Current
  issues, innovations, problems, and other topics asso-
  ciated with technical programs. May be repeated.
  Maximum 6 hours. A

454 Training Aids Development (3) Study and prepa-
  ration of instructional aids and non-print media commonly
  used by technical instructors and trainers. F

455 Performance-Based Evaluation (3) Assessing
  the effectiveness of training through the development
  and implementation of performance evaluation instru-
  ments to determine job performance. Sp

456 Organization and Operation of VICA/HOSA (3)
  Planning, organizing and implementing youth-club activi-
  ties in vocational-technical programs. A

459 New Developments in Industrial Education (3)
  Development of significant problems and recent trends
  in industrial education presented by coordinating instruc-
  tor in conjunction with knowledgeable resource personnel. May be repeated. Maximum 6 hours. E

464 Methods and Mediation in Technology Educa-
  tion (3) Methods and media in teaching technology
  education in the secondary public schools. Prereq:
  Admission to Teacher Education Program. A

465 Materials and Processes (3) Materials relative to
  specification, testing, and methods to classify and
  categorize materials. Determining correct processes
  to match industrial product needs. Prereq: Consent
  of instructor.

466 Course Construction in Technology Education (3)
  Selection and implementation of instructional tech-
  niques, instructional objectives, project/product selection,
  assignments and evaluation. Prereq: Admission to
  Teacher Education Program. F

469 Plastic Technology (3) Characteristics and appli-
  cations of thermoplastic and thermosetting materials.
  Plastics production equipment related product design
  and processing of plastics. Prereq: 186 and admission to
  Teacher Education Program. A

470 Training for Human Resource Development (3)
  Organization and management of training, including
  roles and functions performed and the needs, costs,
  benefits, and productivity of training systems. F

471 Principles of Supervision (3) Problems of moti-
  vation, communication, interpersonal relationships and
  leadership in the workplace. E

473 Internship in Human Resource Development (5-10)
  Assessing, planning, implementing, and evaluat-
  ing the effectiveness of training programs in an industrial
  manufacturing/No Credit only. E

481 Student Teaching: Grades 7-12 and Adults (10)
  Full-time experience in classroom and laboratory teach-
  ing and related responsibilities under the direct
  supervision of a master teacher in the content area.
  Satisfactory/No Credit only. Prereq: Admission to
  Teacher Education Program. E

TEXTILES AND APPAREL

101 Apparel Construction (3) Garment construction
  focused on decision making and time management;
  pattern alterations, fitting and quality of construction.
  Not available for credit for departmental majors. F, Sp

120 Textiles I (3) Consumer-oriented textiles: fibers,
  fabrics, production, production processes, and their
  relation to use, serviceability and care of apparel and household fab-
  rics. E

230 Apparel Evaluation (3) Analysis of construction
  techniques to ascertain cost/quality relationships; ele-
  ments and principles of design in relation to garment
  construction. Prereq: 123. F

232 Design Analysis (3) Apparel design analysis based
  on flat pattern, draping and drafting techniques; com-
  parison of methods for style variations and costing of
  garments. Sp

310 Principles of Merchandising (3) Buying prac-
  tices, problems, procedures, activities, techniques, under-
  standing, standards and merchandising. Prereq:
  Accounting 201. F

320 Textiles II (3) Recent developments in fibers,
  fiber technology, yarn processing, yarn structure and
  fabric construction; dyeing, finishing and printing; tex-
  tile performance and evaluation; legislation and
  standards. Prereq: 120, Chemistry 100-110 or 120-
  130. F

330 Apparel Production (3) Industrial methods in gar-
  ment production; focus on stages of production, plant
  layout, costing and quality control. Prereq: 230. F

340 Cultural and Functional Aspects of Clothing (3)
  Cultural, socio-psychological, functional and techno-
  logical developments in textiles and apparel; integrative
  approach to apparel design. Prereq: Sociology 100. Sp

345 Fashion in History (3) Development of apparel
  styles in western civilization from middle ages to pre-
  sent; factors associated with origin, abandonment, and
  abandonment including historic, social and economic
  settings. F

350 Consumers in the Market (3) Consumer deci-
  sion-making and problems in the domestic and
  international marketplace; consumer issues and poli-
  cies, emphasis on consumer choice, information,
  consumer protection and current issues. Prereq:
  Economics 201. Sp

390 Introduction to Field Experience (1) Interviews,
  placement and planning for field experience. Prereq:
  Approved application for field experience. Sp

410 Retail Management (3) Retail sector of economy
  from management perspective; decision-making in retail
  operations; promotion, price, national issues and poli-
  cies, management of store layout,性感 and control,
  computer application, product mix-strategy. Prereq: 2 semesters Marketing. Sp

415 Fashion Promotion (3) Advertising and special
  purpose media used to promote fashion merchand-
  ise; evaluation of retail sales promotion activities. Sp

186 Courses of Instruction
40 Textile Microscopy and Physical Testing (3) Microscopic techniques applied to textile fibers, yarns and fabric. Standard methods and equipment used in physical testing. Prereq: 320. F

422 Textile Fiber Chemistry (3) Chemistry of textile fibers; emphasis on structure, preparation and reactions; implications relating to dyeing and finishing of fabrics. Prereq: Chemistry 350. Sp

450 Textile and Apparel Economics (3) Economics of the United States textile, apparel, and fiber industries; emphasis upon production, distribution, institutions, impact upon consumers, international and domestic markets. Prereq: Prereq: 350 or consent of instructor. Sp


492 Field Experience in Merchandising, Apparel or Textiles (8) Off-campus, cooperative program with business establishments which merchandise or manufacture textiles and/or apparel. Prereq: 390. Coreq: 490. F

493 Directed Study (1-3) Individual problems for Junior and Senior students with special interests in textiles, merchandising, or apparel. Prereq: Junior or Senior standing, consent of instructor. E

495 Special Topics (3) Topics in textiles, merchandising, and/or apparel. May be repeated. Maximum of 9 hours. Prereq: Junior or Senior standing, consent of instructor. E

497-498 Honors: Textiles and Apparel (3) Individual problems for Junior and Senior students showing special ability and interest in textiles and apparel. Prereq: Recommendation of Department Head. E

THEATRE

100 Introduction to Theatre (3) Understanding theatre: thought, philosophy, aesthetics, and production practices. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

210-211 Survey of World Drama (3,3) 210-Includes Greek, Roman, Medieval, Elizabethan, and Eastern forms of drama. 211-Covers 19th century, as well as realism through contemporary drama. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

220-221 Acting (3,3) 220-Improvisation, theatre games, acting skills. 221-Use of acting skills in extensive scene work. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

226 Voice and Diction (3) Voice production; attention to individual speech problems.

245 Basic Stage Costuming (3) Costume design and construction; basic theory and technique. Production participation required. Prereq: 100.

250 Introduction to Scenery Technology (3) Techniques of scenery and stage properties construction. Production participation required.

260 Fundamentals of Lighting and Sound Production (3) Survey of practical information on electricity, physics, psychology, and instrumentation as it relates to stage lighting and sound production. Emphasis on hands-on skills in labs. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

310-311 History of the Theatre (3,3) 310-Drama in performance with particular emphasis in theatre architecture, scene design, and acting styles Antiquity to Renaissance. 311-The European and modern theaters. 312-From its beginnings to 1900. 313-From 1900 to present. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

320 Advanced Acting (3) Special problems in contemporary roles. Prereq: 220-221 and consent of instructor.

340 Introduction to Costume Design (3) Development of research and rendering skills. Prereq: 245 or consent of instructor.

345 Costume Construction (3) Study and practice of skills in costume construction. Includes stitching, corsetry, millinery, and crafts. Production participation is required.

355 Introduction to Scenic Design (3) Introduction to art and craft of scenic design.


380 Theatre Practicum: Production (1-3) Supervised work on departmental productions. Available for credit only to theatre majors or with consent of department. Prereq: Consent of instructor. May be repeated. Maximum 3 hours.

381 Theatre Practicum: Performance (1-3) Supervised work on departmental productions. Available for credit only to theatre majors or with consent of department. Prereq: Consent of instructor. May be repeated. Maximum 3 hours.

401 Principles of Theatrical Design (3) Fundamental principles of scenic and stage properties relationships. Projects will be assigned to develop understanding and perception.

409 Stage Make-Up (2) Problems in make-up design and application, character analysis, physiognomy and chiaroscuro. Prereq: 100.

410 Dramatic Theory and Criticism (3) Theatre aesthetics from Aristotle to the present.

420 Special Studies in Acting (3) Content varies. Exercises in selected concentrated areas such as styles, techniques, approaches, e.g., Shakespearian, movement, humor. Prereq: 320.

426 Advanced Phonetics (3) Phonetic aspects of contemporary dialects of the English language. Prereq: Consent of instructor.

430 Principles of Play Directing (4) Problems in composition, picturization, rhythm, movement. Prereq: 220, 221 and consent of instructor.


445 Advanced Costume Construction (3) Advanced construction technique, such as tailoring, vacuum forming, plastic molding, and cobbling. Prereq: 345 or consent of instructor.

461 Special Effects in Lighting and Sound (4) Projects in lighting and sound coordination. May include opales, dance, musical theatre, and "rock videos." Final projects will be live productions. Emphasis on developing artistic sensitivity and subtleties in control. Prereq: 260.

461 Special Effects in Lighting and Sound (4) Projects in special effects including creative application of technology. Problem solving, drafting, and execution of effects, props, and sound product. Production participation required. Prereq: 260 or instructor's permission.

462 Advanced Lighting Design (3) Advanced problems in lighting design and theory including areas such as lighting musical theatre, opera, and dance. Prereq: 362 or consent of instructor.

463 Sound Design (3) Sound design for the performing arts. Review of equipment and acoustical factors that affect sound production. Sound designs will be picked from selected plays. Final projects will be mixed, edited, and cue for production.

465 Introduction to Lighting Design for Non-Designers (3) Theory and practice of stage lighting design with emphasis on the relationship between designers and non-design-practioners such as directors, actors, choreographers, architects, etc. Not open for option in lighting design.

470-471 Playwriting (3,3) Advanced instruction in the writing of plays. Prereq: Consent of instructor.

480 Theatre Practicum: Production (1-3) Continuation of 380. Prereq: Consent of Instructor. For theatre majors only. May be repeated. Maximum 3 hours.

481 Theatre Practicum: Performance (1-3) Continuation of 381. Prereq: Consent of Instructor. For theatre majors only. May be repeated. Maximum 3 hours.

491 Foreign Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)

UNIVERSITY HONORS

237, 337, 437 Honors: Concentration in the Humanities (3,3,3) Small group studies of selected topics, issues or problems with a concentration in the humanistic disciplines. Open to all students with a GPA of 3.25 or greater. Topics vary. May be repeated.

247, 347, 447 Honors: Concentration in the Social Sciences (3,3,3) Small group studies of selected topics, issues or problems with a concentration in the social sciences. Open to all students with a GPA of 3.25 or greater. Topics vary. May be repeated.

257, 357, 457 Honors: Concentration in the Natural and Applied Sciences (3,3,3) Small group studies of selected topics, issues or problems with a concentration in the natural and applied sciences. Open to all students with a GPA of 3.25 or greater. Topics vary. May be repeated.

338-348 Tennessee Scholars Seminar (1,1) Sequence limited to and required of all Tennessee Scholars each year. May be repeated. Maximum 8 hours. Satisfactory/No Credit grading only.

491 Honors: Foreign Study (3-15) Open to any undergraduate honors student. Proposals must be approved in advance. See the Director of University Honors for further information.

492 Honors: Off-Campus Study (3-15) Open to any undergraduate honors student. Proposals must be approved in advance. See the Director of University Honors for further information.

493 Honors: Independent Study (3-15) Open to any undergraduate honors student. Proposals must be approved in advance. See the Director of University Honors for further information.
UNIVERSITY STUDIES

401 Freshman University Seminar (3) Introduction to university education as an adventure in personal growth and professional development. A/B/C/D/NC grading. Open only to freshmen, transfer students, and re-entry students, or by permission of instructor.

210-220 Case Studies (4,4) Variable content using case studies and problem-solving approaches to explore interdisciplinary issues. Includes a one-hour learning laboratory. Open only to students enrolled in a University Learning Community.

310-320 Special Topics in University Studies (3,3) Interdisciplinary approaches to issues transcending the boundaries of a single discipline. Topics may be initiated by faculty or students through arrangements with the University Studies Program. Taught by faculty from throughout the University (often team-taught). Extensive use of films, field trips, student discussion. May be repeated. Maximum: 9 hours.

410-420 Advanced Topics in University Studies (3,3) Interdisciplinary research approaches to major issues transcending the boundaries of a single discipline. Topics may be initiated by faculty or students through arrangements with the University Studies Program. Taught by faculty from throughout the University (often team-taught). Extensive use of films, field trips, student discussion. May be repeated. Maximum: 9 hours.

URBAN STUDIES

200 Human-Environment Systems (3) (Same as Interior Design 200.)

250 Introduction to Urban Studies (3) Multidimensional nature of urban studies. Includes lectures by specialists presenting the approach of their disciplines to urban studies; application of general approaches to a specific issue; and collaborative teaching involving most faculty of Urban Studies.

321 Urban Politics and Process (3) (Same as Political Science 321.)

323 Behavioral Geography (3) (Same as Geography 323.)

350 Practicum in Urban Studies (3-4) Student and faculty member team, in conjunction with the East Tennessee Design Center, study a selected problem or aspect of the modern city.

401 The City in the United States (3) (Same as Planning 401.)

402 Survey of Planning (3) (Same as Planning 402.)

441 Urban Geography (3) (Same as Geography 441.)

450 Directed Field Work (3-15) Participant observation and directed field research. Project results are presented to Urban Studies students and faculty.

454 Cities and Urban American History (3) (Same as History 454.)

456 Senior Seminar (3) Variety of disciplines used to approach student selected problem. Prereq: 250, 350 and senior status. Credit may not be applied toward the Zoology major.

501-502 Independent Study (1-15) Registration by consent. May be repeated but one 1 credit hour may be applied toward Zoology major.

WILDFIRE AND FISHERIES SCIENCE

341 Law Enforcement and Public Relations (3) Fundamentals and general principles of local, state and federal laws and regulations governing natural resources and their management. Principles and practices of interacting with the public.

441 Wildlife and Fisheries Techniques (3) Capturing and handling fish and wildlife; population restoration; food habitat sampling; wildlife damage control; marking techniques; fish culture systems; management plans; track and sign identification. Prereq: Forestry, Wildlife, and Fisheries 317 or Biology 230. 2 hours and 1 lab.

443 Fisheries Science (3) Quantification and management of freshwater fisheries including population estimation, age and growth, biological assessment, and stocking. Prereq: Forestry, Wildlife and Fisheries 317 or Biology 230. 6 hours of mathematics. 2 hours and 1 lab.

447 Ecology and Management of Wild Birds (3) Biological and ecological characteristics of game birds, endangered birds, and bird pests. Current principles and practices of wild bird management. Prereq: Forestry, Wildlife and Fisheries 317 or Biology 320. 2 hours and 1 lab.

449 Ecology and Management of Wild Birds (3) Introduction to the study of women through literary genres (fiction, poetry, and drama), including works from diverse historical periods and cultures. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

220 Women in Society (3) Role played by women in various societies during different historical periods, factors which have limited women's participation in society, social scientists' assumptions about women.

230 Marriage and Family: Roles and Relationships (3) (Same as Child and Family Studies 220.)

310 Emergence of the Modern American Woman (3) Role of women in the development of American civilization and values. Major topics include women's legal and political status, the emergence and development of feminism, women and the creative arts, and women's roles in the 20th century American society. Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

234 Women in French Culture (3) (Same as French 324.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

330 Women in Music (3) (Same as Music History 330.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

332 Women in American Literature (3) (Same as English 332.)

340 Women, Politics, and the Law (3) An examination of recent changes in the laws affecting women and a study of the role of women in contemporary American politics.

360 Women in Cross-Cultural Perspective (3) A study of the changing role of women in various contemporary cultures; industrial democracies, developing nations, and communist countries. A team-taught course with guest lectures and slide presentations.

ZOOLOGY

117-118 Honors: Fundamentals of Zoology (4,4) For superior students in any field, open to students with a minimum ACT composite score of 27 or a minimum high school GPA of 3.2, or consent of instructor. Students not achieving at least a B in the first semester must complete the sequence with Biology 120. Must be taken in sequence. 117-Cellular processes, genetics, immunology, 118-Physiology, phylogeny, and ecology. 6 hours combined lecture and lab. May not receive credit for 117-118 and Biology 110-120 or Botany 110-120.

210-220 Human Biology (3,3) For non-majors; not available as prerequisite or major credit in Zoology or Biology. May be taken out of sequence. 210-Diversity of life forms, uniqueness of humans, cell biology, genetics, reproduction, prenatal development. 220-Human physiology and ecology.

320 Human Physiology (5) Fundamentals of human physiology, primarily from the perspective of cellular and organ system interactions. Credit may not be applied toward Zoology major. Prereq: One year of college chemistry. 4 hours and one lab.

400 Human Anatomy (3) Gross and microanatomy of the human body. Credit may not be applied toward Zoology major. Prereq: One year of introductory biology or Zoology 230 or equivalent. 2 hours and 1 lab.

375 Gender in Society (3) (Same as Sociology 375.)

380 The Concept of Woman (3) (Same as Philosophy 380.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

382 Philosophy of Feminism (3) (Same as Philosophy 382.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

383 Women in the Greek and Roman World (3) (Same as Classics 383.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

400 Topics in Women's Studies (3) Content varies. May be repeated.

410 Psychology of Sex Role Development (3)

422 Women Writers in England (3) (Same as English 422.)

425 Women's Health (3) (Same as Health 425.)

432 Women in European History (3) (Same as History 432.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

434 Psychology of Gender (3) (Same as Psychology 434.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

483 Afro-American Women in American Society (3) (Same as Afro-American Studies 483.)

493 Independent Study (1-15) Registration by consent of chair of Women's Studies.

ZOOLOGY

117-118 Honors: Fundamentals of Zoology (4,4) For superior students in any field, open to students with a minimum ACT composite score of 27 or a minimum college GPA of 3.2, or consent of instructor. Students not achieving at least a B in the first semester must complete the sequence with Biology 120. Must be taken in sequence. 117-Cellular processes, genetics, immunology, 118-Physiology, phylogeny, and ecology. 6 hours combined lecture and lab. May not receive credit for 117-118 and Biology 110-120 or Botany 110-120.

210-220 Human Biology (3,3) For non-majors; not available as prerequisite or major credit in Zoology or Biology. May be taken out of sequence. 210-Diversity of life forms, uniqueness of humans, cell biology, genetics, reproduction, prenatal development. 220-Human physiology and ecology.

320 Human Physiology (5) Fundamentals of human physiology, primarily from the perspective of cellular and organ system interactions. Credit may not be applied toward Zoology major. Prereq: One year of college chemistry. 4 hours and one lab.

400 Human Anatomy (3) Gross and microanatomy of the human body. Credit may not be applied toward Zoology major. Prereq: One year of introductory biology or Zoology 230 or equivalent. 2 hours and 1 lab.

375 Gender in Society (3) (Same as Sociology 375.)

380 The Concept of Woman (3) (Same as Philosophy 380.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

382 Philosophy of Feminism (3) (Same as Philosophy 382.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

383 Women in the Greek and Roman World (3) (Same as Classics 383.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

400 Topics in Women's Studies (3) Content varies. May be repeated.

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434 Psychology of Gender (3) (Same as Psychology 434.) Writing-emphasis course: at least one in-class essay examination and 3000 words of writing outside the classroom.

483 Afro-American Women in American Society (3) (Same as Afro-American Studies 483.)

493 Independent Study (1-15) Registration by consent of chair of Women's Studies.
310 Bioethics (3) Relationships between biological discoveries and human values. Open discussions of selected dilemmas arising from new knowledge about evolution of behavior, genetics, reproduction, medicine, and environment.

322 Physiology of Reproduction and Lactation (3) (Same as Animal Science 322.)


331 Animal Development and Embryology Laboratory (2) Coreq: 330. 2 labs.

350 Comparative Vertebrate Biology (4) Origins, phylogeny, diversity and functional anatomy of vertebrates. Laboratory involves dissection of shark, cat, and selected other vertebrates. 2 hours and 2 labs.

360 Comparative Invertebrate Biology (4) Origins, phylogeny and functional anatomy of invertebrates with emphasis on diversity of life forms and adaptations to specific local environments. 2 hours and 2 labs.

370 Ethology and Sociobiology (3) (Same as Psychology 370.)

380 General Entomology (3) Introduction to insects: basic structure, physiology, behavior, evolution and classification of insect orders. 2 hours and 1 lab.

400 Undergraduate Research (2) Research projects under supervision of faculty. Prereq: Junior or senior standing and prior consent of instructor. May be repeated. Maximum of 4 hours may be applied toward the Zoology major.

402 Practicum in Zoology (2) Participation in individualized practical applications of zoology in community, government, and industry. Prereq: Biology 210, 220, 230 and prior consent of instructor.

403 General Genetics Laboratory (2) Experiments designed to illustrate basic principles of inheritance; primary organism used is Drosophila. Prereq: Biology 210, 220, 230 and prior consent of instructor.

404 Cytological Technique (2) Practical experience with a variety of techniques including microscopy, embedding and sectioning, chromosome preparations, autoradiography, in situ hybridization, histochemistry, and immunofluorescence. Prereq: Biology 210, 2 labs.

405-406 Minicourse in Zoology (1) Selected advanced topics in zoology, concentrated in time and subject matter. Consult departmental listing for topics offered. Prereq: As announced. May be repeated for credit but a maximum of 3 hours may be applied toward the Zoology major.

409 Perspectives in Zoology (2) Critical analysis of selected readings in biology. Prereq: Senior standing. Writing-emphasis course: at least one in-class essay examination and 9000 words of writing outside the classroom.

410 Advanced Cell Biology (3) Molecular and supramolecular structure and functions of eukaryotic cells including regulatory mechanisms, physiology, behavior and cellular interactions. Prereq: Biology 210, 220. 2 hours and 1 lab.

415 Parasitology (3) Parasitic relationships: physiological, ecological, evolutionary and economic aspects. Prereq: Biology 230 or consent of instructor. 2 hours and 1 lab.

420 Cell and Tissue Structure and Function (4) Animal cells and tissues at light and electron microscope levels. Prereq: Biology 210. 2 hours and 2 labs.

430 Immunology (3) (Same as Microbiology 430.)

439 Immunology Laboratory (1) (Same as Microbiology 439.)


445 Comparative Animal Physiology (3) Comparison of diverse physiological mechanisms aiding in adaptation to particular habitats and lifestyles. Prereq: Biology 210, 230. 2 hours and 1 lab.

448 Laboratory in Physiology (2) Prereq or Coreq: 440 or 445.

450 Comparative Animal Behavior (3) Principles and methods of ethology with emphasis on ecological, developmental, physiological and evolutionary aspects. Coreq: 459. (Same as Psychology 450.)

459 Comparative Animal Behavior Laboratory (3) Introduction to observational and experimental research in ethology. Coreq: 450. (Same as Psychology 459.)

460 Evolution (3) Modern concepts of animal evolution. Prereq: Biology 220.

465 Human Genetics (3) Genetic and molecular principles and problems of human inheritance. Prereq: Biology 220.

470 Aquatic Ecology (3) Introduction to the physicochemical nature of inland waters with description of biotic communities and their interrelationships. Prereq: Chemistry 120-130 and Biology 230. 2 hours and 1 lab.

472 Arachnology (3) Biology of spiders, mites, scorpions and relatives. Prereq: 360 or 380. 2 hours and 1 lab.

473 Herpetology (3) Biology of amphibians and reptiles with emphasis on ecology and adaptive radiation. Prereq: Biology 230. 2 hours and 1 lab.

474 Ichthyology (3) Evolution, classification, collection and identification, distribution and biology of fishes with emphasis on freshwater fauna of Eastern North America. Prereq: Biology 230 or consent of instructor. 2 hours and 1 lab.

475 Ornithology (3) Behavior, ecology, populations, evolution and field identification of birds. Prereq: Biology 230 or equivalent. 2 hours and 1 lab.

476 Mammalogy (3) Evolution, classification, biogeography, ecology, behavior and functional anatomy of mammals. Prereq: Biology 230 or equivalent. 2 hours and 1 lab.

480 Physiology of Exercise (3) Functions of the body in muscular work: physiological aspects of fatigue, training and adaptation to the environment. Prereq: 230 or 440. 2 hours and 1 lab.

490 Comparative Endocrinology (3) Comparative analysis of physiology and morphology of endocrine glands in vertebrates and invertebrates, their role and interaction in maintenance of the organism and species. Prereq: 440 or equivalent.

491 Independent Study (1-15)

492 Off-Campus Study (1-15)

493 Independent Study (1-15)
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